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Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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Carpal tunnel syndrome, carpal tunnel release, return to work, advice, sickness absence, cohort study

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1
2
3 **TITLE**
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5 Sickness absence after carpal tunnel release: a multi-centre prospective cohort study
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7

8 **ABSTRACT**
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10 **Objectives:** To describe when patients return to different types of work after elective carpal
11 tunnel release (CTR) surgery and identify the factors associated with the duration of sickness
12 absence.
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19 **Design:** Multi-centre prospective observational cohort study.
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21

22 **Setting and participants:** Participants were recruited pre-operatively from 16 UK centres and
23 clinical, occupational and demographic information were collected. Participants completed a
24 weekly diary and questionnaires at four and 12 weeks post-operatively.
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31 **Outcomes:** The main outcome was duration of work absence from date of surgery to date of
32 first return to work.
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36
37 **Results:** 254 participants were enrolled in the study and 201 provided follow-up data. Median
38 duration of sickness absence was 20 days (range 1-99). Earlier return to work was associated
39 with having surgery in primary care and a self-reported work role involving more than four
40 hours of daily computer use. Being female and entitlement to more than a month of paid sick
41 leave were both associated with longer work absences. Duration of work absence was strongly
42 associated with the expected duration of leave, as reported by participants before surgery.
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Earlier return to work was not associated with poorer clinical outcomes reported 12 weeks
after CTR.

Conclusions: There was wide variation in the duration of work absence after CTR across all
occupational categories. A combination of occupational, demographic and clinical factors was

1
2 associated with the duration of work absence, illustrating the complexity of return to work
3
4 decision-making. However, pre-operative expectations were strongly associated with the
5
6 actual duration of leave. We found no evidence that earlier RTW was harmful. Clear, consistent
7
8 advice from clinicians pre-operatively setting expectations of a prompt return to work could
9
10 reduce unnecessary sickness absence after CTR. To enable this, clinicians need evidence-
11
12 informed guidance about appropriate timescales for the safe return to different types of work.
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20 **STRENGTHS AND LIMITATIONS OF THIS STUDY**

- 21 - This multi-centre, prospective study with a large sample size provides robust evidence to
22 understand return to work issues after carpal tunnel release surgery.
23
- 24 - Participants were recruited from primary care, secondary care and private practice sites,
25 representing the breadth of locations where carpal tunnel release is performed in the UK.
26
- 27 - Work absence was the primary outcome and a clear definition was used for its duration
28 with data collected contemporaneously to limit recall bias.
29
- 30 - A standardised method was used to categorise occupations and measure occupational
31 exposures, although this relied on job title, which may not be a true reflection of actual
32 occupational activity.
33
- 34 - All participants underwent open carpal tunnel release, however the method of carpal
35 tunnel syndrome diagnosis was not independently verified and different case definitions
36 for carpal tunnel syndrome may have been included.
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INTRODUCTION

Carpal tunnel syndrome (CTS) occurs when the median nerve becomes compressed within the carpal tunnel at the wrist. Typical sensory symptoms include pain, paraesthesia and/or numbness in the thumb, index, middle and radial half of the ring finger; and motor symptoms include progressive wasting of the thenar muscles. CTS is often associated with marked functional difficulty[1] and treatment is targeted at reducing the median nerve compression by splinting, corticosteroid injection or carpal tunnel release (CTR) surgery[2, 3].

Recent estimates suggest that more than 90,000 CTR procedures will be performed annually in the English NHS by 2025[4], and as the peak incidence for CTS falls within the working lifetime[5], many of these patients will need to return to work after their CTR. However, there is currently no evidence on which to base recommendations about when it might be safe to return to functional activities, including work, after carpal tunnel release (CTR). Our previous survey of UK hand surgeons, primary care surgeons and hand therapists found that clinicians recommended a wide range of times to return to three specified job roles after CTR: 0-30 days for desk-based work (e.g. keyboard, mouse, writing and telephone); 1-56 days for repetitive light manual work (driving, delivery, stacking); and 1-90 days for heavy manual work (e.g. construction)[6]. However, there has not previously been a prospective study of CTR patients in the UK in which time to return to work was the primary outcome. Therefore, it is not known when UK patients return to different occupational activities after CTR or what influences the duration of work absence. It is also unclear whether earlier return to work has a detrimental effect on post-operative clinical outcomes. Possible consequences of returning to work too soon after CTR include wound dehiscence, infection, and delayed healing. Conversely, delayed return to work may increase the risk of progression to long-term sick leave[7] and produce a financial burden for the individual, employer or state.

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5 A systematic review of the prognostic factors associated with return to work after CTR
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7 identified 11 studies which evaluated more than 90 potential prognostic factors[8]. Longer
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9 durations of work absence after CTR were found to be associated with: receipt of workers'
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11 compensation[9]; manual work[10-12]; longer expected durations of work absence[10]; being
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13 on sick leave before CTR surgery[13]; self-blame for the hand problem[13]; and beliefs that the
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15 symptoms were caused by work[12].
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22 Much of the existing research has been conducted at single sites and involved small numbers
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24 of participants. Furthermore, very few studies have specifically explored the influence of a
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26 range of occupational factors. The current multi-centre prospective cohort study was designed
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28 to explore when patients returned to different types of work after CTR and the demographic,
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30 clinical and occupational factors associated with duration of work absence. We also
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32 investigated whether earlier return to work was associated with poorer clinical outcomes
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34 assessed at 12 weeks after CTR.
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41 **METHODS**

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43 This was a prospective cohort study and a convenience sample of participants were recruited
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45 from 16 sites in England and Wales between March 2017 and August 2018. Recruitment took
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47 place before CTR surgery, either at the time of listing for surgery, during pre-operative
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49 screening, or on the day of surgery. At each site, the patient CTR pathway and treatment was
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51 carried out as usual. Sites were NHS secondary care (hospital setting), NHS primary care and
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53 private hand surgery facilities, representing the range of UK healthcare facilities where CTR is
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55 performed. Eligibility criteria are shown in Table 1. Baseline demographic, general health and
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57 occupational information was collected via self-completed questionnaire at the time of
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1
2 recruitment. The questionnaire also included standardised measures of CTS symptoms[14-16]
3
4 and hand function[17]. Questionnaire content was informed by the clinical, demographic and
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6 occupational factors previously shown to be associated with the duration of work absence
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8 after CTR[8].
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14 **TABLE 1. Study eligibility criteria**

15 **Self-selected by potential participants**

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18 1. Aged over 18 and referred for carpal tunnel release surgery
19 2. Routinely work in paid employment for at least 20 hours per week
20 3. Plan to return to work after carpal tunnel release surgery
21 4. Have not previously had carpal tunnel release surgery on either hand
22 5. Have not previously had a serious injury to the same wrist/hand
23
24

25 **Assessed by recruiting clinician**

- 26 1. No planned surgical procedures for conditions other than carpal
27 tunnel syndrome
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34 Follow-up questionnaires were completed four and 12 weeks after CTR and collected
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36 information about return to work, work functioning, scar symptoms, CTS symptoms, and hand
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38 function. Study questionnaires are provided as supplementary files 1-2. Participants were also
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40 asked to complete a short weekly diary from the day after surgery until return to work,
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42 detailing whether they had returned to work that week, and if so, the date of return.
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48 Surgical information was collected from the medical records by a member of the participant's
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50 clinical team. This included: date of CTR, operated hand(s), nature of anaesthetic, incision size,
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52 additional procedures, unexpected findings and suture material. Date, side of CTR and
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54 anaesthetic (general/local) were also reported by participants for cross-checking.
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Public and patient involvement

This research was supported by a patient advisory group consisting of six individuals who had previously undergone CTR at different UK sites. Study questionnaires were developed in collaboration with the patient advisors and these individuals also provided their feedback on the preliminary findings.

Statistical methods

Comparisons were made between those who dropped out of the study before providing any follow-up data and those in the final study sample using pre-specified demographic, clinical and occupational variables (Table 2). Categorical variables were assessed using Chi² test, continuous variables were plotted and assessed using *t*-test if they were normally distributed or Wilcoxon rank-sum test if the distribution was skewed. There was no imputation for missing data.

Manual and non-manual work was coded from job title and industry using the UK Standard Occupational Classification[18, 19]. Return to work time was calculated from the date of surgery to the date of first return to work (as reported by participants).

A Cox proportional hazards model was used to explore the factors associated with return to work time. Baseline and operative variables were assessed in univariate analyses and those which were significant ($p < 0.05$) were included as covariates in the final model. All regression analyses were adjusted for age and sex.

Participants were defined as having a poor outcome if they reported one or more of the following: global rating of change score of “worse”, “unchanged” or “slightly improved” (12

1
2 weeks after CTR)[20]; scar symptoms described as “unbearable”, “very troublesome” or “fairly
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4
5 troublesome” (12 weeks after CTR); use of antibiotics for an incision site infection after
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7 returning to work; and additional sick-leave related to the CTR after returning to work. The
8
9 duration of work absence for those with/without poor outcomes were compared using
10
11 Wilcoxon rank-sum test. In addition, participants were dichotomised to those who returned to
12
13 work within/after seven, 14 and 28 days of surgery and the prevalence rates of poor outcomes
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15 were compared using Chi² for each time period. These time points were based on the median
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17 clinician-recommended return to work time that we reported previously[6].
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25 RESULTS

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27 A total of 254 individuals completed the baseline questionnaire and 201 (79%) provided follow-
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29 up data. Participant numbers and loss to follow-up for each study component are shown in
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31 Figure 1. Participant demographics and comparisons between those who remained in the
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33 study and those who dropped out before follow-up are shown in Table 2.
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39 Figure 1. Participant numbers for each stage of the cohort study

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45 **TABLE 2. Participant demographics assessed at baseline in comparison with those lost to**
46 **follow-up**

| | Study participants n=201 (%) | Lost to follow-up n=53 (%) | P-value |
|--------------------------------------|---------------------------------|-------------------------------|---------|
| Mean age in years (SD) | 52.0 (9.16) | 44.4 (9.55) | <0.001 |
| Sex | | | |
| Male | 76 (37.8) | 20 (37.7) | 0.99 |
| Female | 125 (62.2) | 33 (62.3) | |
| Body mass index (kg/m ²) | | | |
| Normal (18.5-24.9) | 48 (23.9) | 9 (17.0) | 0.51 |
| Overweight (25-29.9) | 66 (32.8) | 16 (30.2) | |
| Obese (≥30) | 73 (36.3) | 22 (41.5) | |

| | | | |
|---|--------------|--------------|------------------|
| <i>Smoking status</i> | | | |
| Never smoked | 109 (54.2) | 26 (49.1) | 0.58 |
| Current/ex-smoker | 90 (44.8) | 27 (50.9) | |
| <i>General health</i> | | | |
| Excellent/very good/good | 174 (86.6) | 42 (79.3) | 0.32 |
| Fair/poor | 26 (12.9) | 11 (20.8) | |
| <i>Number of comorbidities</i> | | | |
| None | 54 (26.9) | 21 (39.6) | 0.15 |
| One | 70 (34.8) | 13 (24.5) | |
| Two or more | 77 (38.3) | 19 (35.9) | |
| <i>Number of disabling comorbidities</i> | | | |
| None | 138 (68.7) | 35 (66.0) | 0.46 |
| One | 41 (20.4) | 9 (17.0) | |
| Two or more | 22 (11.0) | 9 (17.0) | |
| Mean SF-36 mental health score (SD) ^a | 65.6 (17.20) | 60.3 (20.41) | 0.03 |
| Mean bilateral CTS-6 score (SD) ^b | 2.8 (0.77) | 3.0 (0.73) | 0.95 |
| Mean MHQ bilateral activities of daily living score (SD) ^c | 68.8 (23.64) | 55.7 (28.62) | <0.001 |
| Mean MHQ work function score (SD) ^c | 66.1 (22.26) | 60.6 (22.61) | 0.06 |
| <i>Type of job contract</i> | | | |
| Employed (permanent contract) | 164 (81.6) | 37 (69.8) | 0.23 |
| Self-employed | 31 (15.4) | 13 (24.5) | |
| Employed (temporary or zero hours contract) | 5 (2.5) | 3 (5.7) | |
| <i>Type of work ^d</i> | | | |
| Manual | 77 (39) | 31 (58) | 0.01 |
| Non-manual | 123 (61) | 22 (42) | |
| Median level of job demand on hands/wrists (IQR) ^e | 9 (7-10) | 10 (7-10) | 0.15 |
| <i>Job satisfaction</i> | | | |
| Very satisfied | 87 (43.3) | 24 (45.3) | 0.90 |
| Satisfied/fairly satisfied | 92 (45.8) | 24 (45.3) | |
| Dissatisfied/very dissatisfied | 20 (10.0) | 5 (9.4) | |
| Median expected work absence in days (IQR) | 14 (7-28) | 14 (5-21) | 0.46 |
| <i>Expected availability of sick pay</i> | | | |
| ≤1 month | 50 (24.9) | 21 (39.6) | 0.001 |
| >1 month | 94 (46.8) | 11 (20.8) | |
| Unsure | 57 (28.4) | 21 (39.6) | |
| <i>Study site ^f</i> | | | |
| NHS primary care | 73 (36.3) | 13 (24.5) | 0.27 |
| NHS Secondary care | 101 (50.3) | 32 (60.4) | |
| Private hand surgery facilities | 27 (13.4) | 8 (15.1) | |

^a. SF-36 mental health score ranges from 0-100, higher scores indicate better mental health[21].

^b. CTS-6 symptom score ranges from 1-5, higher scores indicate more severe symptoms[14].

^c. Michigan Hand Questionnaire ranges from 0-100, higher scores indicate better functioning[17].

^d. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

^e. Job demand scale range 0-10, 10 indicating very demanding on hands/wrists[13].

^f. Location where the carpal tunnel release surgery was performed. Surgery in primary care was performed by General Practitioners who had completed additional training.

Eighty-six participants (43%) were recruited pre-operatively on the day of their CTR. For the remaining 115 participants, the median time between recruitment and CTR was 14 days (interquartile range [IQR] 5-40). The first follow-up questionnaire was completed a median of 32 days after CTR (IQR 29-38) and the final questionnaire was completed a median of 92 days after CTR (IQR 86-105). All participants underwent open CTR as a day case, and all but two had unilateral surgery. Another two participants required median nerve neurolysis, and one participant was noted to have a vascular abnormality. Sixty-two percent of participants (n=125) were expecting to have a CTR for their other hand in the future. Other baseline demographic and surgical factors are shown in Table 3.

TABLE 3. Participant demographic and surgical factors

| | Number of participants n=201 (%) |
|--------------------------------------|-------------------------------------|
| <i>Age (years)</i> | |
| 26-40 | 23 (11.4) |
| 41-55 | 101 (50.3) |
| ≥ 55 | 77 (38.3) |
| <i>Hand dominance</i> | |
| Right | 178 (88.6) |
| Left | 18 (9.0) |
| Ambidextrous | 5 (2.5) |
| <i>Side of surgery^a</i> | |
| Dominant hand | 134 (66.7) |
| Non-dominant hand | 65 (32.3) |
| Bilateral surgery | 2 (1.0) |
| <i>Surgical speciality and grade</i> | |
| Consultant (plastics/orthopaedics) | 64 (31.8) |
| Registrar (plastics/orthopaedics) | 33 (16.4) |
| General practitioner | 62 (30.9) |
| Not reported | 42 (20.9) |
| <i>Incision type^b</i> | |
| Mini open incision | 129 (64.2) |
| Traditional incision | 2 (1.0) |
| Not reported | 70 (34.8) |
| <i>Suture material</i> | |
| Absorbable | 24 (11.9) |
| Non-absorbable | 126 (62.7) |
| Not reported | 51 (24.4) |

^a. Considered as the non-dominant hand for those who reported ambidexterity.

^b. Mini open incision defined as distal to the distal wrist crease and traditional open excision extending proximally.

1
2 The majority of participants (62%) worked five days per week (range 2-7) and the median
3
4 number of weekly paid work hours was 37.5 (IQR 31-45). Two participants (1%) did not return
5
6 to work during the 12-week study period: one reported that they had been made redundant
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8 and the other that their job was no longer available. Four participants (2%) had incomplete
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10 data (missing return to work date or CTR date) meaning that the duration of work absence
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12 could not be calculated. These six individuals were not included in the analyses of return to
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14 work time, leaving a total sample size of 195. An additional five participants reported that they
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16 had not returned to work, but planned to do so in the future. These individuals were included
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18 in the return to work analysis, censored to the time of last follow-up.
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27 The median duration of work absence after CTR was 20 days (IQR 12-33). Manual workers took
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29 longer to return than non-manual workers: 23.5 days (IQR 14-41) compared with 18 days (IQR
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31 9-31). Those who were self-employed returned to work earlier than those who were
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33 employed: 13 days (IQR 6-19) compared with 22 days (IQR 14-38). Return to work times are
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35 shown in Figure 2. The majority of participants returned to work on a Monday (43%).
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37 Approximately 15% returned each day between Tuesday-Thursday, then ~5% returned each
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39 day from Friday-Sunday. More than half of participants (59%) reported that they needed to
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41 modify their work duties to some extent when they first returned to work. Of these, 62% had
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43 resumed full duties within five weeks.
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51 Univariate analyses of the relationship between baseline factors and the duration of work
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53 absence found 17 factors (age- and sex-adjusted) that were significantly associated with time
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55 to return to work and were entered into the multivariate model, in which five factors remained
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57 significant (Table 4). Sensitivity analyses confirmed that these factors were independently
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59 significant in the model with no collinearity. Non-significant findings in the univariate analyses
60

1
2 are provided in supplementary file 3. Having surgery in primary care and having a job with
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4 more than four hours of daily computer use were both associated with earlier return to work
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6 than their respective reference categories. Being female and having access to more than a
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8 month of paid sick leave were both associated with longer durations of work absence than
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10 their respected reference categories. Compared to those who expected to return within a
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12 week, there was a sequential increase in the likelihood of longer durations of work absence for
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14 those expecting to return between 7-14 days, 15-30 days and >30 days (Table 4), which
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16 showed a significant gradient effect ($p<0.001$).
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TABLE 4. Cox proportional hazards analyses of the association between baseline demographic, clinical and occupational factors and the duration of work absence after carpal tunnel release

| | Univariable analyses | | | | | | Multivariable analysis | | |
|--|----------------------|----------------------------|----------------------|---------------|--------------------------|---------|------------------------|--------------------------|------------------|
| | N | Median work absence (days) | Inter quartile range | Hazards ratio | 95% Confidence intervals | P value | Hazard s ratio | 95% Confidence intervals | P value |
| <i>Sex</i> | | | | | | | | | |
| Male | 72 | 17.5 | 8-31 | 1 | - | - | 1 | - | - |
| Female | 118 | 21.5 | 14-35 | 0.79 | 0.59, 1.06 | 0.12 | 0.56 | 0.36, 0.88 | 0.01 |
| <i>Age in years</i> | | | | | | | | | |
| 26-40 | 21 | 20 | 15-30 | 1.01 | 0.63, 1.63 | 0.96 | 1.44 | 0.82, 2.55 | 0.21 |
| 41-55 | 94 | 20 | 9-33 | 1 | - | - | 1 | - | - |
| >55 | 75 | 17 | 12-35 | 1.03 | 0.76, 1.40 | 0.83 | 1.15 | 0.80, 1.65 | 0.44 |
| <i>Smoking status</i> | | | | | | | | | |
| Never | 105 | 16 | 12-31 | 1 | - | - | 1 | - | - |
| Current/ex | 83 | 23 | 13-41 | 0.74 | 0.56, 1.00 | 0.046 | 0.75 | 0.51, 1.09 | 0.13 |
| <i>Site</i> | | | | | | | | | |
| NHS Primary care | 72 | 19.5 | 13-33 | 1.18 | 0.87, 1.62 | 0.29 | 1.54 | 1.05, 2.25 | 0.03 |
| NHS Secondary care | 92 | 20 | 12-39.5 | 1 | - | - | 1 | - | - |
| Private facilities | 26 | 20 | 7-28 | 1.63 | 1.04, 2.54 | 0.03 | 1.46 | 0.87, 2.44 | 0.15 |
| <i>Afraid of long-term hand problems^a</i> | | | | | | | | | |
| No | 105 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| Yes | 82 | 20.5 | 13-42 | 0.69 | 0.51, 0.93 | 0.01 | 0.93 | 0.67, 1.30 | 0.68 |
| <i>CTS-6 score for side of surgery (tertiles)^b</i> | | | | | | | | | |
| Good (1-3.0) | 65 | 16 | 10-27 | 1 | - | - | 1 | - | - |
| Intermediate (3.2-3.8) | 58 | 21.5 | 14-35 | 0.77 | 0.54, 1.10 | 0.15 | 1.19 | 0.77, 1.84 | 0.44 |
| Poor (8.8-5) | 59 | 24 | 13-41 | 0.67 | 0.47, 0.97 | 0.03 | 1.04 | 0.65, 1.66 | 0.87 |
| <i>Type of work contract</i> | | | | | | | | | |
| Employed (permanent) | 154 | 22 | 14-38 | 1 | - | - | 1 | - | - |
| Self-employed | 30 | 13 | 6-19 | 1.72 | 1.13, 2.61 | 0.01 | 1.19 | 0.67, 2.14 | 0.55 |
| Zero hours/temporary | 5 | 12 | 3-31 | 2.01 | 0.81, 5.00 | 0.13 | 0.73 | 0.25, 2.14 | 0.56 |
| <i>Duration of available sick pay</i> | | | | | | | | | |
| ≤1 month | 49 | 16 | 12-29 | 1 | - | - | 1 | - | - |
| >1 month | 88 | 27 | 15-42 | 0.59 | 0.41, 0.85 | 0.004 | 0.46 | 0.28, 0.76 | 0.002 |
| Unsure | 53 | 16 | 10-23 | 1.19 | 0.80, 1.77 | 0.40 | 1.01 | 0.61, 1.66 | 0.97 |
| <i>Access to occupational health at work</i> | | | | | | | | | |
| No | 110 | 15.5 | 9-29 | 1.77 | 1.31, 2.38 | <0.001 | 1.42 | 0.91, 2.19 | 0.12 |
| Yes | 79 | 25 | 16-42 | 1 | - | - | 1 | - | - |
| <i>Expected duration of leave after carpal tunnel release (days)</i> | | | | | | | | | |
| <7 | 35 | 4 | 2-12 | 1 | - | - | 1 | - | - |
| 7-14 | 75 | 16 | 13-26 | 0.23 | 0.15, 0.36 | <0.001 | 0.27 | 0.16, 0.45 | <0.001 |
| 15-29 | 35 | 29 | 22-39 | 0.12 | 0.07, 0.19 | <0.001 | 0.19 | 0.10, 0.37 | <0.001 |
| ≥30 | 45 | 42 | 21-44 | 0.08 | 0.05, 0.14 | <0.001 | 0.12 | 0.06, 0.23 | <0.001 |
| <i>MHQ work functioning score (tertiles)^c</i> | | | | | | | | | |
| Poor (0-55) | 67 | 20 | 13-35 | 0.68 | 0.47, 0.98 | 0.04 | 0.83 | 0.50, 1.40 | 0.49 |
| Intermediate (60-80) | 72 | 21 | 12.5-39.5 | 0.77 | 0.53, 1.10 | 0.15 | 0.81 | 0.50, 1.31 | 0.39 |
| Good (81-100) | 51 | 17 | 10-29 | 1 | - | - | 1 | - | - |
| <i>Job satisfaction^d</i> | | | | | | | | | |
| Satisfied | 169 | 19 | 11-31 | 1 | - | - | 1 | - | - |
| Dissatisfied | 19 | 38 | 21-43 | 0.61 | 0.38, 0.99 | 0.04 | 0.67 | 0.38, 1.16 | 0.15 |
| <i>Believe that the hand problem was caused by work^e</i> | | | | | | | | | |
| No | 112 | 19 | 13-31 | 1 | - | - | 1 | - | - |
| Agree/strongly agree | 76 | 23 | 10-42 | 0.62 | 0.46, 0.85 | 0.003 | 0.82 | 0.57, 1.17 | 0.28 |
| <i>Job is demanding on hands/wrists^a</i> | | | | | | | | | |
| No | 35 | 16 | 6-27 | 1 | - | - | 1 | - | - |

| | | | | | | | | | | |
|----|---|-----|------|----------|------|------------|--------|------|------------|-------------|
| 1 | | | | | | | | | | |
| 2 | Yes | 155 | 20 | 13-38 | 0.61 | 0.42, 0.89 | 0.01 | 0.68 | 0.42, 1.12 | 0.13 |
| 3 | <i>Type of work^f</i> | | | | | | | | | |
| 4 | Non-manual | 119 | 18 | 9-31 | 1 | - | - | 1 | - | - |
| 5 | Manual | 70 | 23.5 | 14-41 | 0.66 | 0.48, 0.89 | 0.01 | 0.97 | 0.57, 1.64 | 0.90 |
| 6 | <i>Work involves target-driven pay^g</i> | | | | | | | | | |
| 7 | No | 149 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| 8 | Yes | 31 | 22 | 13-45 | 0.61 | 0.41, 0.91 | 0.02 | 0.97 | 0.59, 1.61 | 0.91 |
| 9 | <i>Duration of computer use at work (hours)^g</i> | | | | | | | | | |
| 10 | <1 | 69 | 28 | 17-42 | 1 | - | - | 1 | - | - |
| 11 | >1 to <4 | 33 | 16 | 10-31 | 2.20 | 1.43, 3.38 | <0.001 | 1.01 | 0.56, 1.81 | 0.98 |
| 12 | ≥4 | 84 | 16 | 7-27 | 2.38 | 1.67, 3.38 | <0.001 | 1.85 | 1.08, 3.16 | 0.03 |
| 13 | <i>Work involves lifting or carrying ≥10 kg^g</i> | | | | | | | | | |
| 14 | No | 108 | 18.5 | 11-30 | 1 | - | - | 1 | - | - |
| 15 | Yes | 77 | 24 | 13-40 | 0.61 | 0.42, 0.86 | 0.01 | 0.80 | 0.48, 1.33 | 0.39 |
| 16 | <i>Work involves pushing/pulling a heavy weight^g</i> | | | | | | | | | |
| 17 | No | 104 | 16 | 8.5-28.5 | 1 | - | - | 1 | - | - |
| 18 | Yes | 83 | 26 | 16-42 | 0.51 | 0.37, 0.70 | <0.001 | 0.97 | 0.61, 1.55 | 0.90 |
| 19 | | | | | | | | | | |

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21 Total sample size n=195. All analyses were adjusted for age and sex. All significant variables in the univariate analyses
 22 (p<0.05) were entered into the multivariable model.

23 ^a. Reported on a 0-10 scale, dichotomised to no (0-6) and yes (7-10)[13].

24 ^b. CTS-6 score [14] with data driven tertiles.

25 ^c. Michigan Hand Questionnaire work performance subscale scored from 0-100, higher scores indicate better
 26 perceived work performance[17]. Data driven tertiles.

27 ^d. Reported on a 5-point scale, dichotomised to satisfied (very satisfied/satisfied/fairly satisfied) and dissatisfied
 28 (dissatisfied/very dissatisfied).

29 ^e. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor
 30 disagree/disagree/disagree strongly[22].

31 ^f. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

32 ^g. As part of the normal working day[23].

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Clinical outcomes after CTR are shown in Table 5. Using the definition outlined in the methods, a total of 46 participants (24%) were identified as having at least one poor outcome (CTS symptoms that were worse, unchanged or only slightly better; scar symptoms that were at least fairly troublesome; required post-operative antibiotics or had additional time off work after first return). Of these participants, the majority (n=38, 83%) reported only a single component of poor outcome. Three individuals defined as having a poor outcome had not returned to work at the point of last follow-up (as compared with two individuals in the rest of the study sample). For those who had returned to work, the median duration of work absence for those with a poor outcome was 22 days (IQR 12-42) compared with 19 days (IQR 12-32) for those without (Figure 2). This difference was not significant (Wilcoxon rank-sum, p=0.24).

TABLE 5. Clinical outcomes after carpal tunnel release

| | Mean score (standard deviation) | |
|---|---------------------------------|------------------------|
| | Before surgery | 12 weeks after surgery |
| CTS-6 (operated hand) ^a | 3.3 (0.87) | 1.2 (0.54) |
| MHQ function (operated hand) ^b | 50 (22.1) | 79 (19.4) |
| MHQ satisfaction with function (operated hand) ^b | 38 (25.7) | 82 (21.3) |
| MHQ bilateral activities of daily living ^b | 69 (23.7) | 88 (13.8) |
| MHQ activities of daily living (operated hand) ^b | 65 (28.1) | 87 (18.5) |
| | Number of participants (%) | |
| <i>Global rating of change score</i> | | |
| Completely cured | - | 65 (33.3) |
| Much better | - | 98 (50.3) |
| Slightly better | - | 13 (6.7) |
| Unchanged | - | 2 (1.0) |
| Worse | - | 5 (2.6) |
| <i>Scar symptom severity</i> | | |
| Not at all troublesome | - | 99 (50.8) |
| A little troublesome | - | 63 (32.3) |
| Fairly troublesome | - | 18 (9.2) |
| Very troublesome | - | 2 (1.0) |
| Unbearable | - | 0 |
| Required post-operative antibiotics | - | 10 (5.1) |
| Additional sick leave after first returning to work | - | 12 (6.2) |

Grey shading indicates the categories which were combined to define a poor surgical outcome.

^a. CTS-6 assessment of carpal tunnel syndrome symptoms[14]. Range 1-5: 1 equals no symptoms.

^b. MHQ Michigan Hand Questionnaire[17]. Range 0-100: 100 equals no deficit or dissatisfaction.

Figure 2. Duration of work absence after carpal tunnel release

There was no significant difference in the prevalence of a poor outcome among those who returned to work within or after seven days of CTR (20% versus 24%, Chi^2 $p=0.63$). Similarly, there was no significant difference in the prevalence of a poor outcome among those who returned to work within or after 14 days (19% versus 25%, Chi^2 $p=0.31$), or within or after 28 days of CTR (21% versus 27%, Chi^2 $p=0.33$).

DISCUSSION

In this multi-site prospective cohort study, the median duration of work absence was 20 days (range 1-99), a duration similar to that reported by other European studies[24]. Earlier return to work was associated with typing for ≥ 4 hours at work (as compared with more physical workplace tasks) and undergoing surgery in primary care (as compared with secondary care or private practice). Pre-operative expectations about return to work were important significant predictors of actual return to work times. We found no evidence of poorer clinical outcomes in the first 12 weeks amongst those who returned to work earlier. At each time point, fewer manual workers had returned to work than non-manual workers and fewer employed workers had returned than self-employed (Figure 2). Both findings have been reported previously[10, 11, 25, 26], however, neither the type of work (manual/non-manual) nor the type of work contract (employed/self-employed) were significantly associated with the duration of work absence in the mutually adjusted model. These results illustrate the importance of considering the range of relevant demographic, clinical and occupational factors, which may have been confounders, moderators or mediators in previous studies.

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3 Five variables were independently associated with longer duration of work absence in the final
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5 model. Two were occupational factors: infrequent computer use and availability of sick pay.
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7 Cowan et al.[10], recorded earlier return to work after CTR for desk-based workers and we
8
9 have shown previously that UK hand surgeons and hand therapists report that they advise
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11 earlier return to desk-based workers[6]. The relationship between longer duration of work
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13 absence and availability of sick pay has also be reported previously for those with and without
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15 worker's compensation[9, 24]. It is plausible that financial necessity is driving earlier return to
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17 work for those with limited sick pay. Alternatively, those with access to paid leave might
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19 choose to take the maximum available duration.
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27 Only one clinical factor was significantly associated with the duration of work absence:
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29 participants who had their CTR surgery in primary care were more likely to return to work
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31 earlier than those whose procedure took place in an NHS hospital setting. One possible reason
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33 is that patients with more complex disease may be more commonly referred to secondary,
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35 rather than primary, care for their CTR and these patients may require longer off work after
36
37 their surgery. However, in the current study the proportion and degree of comorbidities, and
38
39 the extent of pre-operative symptoms reported by participants were similar across all settings.
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42 Another possibility is that the patients' expectations of the surgery may be different: CTR
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44 performed in a primary care setting might be perceived by patients as being more minor than
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46 surgery in a hospital operating theatre. Alternatively, the general practice surgeons may have
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48 recommended earlier return to work than those based in a hospital, although the median
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50 expected duration of work absence for participants in the current study was the same across
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52 all settings.
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3 Only one demographic factor was statistically significant: women were more likely to take
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5 longer to return to work than men. Whilst we found inconsistent data about the effect of
6
7 gender on return to work after CTR in the literature[27, 28], female gender has been
8
9 associated with longer periods of work absence for other health conditions[29]. Researchers
10
11 should continue to include sex as a covariate in analyses of return to work outcomes, although
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13 there is currently insufficient evidence to support any difference in return to work
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15 recommendations after CTR based on sex. Further qualitative investigation is required in order
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17 to understand the context for this.
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25 Finally, those who expected to return to work more quickly were significantly more likely to do
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27 so. It has been shown previously that patient expectations are a prominent determinant of
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29 return to work time, or other return to work outcomes, for musculoskeletal or mental health
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31 conditions[29-31]. The role of expectations on outcomes, including the expected and actual
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33 timing for return to work and driving after hand and wrist surgery, requires further
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35 exploration, particularly because expectations are a potentially modifiable characteristic which
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37 could be influenced by the advice provided by clinicians pre-operatively.
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45 In total, approximately a quarter of participants in this study were considered to have a poor
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47 outcome using our composite definition. We chose to use a multi-component definition which
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49 was deliberately very stringent to minimise the chances of missing any harm caused by early
50
51 return to work. Our rates of poorer outcomes were in fact similar to those reported in other
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53 CTR populations[20, 32, 33]. Importantly, we found no relationship between earlier return to
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55 work and occurrence of poor outcomes within 12 weeks of CTR in this cohort study.
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3 There are a number of limitations of the current study, including the reliance on self-reported
4 data. Work absence is not logged on a national database in the UK and therefore could only be
5 obtained through self-report. To minimise errors of recall, date of return to work was
6 determined contemporaneously. The recall duration for measures of function and symptoms
7 was limited to a maximum of four weeks, consistent with the outcome measures used[14, 17].
8
9 We set out to recruit a large sample of working-aged adults undergoing CTR. Our prospectively
10 recruited sample from 16 sites is one of the largest reported in the literature to date, with a
11 good follow up response rate (79%), but it remains possible that we were under-powered to
12 detect some of the factors which may have been associated with delayed return to work. The
13 findings may also not be generalisable to working populations in regions outside of central and
14 southern England and Wales or employed in other industries. The observed differences
15 between those who completed the study and those who were lost to follow-up (younger,
16 better mental health, more likely manual workers) may further limit the generalisability of the
17 findings.
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39 All participants were presumed to have CTS as diagnosed by their treating clinician. Many
40 studies of CTS include nerve conduction study (NCS) findings as part of their eligibility criteria,
41 although this was not possible in the current study because NCS are not routinely
42 recommended for pre-operative diagnosis of CTS in the UK[2]. Our eligibility criteria required
43 that only people undergoing their first CTR were included and reported upon in this study (so
44 that previous experiences with CTR were not potential confounders). However, more than
45 three quarters of the cohort reported bilateral symptoms. The possible impact of persisting
46 CTS symptoms in the non-operated hand on return to work also needs to be considered.
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3 For the current study, we considered both occupational title and self-reported occupational
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5 exposures collected in a standardised questionnaire format[13, 18, 19, 23]. Categorisation
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7 based on job title and industry may not accurately reflect the physical and/or psychosocial
8
9 aspects of job role. There is a need for an agreed approach to identifying and recording key
10
11 physical demands and psychosocial exposures of jobs to enable consistent exploration of their
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13 impact on work and clinical outcomes following surgery or other intervention. Approaches
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15 such as job exposure matrices[34] could facilitate this in future research.
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23 In summary, this large multi-centre prospective cohort study investigated when participants
24
25 return to work after CTR. Expectations about return to work (reported before surgery) were
26
27 strongly associated with actual work absence, regardless of the job role or self-reported upper
28
29 limb activities involved. Patient expectations can be influenced by many factors, but one of the
30
31 most important is the advice provided by clinicians, in particular the surgeon. This suggests
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33 that clear, consistent advice could have an important effect on duration of sick leave. To date
34
35 there is no evidence-based guidance informing clinicians what to advise about returning to
36
37 different types of work after CTR. Further research is required to reach a consensus and
38
39 explore whether the provision of targeted, consistent and standardised advice can alter the
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41 expected duration of work absence, reducing unnecessary sick leave, without causing adverse
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43 effects on clinical outcomes.
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11 **Conflicts of interest**

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13
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36 Health.
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44 **Informed consent**

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46 Written informed consent was obtained from the patient(s) for their anonymised information
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48 to be published in this article.
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53 **Ethics approval**

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55 Full ethics approval was granted by the NHS Health Research Authority (IRAS 209840:
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57 16/WA/0390) and University of Southampton (ERGO 25757) Ethics Committees.
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Contributorship

The study was devised by LN, KWB, JA, DW and DC. LN completed data collection and analysis, with assistance from GN and KWB. All authors contributed to the interpretation of the data. LN wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and approved the final version.

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5 recruit to the REACTS study.
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For peer review only

Figure 1. Participant numbers for each stage of the cohort study

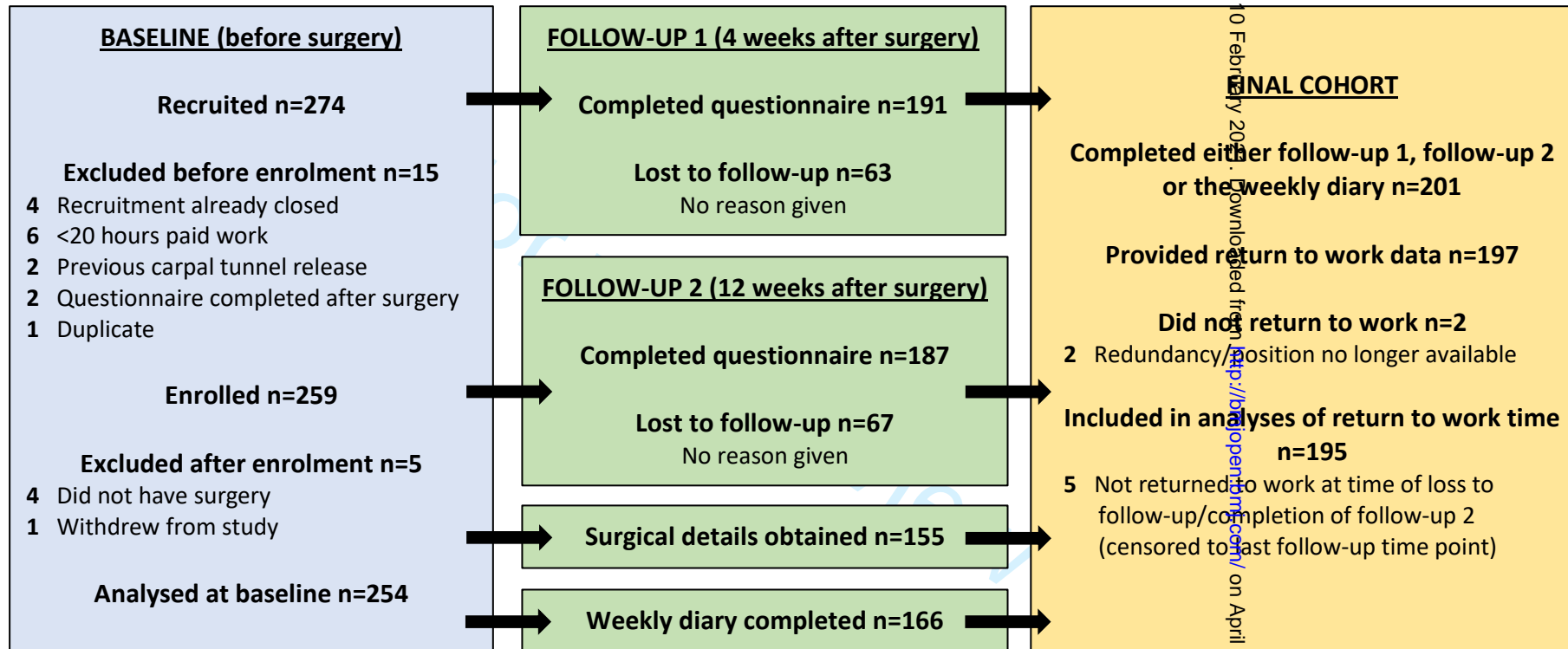
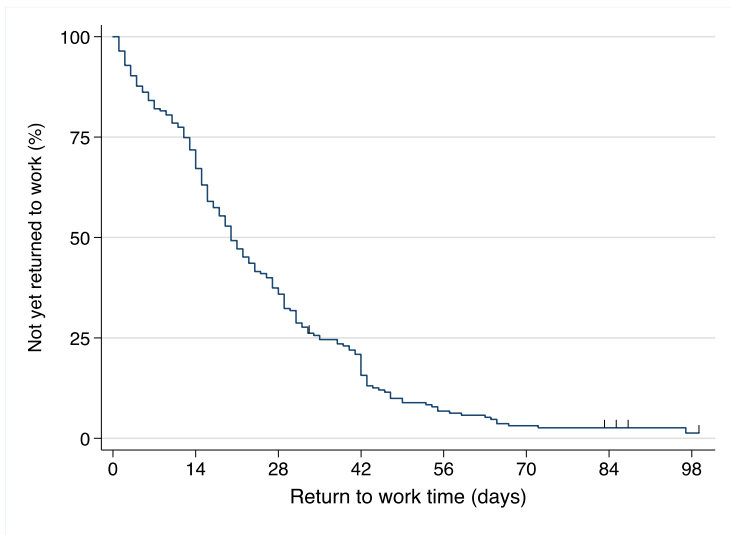
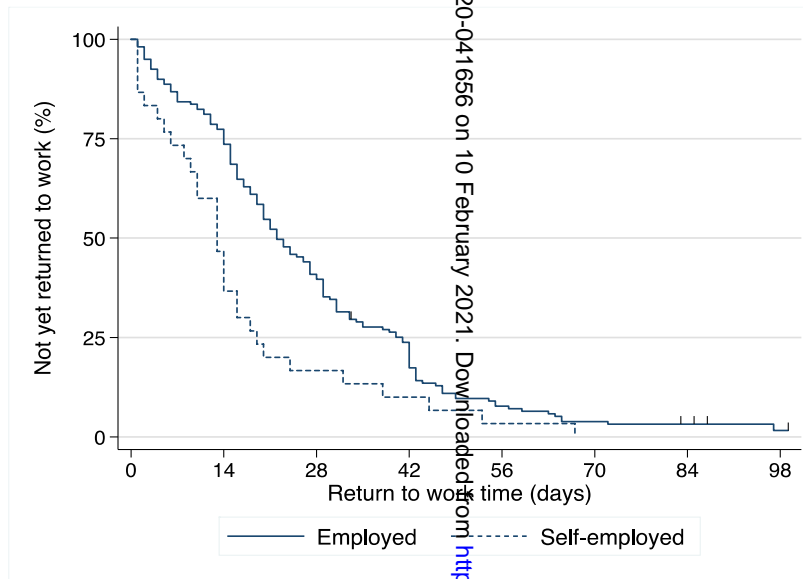


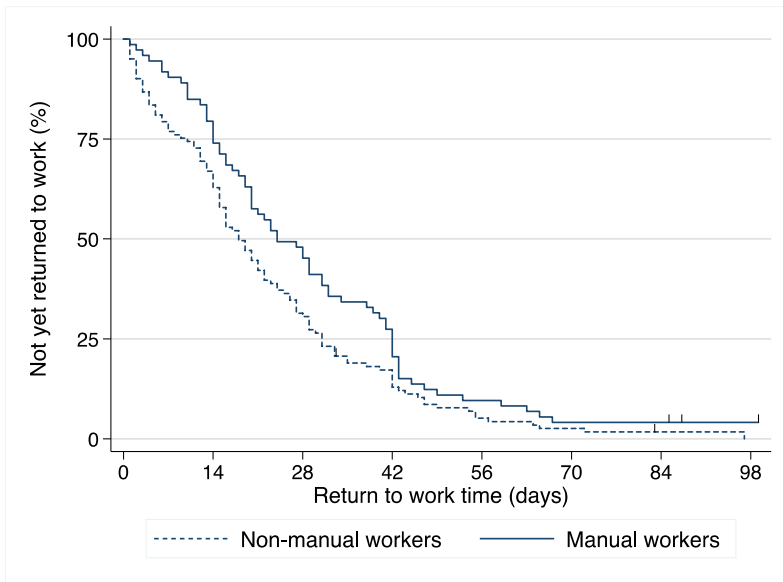
Figure 2. Duration of work absence after carpal tunnel release



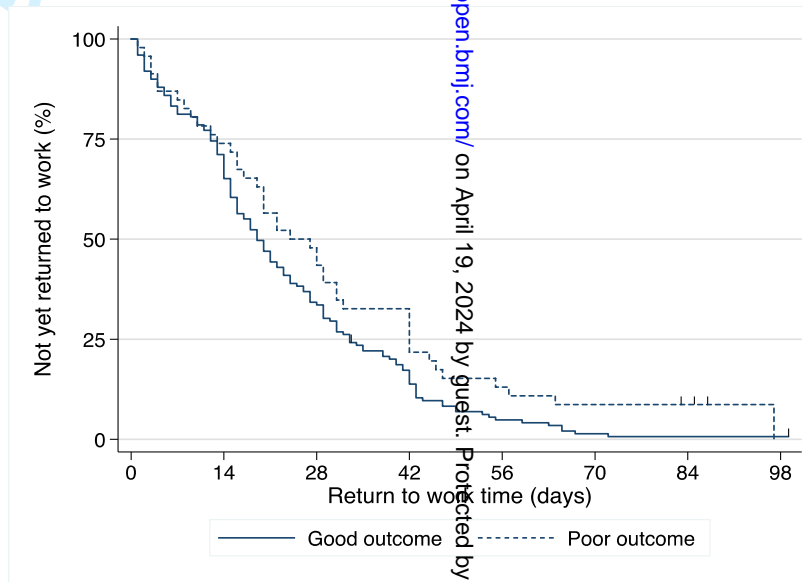
A. Whole cohort



B. Employed versus self-employed workers



C. Non-manual versus manual workers



D. With versus without a poor outcome

Vertical lines indicate right censoring for those who had not returned to work at the point of last follow-up

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Please fill in today's date

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Before Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

Preprint

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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For peer review only

CONSENT FORM (IRAS reference: 209840)

You should complete this form after you have read the Participant Information Sheet.

REACTS: Return to employment after carpal tunnel release surgery

Thank you for considering taking part in this research. If you have any questions arising from the Participant Information Sheet, please ask the research team before you decide whether to take part.

Please initial the boxes if you agree with each statement

1. I have read the Participant Information Sheet (version 2.0; 06.12.16) and have had the opportunity to ask questions about the study.
2. I meet the criteria for being involved in this study:
 - Aged over 18 and referred for carpal tunnel release surgery
 - Routinely work in paid employment for at least 20 hours per week
 - Plan to return to work after carpal tunnel release surgery
 - Have not previously had carpal tunnel release surgery on either hand
 - Have not previously had a serious injury to the same wrist/hand that will have the carpal tunnel release operation
3. I agree to take part in this research and agree for my data to be used for the purposes explained in the Participant Information Sheet (version 2.0; 06.12.16). I understand that this information will be handled in accordance with the terms of the UK Data Protection Act 1998.
 - a. I agree for the REACTS research team to access pre-operative test results concerning my hand and wrist symptoms. No other information will be accessed.
 - b. I agree for the REACTS research team to access my carpal tunnel release surgical record. No other information will be accessed.
4. I understand that if I decide at any time during the research that I no longer wish to take part, I can notify the researchers and withdraw from the study immediately, without giving a reason. If I do, I understand that I can ask for any contribution I have already made to be removed from the study, up to the time when I have completed the final questionnaire.

Signature _____ Date ____ / ____ / ____

Name _____ Phone _____
(please print) (only to be used if we lose touch)

Postal address _____

Email address _____
(please print)



ADDITIONAL QUESTIONS

Please circle one response for each question

I prefer to receive the next two questionnaires by **Post** **Email** **Don't mind**

I prefer to receive correspondence about the study by **Post** **Email** **Don't mind**

I would like to be notified of the findings from this research **Yes** **No**

I am happy to be contacted about the next stage of the research, which will involve a one-off discussion with the lead researcher **Yes** **No**

I am happy to be contacted about other studies related to this research **Yes** **No**

When the research team receives your completed questionnaire and consent form, we will sign it below and return a copy to you for your records.

Researcher signature _____ Date ____ / ____ / ____

Researcher name _____

University of Southampton research supervisors:
Professor Karen Walker-Bone | Professor Jo Adams | Professor David Warwick

SECTION A: BACKGROUND

1 What is your date of birth?

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

2 Are you:

Male Female Other

3 Are you:

Right handed Left handed Both

4 Do you routinely carry out paid work for 20 hours or longer in a given week?

Yes No

*If no, thank you for your interest in our study, however, we are only looking for individuals who carry out paid work for at least 20 hours per week. You **do not** need to complete the rest of the questionnaire, but please return it using the pre-paid envelope provided.*

5 When do you expect to have your carpal tunnel surgery?

Please enter the exact date if known, or provide the approximate month and year if unsure.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

6 Which hand will be operated on?

If both hands please answer Question 6.1; if one hand, please move on to Question 7.

Right Left Both

6.1 If both hands, which side will be operated on first?

Right Left Both sides operated
on the same day Unsure

7 Do you have access to an occupational health service through your place of work?

Yes No Unsure

8 Do you expect to take any time off work following your surgery?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No Unsure

8.1 If you do expect to take time off work, how long do you expect to take?

Please complete using days, weeks or months; whichever applies.

Days Weeks Months

SECTION A: BACKGROUND

9 Have you been given any information about your operation?

If yes, please answer Question 9.1; if no, please move on to Question 10.

Yes No

9.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
 - b) Hospital nurse
 - c) GP or practice nurse
 - d) Hand therapist
 - e) Physiotherapist or occupational therapist
 - f) Occupational health nurse or doctor
 - g) Employer
 - h) Friend or family member
 - i) Internet
 - j) Other (*please specify*)
-

10 Have you been given any information about returning to work after your surgery?

If yes, please answer the rest of Question 10; if no, please move on to Question 11.

Yes No

10.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
 - b) Hospital nurse
 - c) GP or practice nurse
 - d) Hand therapist
 - e) Physiotherapist or occupational therapist
 - f) Occupational health nurse or doctor
 - g) Employer
 - h) Friend or family member
 - i) Internet
 - j) Other (*please specify*)
-

10.2 What advice were you given?

If this advice came from more than one source, please indicate who advised what.

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SECTION B: WORK

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12 What is your MAIN occupation at the moment (e.g. secretary, teacher, builder etc.)?

.....

13 And in what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc)?

.....

14 Which of the following best describes your present work situation for your MAIN occupation? Please tick one box.

- a) Employed (permanent contract) d) Self-employed
- b) Employed (temporary/renewable contract) e) Other (please specify)
- c) Zero hours contract

15 On average, how many hours per week do you normally work in your main occupation?

hours

16 On average, how many days per week do you normally work in your main occupation?

days

17 Do you have any other paid work?
If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, on average, how many hours a week do you work in other paid jobs? hours

18 Does an average day at work in your MAIN job normally involve any of the following? Please tick one box for each question.

- | | Yes | No |
|---|--------------------------|--------------------------|
| a) Piecework in which you are paid according to the number of articles or tasks you or your team make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| b) A target number of articles or tasks that you or your team are expected to make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Payment of a bonus if you make or finish more than an agreed number of articles/tasks in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Working to tight deadlines | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Use of a computer keyboard or mouse for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION B: WORK

| | Yes | No |
|--|--------------------------|--------------------------|
| f) Use of a computer keyboard or mouse for longer than 4 hours in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Other tasks involving repeated movements of the wrist or fingers for longer than 4 hours in total? <i>(Please indicate which tasks)</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | |
| ----- | | |
| h) Working with a powered tool that makes your hand(s) or arm(s) vibrate (e.g. chain saw, pneumatic drill)? | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Working with your hand(s) above shoulder height for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Lifting or carrying weights of 5 kg (11 lbs) or more in one hand (e.g. a tool bag or heavy briefcase)? | <input type="checkbox"/> | <input type="checkbox"/> |
| k) Lifting or carrying a weight of 10 kg (22 lbs) or more? | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Tasks involving pushing or pulling a heavy weight? | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Working for longer than two hours in total with your neck bent forward? | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Working for longer than half an hour in total with your neck twisted e.g. when looking to one side? | <input type="checkbox"/> | <input type="checkbox"/> |
| o) Driving for more than an hour? | <input type="checkbox"/> | <input type="checkbox"/> |

19 Do you find your MAIN job demanding on your hands/wrists?
Please circle one number, where 0 represents not at all, and 10 represents very much.

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much

20 Does your MAIN employer (or boss/colleagues if self-employed) know about your hand/wrist problem?
If yes, please answer Question 20.1; if no, or not applicable, please move on to Question 21.

Yes No N/A self-employed and work alone

20.1 Is your MAIN employer (or boss/colleagues if self-employed) supportive of your hand/wrist problem?
Please circle one number, where 0 represents not at all, and 10 represents very much

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much

SECTION B: WORK

The following questions refer to how you did in your MAIN job during the past 4 weeks.

21 weeks.

Please tick one box for each question.

| How much of the time during the past 4 weeks ... | Always | Often | Sometimes | Rarely | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Were you unable to do your work because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Did you have to shorten your work day because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Did you have to take breaks at work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Did you get less done because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you take longer to do the tasks in your work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 **During the past 4 weeks, how much time have you missed from your MAIN job for the following reasons?**

Please write 0 if you have not missed any time from work during this period. You can answer in days or hours, whichever applies.

- a) Time missed because of the problem with your hand(s)/wrist(s) Days **or** Hours
- b) Time missed because of any other problem Days **or** Hours

23 **If you fell ill and were off work, how long could you get your normal full pay (excluding bonuses)?**

Please tick the option that best represents your MAIN job.

- | | | | |
|-----------------------|--------------------------|-----------------------|--------------------------|
| a) Less than one week | <input type="checkbox"/> | d) More than 6 months | <input type="checkbox"/> |
| b) 1 – 4 weeks | <input type="checkbox"/> | e) Not sure | <input type="checkbox"/> |
| c) 1 – 6 months | <input type="checkbox"/> | | |

24 **How satisfied are you with your MAIN job as a whole, taking everything into consideration?** This includes your salary, career possibilities, management, colleagues etc. Please tick one box.

- | | | | |
|-------------------------------|--------------------------|----------------------|--------------------------|
| a) Very satisfied | <input type="checkbox"/> | c) Dissatisfied | <input type="checkbox"/> |
| b) Satisfied/fairly satisfied | <input type="checkbox"/> | d) Very dissatisfied | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

25 In general, would you say your health is:

- a) Excellent d) Fair
- b) Very good e) Poor
- c) Good

26 What is your height? Please answer in either feet and inches or centimetres.

feet inches *or* cms

27 What is your weight? Please answer in either stones and pounds or kilograms.

stones lbs *or* kgs

28 Do you, or have you ever, smoked regularly? Please tick one box.

- a) I have never smoked regularly c) I regularly smoke
- b) I have smoked in the past, but do not currently smoke regularly

29 The following is a list of common health problems. Please indicate if you currently have, or don't have, the problem listed in part 1. If you have the problem, please answer the corresponding question in part 2. Please answer all questions in part 1.

| HEALTH PROBLEM | PART 1 | | PART 2 | |
|-----------------------------------|----------------------------------|--------------------------|--------------------------------|--------------------------|
| | Do you have the problem? | | Does it limit your activities? | |
| | NO | YES | NO | YES |
| | <i>(if yes move to part 2)</i> → | | | |
| a) Heart disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) High blood pressure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Lung disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Diabetes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Ulcer or stomach disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Kidney disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Liver disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Thyroid disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Anaemia or other blood disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

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| HEALTH PROBLEM continued... | Do you have the problem? | | Does it limit your activities? | |
|-----------------------------|--------------------------|--------------------------|--------------------------------|--------------------------|
| | NO | YES | NO | YES |
| k) Depression | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Osteoarthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Back pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Rheumatoid arthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

(if yes move to part 2) →

29.1 Please list any other medical problems that have not been mentioned.

| | Does it limit your activities? | |
|----------|--------------------------------|--------------------------|
| | NO | YES |
| o) | <input type="checkbox"/> | <input type="checkbox"/> |
| p) | <input type="checkbox"/> | <input type="checkbox"/> |
| q) | <input type="checkbox"/> | <input type="checkbox"/> |

30 The following questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling. Please tick one box for each row.

| How much of the time during the past 4 weeks ... | All of the time | Most of the time | A good bit of the time | Some of the time | A little bit of the time | None of the time |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Did you feel full of 'get-up-and-go'? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Have you been a very nervous person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Have you felt so down in the dumps that nothing could cheer you up? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Have you felt calm and peaceful? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you have a lot of energy? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Have you felt downhearted and blue? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Did you feel worn out? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Have you been a happy person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Did you feel tired? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

31 Below is a list of problems that people sometimes have. Please read each one carefully and tick the box that best describes how much that problem has distressed or bothered you during the *past 7 days*, including today?
Please tick one box for each row.

| | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Faintness or dizziness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pains in the heart or chest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Nausea or upset stomach | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Trouble getting your breath | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hot or cold spells | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

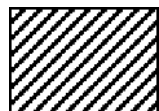
SECTION D: HAND AND WRIST FUNCTION

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In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **RIGHT** hand or wrist?

32 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 34.



Pain



Tingling or numbness

RIGHT HAND



33 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **LEFT** hand or wrist?

34 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 36.

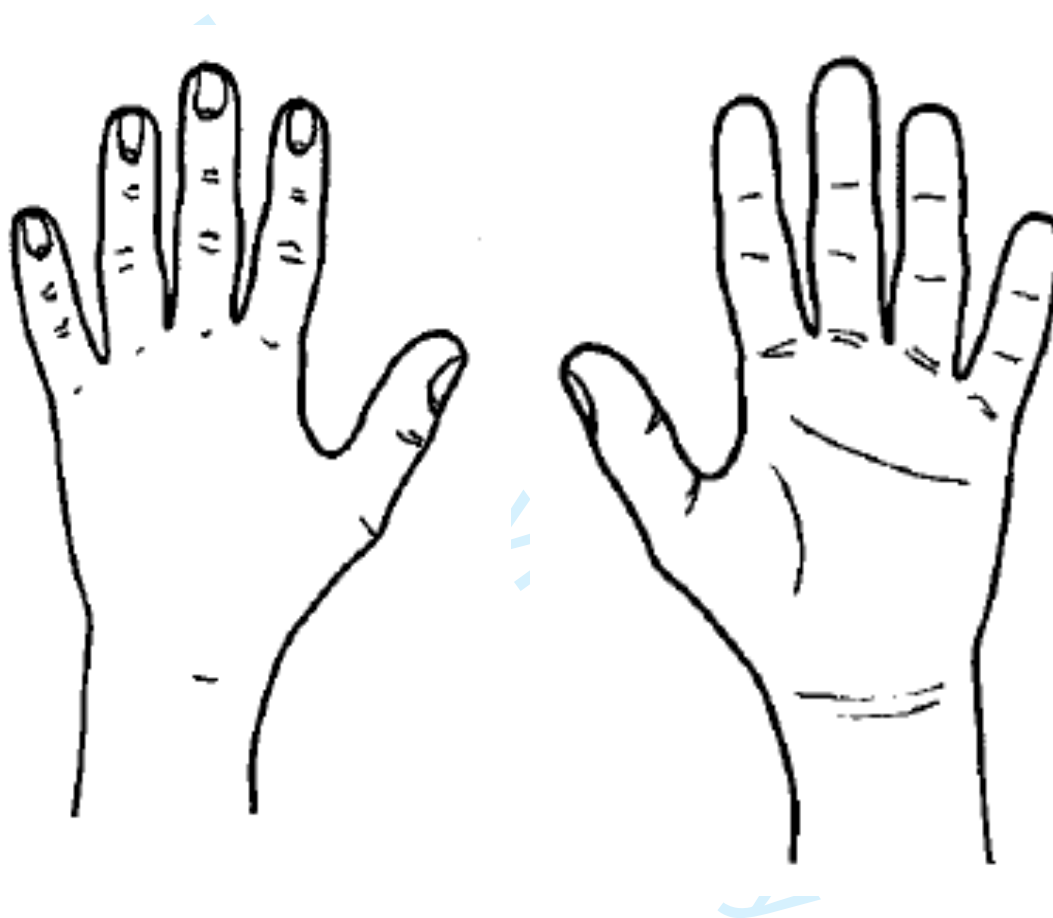


Pain



Tingling or numbness

LEFT HAND



35 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your symptoms over the ***last 7 days***.

36 Please answer for each hand, even if you only have problems with one side.
Please tick one box for each row.

| 36.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 36.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

37 This question refers to the appearance (look) of your hand during the ***past 7 days***. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

38 Please answer the following questions on a scale of 0-10, where 0 represents not at all, and 10 represents very much. Please circle one number for each question.

38.1 Do you think that you will be able to use your hand normally 3 months after the operation?

0 1 2 3 4 5 6 7 8 9 10

38.2 Are you afraid of having long-term problems with your hand?

0 1 2 3 4 5 6 7 8 9 10

38.3 Do you blame yourself for your hand problem?

0 1 2 3 4 5 6 7 8 9 10

38.4 Are your family and friends supportive of your hand problem?

0 1 2 3 4 5 6 7 8 9 10

39 The following statements describe people's beliefs about their health problems. Please indicate whether you agree or disagree with them in relation to the problems you have with your hand(s) or wrist(s). Please tick the box which most closely reflects how you feel for each statement.

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly Disagree |
|---|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| a) Problems like this run in my family | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I think I was born with a weakness or underlying problem in this part of my body | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) My problem was caused by work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Work probably didn't cause my problem, but it made it worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) I have a lot of stress in my life and that has made my problem a lot worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) I think a lack of exercise probably contributed to my problem | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) As you get older, parts of the body start to wear out and problems like mine are likely to occur | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

40 We are interested in the types of thoughts and feelings that you have when you are in pain. The following statements describe different thoughts and feelings that may be associated with pain. Please indicate the degree to which you have these thoughts and feelings when you are experiencing pain. Please tick one box for each statement.

| | Not at all | To a slight degree | To a moderate degree | To a great degree | All of the time |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) I keep thinking about how badly I want the pain to stop | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) It's terrible and I think it's never going to get any better | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I become afraid that the pain may get worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I anxiously want the pain to go away | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the function of your hands/wrists during the **past 7 days**. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 41 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your right hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your right fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your right wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 42 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your left hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your left fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your left wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the ability of your hands to do certain tasks during the **past 7 days**. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

43 How difficult was it for you to perform the following activities using your RIGHT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

44 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

45 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question

46 How satisfied were you with your RIGHT hand/wrist during the past 7 days?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

47 How satisfied were you with your LEFT hand/wrist during the past 7 days?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions, or would like any additional information, please contact Lisa Newington on:

ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

For peer review only - <http://hmgopen.bmj.com/site/about/guidelines.xhtml>



REACTS ID:

One Month After Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

only

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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SECTION A: ABOUT YOUR OPERATION

Please fill in today's date

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

1 What was the date of your carpal tunnel release surgery?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

2 Which side was operated on? Please tick one box.

Right Left Both

3 What type of anaesthetic did you have? Please tick one box.

- a) General anaesthetic (you were sent to sleep)
- b) Local or regional anaesthetic (your arm was made numb, but you were still awake)
- c) Other (*please specify*)
-
- d) Unsure

4 How long did you need to stay in the hospital/clinic after your operation? Please tick one box (and specify the number of nights, if applicable).

- a) I went home the same day
 - b) I needed to stay overnight (one night only)
 - c) I needed to stay for more than one night
- (*Please specify for how long*) nights

SECTION A: ABOUT YOUR OPERATION

5 Have you used any of the following services specifically for your operated hand(s) since your surgery?

Please give the number of visits for each service, and the date(s) attended, if known.

| | I used this service in the NHS | | I used this service privately | |
|--|--------------------------------|--------------------------|-------------------------------|--------------------------|
| | Number of visits | Dates attended, if known | Number of visits | Dates attended, if known |
| a) Your surgeon, or one of the surgical team | | | | |
| b) GP or practice nurse | | | | |
| c) Hospital nurse | | | | |
| d) Pharmacist | | | | |
| e) Hand therapist | | | | |
| f) Other physiotherapist or occupational therapist | | | | |
| g) Chiropractor or osteopath | | | | |
| h) Occupational health nurse or doctor | | | | |
| i) Accident and emergency (A&E) or minor injuries unit | | | | |
| j) Other (<i>please specify</i>) | | | | |

SECTION A: ABOUT YOUR OPERATION

6 Have you taken any antibiotics for an infection in your surgical wound?
Please do not include any antibiotics you were prescribed at the time of your operation.

Yes No

If yes, what date did you start taking the antibiotics?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7 Have you been admitted to hospital because of a problem with your operated hand(s)? If yes, please answer the rest of Question 7; if no, please move on to Question 8.

Yes No

7.1 If yes, when were you first admitted?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7.2 How many nights did you stay in hospital?

Please answer 0 if you didn't stay overnight.

| | |
|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|

nights

7.3 Did you require another operation?

Yes No

8 Have you been advised that you may need a carpal tunnel release for your other hand in the future?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No

8.1 If yes, when are you expecting to have this surgery? Please tick one box.

- a) In less than 2 months
- b) In 2-5 months
- c) In 6-11 months
- d) In more than a year
- e) Unsure

9 If you would like to give us any other information about your operation, or the healthcare services you have used, please do so here:

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SECTION B: WORK

10 Compared to before your surgery, which of the following best describes your current work situation? Please tick one box.

- a) Returned to the same job, work duties and hours – **please go to Question 14**
- b) Returned to the same job, with altered duties or hours – **please go to Question 14**
- c) Started a new job – **please go to Question 11**
- d) Not yet returned to work, but plan to return in the future – **please go to Question 12**
- e) Do not plan to return to work – **please go to Question 13**

11 Thinking about your new job:

11.1 What is your main occupation now (e.g. secretary, teacher, builder etc.)?

.....

11.2 In what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc.)?

.....

11.3 Did you change jobs because of your hand/wrist problem? Please tick one box.

- a) Yes, my hand/wrist problem was the main reason for my job change
- b) Yes, my hand/wrist problem was one of several reasons for my job change
- c) No, my job change was nothing to do with my hand/wrist problem
- d) Other, please specify
-
-

Please go to Question 14

SECTION B: WORK

13 If you do not plan to return to work, what is the main reason for this decision? Please tick one box.

- a) Retirement
- b) Redundancy
- c) Position/work no longer available
- d) Unable to do your work because of your problem with your hand(s)/wrist(s)
- e) Unable to do your work because of any other problem
- f) Other (*please specify*)
-
-
-

13.1 Have you been advised not to return to work by anyone? If yes, please answer Question 13.2; if no, please move on to Question 21.

Yes No

13.2 If yes, who by? Please tick all that apply.

- | | | | |
|--|--------------------------|---|--------------------------|
| a) Your surgeon or a member of the surgical team | <input type="checkbox"/> | f) Occupational health nurse or doctor | <input type="checkbox"/> |
| b) Hospital nurse | <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) | <input type="checkbox"/> |
| c) GP or practice nurse | <input type="checkbox"/> | h) Friend or family member | <input type="checkbox"/> |
| d) Hand therapist | <input type="checkbox"/> | i) Other (<i>please specify</i>) | <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist | <input type="checkbox"/> | | |
| | | | |

Please go to Question 21

SECTION B: WORK

14 When did you first return to work after your carpal tunnel release surgery?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

15 How much work-time did you miss between the date of your surgery and the date you first returned to work?

Please include all work-time missed, even if this had been pre-arranged with your employer, or was taken as annual leave. You can answer in hours, days or weeks, whichever applies.

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

15.1 Was any of this time paid?

Please tick one box (and provide the amount of time, if applicable).

- a) Yes, all of my time away from work was paid
- b) Yes, some of my time away from work was paid
(please specify how much time was paid, you can use hours, days or weeks, whichever applies)

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

- c) No, none of my time off was paid
- d) Not sure

16 Since your surgery, have you discussed when to return to work with anyone?

If yes, please answer the rest of Question 16; if no, please move on to Question 17.

Yes No

16.1 If yes, who did you discuss this with? Please tick all that apply.

- | | |
|---|--|
| a) Your surgeon or a member of the surgical team <input type="checkbox"/> | f) Occupational health nurse or doctor <input type="checkbox"/> |
| b) Hospital nurse <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) <input type="checkbox"/> |
| c) GP or practice nurse <input type="checkbox"/> | h) Friend or family member <input type="checkbox"/> |
| d) Hand therapist <input type="checkbox"/> | i) Other <i>(please specify)</i> <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist <input type="checkbox"/> | |
| | |

SECTION B: WORK

16.2 Please list any advice you have been given (since your surgery) about when and how to return to work?
This could include any activities to avoid or timescales to follow. If this advice came from more than one place, please indicate who advised what.

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17 Since returning to work after your operation, have you needed to take any time off work because of a problem with your operated hand(s)/wrist(s)?
If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, how much time did you take off work?
Please answer in days or hours, whichever applies.

hours days weeks

18 When you first returned to work after your surgery, did you work shorter hours than would be normal for your job as a direct result of your operation?
If yes, please answer the rest of Question 18; if no, please move on to Question 19.

Yes No

18.1 Have you since gone back to working full hours?
If yes, please answer Question 18.2; if no, please move on to Question 19.

Yes No

18.2 If yes, when did you return to full working hours?
If you do not know the exact date, approximately how many weeks did you work reduced hours?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

a) Less than a week

c) More than 2 weeks, but less than 3 weeks

b) 1 – 2 weeks

d) 3 weeks or longer

SECTION B: WORK

19 When you first returned to work after your surgery, did you need to alter or avoid any of your usual work duties as a direct result of your operation?

If yes, please answer the rest of Question 19; if no, please move on to Question 20.

Yes No

19.1 Have you since gone back to full duties?

If yes, please answer Question 19.2; if no, please move on to Question 20.

Yes No

If yes, when did you return to full working duties?

19.2 If you do not know the exact date, approximately how many weeks did you have altered work duties?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week
- b) 1 – 2 weeks
- c) More than 2 weeks, but less than 3 weeks
- d) 3 weeks or longer

20 If you would like to give us any additional information about returning to work, please do so here:

.....

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SECTION C: HAND AND WRIST SYMPTOMS

21 The following questions refer to your symptoms over the last 7 days. Please answer for each hand. Please tick one box for each row.

| 21.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 21.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 This question refers to the appearance (look) of your hands during the past 7 days. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: HAND AND WRIST SYMPTOMS

23 How do you rate your symptoms in your operated hand(s) now, compared to before your surgery? Please tick one box.

- a) Completely cured c) Unchanged e) Worse
 b) Much better d) Slightly better

24 The following questions ask specifically about your scar. Please think about your scar over the ***past 7 days***.

24.1 Has your scar been itchy?

If yes, please continue; if no, please move on to Question 24.2

Yes No

Yes, it was itchy: Sometimes Often Always

And when it was itchy, it was: Slightly itchy Fairly itchy Very itchy

24.2 Has your scar caused you pain?

If yes, please continue; if no, please move on to Question 24.3

Yes No

Yes, it was painful: Sometimes Often Always

And when it hurt, it was: Slightly painful Fairly painful Very painful

24.3 Has your scar been uncomfortable?

If yes, please continue; if no, please move on to Question 24.4

Yes No

Yes, it was uncomfortable: Sometimes Often Always

And when it was uncomfortable, it was: Slightly uncomfortable Fairly uncomfortable Very uncomfortable

SECTION C: HAND AND WRIST SYMPTOMS

24.4 Has your scar felt numb?

If yes, please continue; if no, please move on to Question 24.5

Yes No

Yes, it was numb: Sometimes Often Always

And when it felt numb, it was: Slightly numb Fairly numb Very numb

24.5 Have you had odd sensations in your scar e.g. tightening, pulling or pins and needles? If yes, please continue; if no, please move on to Question 24.6

Yes No

Yes, I have had odd sensations: Sometimes Often Always

24.6 Has your scar caught on things e.g. clothing?

If yes, please continue; if no, please move on to Question 24.7

Yes No

Yes, it has caught on things: Sometimes Often Always

24.7 Overall, how troublesome are the symptoms from your scar?

Please tick one box.

Not at all troublesome A little troublesome Fairly troublesome Very troublesome Unbearable

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the function of your hands/wrists during the ***past 7 days***. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 25 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>right</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>right</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>right</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 26 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>left</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>left</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>left</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the ability of your hands to do certain tasks during the ***past 7 days***. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

| 27 How difficult was it for you to perform the following activities using your RIGHT HAND? | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

28 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

29 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question.

30 How satisfied were you with your RIGHT hand/wrist during the **past 7 days**?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

31 How satisfied were you with your LEFT hand/wrist during the *past 7 days*?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

32 If you would like to give us any additional information about your hand and wrist function, please do so here:

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**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions or would like any additional information, please contact Lisa Newington on:
In@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

SUPPLEMENTARY TABLES

1. Cox proportional hazards univariate analyses of the association between demographic and general health factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Body mass index (kg/m²)</i> | | | | | | |
| Normal (18.5-24.9) | 47 | 20 | 12-33 | 1 | - | - |
| Over (25.0-29.9) | 64 | 19 | 12.5-29 | 0.98 | 0.65, 1.46 | 0.91 |
| Obese (≥30) | 67 | 21 | 10-40 | 0.88 | 0.60, 1.28 | 0.50 |
| <i>Surgery to dominant hand ²</i> | | | | | | |
| Yes | 128 | 19.5 | 12-33 | 1 | - | - |
| No | 62 | 22 | 12-35 | 0.83 | 0.61, 1.14 | 0.25 |
| <i>General health status</i> | | | | | | |
| Excellent/very good/ good | 165 | 19 | 12-32 | 1 | - | - |
| Fair/poor | 24 | 28.5 | 12.5-42 | 0.74 | 0.47, 1.16 | 0.19 |
| <i>Number of comorbidities ³</i> | | | | | | |
| None | 49 | 18 | 7-32 | 1 | - | - |
| One | 67 | 24 | 14-42 | 0.87 | 0.59, 1.27 | 0.47 |
| Two or more | 74 | 19.5 | 10-29 | 1.11 | 0.76, 1.62 | 0.60 |
| <i>Number of disability comorbidities ³</i> | | | | | | |
| None | 130 | 19 | 9-33 | 1 | - | - |
| One | 39 | 26 | 13-31 | 0.75 | 0.52, 1.08 | 0.12 |
| Two or more | 21 | 20 | 14-31 | 0.81 | 0.50, 1.32 | 0.40 |
| <i>Number of somatising symptoms ⁴</i> | | | | | | |
| None | 96 | 19 | 10.5-35 | 1 | - | - |
| One | 51 | 22 | 13-34 | 0.98 | 0.70, 1.38 | 0.91 |
| Two or more | 42 | 19.5 | 14-31 | 0.84 | 0.58, 1.22 | 0.36 |
| <i>SF36 Mental health score (tertiles) ⁵</i> | | | | | | |
| Poor (22.2-57.8) | 60 | 24 | 16-39 | 0.71 | 0.50, 1.03 | 0.07 |
| Intermediate (60.0-75.6) | 68 | 18.5 | 11-36.5 | 0.88 | 0.62, 1.25 | 0.48 |
| Good (77.8-97.8) | 60 | 16.5 | 7-30 | 1 | - | - |

Total sample size n=195.

¹. Adjusted for age and sex.

². Considered and the non-dominant hand for those who reported ambidexterity (n=4) and dominant hand for those undergoing simultaneous bilateral surgery (n=2).

³. Adapted from the self-administered co-morbidity questionnaire [1].

⁴. Adapted from the four-dimensional symptom questionnaire [2].

⁵. Taken from the SF-36 with data-driven tertiles [3].

2. Cox proportional hazards univariate analyses of the association between health beliefs and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Believe will be unable to use hand normally in 3 months ²</i> | | | | | | |
| No | 168 | 20 | 12-32.5 | 1 | - | - |
| Yes | 20 | 20.5 | 14.5-40 | 1.04 | 0.65, 1.67 | 0.87 |
| <i>Blames self for hand problem ²</i> | | | | | | |
| No | 162 | 20 | 12-35 | 1 | - | - |
| Yes | 26 | 22 | 14-31 | 1.08 | 0.70, 1.66 | 0.73 |
| <i>Lack of support from family/friends ²</i> | | | | | | |
| No | 156 | 20 | 12-32.5 | 1 | - | - |
| Yes | 32 | 19.5 | 13-40 | 0.88 | 0.60, 1.29 | 0.51 |
| <i>Problem runs in the family/born with a weakness ³</i> | | | | | | |
| No | 134 | 20 | 12-35 | 1 | - | - |
| Agree/strongly agree | 54 | 23 | 12-31 | 0.88 | 0.63, 1.21 | 0.42 |
| <i>Stress made the problem worse ³</i> | | | | | | |
| No | 169 | 20 | 12-33 | 1 | - | - |
| Agree/strongly agree | 19 | 28 | 14-40 | 0.79 | 0.48, 1.28 | 0.33 |
| <i>Lack of exercise contributed to the problem ³</i> | | | | | | |
| No | 172 | 20 | 13-33 | 1 | - | - |
| Agree/strongly agree | 16 | 15 | 10.5-34.5 | 1.23 | 0.73, 2.06 | 0.43 |
| <i>Getting older contributes to the problem ³</i> | | | | | | |
| No | 79 | 26 | 14-42 | 1 | - | - |
| Agree/strongly agree | 108 | 16 | 10-29 | 1.28 | 0.94, 1.74 | 0.11 |
| <i>Work probably didn't cause the problem, but made it worse ³</i> | | | | | | |
| No | 100 | 20.5 | 12-35 | 1 | - | - |
| Agree/strongly agree | 86 | 19.5 | 13-31 | 1.01 | 0.75, 1.35 | 0.95 |
| <i>Pain catastrophisation to at least a moderate degree ⁴</i> | | | | | | |
| No | 133 | 19 | 10-33 | 1 | - | - |
| Yes | 55 | 22 | 15-31 | 0.81 | 0.59, 1.12 | 0.21 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Reported on a 0-10 scale and dichotomised to no (0-6) and yes (7-10) [4].

³. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor disagree/disagree/disagree strongly [5].

⁴. Pain catastrophizing scale dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions and those who did not [6].

3. Cox proportional hazards univariate analyses of the association between clinical and surgical factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Katz hand diagram score for side of surgery</i> ² | | | | | | |
| Classic/probable | 126 | 22 | 14-38 | 1 | - | - |
| Possible/unlikely | 60 | 16.5 | 9.5-30.5 | 1.10 | 0.81, 1.51 | 0.54 |
| <i>Duration of symptoms</i> | | | | | | |
| ≤ 1 year | 47 | 19 | 10-31 | 1 | - | - |
| > 1 year | 141 | 20 | 13-34 | 0.86 | 0.62, 1.21 | 0.38 |
| <i>Nerve conduction studies performed</i> | | | | | | |
| No | 71 | 21 | 14-35 | 1 | - | - |
| Yes | 79 | 20 | 11-33 | 1.14 | 0.83, 1.58 | 0.41 |
| <i>Type of suture material</i> | | | | | | |
| Non-absorbable | 119 | 21 | 12-38 | 1 | - | - |
| Absorbable | 23 | 20 | 13-29 | 1.15 | 0.73, 1.83 | 0.55 |
| <i>MHQ function score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-40) | 79 | 20 | 13-41 | 0.80 | 0.57, 1.12 | 0.19 |
| Intermediate (44-55) | 48 | 19.5 | 13.5-33 | 0.81 | 0.55, 1.19 | 0.29 |
| Good (60-100) | 61 | 20 | 7-29 | 1 | - | - |
| <i>MHQ bilateral activities of daily living score (tertiles)</i> ³ | | | | | | |
| Poor (0-61) | 72 | 19 | 12.5-33.5 | 0.96 | 0.66, 1.38 | 0.81 |
| Intermediate (64-82) | 55 | 21 | 13-38 | 0.70 | 0.49, 1.01 | 0.06 |
| Good (83-100) | 62 | 20 | 10-31 | 1 | - | - |
| <i>MHQ activities of daily living score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-55) | 63 | 20 | 12-42 | 0.81 | 0.56, 1.18 | 0.27 |
| Intermediate (58-80) | 63 | 20 | 14-35 | 0.86 | 0.61, 1.23 | 0.42 |
| Good (85-100) | 63 | 20 | 9-32 | 1 | - | - |
| <i>MHQ satisfaction score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-25) | 88 | 21.5 | 13-42 | 0.78 | 0.55, 1.11 | 0.16 |
| Intermediate (29-50) | 49 | 18 | 14-29 | 0.87 | 0.59, 1.28 | 0.48 |
| Good (54-100) | 53 | 20 | 9-31 | 1 | - | - |
| <i>Satisfaction with appearance for side of surgery</i> ⁴ | | | | | | |
| Satisfied | 136 | 20 | 10.5-31.5 | 1 | - | - |
| Dissatisfied | 53 | 20 | 13-40 | 0.84 | 0.61, 1.16 | 0.29 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Adapted from Calfee et al. [7].

³. Michigan Hand Questionnaire [8]. Data-driven tertiles.

⁴. Reported on a 5-point scale in response to the statement: I am satisfied with the appearance (look) of my hand. Dichotomised as satisfied (strongly agree/agree) and dissatisfied (neither agree nor disagree, disagree, strongly disagree).

4. Cox proportional hazards univariate analyses of the association between occupational factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Have more than one paid job</i> | | | | | | |
| No | 177 | 20 | 12-32 | 1 | - | - |
| Yes | 12 | 26.5 | 19-42 | 0.61 | 0.34, 1.11 | 0.11 |
| <i>Total paid work hours per week ²</i> | | | | | | |
| ≤37.5 | 97 | 22 | 15-38 | 1 | - | - |
| >37.5 | 93 | 16 | 6-29 | 1.25 | 0.88, 1.79 | 0.21 |
| <i>Number of work days per week</i> | | | | | | |
| <5 | 55 | 23 | 15-35 | 1 | 0.72, 1.39 | 0.98 |
| 5 | 116 | 19 | 10.5-33 | 1 | - | - |
| >5 | 19 | 13 | 6-31 | 1.28 | 0.77, 2.14 | 0.34 |
| <i>Sick leave taken for this problem in the last month</i> | | | | | | |
| No | 154 | 20 | 12-33 | 1 | - | - |
| Yes | 20 | 15 | 9.5-30 | 0.99 | 0.61, 1.60 | 0.95 |
| <i>Sick leave taken for another problem in the last month</i> | | | | | | |
| No | 152 | 19 | 10.5-31 | 1 | - | - |
| Yes | 18 | 30 | 21-42 | 0.67 | 0.41, 1.09 | 0.10 |
| <i>Received advice about return to work after surgery</i> | | | | | | |
| Yes | 134 | 19 | 12-31 | 1 | - | - |
| No | 53 | 22 | 14-41 | 0.92 | 0.67, 1.27 | 0.61 |
| <i>Required to work to tight deadlines ³</i> | | | | | | |
| No | 75 | 23 | 14-40 | 1 | - | - |
| Yes | 112 | 18 | 9.5-31 | 1.19 | 0.89, 1.61 | 0.24 |
| <i>Use power tools that make the hand/arm vibrate ³</i> | | | | | | |
| No | 145 | 19 | 12-32 | 1 | - | - |
| Yes | 38 | 22 | 14-42 | 0.68 | 0.44, 1.05 | 0.08 |
| <i>Work with hands above shoulder height for >1 hour ³</i> | | | | | | |
| No | 147 | 20 | 12-33 | 1 | - | - |
| Yes | 34 | 19.5 | 13-33 | 0.89 | 0.60, 1.32 | 0.56 |
| <i>Work with neck bent forward for >2 hours ³</i> | | | | | | |
| No | 114 | 21 | 13-39 | 1 | - | - |
| Yes | 73 | 18 | 8-31 | 1.19 | 0.88, 1.60 | 0.26 |
| <i>Work with neck twisted for >30 minutes ³</i> | | | | | | |
| No | 136 | 20 | 12-34 | 1 | - | - |
| Yes | 47 | 22 | 13-32 | 0.93 | 0.66, 1.32 | 0.70 |
| <i>Drive for >1 hour per day ³</i> | | | | | | |
| No | 115 | 21 | 13-38 | 1 | - | - |
| Yes | 70 | 16 | 7-31 | 1.22 | 0.88, 1.68 | 0.24 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Dichotomised by the median for the sample population

³. As part of the normal working day [9].

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STROBE checklist (cohort study)

| Item | Recommendation | Location |
|---------------------------|--|-------------------------------------|
| Title and abstract | | |
| <i>Title</i> | Indicate study design | Title |
| Introduction | | |
| <i>Background</i> | Explain scientific background and rationale | Introduction |
| <i>Objectives</i> | State objectives and any pre-specified hypotheses | Introduction |
| Methods | | |
| <i>Study design</i> | Present key elements of the study design early | Introduction & methods |
| <i>Setting</i> | Describe the setting, locations and relevant dates | Methods |
| <i>Participants</i> | Give eligibility criteria, sources and methods of selection of participants, and methods of follow-up | Methods & table 1 |
| <i>Variables</i> | Clearly define all outcomes, exposures, predictors, potential confounders and effect modifiers | Methods & supplementary files 1-2 |
| <i>Data sources</i> | Give sources of data and methods of assessment | Methods & tables 2-5 |
| <i>Bias</i> | Describe and effects to address potential sources of bias | Methods & discussion |
| <i>Study size</i> | Explain how the study size was determined | Methods |
| Quantitative variables | Described how quantitative variables were handled in the analyses | Tables 2-5 |
| Statistical methods | Described all statistical methods Explain how missing data were addressed Explain how lost to follow-up was addressed | Statistical methods & tables 2-5 |
| Results | | |
| <i>Participants</i> | Reported the number of individuals at each stage of the study Give reasons for non-participation | Figure 1 Figure 1 |
| <i>Descriptive data</i> | Give characteristics of study participants Indicate number of participants for each variables of interest Summarise follow-up time | Tables 2-5 Tables 2-5 Results |
| <i>Outcome data</i> | Report number of outcome events over time | Results |
| <i>Main results</i> | Give adjusted and unadjusted estimates and measures of precision. Make clear which confounders were adjusted for | Table 4 & supplementary file 3 |
| <i>Other analyses</i> | Reported any subgroup analyses | Table 4 & supplementary file 3 |

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Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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KEY WORDS

Carpal tunnel syndrome, carpal tunnel release, return to work, advice, sickness absence, cohort study

Word count: 3,713

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3 **TITLE**
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5 Sickness absence after carpal tunnel release: a multi-centre prospective cohort study
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10
11 **ABSTRACT**
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13 **Objectives:** To describe when patients return to different types of work after elective carpal
14 tunnel release (CTR) surgery and identify the factors associated with the duration of sickness
15 absence.
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22 **Design:** Multi-centre prospective observational cohort study.
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25 **Setting and participants:** Participants were recruited pre-operatively from 16 UK centres and
26 clinical, occupational and demographic information were collected. Participants completed a
27 weekly diary and questionnaires at four and 12 weeks post-operatively.
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34 **Outcomes:** The main outcome was duration of work absence from date of surgery to date of
35 first return to work.
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40 **Results:** 254 participants were enrolled in the study and 201 provided follow-up data. Median
41 duration of sickness absence was 20 days (range 1-99). Earlier return to work was associated
42 with having surgery in primary care and a self-reported work role involving more than four
43 hours of daily computer use. Being female and entitlement to more than a month of paid sick
44 leave were both associated with longer work absences. Duration of work absence was strongly
45 associated with the expected duration of leave, as reported by participants before surgery.
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Earlier return to work was not associated with poorer clinical outcomes reported 12 weeks
after CTR.

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3 **Conclusions:** There was wide variation in the duration of work absence after CTR across all
4 occupational categories. A combination of occupational, demographic and clinical factors was
5 associated with the duration of work absence, illustrating the complexity of return to work
6 decision-making. However, pre-operative expectations were strongly associated with the
7 actual duration of leave. We found no evidence that earlier return to work was harmful. Clear,
8 consistent advice from clinicians pre-operatively setting expectations of a prompt return to
9 work could reduce unnecessary sickness absence after CTR. To enable this, clinicians need
10 evidence-informed guidance about appropriate timescales for the safe return to different
11 types of work.
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27 **STRENGTHS AND LIMITATIONS OF THIS STUDY**

- 28 - This multi-centre, prospective study with a large sample size provides robust evidence to
29 understand return to work issues after carpal tunnel release surgery.
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- 32 - Participants were recruited from primary care, secondary care and private practice sites,
33 representing the breadth of locations where carpal tunnel release is performed in the UK.
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- 36 - Work absence was the primary outcome and a clear definition was used for its duration
37 with data collected contemporaneously to limit recall bias.
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- 40 - A standardised method was used to categorise occupations and measure occupational
41 exposures, although this relied on job title, which may not be a true reflection of actual
42 occupational activity.
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- 45 - All participants underwent open carpal tunnel release, however the method of carpal
46 tunnel syndrome diagnosis was not independently verified and different case definitions
47 for carpal tunnel syndrome may have been included.
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INTRODUCTION

Carpal tunnel syndrome (CTS) occurs when the median nerve becomes compressed within the carpal tunnel at the wrist. Typical sensory symptoms include pain, paraesthesia and/or numbness in the thumb, index, middle and radial half of the ring finger; and motor symptoms include progressive wasting of the thenar muscles. CTS is often associated with marked functional difficulty[1] and treatment is targeted at reducing the median nerve compression by splinting, corticosteroid injection or carpal tunnel release (CTR) surgery[2, 3].

Recent estimates suggest that more than 90,000 CTR procedures will be performed annually in the English NHS by 2025[4], and as the peak incidence for CTS falls within the working lifetime[5], many of these patients will need to return to work after their CTR. However, there is currently no evidence on which to base recommendations about when it might be safe to return to functional activities, including work, after carpal tunnel release (CTR). Our previous survey of UK hand surgeons, primary care surgeons and hand therapists found that clinicians recommended a wide range of times to return to three specified job roles after CTR: 0-30 days for desk-based work (e.g. keyboard, mouse, writing and telephone); 1-56 days for repetitive light manual work (driving, delivery, stacking); and 1-90 days for heavy manual work (e.g. construction)[6]. However, there has not previously been a prospective study of CTR patients in the UK in which time to return to work was the primary outcome. Therefore, it is not known when UK patients return to different occupational activities after CTR or what influences the duration of work absence. It is also unclear whether earlier return to work has a detrimental effect on post-operative clinical outcomes. Possible consequences of returning to work too soon after CTR include wound dehiscence, infection, and delayed healing. Conversely, delayed return to work may increase the risk of progression to long-term sick leave[7] and produce a financial burden for the individual, employer or state.

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5 A systematic review of the prognostic factors associated with return to work after CTR
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7 identified 11 studies which evaluated more than 90 potential prognostic factors[8]. Longer
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9 durations of work absence after CTR were found to be associated with: receipt of workers'
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11 compensation[9]; manual work[10-12]; longer expected durations of work absence[10]; being
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13 on sick leave before CTR surgery[13]; self-blame for the hand problem[13]; and beliefs that the
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15 symptoms were caused by work[12].
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22 Much of the existing research has been conducted at single sites and involved small numbers
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24 of participants. Furthermore, very few studies have specifically explored the influence of a
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26 range of occupational factors. The current multi-centre prospective cohort study was designed
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28 to explore when patients returned to different types of work after CTR and the demographic,
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30 clinical and occupational factors associated with duration of work absence. We also
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32 investigated whether earlier return to work was associated with poorer clinical outcomes
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34 assessed at 12 weeks after CTR.
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41 **METHODS**

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43 This was a prospective cohort study and a convenience sample of participants were recruited
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45 from 16 sites in England and Wales between March 2017 and August 2018. Recruitment took
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47 place before CTR surgery, either at the time of listing for surgery, during pre-operative
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49 screening, or on the day of surgery. At each site, the patient CTR pathway and treatment was
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51 carried out as usual. Sites were NHS secondary care (hospital setting), NHS primary care and
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53 private hand surgery facilities, representing the range of UK healthcare facilities where CTR is
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55 performed. Provision of CTR in the UK was explored through discussion with relevant national
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2 organisations (British Society for Surgery of the Hand and Association for Surgeons in Primary
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4 Care). Sites were recruited through National Institute for Health Research infrastructure.
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10 Eligibility criteria are shown in Table 1. Baseline demographic, general health and occupational
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12 information was collected via self-completed questionnaire at the time of recruitment. The
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14 questionnaire also included standardised measures of CTS symptoms[14-16] and hand
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16 function[17]. Questionnaire content was informed by the clinical, demographic and
17
18 occupational factors previously identified in a systematic review of prognostic factors for
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20 return to work after CTR[8], and developed in collaboration with our patient advisory group.
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22 The reasoning for item inclusion is provided in supplementary file 1.
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30 **TABLE 1. Study eligibility criteria**

31 **Self-selected by potential participants**

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1. Aged over 18 and referred for carpal tunnel release surgery
 2. Routinely work in paid employment for at least 20 hours per week
 3. Plan to return to work after carpal tunnel release surgery
 4. Have not previously had carpal tunnel release surgery on either hand
 5. Have not previously had a serious injury to the same wrist/hand

40 **Assessed by recruiting clinician**

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1. No planned surgical procedures for conditions other than carpal tunnel syndrome

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Follow-up questionnaires were completed four and 12 weeks after CTR and collected information about return to work, work functioning, scar symptoms, CTS symptoms, and hand function. Study questionnaires are provided as supplementary files 2-3. Participants were also asked to complete a short weekly diary from the day after surgery until return to work, detailing whether they had returned to work that week, and if so, the date of return. Steps were taken to minimise loss to follow-up after recruitment. To maximise retention, we

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incentivised with a shopping voucher on completion of the study (£10) and sent up to three reminders using a combination of post, email and text.

Surgical information was collected from the medical records by a member of the participant's clinical team. This included: date of CTR, operated hand(s), nature of anaesthetic, incision size, additional procedures, unexpected findings and suture material. Date, side of CTR and anaesthetic (general/local) were also reported by participants for cross-checking.

Public and patient involvement

This research was supported by a patient advisory group consisting of six individuals who had previously undergone CTR at different UK sites. Study questionnaires were developed in collaboration with the patient advisors and these individuals also provided their feedback on the preliminary findings.

Statistical methods

Comparisons were made between those who dropped out of the study before providing any follow-up data and those in the final study sample using pre-specified demographic, clinical and occupational variables (Table 2).

Manual and non-manual work was coded from job title and industry using the UK Standard Occupational Classification[18, 19]. Return to work time was calculated from the date of surgery to the date of first return to work (as reported by participants).

A Cox proportional hazards model was used to explore the factors associated with return to work time. Baseline and operative variables were assessed in univariable analyses and those

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2 which were significant ($p < 0.05$) were included as covariates in the final model. All regression
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4 analyses were adjusted for age and sex.
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10 Participants were defined as having a poor outcome if they reported one or more of the
11 following: global rating of change score of “worse”, “unchanged” or “slightly improved” (12
12 weeks after CTR)[20]; scar symptoms described as “unbearable”, “very troublesome” or “fairly
13 troublesome” (12 weeks after CTR); use of antibiotics for an incision site infection after
14 returning to work; and additional sick-leave related to the CTR after returning to work. The
15 duration of work absence for those with/without poor outcomes were compared using
16 Wilcoxon rank-sum test. In addition, participants were dichotomised to those who returned to
17 work within/after seven, 14 and 28 days of surgery and the prevalence rates of poor outcomes
18 were compared using χ^2 for each time period. These time points were based on the median
19 clinician-recommended return to work time that we reported previously[6].
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There was no imputation for missing data. Missing values were coded as a separate category
for each of the variables included, and participant numbers are provided for each variable in
the accompanying tables.

RESULTS

A total of 254 individuals completed the baseline questionnaire and 201 (79%) provided follow-up data. Participant numbers and loss to follow-up for each study component are shown in Figure 1. Participant demographics and comparisons between those who remained in the study and those who dropped out before follow-up are shown in Table 2.

Figure 1. Participant numbers for each stage of the cohort study

TABLE 2. Participant demographics assessed at baseline in comparison with those lost to follow-up

| | Study participants n=201 (%) | Lost to follow-up n=53 (%) |
|---|---|---------------------------------------|
| Mean age in years (SD) | 52.0 (9.16) | 44.4 (9.55) |
| <i>Sex</i> | | |
| Male | 76 (37.8) | 20 (37.7) |
| Female | 125 (62.2) | 33 (62.3) |
| <i>Body mass index (kg/m²)</i> | | |
| Normal (18.5-24.9) | 48 (23.9) | 9 (17.0) |
| Overweight (25-29.9) | 66 (32.8) | 16 (30.2) |
| Obese (≥30) | 73 (36.3) | 22 (41.5) |
| <i>Smoking status</i> | | |
| Never smoked | 109 (54.2) | 26 (49.1) |
| Current/ex-smoker | 90 (44.8) | 27 (50.9) |
| <i>General health</i> | | |
| Excellent/very good/good | 174 (86.6) | 42 (79.3) |
| Fair/poor | 26 (12.9) | 11 (20.8) |
| <i>Number of comorbidities</i> | | |
| None | 54 (26.9) | 21 (39.6) |
| One | 70 (34.8) | 13 (24.5) |
| Two or more | 77 (38.3) | 19 (35.9) |
| <i>Number of disabling comorbidities</i> | | |
| None | 138 (68.7) | 35 (66.0) |
| One | 41 (20.4) | 9 (17.0) |
| Two or more | 22 (11.0) | 9 (17.0) |
| Mean SF-36 mental health score (SD) ^a | 65.6 (17.20) | 60.3 (20.41) |
| Mean bilateral CTS-6 score (SD) ^b | 2.8 (0.77) | 3.0 (0.73) |
| Mean MHQ bilateral activities of daily living score (SD) ^c | 68.8 (23.64) | 55.7 (28.62) |
| Mean MHQ work function score (SD) ^c | 66.1 (22.26) | 60.6 (22.61) |
| <i>Type of job contract</i> | | |
| Employed (permanent contract) | 164 (81.6) | 37 (69.8) |
| Self-employed | 31 (15.4) | 13 (24.5) |
| Employed (temporary or zero hours contract) | 5 (2.5) | 3 (5.7) |
| <i>Type of work</i> ^d | | |
| Manual | 77 (39) | 31 (58) |
| Non-manual | 123 (61) | 22 (42) |
| Median level of job demand on hands/wrists (IQR) ^e | 9 (7-10) | 10 (7-10) |
| <i>Job satisfaction</i> | | |
| Very satisfied | 87 (43.3) | 24 (45.3) |
| Satisfied/fairly satisfied | 92 (45.8) | 24 (45.3) |
| Dissatisfied/very dissatisfied | 20 (10.0) | 5 (9.4) |
| Median expected work absence in days (IQR) | 14 (7-28) | 14 (5-21) |
| <i>Expected availability of sick pay</i> | | |
| ≤1 month | 50 (24.9) | 21 (39.6) |
| >1 month | 94 (46.8) | 11 (20.8) |
| Unsure | 57 (28.4) | 21 (39.6) |

| <i>Study site</i> ^f | | |
|---------------------------------|------------|-----------|
| NHS primary care | 73 (36.3) | 13 (24.5) |
| NHS Secondary care | 101 (50.3) | 32 (60.4) |
| Private hand surgery facilities | 27 (13.4) | 8 (15.1) |

^a. SF-36 mental health score ranges from 0-100, higher scores indicate better mental health[21].

^b. CTS-6 symptom score ranges from 1-5, higher scores indicate more severe symptoms[14].

^c. Michigan Hand Questionnaire ranges from 0-100, higher scores indicate better functioning[17].

^d. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

^e. Job demand scale range 0-10, 10 indicating very demanding on hands/wrists[13].

^f. Location where the carpal tunnel release surgery was performed. Surgery in primary care was performed by General Practitioners who had completed additional training.

Eighty-six participants (43%) were recruited pre-operatively on the day of their CTR. For the remaining 115 participants, the median time between recruitment and CTR was 14 days (interquartile range [IQR] 5-40). The first follow-up questionnaire was completed a median of 32 days after CTR (IQR 29-38) and the final questionnaire was completed a median of 92 days after CTR (IQR 86-105). All participants underwent open CTR as a day case, and all but two had unilateral surgery. Another two participants required median nerve neurolysis, and one participant was noted to have a vascular abnormality. Sixty-two percent of participants (n=125) were expecting to have a CTR for their other hand in the future. Other baseline demographic and surgical factors are shown in Table 3.

TABLE 3. Participant demographic and surgical factors

| | Number of participants n=201 (%) |
|--------------------------------------|-------------------------------------|
| <i>Age (years)</i> | |
| 26-40 | 23 (11.4) |
| 41-55 | 101 (50.3) |
| ≥ 55 | 77 (38.3) |
| <i>Hand dominance</i> | |
| Right | 178 (88.6) |
| Left | 18 (9.0) |
| Ambidextrous | 5 (2.5) |
| <i>Side of surgery</i> ^a | |
| Dominant hand | 134 (66.7) |
| Non-dominant hand | 65 (32.3) |
| Bilateral surgery | 2 (1.0) |
| <i>Surgical speciality and grade</i> | |

| | |
|------------------------------------|------------|
| Consultant (plastics/orthopaedics) | 64 (31.8) |
| Registrar (plastics/orthopaedics) | 33 (16.4) |
| General practitioner | 62 (30.9) |
| Not reported | 42 (20.9) |
| <i>Incision type</i> ^b | |
| Mini open incision | 129 (64.2) |
| Traditional incision | 2 (1.0) |
| Not reported | 70 (34.8) |
| <i>Suture material</i> | |
| Absorbable | 24 (11.9) |
| Non-absorbable | 126 (62.7) |
| Not reported | 51 (24.4) |

^a. Considered as the non-dominant hand for those who reported ambidexterity.

^b. Mini open incision defined as distal to the distal wrist crease and traditional open excision extending proximally.

The majority of participants (62%) worked five days per week (range 2-7) and the median number of weekly paid work hours was 37.5 (IQR 31-45). Two participants (1%) did not return to work during the 12-week study period: one reported that they had been made redundant and the other that their job was no longer available. Four participants (2%) had incomplete data (missing return to work date or CTR date) meaning that the duration of work absence could not be calculated. These six individuals were not included in the analyses of return to work time, leaving a total sample size of 195. An additional five participants reported that they had not returned to work, but planned to do so in the future. These individuals were included in the return to work analysis, censored to the time of last follow-up.

The median duration of work absence after CTR was 20 days (IQR 12-33). Manual workers took longer to return than non-manual workers: 23.5 days (IQR 14-41) compared with 18 days (IQR 9-31). Those who were self-employed returned to work earlier than those who were employed: 13 days (IQR 6-19) compared with 22 days (IQR 14-38). Return to work times are shown in Figure 2. The majority of participants returned to work on a Monday (43%).

Approximately 15% returned each day between Tuesday-Thursday, then ~5% returned each

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2 day from Friday-Sunday. More than half of participants (59%) reported that they needed to
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4 modify their work duties to some extent when they first returned to work. Of these, 62% had
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6 resumed full duties within five weeks.
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12 Univariable analyses of the relationship between baseline factors and the duration of work
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14 absence found 17 factors (age- and sex-adjusted) that were significantly associated with time
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16 to return to work and were entered into the multivariable model, in which five factors
17
18 remained significant (Table 4). Sensitivity analyses confirmed that these factors remained
19
20 independently significant in the model. Non-significant findings in the univariable analyses are
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22 provided in supplementary file 4. Having surgery in primary care and having a job with more
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24 than four hours of daily computer use were both associated with earlier return to work than
25
26 their respective reference categories. Being female and having access to more than a month of
27
28 paid sick leave were both associated with longer durations of work absence than their
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30 respected reference categories. Compared to those who expected to return within a week,
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32 there was a sequential increase in the likelihood of longer durations of work absence for those
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34 expecting to return between 7-14 days, 15-30 days and >30 days (Table 4), which showed a
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36 significant gradient effect ($p < 0.001$).
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TABLE 4. Cox proportional hazards analyses of the association between baseline demographic, clinical and occupational factors and the duration of work absence after carpal tunnel release

| | Univariable analyses | | | | | | Multivariable analysis | | |
|--|----------------------|----------------------------|----------------------|---------------|--------------------------|---------|------------------------|--------------------------|------------------|
| | N | Median work absence (days) | Inter quartile range | Hazards ratio | 95% Confidence intervals | P value | Hazard s ratio | 95% Confidence intervals | P value |
| <i>Sex</i> | | | | | | | | | |
| Male | 72 | 17.5 | 8-31 | 1 | - | - | 1 | - | - |
| Female | 118 | 21.5 | 14-35 | 0.79 | 0.59, 1.06 | 0.12 | 0.56 | 0.36, 0.88 | 0.01 |
| <i>Age in years</i> | | | | | | | | | |
| 26-40 | 21 | 20 | 15-30 | 1.01 | 0.63, 1.63 | 0.96 | 1.44 | 0.82, 2.55 | 0.21 |
| 41-55 | 94 | 20 | 9-33 | 1 | - | - | 1 | - | - |
| >55 | 75 | 17 | 12-35 | 1.03 | 0.76, 1.40 | 0.83 | 1.15 | 0.80, 1.65 | 0.44 |
| <i>Smoking status</i> | | | | | | | | | |
| Never | 105 | 16 | 12-31 | 1 | - | - | 1 | - | - |
| Current/ex | 83 | 23 | 13-41 | 0.74 | 0.56, 1.00 | 0.046 | 0.75 | 0.51, 1.09 | 0.13 |
| <i>Site</i> | | | | | | | | | |
| NHS Primary care | 72 | 19.5 | 13-33 | 1.18 | 0.87, 1.62 | 0.29 | 1.54 | 1.05, 2.25 | 0.03 |
| NHS Secondary care | 92 | 20 | 12-39.5 | 1 | - | - | 1 | - | - |
| Private facilities | 26 | 20 | 7-28 | 1.63 | 1.04, 2.54 | 0.03 | 1.46 | 0.87, 2.44 | 0.15 |
| <i>Afraid of long-term hand problems^a</i> | | | | | | | | | |
| No | 105 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| Yes | 82 | 20.5 | 13-42 | 0.69 | 0.51, 0.93 | 0.01 | 0.93 | 0.67, 1.30 | 0.68 |
| <i>CTS-6 score for side of surgery (tertiles)^b</i> | | | | | | | | | |
| Good (1-3.0) | 65 | 16 | 10-27 | 1 | - | - | 1 | - | - |
| Intermediate (3.2-3.8) | 58 | 21.5 | 14-35 | 0.77 | 0.54, 1.10 | 0.15 | 1.19 | 0.77, 1.84 | 0.44 |
| Poor (3.8-5) | 59 | 24 | 13-41 | 0.67 | 0.47, 0.97 | 0.03 | 1.04 | 0.65, 1.66 | 0.87 |
| <i>Type of work contract</i> | | | | | | | | | |
| Employed (permanent) | 154 | 22 | 14-38 | 1 | - | - | 1 | - | - |
| Self-employed | 30 | 13 | 6-19 | 1.72 | 1.13, 2.61 | 0.01 | 1.19 | 0.67, 2.14 | 0.55 |
| Zero hours/temporary | 5 | 12 | 3-31 | 2.01 | 0.81, 5.00 | 0.13 | 0.73 | 0.25, 2.14 | 0.56 |
| <i>Duration of available sick pay</i> | | | | | | | | | |
| ≤1 month | 49 | 16 | 12-29 | 1 | - | - | 1 | - | - |
| >1 month | 88 | 27 | 15-42 | 0.59 | 0.41, 0.85 | 0.004 | 0.46 | 0.28, 0.76 | 0.002 |
| Unsure | 53 | 16 | 10-23 | 1.19 | 0.80, 1.77 | 0.40 | 1.01 | 0.61, 1.66 | 0.97 |
| <i>Access to occupational health at work</i> | | | | | | | | | |
| No | 110 | 15.5 | 9-29 | 1.77 | 1.31, 2.38 | <0.001 | 1.42 | 0.91, 2.19 | 0.12 |
| Yes | 79 | 25 | 16-42 | 1 | - | - | 1 | - | - |
| <i>Expected duration of leave after carpal tunnel release (days)</i> | | | | | | | | | |
| <7 | 35 | 4 | 2-12 | 1 | - | - | 1 | - | - |
| 7-14 | 75 | 16 | 13-26 | 0.23 | 0.15, 0.36 | <0.001 | 0.27 | 0.16, 0.45 | <0.001 |
| 15-29 | 35 | 29 | 22-39 | 0.12 | 0.07, 0.19 | <0.001 | 0.19 | 0.10, 0.37 | <0.001 |
| ≥30 | 45 | 42 | 21-44 | 0.08 | 0.05, 0.14 | <0.001 | 0.12 | 0.06, 0.23 | <0.001 |
| <i>MHQ work functioning score (tertiles)^c</i> | | | | | | | | | |
| Poor (0-55) | 67 | 20 | 13-35 | 0.68 | 0.47, 0.98 | 0.04 | 0.83 | 0.50, 1.40 | 0.49 |
| Intermediate (60-80) | 72 | 21 | 12.5-39.5 | 0.77 | 0.53, 1.10 | 0.15 | 0.81 | 0.50, 1.31 | 0.39 |
| Good (81-100) | 51 | 17 | 10-29 | 1 | - | - | 1 | - | - |
| <i>Job satisfaction^d</i> | | | | | | | | | |
| Satisfied | 169 | 19 | 11-31 | 1 | - | - | 1 | - | - |
| Dissatisfied | 19 | 38 | 21-43 | 0.61 | 0.38, 0.99 | 0.04 | 0.67 | 0.38, 1.16 | 0.15 |
| <i>Believe that the hand problem was caused by work^e</i> | | | | | | | | | |
| No | 112 | 19 | 13-31 | 1 | - | - | 1 | - | - |
| Agree/strongly agree | 76 | 23 | 10-42 | 0.62 | 0.46, 0.85 | 0.003 | 0.82 | 0.57, 1.17 | 0.28 |
| <i>Job is demanding on hands/wrists^a</i> | | | | | | | | | |
| No | 35 | 16 | 6-27 | 1 | - | - | 1 | - | - |

| | | | | | | | | | | |
|----|---|-----|------|----------|------|------------|--------|------|------------|-------------|
| 1 | | | | | | | | | | |
| 2 | Yes | 155 | 20 | 13-38 | 0.61 | 0.42, 0.89 | 0.01 | 0.68 | 0.42, 1.12 | 0.13 |
| 3 | <i>Type of work^f</i> | | | | | | | | | |
| 4 | Non-manual | 119 | 18 | 9-31 | 1 | - | - | 1 | - | - |
| 5 | Manual | 70 | 23.5 | 14-41 | 0.66 | 0.48, 0.89 | 0.01 | 0.97 | 0.57, 1.64 | 0.90 |
| 6 | <i>Work involves target-driven pay^g</i> | | | | | | | | | |
| 7 | No | 149 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| 8 | Yes | 31 | 22 | 13-45 | 0.61 | 0.41, 0.91 | 0.02 | 0.97 | 0.59, 1.61 | 0.91 |
| 9 | <i>Duration of computer use at work (hours)^g</i> | | | | | | | | | |
| 10 | <1 | 69 | 28 | 17-42 | 1 | - | - | 1 | - | - |
| 11 | >1 to <4 | 33 | 16 | 10-31 | 2.20 | 1.43, 3.38 | <0.001 | 1.01 | 0.56, 1.81 | 0.98 |
| 12 | ≥4 | 84 | 16 | 7-27 | 2.38 | 1.67, 3.38 | <0.001 | 1.85 | 1.08, 3.16 | 0.03 |
| 13 | <i>Work involves lifting or carrying ≥10 kg^g</i> | | | | | | | | | |
| 14 | No | 108 | 18.5 | 11-30 | 1 | - | - | 1 | - | - |
| 15 | Yes | 77 | 24 | 13-40 | 0.61 | 0.42, 0.86 | 0.01 | 0.80 | 0.48, 1.33 | 0.39 |
| 16 | <i>Work involves pushing/pulling a heavy weight^g</i> | | | | | | | | | |
| 17 | No | 104 | 16 | 8.5-28.5 | 1 | - | - | 1 | - | - |
| 18 | Yes | 83 | 26 | 16-42 | 0.51 | 0.37, 0.70 | <0.001 | 0.97 | 0.61, 1.55 | 0.90 |
| 19 | | | | | | | | | | |

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21 Total sample size n=195. All analyses were adjusted for age and sex. All significant variables in the univariable analyses
 22 (p<0.05) were entered into the multivariable model.

23 ^a. Reported on a 0-10 scale, dichotomised to no (0-6) and yes (7-10)[13].

24 ^b. CTS-6 score [14] with data driven tertiles.

25 ^c. Michigan Hand Questionnaire work performance subscale scored from 0-100, higher scores indicate better
 26 perceived work performance[17]. Data driven tertiles.

27 ^d. Reported on a 5-point scale, dichotomised to satisfied (very satisfied/satisfied/fairly satisfied) and dissatisfied
 28 (dissatisfied/very dissatisfied).

29 ^e. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor
 30 disagree/disagree/disagree strongly[22].

31 ^f. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

32 ^g. As part of the normal working day[23].

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Clinical outcomes after CTR are shown in Table 5. Using the definition outlined in the methods, a total of 46 participants (24%) were identified as having at least one poor outcome (CTS symptoms that were worse, unchanged or only slightly better; scar symptoms that were at least fairly troublesome; required post-operative antibiotics or had additional time off work after first return). Of these participants, the majority (n=38, 83%) reported only a single component of poor outcome. Three individuals defined as having a poor outcome had not returned to work at the point of last follow-up (as compared with two individuals in the rest of the study sample). For those who had returned to work, the median duration of work absence for those with a poor outcome was 22 days (IQR 12-42) compared with 19 days (IQR 12-32) for those without (Figure 2). This difference was not significant (Wilcoxon rank-sum, p=0.24).

TABLE 5. Clinical outcomes after carpal tunnel release

| | Mean score (standard deviation) | |
|---|---------------------------------|------------------------|
| | Before surgery | 12 weeks after surgery |
| CTS-6 (operated hand) ^a | 3.3 (0.87) | 1.2 (0.54) |
| MHQ function (operated hand) ^b | 50 (22.1) | 79 (19.4) |
| MHQ satisfaction with function (operated hand) ^b | 38 (25.7) | 82 (21.3) |
| MHQ bilateral activities of daily living ^b | 69 (23.7) | 88 (13.8) |
| MHQ activities of daily living (operated hand) ^b | 65 (28.1) | 87 (18.5) |
| | Number of participants (%) | |
| <i>Global rating of change score</i> | | |
| Completely cured | - | 65 (33.3) |
| Much better | - | 98 (50.3) |
| Slightly better | - | 13 (6.7) |
| Unchanged | - | 2 (1.0) |
| Worse | - | 5 (2.6) |
| <i>Scar symptom severity</i> | | |
| Not at all troublesome | - | 99 (50.8) |
| A little troublesome | - | 63 (32.3) |
| Fairly troublesome | - | 18 (9.2) |
| Very troublesome | - | 2 (1.0) |
| Unbearable | - | 0 |
| Required post-operative antibiotics | - | 10 (5.1) |
| Additional sick leave after first returning to work | - | 12 (6.2) |

Grey shading indicates the categories which were combined to define a poor surgical outcome.

^a. CTS-6 assessment of carpal tunnel syndrome symptoms[14]. Range 1-5: 1 equals no symptoms.

^b. MHQ Michigan Hand Questionnaire[17]. Range 0-100: 100 equals no deficit or dissatisfaction.

Figure 2. Duration of work absence after carpal tunnel release

There was no significant difference in the prevalence of a poor outcome among those who returned to work within or after seven days of CTR (20% versus 24%, Chi^2 $p=0.63$). Similarly, there was no significant difference in the prevalence of a poor outcome among those who returned to work within or after 14 days (19% versus 25%, Chi^2 $p=0.31$), or within or after 28 days of CTR (21% versus 27%, Chi^2 $p=0.33$).

DISCUSSION

In this multi-site prospective cohort study, the median duration of work absence was 20 days (range 1-99), a duration similar to that reported by other European studies[24]. Earlier return to work was associated with typing for ≥ 4 hours at work (as compared with more physical workplace tasks) and undergoing surgery in primary care (as compared with secondary care or private practice). Pre-operative expectations about return to work were important significant predictors of actual return to work times. We found no evidence of poorer clinical outcomes in the first 12 weeks amongst those who returned to work earlier. At each time point, fewer manual workers had returned to work than non-manual workers and fewer employed workers had returned than self-employed (Figure 2). Both findings have been reported previously[10, 11, 25, 26], however, neither the type of work (manual/non-manual) nor the type of work contract (employed/self-employed) were significantly associated with the duration of work absence in the mutually adjusted model. These results illustrate the importance of considering the range of relevant demographic, clinical and occupational factors, which may have been confounders, moderators or mediators in previous studies.

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3 Five variables remained statistically significantly associated with longer duration of work
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5 absence in the final model. Two were occupational factors: infrequent computer use and
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7 availability of sick pay. Cowan et al.[10], recorded earlier return to work after CTR for desk-
8
9 based workers and we have shown previously that UK hand surgeons and hand therapists
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11 report that they advise earlier return to desk-based workers[6]. The relationship between
12
13 longer duration of work absence and availability of sick pay has also be reported previously for
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15 those with and without worker's compensation[9, 24]. It is plausible that financial necessity is
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17 driving earlier return to work for those with limited sick pay. Alternatively, those with access to
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19 paid leave might choose to take the maximum available duration.
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27 Only one clinical factor was significantly associated with the duration of work absence:
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29 participants who had their CTR surgery in primary care were more likely to return to work
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31 earlier than those whose procedure took place in an NHS hospital setting. One possible reason
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33 is that patients with more complex disease may be more commonly referred to secondary,
34
35 rather than primary, care for their CTR and these patients may require longer off work after
36
37 their surgery. However, in the current study the proportion and degree of comorbidities, and
38
39 the extent of pre-operative symptoms reported by participants were similar across all settings.
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42 Another possibility is that the patients' expectations of the surgery may be different: CTR
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44 performed in a primary care setting might be perceived by patients as being more minor than
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46 surgery in a hospital operating theatre. Alternatively, the general practice surgeons may have
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48 recommended earlier return to work than those based in a hospital, although the median
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50 expected duration of work absence for participants in the current study was the same across
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52 all settings. The inclusion of CTR performed in primary care is a strength of the study. CTR and
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2 other surgical procedures, such as vasectomy and minor skin surgery, are regularly performed
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5 by trained General Practitioners in the UK[27].
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10 Only one demographic factor was statistically significant: women were more likely to take
11
12 longer to return to work than men. Whilst we found inconsistent data about the effect of
13
14 gender on return to work after CTR in the literature[28, 29], female gender has been
15
16 associated with longer periods of work absence for other health conditions[30]. Researchers
17
18 should continue to include sex as a covariate in analyses of return to work outcomes, although
19
20 there is currently insufficient evidence to support any difference in return to work
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22 recommendations after CTR based on sex. Further qualitative investigation is required in order
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24 to understand the context for this.
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32 Finally, those who expected to return to work more quickly were significantly more likely to do
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34 so. It has been shown previously that patient expectations are a prominent determinant of
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36 return to work time, or other return to work outcomes, for musculoskeletal or mental health
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38 conditions[30-32]. The role of expectations on outcomes, including the expected and actual
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40 timing for return to work and driving after hand and wrist surgery, requires further
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42 exploration, particularly because expectations are a potentially modifiable characteristic which
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44 could be influenced by the advice provided by clinicians pre-operatively.
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51 In total, approximately a quarter of participants in this study were considered to have a poor
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53 outcome using our composite definition. We chose to use a multi-component definition which
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55 was deliberately very stringent to minimise the chances of missing any harm caused by early
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57 return to work. Our rates of poorer outcomes were in fact similar to those reported in other
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3 CTR populations[20, 33, 34]. Importantly, we found no relationship between earlier return to
4
5 work and occurrence of poor outcomes within 12 weeks of CTR in this cohort study. We
6
7 acknowledge that a longer follow-up duration would have aided the assessment of post-
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9 operative symptom resolution, however this was not possible with the resources available and
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11 was not a primary objective of the study.
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18 There are a number of limitations of the current study, including the reliance on self-reported
19
20 data. Work absence is not logged on a national database in the UK and therefore could only be
21
22 obtained through self-report. To minimise errors of recall, date of return to work was
23
24 determined contemporaneously. The recall duration for measures of function and symptoms
25
26 was limited to a maximum of four weeks, consistent with the outcome measures used[14, 17].
27
28 We set out to recruit a large sample of working-aged adults undergoing CTR. Our prospectively
29
30 recruited sample from 16 sites is one of the largest reported in the literature to date, with a
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32 good follow up response rate (79%), but it remains possible that we were under-powered to
33
34 detect some of the factors which may have been associated with delayed return to work.
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36 Specifically, this could result where some levels of categorical variables of interest have lower
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38 prevalence, for example, the type of work contract (>80% of participants reported that they
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40 had a permanent work contract, compared with ~15% who were self-employed).
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50 Following our *a priori* analysis plan, the association between each baseline variable and the
51
52 duration of work absence was individually assessed in separate age- and sex-adjusted analyses.
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54 Only those variables which reached significance at the 5% level ($p < 0.05$) were included in the
55
56 multivariable model. In order to test the stability of our model, and to identify whether any
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58 potential associations had been missed, this was tested using 1% and 20% cut-offs. In both test
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2 scenarios, the findings were similar to those presented in our final model (Table 4), suggesting
3 that our model is robust. However, we acknowledge that alternative methods of selecting
4 variables for inclusion (such as forward inclusion or backward elimination) may have yielded
5 slightly different results, particularly for variables that were close to our significance cut-off of
6 5%.
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17 The findings may not be generalisable to working populations in regions outside of central and
18 southern England and Wales or employed in other industries. Steps were taken to include the
19 main settings where CTR is performed in the UK, but we acknowledge that CTR may also be
20 performed by other specialities. Individuals who chose to participate in the study may not be
21 fully representative of the wider CTR population, and the observed differences between those
22 who completed the study and those who were lost to follow-up (younger, poorer mental
23 health, more likely manual workers) also limit generalisability.
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37 Endoscopic CTR has been associated with earlier return to work than open CTR [35], however it
38 was not possible to assess this in the current study. At present, endoscopic CTR is not routinely
39 performed in the UK[6]. Anecdotally, most providers will not fund the extra cost of endoscopic
40 CTR, which requires extra equipment, longer operating times and more experienced surgeons.
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47 Recruitment to the current study was not limited to patients undergoing open CTR, but no
48 endoscopic procedures were performed during the study at any of our sites.
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54 All participants were presumed to have CTS as diagnosed by their treating clinician. Many
55 studies of CTS include nerve conduction study (NCS) findings as part of their eligibility criteria,
56 although this was not possible in the current study because NCS are not routinely
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3 recommended for pre-operative diagnosis of CTS in the UK[2]. Our eligibility criteria required
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5 that only people undergoing their first CTR were included and reported upon in this study (so
6
7 that previous experiences with CTR were not potential confounders). However, more than
8
9 three quarters of the cohort reported bilateral symptoms. The possible impact of persisting
10
11 CTS symptoms in the non-operated hand on return to work also needs to be considered.
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17 For the current study, we considered both occupational title and self-reported occupational
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19 exposures collected in a standardised questionnaire format[13, 18, 19, 23]. Categorisation
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21 based on job title and industry may not accurately reflect the physical and/or psychosocial
22
23 aspects of job role. Furthermore, co-occurrence of occupational exposures may be more
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25 common in some types of jobs than in others, for example lifting >10kg and pushing or pulling
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27 a heavy weight.
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34 There is a need for an agreed approach to identifying and recording key physical demands and
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36 psychosocial exposures of jobs to enable consistent exploration of their impact on work and
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38 clinical outcomes following surgery or other intervention. Approaches such as job exposure
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40 matrices[36] could facilitate this in future research.
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47 In summary, this large multi-centre prospective cohort study investigated when participants
48
49 return to work after CTR. Expectations about return to work (reported before surgery) were
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51 strongly associated with actual work absence, regardless of the job role or self-reported upper
52
53 limb activities involved. Patient expectations can be influenced by many factors, but one of the
54
55 most important is the advice provided by clinicians, in particular the surgeon. This suggests
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57 that clear, consistent advice could have an important effect on duration of sick leave. To date
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3 there is no evidence-based guidance informing clinicians what to advise about returning to
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5 different types of work after CTR. Further research is required to reach a consensus and
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7 explore whether the provision of targeted, consistent and standardised advice can alter the
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9 expected duration of work absence, reducing unnecessary sick leave, without causing adverse
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11 effects on clinical outcomes.
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35 Conflicts of interest

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10 **Informed consent**

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12 Written informed consent was obtained from the patient(s) for their anonymised information
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15 to be published in this article.
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20 **Ethics approval**

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22 Full ethics approval was granted by the NHS Health Research Authority (IRAS 209840:
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24 16/WA/0390) and University of Southampton (ERGO 25757) Ethics Committees.
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30 **Contributorship**

31
32 The study was devised by LN, KWB, JA, DW and DC. LN completed data collection and analysis,
33
34 with assistance from GN and KWB. All authors contributed to the interpretation of the data. LN
35
36 wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and
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38 approved the final version.
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26
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Figure 1. Participant numbers for each stage of the cohort study

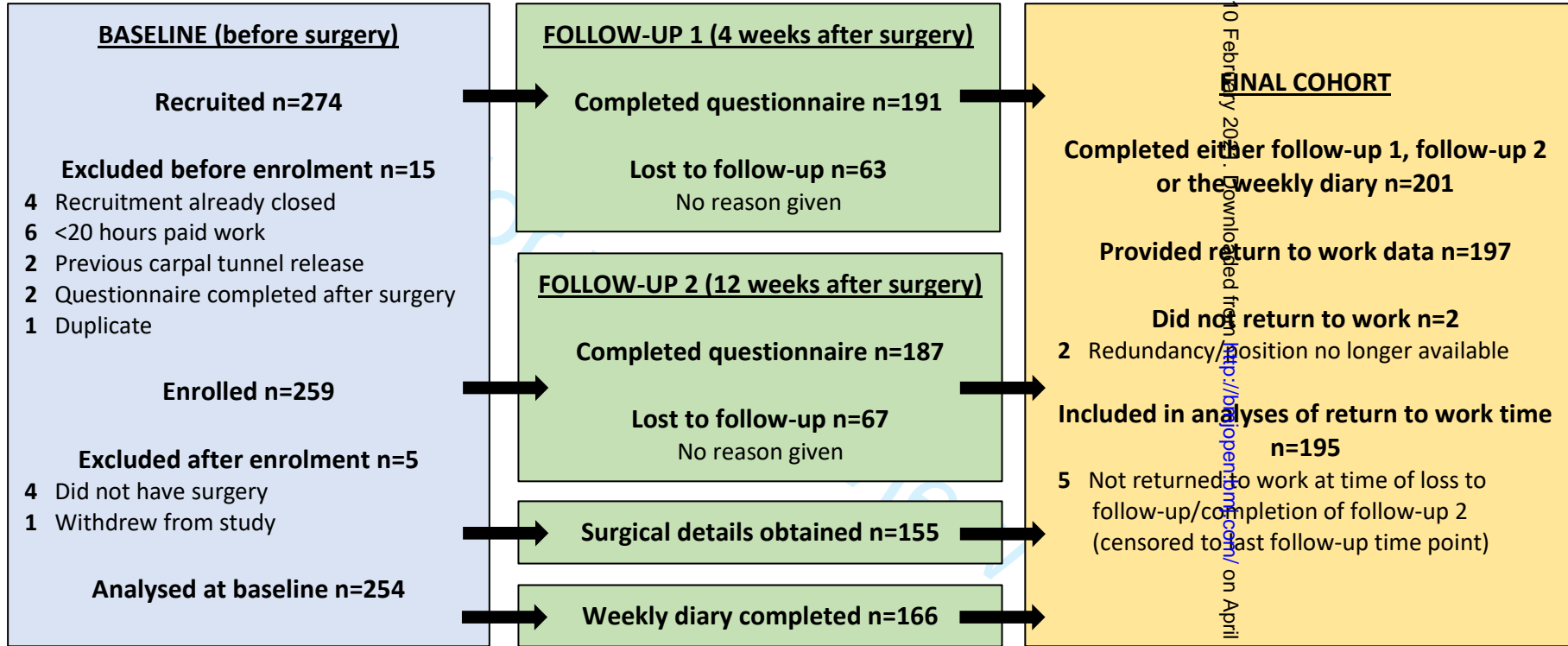
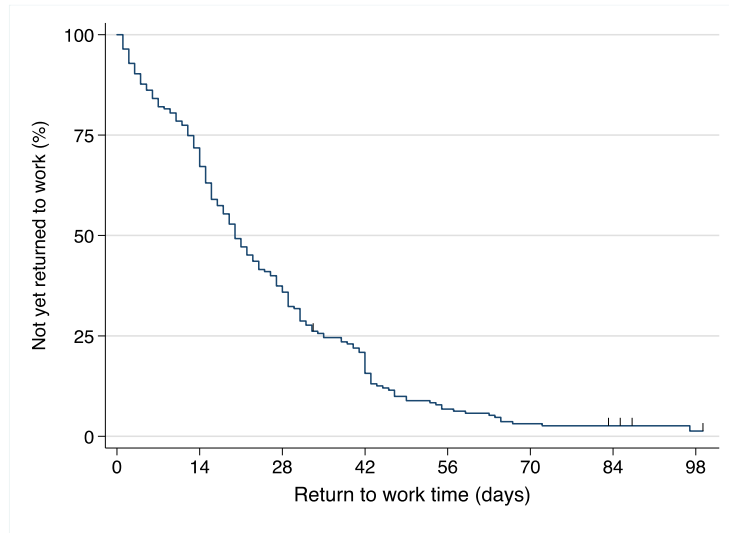
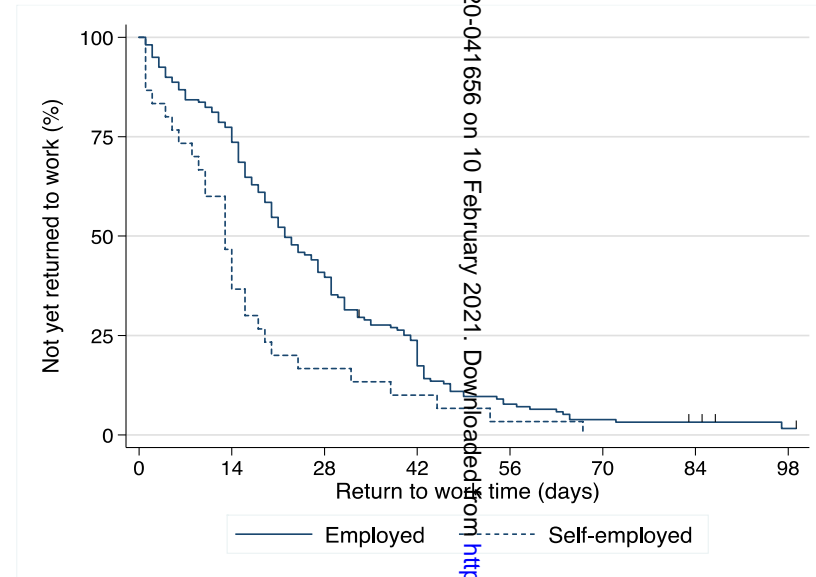


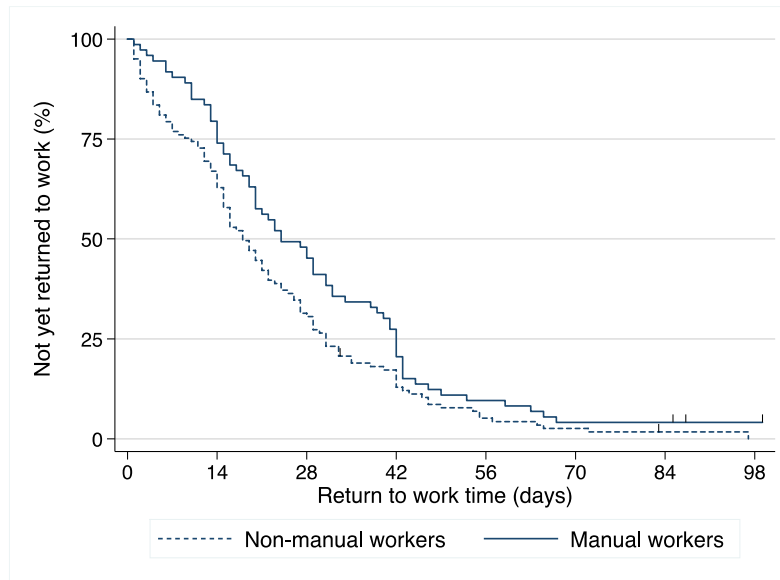
Figure 2. Duration of work absence after carpal tunnel release



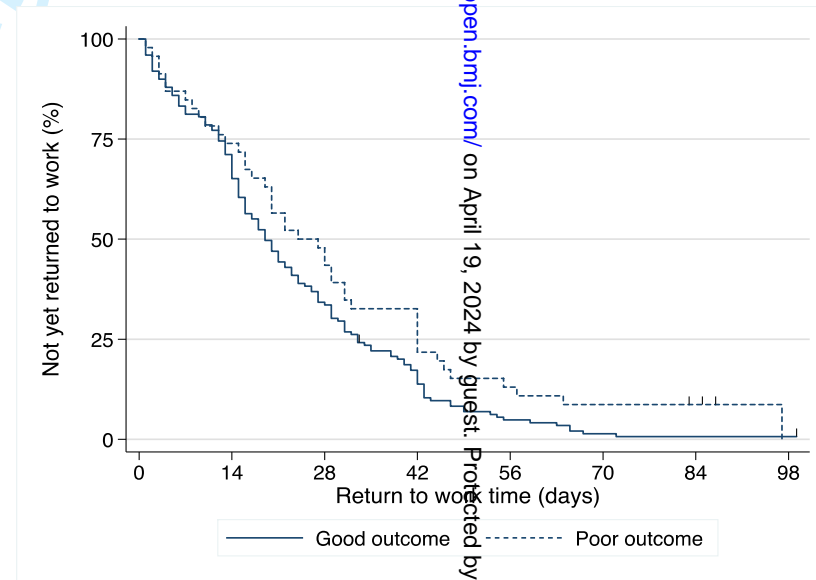
A. Whole cohort



B. Employed versus self-employed workers



C. Non-manual versus manual workers



D. With versus without a poor outcome

Vertical lines indicate right censoring for those who had not returned to work at the point of last follow-up

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Development of the REACTS study questionnaire: Reasoning for item inclusion

Questions were chosen to capture information on variables that might be expected to influence return to work after CTR.

Demographic factors

General demographic information was requested including date of birth, sex and hand dominance. Other studies have found that older age was associated with poorer work outcomes after CTR [1, 2], while no clear sex effect has been shown [3, 4]. Hand dominance in relation to side of surgery is rarely reported in CTR studies, however, surgery to the non-dominant hand has been linked to quicker and more complete resolution of CTS symptoms [5].

Carpal tunnel release planning

Information was collected on the expected date of CTR, side of surgery, availability of occupational health services and the patient's expectations about time off work post-surgery. Expected duration of work absence has been identified as a determinant of return to work time in previous CTR studies [2, 6].

Occupational factors

Participants were asked to list their main occupation and the industry in which they work (examples were provided to facilitate the response). This information was processed using the UK Office for National Statistics Standard Occupational Classification [7] and Computer Assisted Structured Coding tool (Cascot) [8] to generate manual and non-manual categories. Cases where the coding match was confirmed as less than 64% were reviewed by the lead researcher and coded by hand [8]. This was checked by the department data manager and any queries resolved through discussion.

Participants were asked to categorise their employment type as: employed (permanent contract), employed (temporary/renewable contract), zero hours contract and self-employed. Our systematic review found earlier return to work times for self-employed individuals compared to those who were employed [9]; but this was only investigated in two

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Newington et al. (2020). Sickness absence after carpal tunnel release: a multicentre prospective cohort study studies [10, 11]. The additional sub-categories for employment type listed above and a separate question about sick-pay entitlement were included to allow the impact of work contract type to be explored [12]. Participants were also asked how many hours they usually worked each week and over how many days; this information was collected for the participant's main job and any other routine paid work. The total number of work hours per week was calculated by combining the hours for main and additional jobs.

Occupational activities that load the upper limb and potential work stressors were asked as a series of yes/no questions following the format of a recent multi-centre RCT exploring management of non-specific distal arm pain [13]. These questions originated in the Job Content Questionnaire, designed to assess psychological and physical aspects of work [14]. Activities included: computer use, tasks involving repeated wrist/finger movement, holding vibrating tools, lifting more than 5 or 10kgs, pushing/pulling a heavy weight, working with the neck flexed or rotated, and driving. Our systematic review found that manual workers took longer to return to work than non-manual workers [9] and these questions were used to determine the self-reported level of upper limb manual activity involved in each participant's job.

Potential psychosocial work stressors were also assessed. These included piecemeal work, activity targets and bonuses, and tight deadlines. As the first three items all concerned payment for results, these were combined for the analyses. Participants were also asked whether they found their main job demanding on their hands/wrist and whether their boss/colleagues were supportive. Both questions were scored on a 0-10 scale as reported previously in a study of sick leave duration after endoscopic CTR [15]. These were dichotomised as supportive (7-10) and neutral/unsupportive (0-6). A question about general job satisfaction was also included later in this section of the questionnaire, with the Likert response options: very satisfied, satisfied/fairly satisfied, dissatisfied and very dissatisfied [15, 16]. The last two options were condensed to give three categories for the analyses.

To assess self-reported work function, participants were asked to complete the work performance section of the Michigan Hand Questionnaire (MHQ) [17]. This patient reported outcome measure is frequently used in upper limb clinical practice and research and has

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3 been validated for use with CTS and CTR populations [18]. Permission was granted for the
4 MHQ to be used in the study. The questionnaire asked participants to recall how much
5 difficulty they had with general work tasks over the past four weeks in relation to problems
6 with their hands/wrists, for example: needing to shorten their working day, taking longer to
7 complete tasks or needing to take breaks. Using the standard scoring, each question was
8 completed on a Likert scale of: always, often, sometimes, rarely and never, and combined to
9 give a score from 0-100, with 100 representing no problems with work functioning [19].
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11 Participants were also asked whether they had taken any periods of sickness absence from
12 work over the previous four weeks, both related to the hand/wrist problem, or for any
13 other problem.
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23 **General health**

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25 Seven general health questions were included to capture information on comorbidities,
26 physical and mental health and somatisation. Self-reported health was assessed using the
27 first SF-36 question: In general, would you say your health is – excellent, very good, good,
28 fair, poor [20]. This was taken from the original SF-36 version, which is free from licence
29 charges and was dichotomised as excellent/very good/good and fair/poor for the analyses.
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36 Participants were asked their height and weight to enable the calculation of BMI (body mass
37 index; weight in kilograms/height in metres squared). This was categorised using standard
38 WHO classification: underweight (BMI <18.5), normal weight (BMI 18.5-24.9), overweight
39 (BMI 25.0-29.9) and obese (BMI ≥30.0) [21]. Smoking status was categorised as those who
40 have never smoked regularly, those who have smoked in the past and those who regularly
41 smoke, with the latter two categories combined for the analyses. Previous studies have
42 found that obesity (BMI ≥30) was linked to poorer work outcomes [1] and smoking was
43 linked to poorer clinical outcomes after CTR [22].
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52 A list of common health problems and their impact on general activities was assessed using
53 the Self-Administered Comorbidity Questionnaire [23]. Participants were asked first to
54 select whether they have any of the 14 medical conditions and if so whether this limited
55 their activities. All medical conditions were worded in an accessible format, as evaluated by
56 the patient advisory group. Responses were analysed as the number of comorbidities and
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the number of disabling comorbidities using the scale: 0, 1, ≥ 2 . Mental health was assessed using the mental health and vitality questions from the licence-free version of the SF-36 [20]. One modification was made to change the wording of the question 'Did you feel full of pep?' to 'Did you feel full of get-up-and-go?' for the UK rather than US setting. The questions were used to calculate the summary score from 0-100 (where 100 represents no disability).

Somatisation was assessed using a subset of five questions from the Four-Dimensional Symptom Questionnaire [24] as previously reported in UK cohort studies of health and employment [25] and upper limb pain in primary care [26]. The number of symptoms that were rated by the participant as at least moderately distressing were used to create the analysis categories of: 0, 1, ≥ 2 symptoms.

Hand and wrist symptoms and function

Katz & Stirrat hand diagrams were included for the participants to indicate where on their hand(s) they experience pain and/or tingling and numbness [27]. This self-administered tool can be used clinically as part of the CTS diagnosis process using the scoring system modified by Calfee et al. [28]. A question on symptom duration was also included and categorised as less than 3 months, 3-6 months, 6-12 months and more than a year. This was dichotomised to ≤ 1 year and > 1 year for analysis. All participants were expected to have clinically diagnosed CTS as they were undergoing CTR, but participants were asked to answer for both hands, so that symptoms in the non-operated hand were also assessed. This was used to define bilateral or unilateral symptoms. Hand diagram scores were dichotomised according to a stringent definition of CTS (classic and probable) and unlikely CTS (possible and unlikely).

The CTS-6 questionnaire was included to assess the severity of CTS symptoms [29]. This tool is a shorter version of the Boston Carpal Tunnel Questionnaire [30] and has been assessed for use pre- and post CTR surgery. The six questions explore the severity of pain and numbness, whether this occurs during the daytime or at night, and whether this wakes the individual. Participants were asked to complete these questions separately for each hand using a 5-point Likert scale. Using the standard scoring criteria, responses for each item

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3 were combined to give a mean score ranging from 1-5, with 5 representing the highest
4 severity of symptoms. If one response was missing (per hand) this was imputed using the
5 mean score of the remaining responses [29].
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10 Hand function was assessed using the MHQ sub-sections on unilateral hand function (asked
11 for each hand), satisfaction with hand function (asked for each hand), and ability to perform
12 unilateral and bilateral activities of daily living (ADLs) [17]. The MHQ summary question
13 relating to the level of satisfaction with the appearance of each hand was also included. All
14 questions were scored on the 5-point Likert scales provided and used the standard wording
15 and scoring to enable comparison with other study populations. Possible scores for each
16 sub-section range from 1-100, with 100 representing no problems or the highest level of
17 satisfaction. Missing data were imputed according to the MHQ guidelines, which allow the
18 scale to be calculated if more than 50% of the questions for each sub-section have been
19 completed [19].
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30 **Health beliefs**

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32 The remaining questions related to health beliefs. Beliefs about the cause of symptoms and
33 likely prognosis have been identified as key themes in health-seeking behaviour for CTS [31]
34 and upper limb pain [26], and blaming oneself for the hand problem has been associated
35 with long durations of sick leave after endoscopic CTR [15]. The participant's expectations
36 for being able to use the affected hand normally within 3 months of surgery, fear of long-
37 term hand problems, blaming oneself for the hand problem and the perceived level of
38 support available from friends and family were assessed. Responses were rated on a 0-10
39 scale as reported by Hansen et al. [15]. All responses were converted to a unidirectional
40 scale with 10 being the best outcome, and were dichotomised as neutral/negative response
41 0-6 and positive response 7-10.
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52 Participants were also asked to agree/disagree (via a 5-point Likert scale) with a series of
53 seven questions about the believed cause of their symptoms. Using previously reported
54 methods, the responses were dichotomised to those who agreed (agree/strongly agree) and
55 those who did not agree (neither agree nor disagree/disagree/disagree strongly) with each
56 statement [26]. The first two questions were combined to generate six items: 1) I think I was
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born with a weakness in this part of my body/problems like this run in my family; 2) my problem was caused by work; 3) my problem probably wasn't caused by work, but work made it worse; 4) I have a lot of stress in my life and that has made my problem a lot worse; 5) a lack of exercise probably contributed to my problem; 6) as you get older, parts of the body wear out and problems like mine are likely [26].

Finally, the abbreviated Pain Catastrophizing Scale was included, which provides insight about the participant's pain beliefs [32]. Responses were dichotomised to those who reported catastrophising pain thoughts and feelings to at least a moderate degree in response to all questions, and those who did not.

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Before Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

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CONSENT FORM (IRAS reference: 209840)

You should complete this form after you have read the Participant Information Sheet.

REACTS: Return to employment after carpal tunnel release surgery

Thank you for considering taking part in this research. If you have any questions arising from the Participant Information Sheet, please ask the research team before you decide whether to take part.

Please initial the boxes if you agree with each statement

1. I have read the Participant Information Sheet (version 2.0; 06.12.16) and have had the opportunity to ask questions about the study.
2. I meet the criteria for being involved in this study:
 - Aged over 18 and referred for carpal tunnel release surgery
 - Routinely work in paid employment for at least 20 hours per week
 - Plan to return to work after carpal tunnel release surgery
 - Have not previously had carpal tunnel release surgery on either hand
 - Have not previously had a serious injury to the same wrist/hand that will have the carpal tunnel release operation
3. I agree to take part in this research and agree for my data to be used for the purposes explained in the Participant Information Sheet (version 2.0; 06.12.16). I understand that this information will be handled in accordance with the terms of the UK Data Protection Act 1998.
 - a. I agree for the REACTS research team to access pre-operative test results concerning my hand and wrist symptoms. No other information will be accessed.
 - b. I agree for the REACTS research team to access my carpal tunnel release surgical record. No other information will be accessed.
4. I understand that if I decide at any time during the research that I no longer wish to take part, I can notify the researchers and withdraw from the study immediately, without giving a reason. If I do, I understand that I can ask for any contribution I have already made to be removed from the study, up to the time when I have completed the final questionnaire.

Signature _____ Date ____ / ____ / ____

Name _____ Phone _____
(please print) (only to be used if we lose touch)

Postal address _____

Email address _____
(please print)

ADDITIONAL QUESTIONS*Please circle one response for each question*I prefer to receive the next two questionnaires by **Post** **Email** **Don't mind**I prefer to receive correspondence about the study by **Post** **Email** **Don't mind**I would like to be notified of the findings from this research **Yes** **No**I am happy to be contacted about the next stage of the research,
which will involve a one-off discussion with the lead researcher **Yes** **No**I am happy to be contacted about other studies related to this
research **Yes** **No**

When the research team receives your completed questionnaire and consent form, we will sign it below and return a copy to you for your records.

Researcher signature _____ Date ____ / ____ / ____

Researcher name _____

University of Southampton research supervisors:

Professor Karen Walker-Bone | Professor Jo Adams | Professor David Warwick

SECTION A: BACKGROUND

1 What is your date of birth?

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

2 Are you:

Male Female Other

3 Are you:

Right handed Left handed Both

4 Do you routinely carry out paid work for 20 hours or longer in a given week?

Yes No

*If no, thank you for your interest in our study, however, we are only looking for individuals who carry out paid work for at least 20 hours per week. You **do not** need to complete the rest of the questionnaire, but please return it using the pre-paid envelope provided.*

5 When do you expect to have your carpal tunnel surgery?

Please enter the exact date if known, or provide the approximate month and year if unsure.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

6 Which hand will be operated on?

If both hands please answer Question 6.1; if one hand, please move on to Question 7.

Right Left Both

6.1 If both hands, which side will be operated on first?

Right Left Both sides operated
on the same day Unsure

7 Do you have access to an occupational health service through your place of work?

Yes No Unsure

8 Do you expect to take any time off work following your surgery?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No Unsure

8.1 If you do expect to take time off work, how long do you expect to take?

Please complete using days, weeks or months; whichever applies.

Days Weeks Months

SECTION B: WORK

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4 **12** What is your MAIN occupation at the moment (e.g. secretary, teacher, builder
5 etc.)?
6
7

8
9 **13** And in what industry do you work (e.g. farming, shipyard, car factory, shoe
10 shop, hospital, insurance office etc)?
11
12

13
14 **14** Which of the following best describes your present work situation for your
15 MAIN occupation? Please tick one box.
16

- 17 a) Employed (permanent contract) d) Self-employed
18 b) Employed (temporary/renewable contract) e) Other (*please specify*)
19 c) Zero hours contract
20
21
22
23

24
25 **15** On average, how many hours per week do you normally work in your main
26 occupation?
27

28 hours
29

30
31 **16** On average, how many days per week do you normally work in your main
32 occupation?
33

34 days
35

36
37 **17** Do you have any other paid work?
38

If yes, please answer Question 17.1; if no, please move on to Question 18.

39 Yes No
40

41
42 **17.1** If yes, on average, how many hours a week do you work in hours
43 other paid jobs?
44

45
46 **18** Does an average day at work in your MAIN job normally involve any of the
47 following? Please tick one box for each question.

- | | Yes | No |
|--|--------------------------|--------------------------|
| 48 a) Piecework in which you are paid according to the number of articles or 49 tasks you or your team make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| 50 b) A target number of articles or tasks that you or your team are expected 51 to make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| 52 c) Payment of a bonus if you make or finish more than an agreed number 53 of articles/tasks in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| 54 d) Working to tight deadlines | <input type="checkbox"/> | <input type="checkbox"/> |
| 55 e) Use of a computer keyboard or mouse for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION B: WORK

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| | Yes | No |
|--|--------------------------|--------------------------|
| f) Use of a computer keyboard or mouse for longer than 4 hours in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Other tasks involving repeated movements of the wrist or fingers for longer than 4 hours in total? <i>(Please indicate which tasks)</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | |
| ----- | | |
| h) Working with a powered tool that makes your hand(s) or arm(s) vibrate (e.g. chain saw, pneumatic drill)? | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Working with your hand(s) above shoulder height for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Lifting or carrying weights of 5 kg (11 lbs) or more in one hand (e.g. a tool bag or heavy briefcase)? | <input type="checkbox"/> | <input type="checkbox"/> |
| k) Lifting or carrying a weight of 10 kg (22 lbs) or more? | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Tasks involving pushing or pulling a heavy weight? | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Working for longer than two hours in total with your neck bent forward? | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Working for longer than half an hour in total with your neck twisted e.g. when looking to one side? | <input type="checkbox"/> | <input type="checkbox"/> |
| o) Driving for more than an hour? | <input type="checkbox"/> | <input type="checkbox"/> |

19 Do you find your MAIN job demanding on your hands/wrists?
Please circle one number, where 0 represents not at all, and 10 represents very much.

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much

20 Does your MAIN employer (or boss/colleagues if self-employed) know about your hand/wrist problem?
If yes, please answer Question 20.1; if no, or not applicable, please move on to Question 21.

Yes No N/A self-employed and work alone

20.1 Is your MAIN employer (or boss/colleagues if self-employed) supportive of your hand/wrist problem?
Please circle one number, where 0 represents not at all, and 10 represents very much

0 1 2 3 4 5 6 7 8 9 10

Not at all Very much

SECTION B: WORK

The following questions refer to how you did in your MAIN job during the past 4 weeks.

21 weeks.

Please tick one box for each question.

- | | Always | Often | Sometimes | Rarely | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| How much of the time during the past 4 weeks ... | | | | | |
| a) Were you unable to do your work because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Did you have to shorten your work day because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Did you have to take breaks at work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Did you get less done because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you take longer to do the tasks in your work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 **During the past 4 weeks, how much time have you missed from your MAIN job for the following reasons?**

Please write 0 if you have not missed any time from work during this period. You can answer in days or hours, whichever applies.

- | | | | | | | | |
|--|---|---|------|-----------|---|---|-------|
| a) Time missed because of the problem with your hand(s)/wrist(s) | <input style="width: 20px; height: 20px;" type="text"/> | <input style="width: 20px; height: 20px;" type="text"/> | Days | or | <input style="width: 20px; height: 20px;" type="text"/> | <input style="width: 20px; height: 20px;" type="text"/> | Hours |
| b) Time missed because of any other problem | <input style="width: 20px; height: 20px;" type="text"/> | <input style="width: 20px; height: 20px;" type="text"/> | Days | or | <input style="width: 20px; height: 20px;" type="text"/> | <input style="width: 20px; height: 20px;" type="text"/> | Hours |

23 **If you fell ill and were off work, how long could you get your normal full pay (excluding bonuses)?**

Please tick the option that best represents your MAIN job.

- | | | | |
|-----------------------|--------------------------|-----------------------|--------------------------|
| a) Less than one week | <input type="checkbox"/> | d) More than 6 months | <input type="checkbox"/> |
| b) 1 – 4 weeks | <input type="checkbox"/> | e) Not sure | <input type="checkbox"/> |
| c) 1 – 6 months | <input type="checkbox"/> | | |

24 **How satisfied are you with your MAIN job as a whole, taking everything into consideration?** This includes your salary, career possibilities, management, colleagues etc. Please tick one box.

- | | | | |
|-------------------------------|--------------------------|----------------------|--------------------------|
| a) Very satisfied | <input type="checkbox"/> | c) Dissatisfied | <input type="checkbox"/> |
| b) Satisfied/fairly satisfied | <input type="checkbox"/> | d) Very dissatisfied | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

25 In general, would you say your health is:

- a) Excellent
- b) Very good
- c) Good
- d) Fair
- e) Poor

26 What is your height? Please answer in either feet and inches or centimetres.

feet inches *or* cms

27 What is your weight? Please answer in either stones and pounds or kilograms.

stones lbs *or* kgs

28 Do you, or have you ever, smoked regularly? Please tick one box.

- a) I have never smoked regularly
- b) I have smoked in the past, but do not currently smoke regularly
- c) I regularly smoke

29 The following is a list of common health problems. Please indicate if you currently have, or don't have, the problem listed in part 1. If you have the problem, please answer the corresponding question in part 2. Please answer all questions in part 1.

| HEALTH PROBLEM | PART 1 | | PART 2 | |
|-----------------------------------|---------------------------|--------------------------|--------------------------------|--------------------------|
| | Do you have the problem? | | Does it limit your activities? | |
| | NO | YES | NO | YES |
| | (if yes move to part 2) → | | | |
| a) Heart disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) High blood pressure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Lung disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Diabetes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Ulcer or stomach disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Kidney disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Liver disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Thyroid disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Anaemia or other blood disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

| HEALTH PROBLEM continued... | Do you have the problem? | | Does it limit your activities? | |
|-----------------------------|---------------------------|--------------------------|--------------------------------|--------------------------|
| | NO | YES | NO | YES |
| | (if yes move to part 2) → | | | |
| k) Depression | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Osteoarthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Back pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Rheumatoid arthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

29.1 Please list any other medical problems that have not been mentioned.

| | Does it limit your activities? | |
|----------|--------------------------------|--------------------------|
| | NO | YES |
| o) | <input type="checkbox"/> | <input type="checkbox"/> |
| p) | <input type="checkbox"/> | <input type="checkbox"/> |
| q) | <input type="checkbox"/> | <input type="checkbox"/> |

30 The following questions are about how you feel and how things have been with you during the **past 4 weeks**. For each question, please give the answer that comes closest to the way you have been feeling. Please tick one box for each row.

| How much of the time during the past 4 weeks ... | All of the time | Most of the time | A good bit of the time | Some of the time | A little bit of the time | None of the time |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Did you feel full of 'get-up-and-go'? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Have you been a very nervous person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Have you felt so down in the dumps that nothing could cheer you up? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Have you felt calm and peaceful? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you have a lot of energy? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Have you felt downhearted and blue? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Did you feel worn out? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Have you been a happy person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Did you feel tired? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

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31 Below is a list of problems that people sometimes have. Please read each one carefully and tick the box that best describes how much that problem has distressed or bothered you during the *past 7 days*, including today?
Please tick one box for each row.

| | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Faintness or dizziness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pains in the heart or chest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Nausea or upset stomach | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Trouble getting your breath | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hot or cold spells | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **RIGHT** hand or wrist?

32 Please mark where on your hand/wrist you experienced these symptoms using the key below.

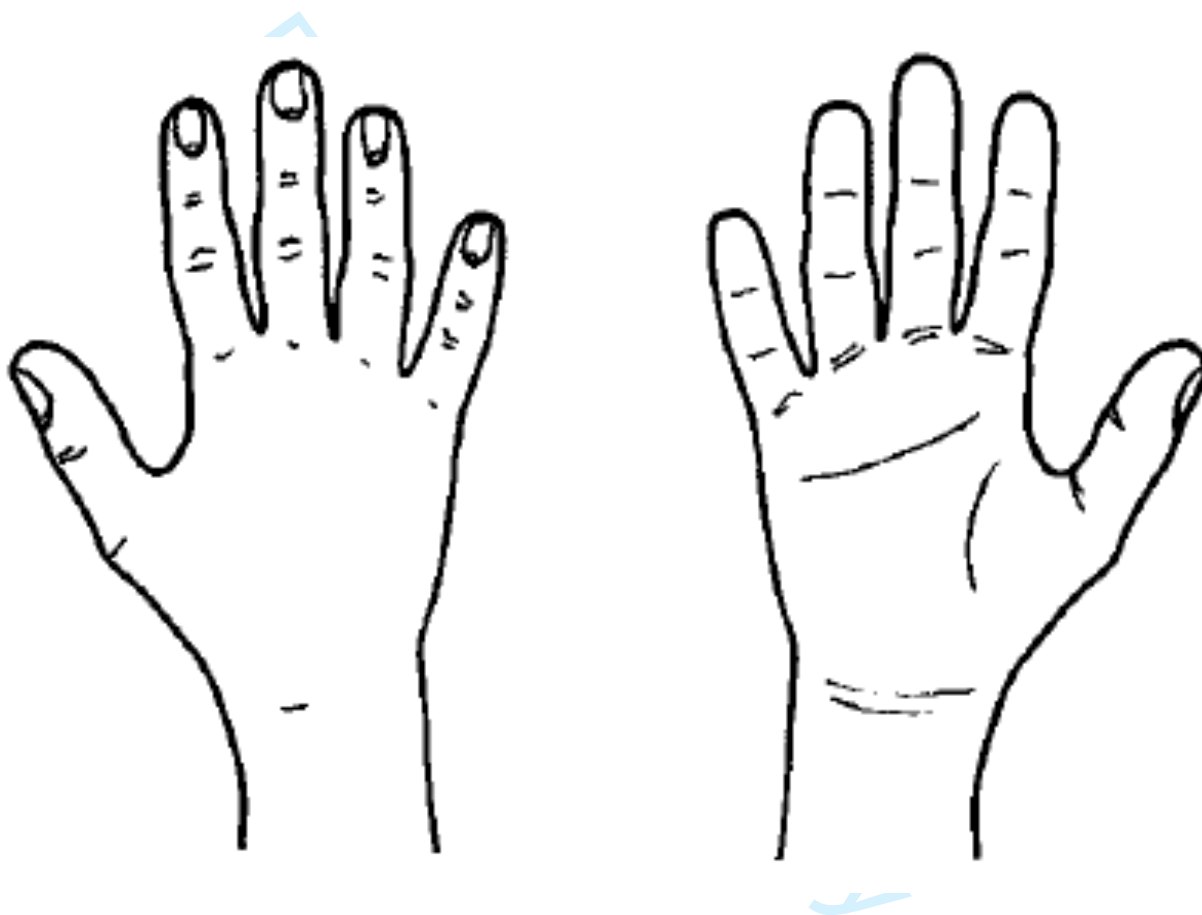
If you do not have any symptoms in your right hand, please move on to Question 34.



Pain



Tingling or numbness

RIGHT HAND

33 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **LEFT** hand or wrist?

34 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 36.

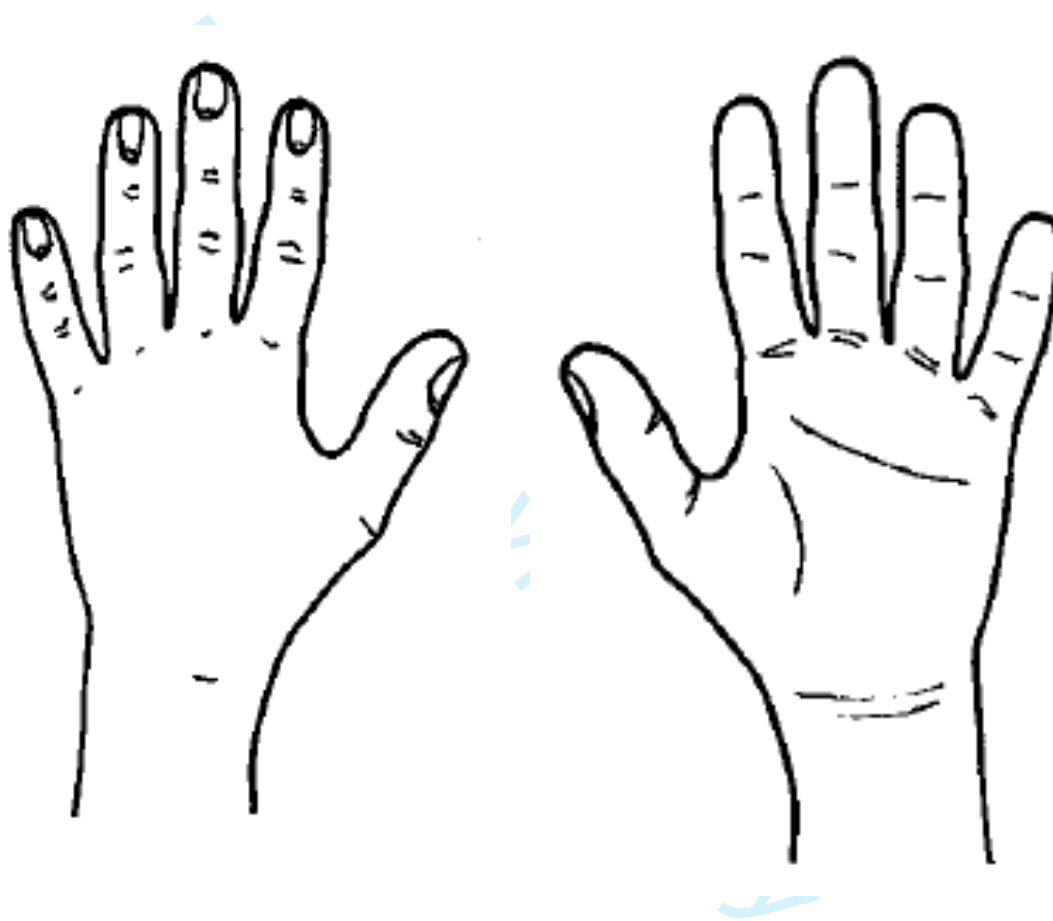


Pain



Tingling or numbness

LEFT HAND



35 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your symptoms over the ***last 7 days***.

36 Please answer for each hand, even if you only have problems with one side.
Please tick one box for each row.

| 36.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 36.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

37 This question refers to the appearance (look) of your hand during the ***past 7 days***. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

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38 Please answer the following questions on a scale of 0-10, where 0 represents not at all, and 10 represents very much. Please circle one number for each question.

38.1 Do you think that you will be able to use your hand normally 3 months after the operation?

0 1 2 3 4 5 6 7 8 9 10

38.2 Are you afraid of having long-term problems with your hand?

0 1 2 3 4 5 6 7 8 9 10

38.3 Do you blame yourself for your hand problem?

0 1 2 3 4 5 6 7 8 9 10

38.4 Are your family and friends supportive of your hand problem?

0 1 2 3 4 5 6 7 8 9 10

39 The following statements describe people's beliefs about their health problems. Please indicate whether you agree or disagree with them in relation to the problems you have with your hand(s) or wrist(s). Please tick the box which most closely reflects how you feel for each statement.

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly Disagree |
|---|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| a) Problems like this run in my family | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I think I was born with a weakness or underlying problem in this part of my body | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) My problem was caused by work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Work probably didn't cause my problem, but it made it worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) I have a lot of stress in my life and that has made my problem a lot worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) I think a lack of exercise probably contributed to my problem | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) As you get older, parts of the body start to wear out and problems like mine are likely to occur | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

40 We are interested in the types of thoughts and feelings that you have when you are in pain. The following statements describe different thoughts and feelings that may be associated with pain. Please indicate the degree to which you have these thoughts and feelings when you are experiencing pain. Please tick one box for each statement.

| | Not at all | To a slight degree | To a moderate degree | To a great degree | All of the time |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) I keep thinking about how badly I want the pain to stop | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) It's terrible and I think it's never going to get any better | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I become afraid that the pain may get worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I anxiously want the pain to go away | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the function of your hands/wrists during the ***past 7 days***. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 41 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>right</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>right</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>right</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 42 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>left</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>left</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>left</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the ability of your hands to do certain tasks during the **past 7 days**. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

43 How difficult was it for you to perform the following activities using your RIGHT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

44 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

45 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your satisfaction with your hands/wrists during the ***past 7 days***. Please tick one box for each question

46 How satisfied were you with your **RIGHT** hand/wrist during the ***past 7 days***?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

47 How satisfied were you with your **LEFT** hand/wrist during the ***past 7 days***?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.



If you have any questions, or would like any additional information, please contact Lisa Newington on:

ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

For peer review only - <http://hmgopen.bmj.com/site/about/guidelines.xhtml>



REACTS ID:

One Month After Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

only

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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SECTION A: ABOUT YOUR OPERATION

Please fill in today's date

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

1 What was the date of your carpal tunnel release surgery?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

2 Which side was operated on? Please tick one box.

Right

Left

Both

3 What type of anaesthetic did you have? Please tick one box.

a) General anaesthetic (you were sent to sleep)

b) Local or regional anaesthetic (your arm was made numb, but you were still awake)

c) Other (*please specify*)

d) Unsure

4 How long did you need to stay in the hospital/clinic after your operation?
Please tick one box (and specify the number of nights, if applicable).

a) I went home the same day

b) I needed to stay overnight (one night only)

c) I needed to stay for more than one night

(Please specify for how long)

| | |
|--|--|
| | |
|--|--|

 nights

SECTION A: ABOUT YOUR OPERATION

5 Have you used any of the following services specifically for your operated hand(s) since your surgery?

Please give the number of visits for each service, and the date(s) attended, if known.

| | I used this service in the NHS | | I used this service privately | |
|--|--------------------------------|--------------------------|-------------------------------|--------------------------|
| | Number of visits | Dates attended, if known | Number of visits | Dates attended, if known |
| a) Your surgeon, or one of the surgical team | | | | |
| b) GP or practice nurse | | | | |
| c) Hospital nurse | | | | |
| d) Pharmacist | | | | |
| e) Hand therapist | | | | |
| f) Other physiotherapist or occupational therapist | | | | |
| g) Chiropractor or osteopath | | | | |
| h) Occupational health nurse or doctor | | | | |
| i) Accident and emergency (A&E) or minor injuries unit | | | | |
| j) Other (<i>please specify</i>) | | | | |

SECTION A: ABOUT YOUR OPERATION

6 Have you taken any antibiotics for an infection in your surgical wound?
Please do not include any antibiotics you were prescribed at the time of your operation.

Yes No

If yes, what date did you start taking the antibiotics?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7 Have you been admitted to hospital because of a problem with your operated hand(s)? If yes, please answer the rest of Question 7; if no, please move on to Question 8.

Yes No

7.1 If yes, when were you first admitted?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7.2 How many nights did you stay in hospital?

Please answer 0 if you didn't stay overnight.

| | |
|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|

nights

7.3 Did you require another operation?

Yes No

8 Have you been advised that you may need a carpal tunnel release for your other hand in the future?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No

8.1 If yes, when are you expecting to have this surgery? Please tick one box.

- a) In less than 2 months
- b) In 2-5 months
- c) In 6-11 months
- d) In more than a year
- e) Unsure

9 If you would like to give us any other information about your operation, or the healthcare services you have used, please do so here:

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SECTION B: WORK

10 Compared to before your surgery, which of the following best describes your current work situation? Please tick one box.

- a) Returned to the same job, work duties and hours – **please go to Question 14**
- b) Returned to the same job, with altered duties or hours – **please go to Question 14**
- c) Started a new job – **please go to Question 11**
- d) Not yet returned to work, but plan to return in the future – **please go to Question 12**
- e) Do not plan to return to work – **please go to Question 13**

11 Thinking about your new job:

11.1 What is your main occupation now (e.g. secretary, teacher, builder etc.)?

11.2 In what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc.)?

11.3 Did you change jobs because of your hand/wrist problem? Please tick one box.

- a) Yes, my hand/wrist problem was the main reason for my job change
- b) Yes, my hand/wrist problem was one of several reasons for my job change
- c) No, my job change was nothing to do with my hand/wrist problem
- d) Other, please specify

Please go to Question 14

SECTION B: WORK

13 If you do not plan to return to work, what is the main reason for this decision? Please tick one box.

- a) Retirement
- b) Redundancy
- c) Position/work no longer available
- d) Unable to do your work because of your problem with your hand(s)/wrist(s)
- e) Unable to do your work because of any other problem
- f) Other (*please specify*)
-
-
-
-

13.1 Have you been advised not to return to work by anyone? If yes, please answer Question 13.2; if no, please move on to Question 21.

Yes No

13.2 If yes, who by? Please tick all that apply.

- | | | | |
|--|--------------------------|---|--------------------------|
| a) Your surgeon or a member of the surgical team | <input type="checkbox"/> | f) Occupational health nurse or doctor | <input type="checkbox"/> |
| b) Hospital nurse | <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) | <input type="checkbox"/> |
| c) GP or practice nurse | <input type="checkbox"/> | h) Friend or family member | <input type="checkbox"/> |
| d) Hand therapist | <input type="checkbox"/> | i) Other (<i>please specify</i>) | <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist | <input type="checkbox"/> | | |
| | | | |

Please go to Question 21

SECTION B: WORK

14 When did you first return to work after your carpal tunnel release surgery?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

15 How much work-time did you miss between the date of your surgery and the date you first returned to work?

Please include all work-time missed, even if this had been pre-arranged with your employer, or was taken as annual leave. You can answer in hours, days or weeks, whichever applies.

| | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

15.1 Was any of this time paid?

Please tick one box (and provide the amount of time, if applicable).

- a) Yes, all of my time away from work was paid
- b) Yes, some of my time away from work was paid
(please specify how much time was paid, you can use hours, days or weeks, whichever applies)

| | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

- c) No, none of my time off was paid
- d) Not sure

16 Since your surgery, have you discussed when to return to work with anyone?

If yes, please answer the rest of Question 16; if no, please move on to Question 17.

Yes No

16.1 If yes, who did you discuss this with? Please tick all that apply.

- | | |
|---|--|
| a) Your surgeon or a member of the surgical team <input type="checkbox"/> | f) Occupational health nurse or doctor <input type="checkbox"/> |
| b) Hospital nurse <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) <input type="checkbox"/> |
| c) GP or practice nurse <input type="checkbox"/> | h) Friend or family member <input type="checkbox"/> |
| d) Hand therapist <input type="checkbox"/> | i) Other (please specify) <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist <input type="checkbox"/> | |
| | |

SECTION B: WORK

16.2 Please list any advice you have been given (since your surgery) about when and how to return to work?

This could include any activities to avoid or timescales to follow. If this advice came from more than one place, please indicate who advised what.

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17 Since returning to work after your operation, have you needed to take any time off work because of a problem with your operated hand(s)/wrist(s)?

If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, how much time did you take off work?

Please answer in days or hours, whichever applies.

hours days weeks

18 When you first returned to work after your surgery, did you work shorter hours than would be normal for your job as a direct result of your operation?

If yes, please answer the rest of Question 18; if no, please move on to Question 19.

Yes No

18.1 Have you since gone back to working full hours?

If yes, please answer Question 18.2; if no, please move on to Question 19.

Yes No

18.2 If yes, when did you return to full working hours?

If you do not know the exact date, approximately how many weeks did you work reduced hours?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week
- b) 1 – 2 weeks
- c) More than 2 weeks, but less than 3 weeks
- d) 3 weeks or longer

SECTION B: WORK

19 When you first returned to work after your surgery, did you need to alter or avoid any of your usual work duties as a direct result of your operation?

If yes, please answer the rest of Question 19; if no, please move on to Question 20.

Yes No

19.1 Have you since gone back to full duties?

If yes, please answer Question 19.2; if no, please move on to Question 20.

Yes No

If yes, when did you return to full working duties?

19.2 If you do not know the exact date, approximately how many weeks did you have altered work duties?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|

d d m m y y y y

- a) Less than a week c) More than 2 weeks, but less than 3 weeks
- b) 1 – 2 weeks d) 3 weeks or longer

20 If you would like to give us any additional information about returning to work, please do so here:

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SECTION C: HAND AND WRIST SYMPTOMS

21 The following questions refer to your symptoms over the last 7 days. Please answer for each hand. Please tick one box for each row.

| 21.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 21.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 This question refers to the appearance (look) of your hands during the past 7 days. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: HAND AND WRIST SYMPTOMS

23 How do you rate your symptoms in your operated hand(s) now, compared to before your surgery? Please tick one box.

- a) Completely cured c) Unchanged e) Worse
 b) Much better d) Slightly better

24 The following questions ask specifically about your scar. Please think about your scar over the ***past 7 days***.

24.1 Has your scar been itchy?

If yes, please continue; if no, please move on to Question 24.2

Yes No

Yes, it was itchy: Sometimes Often Always

And when it was itchy, it was: Slightly itchy Fairly itchy Very itchy

24.2 Has your scar caused you pain?

If yes, please continue; if no, please move on to Question 24.3

Yes No

Yes, it was painful: Sometimes Often Always

And when it hurt, it was: Slightly painful Fairly painful Very painful

24.3 Has your scar been uncomfortable?

If yes, please continue; if no, please move on to Question 24.4

Yes No

Yes, it was uncomfortable: Sometimes Often Always

And when it was uncomfortable, it was: Slightly uncomfortable Fairly uncomfortable Very uncomfortable

SECTION C: HAND AND WRIST SYMPTOMS

24.4 Has your scar felt numb?

If yes, please continue; if no, please move on to Question 24.5

Yes No

Yes, it was numb: Sometimes Often Always

And when it felt numb, it was: Slightly numb Fairly numb Very numb

24.5 Have you had odd sensations in your scar e.g. tightening, pulling or pins and needles? If yes, please continue; if no, please move on to Question 24.6

Yes No

Yes, I have had odd sensations: Sometimes Often Always

24.6 Has your scar caught on things e.g. clothing?

If yes, please continue; if no, please move on to Question 24.7

Yes No

Yes, it has caught on things: Sometimes Often Always

24.7 Overall, how troublesome are the symptoms from your scar?

Please tick one box.

Not at all troublesome A little troublesome Fairly troublesome Very troublesome Unbearable

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the function of your hands/wrists during the ***past 7 days***. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 25 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>right</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>right</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>right</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 26 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>left</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>left</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>left</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the ability of your hands to do certain tasks during the ***past 7 days***. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

27 How difficult was it for you to perform the following activities using your RIGHT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

28 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

29 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question.

30 How satisfied were you with your RIGHT hand/wrist during the past 7 days?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

31 How satisfied were you with your LEFT hand/wrist during the *past 7 days*?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

32 If you would like to give us any additional information about your hand and wrist function, please do so here:

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.....

.....

Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.



If you have any questions or would like any additional information, please contact
 Lisa Newington on:
 ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

SUPPLEMENTARY TABLES

1. Cox proportional hazards univariate analyses of the association between demographic and general health factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Body mass index (kg/m²)</i> | | | | | | |
| Normal (18.5-24.9) | 47 | 20 | 12-33 | 1 | - | - |
| Over (25.0-29.9) | 64 | 19 | 12.5-29 | 0.98 | 0.65, 1.46 | 0.91 |
| Obese (≥30) | 67 | 21 | 10-40 | 0.88 | 0.60, 1.28 | 0.50 |
| <i>Surgery to dominant hand ²</i> | | | | | | |
| Yes | 128 | 19.5 | 12-33 | 1 | - | - |
| No | 62 | 22 | 12-35 | 0.83 | 0.61, 1.14 | 0.25 |
| <i>General health status</i> | | | | | | |
| Excellent/very good/ good | 165 | 19 | 12-32 | 1 | - | - |
| Fair/poor | 24 | 28.5 | 12.5-42 | 0.74 | 0.47, 1.16 | 0.19 |
| <i>Number of comorbidities ³</i> | | | | | | |
| None | 49 | 18 | 7-32 | 1 | - | - |
| One | 67 | 24 | 14-42 | 0.87 | 0.59, 1.27 | 0.47 |
| Two or more | 74 | 19.5 | 10-29 | 1.11 | 0.76, 1.62 | 0.60 |
| <i>Number of disability comorbidities ³</i> | | | | | | |
| None | 130 | 19 | 9-33 | 1 | - | - |
| One | 39 | 26 | 13-31 | 0.75 | 0.52, 1.08 | 0.12 |
| Two or more | 21 | 20 | 14-31 | 0.81 | 0.50, 1.32 | 0.40 |
| <i>Number of somatising symptoms ⁴</i> | | | | | | |
| None | 96 | 19 | 10.5-35 | 1 | - | - |
| One | 51 | 22 | 13-34 | 0.98 | 0.70, 1.38 | 0.91 |
| Two or more | 42 | 19.5 | 14-31 | 0.84 | 0.58, 1.22 | 0.36 |
| <i>SF36 Mental health score (tertiles) ⁵</i> | | | | | | |
| Poor (22.2-57.8) | 60 | 24 | 16-39 | 0.71 | 0.50, 1.03 | 0.07 |
| Intermediate (60.0-75.6) | 68 | 18.5 | 11-36.5 | 0.88 | 0.62, 1.25 | 0.48 |
| Good (77.8-97.8) | 60 | 16.5 | 7-30 | 1 | - | - |

Total sample size n=195.

¹. Adjusted for age and sex.

². Considered and the non-dominant hand for those who reported ambidexterity (n=4) and dominant hand for those undergoing simultaneous bilateral surgery (n=2).

³. Adapted from the self-administered co-morbidity questionnaire [1].

⁴. Adapted from the four-dimensional symptom questionnaire [2].

⁵. Taken from the SF-36 with data-driven tertiles [3].

2. Cox proportional hazards univariate analyses of the association between health beliefs and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Believe will be unable to use hand normally in 3 months ²</i> | | | | | | |
| No | 168 | 20 | 12-32.5 | 1 | - | - |
| Yes | 20 | 20.5 | 14.5-40 | 1.04 | 0.65, 1.67 | 0.87 |
| <i>Blames self for hand problem ²</i> | | | | | | |
| No | 162 | 20 | 12-35 | 1 | - | - |
| Yes | 26 | 22 | 14-31 | 1.08 | 0.70, 1.66 | 0.73 |
| <i>Lack of support from family/friends ²</i> | | | | | | |
| No | 156 | 20 | 12-32.5 | 1 | - | - |
| Yes | 32 | 19.5 | 13-40 | 0.88 | 0.60, 1.29 | 0.51 |
| <i>Problem runs in the family/born with a weakness ³</i> | | | | | | |
| No | 134 | 20 | 12-35 | 1 | - | - |
| Agree/strongly agree | 54 | 23 | 12-31 | 0.88 | 0.63, 1.21 | 0.42 |
| <i>Stress made the problem worse ³</i> | | | | | | |
| No | 169 | 20 | 12-33 | 1 | - | - |
| Agree/strongly agree | 19 | 28 | 14-40 | 0.79 | 0.48, 1.28 | 0.33 |
| <i>Lack of exercise contributed to the problem ³</i> | | | | | | |
| No | 172 | 20 | 13-33 | 1 | - | - |
| Agree/strongly agree | 16 | 15 | 10.5-34.5 | 1.23 | 0.73, 2.06 | 0.43 |
| <i>Getting older contributes to the problem ³</i> | | | | | | |
| No | 79 | 26 | 14-42 | 1 | - | - |
| Agree/strongly agree | 108 | 16 | 10-29 | 1.28 | 0.94, 1.74 | 0.11 |
| <i>Work probably didn't cause the problem, but made it worse ³</i> | | | | | | |
| No | 100 | 20.5 | 12-35 | 1 | - | - |
| Agree/strongly agree | 86 | 19.5 | 13-31 | 1.01 | 0.75, 1.35 | 0.95 |
| <i>Pain catastrophisation to at least a moderate degree ⁴</i> | | | | | | |
| No | 133 | 19 | 10-33 | 1 | - | - |
| Yes | 55 | 22 | 15-31 | 0.81 | 0.59, 1.12 | 0.21 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Reported on a 0-10 scale and dichotomised to no (0-6) and yes (7-10) [4].

³. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor disagree/disagree/disagree strongly [5].

⁴. Pain catastrophizing scale dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions and those who did not [6].

3. Cox proportional hazards univariate analyses of the association between clinical and surgical factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Katz hand diagram score for side of surgery</i> ² | | | | | | |
| Classic/probable | 126 | 22 | 14-38 | 1 | - | - |
| Possible/unlikely | 60 | 16.5 | 9.5-30.5 | 1.10 | 0.81, 1.51 | 0.54 |
| <i>Duration of symptoms</i> | | | | | | |
| ≤ 1 year | 47 | 19 | 10-31 | 1 | - | - |
| > 1 year | 141 | 20 | 13-34 | 0.86 | 0.62, 1.21 | 0.38 |
| <i>Nerve conduction studies performed</i> | | | | | | |
| No | 71 | 21 | 14-35 | 1 | - | - |
| Yes | 79 | 20 | 11-33 | 1.14 | 0.83, 1.58 | 0.41 |
| <i>Type of suture material</i> | | | | | | |
| Non-absorbable | 119 | 21 | 12-38 | 1 | - | - |
| Absorbable | 23 | 20 | 13-29 | 1.15 | 0.73, 1.83 | 0.55 |
| <i>MHQ function score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-40) | 79 | 20 | 13-41 | 0.80 | 0.57, 1.12 | 0.19 |
| Intermediate (44-55) | 48 | 19.5 | 13.5-33 | 0.81 | 0.55, 1.19 | 0.29 |
| Good (60-100) | 61 | 20 | 7-29 | 1 | - | - |
| <i>MHQ bilateral activities of daily living score (tertiles)</i> ³ | | | | | | |
| Poor (0-61) | 72 | 19 | 12.5-33.5 | 0.96 | 0.66, 1.38 | 0.81 |
| Intermediate (64-82) | 55 | 21 | 13-38 | 0.70 | 0.49, 1.01 | 0.06 |
| Good (83-100) | 62 | 20 | 10-31 | 1 | - | - |
| <i>MHQ activities of daily living score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-55) | 63 | 20 | 12-42 | 0.81 | 0.56, 1.18 | 0.27 |
| Intermediate (58-80) | 63 | 20 | 14-35 | 0.86 | 0.61, 1.23 | 0.42 |
| Good (85-100) | 63 | 20 | 9-32 | 1 | - | - |
| <i>MHQ satisfaction score for side of surgery (tertiles)</i> ³ | | | | | | |
| Poor (0-25) | 88 | 21.5 | 13-42 | 0.78 | 0.55, 1.11 | 0.16 |
| Intermediate (29-50) | 49 | 18 | 14-29 | 0.87 | 0.59, 1.28 | 0.48 |
| Good (54-100) | 53 | 20 | 9-31 | 1 | - | - |
| <i>Satisfaction with appearance for side of surgery</i> ⁴ | | | | | | |
| Satisfied | 136 | 20 | 10.5-31.5 | 1 | - | - |
| Dissatisfied | 53 | 20 | 13-40 | 0.84 | 0.61, 1.16 | 0.29 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Adapted from Calfee et al. [7].

³. Michigan Hand Questionnaire [8]. Data-driven tertiles.

⁴. Reported on a 5-point scale in response to the statement: I am satisfied with the appearance (look) of my hand. Dichotomised as satisfied (strongly agree/agree) and dissatisfied (neither agree nor disagree, disagree, strongly disagree).

4. Cox proportional hazards univariate analyses of the association between occupational factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Have more than one paid job</i> | | | | | | |
| No | 177 | 20 | 12-32 | 1 | - | - |
| Yes | 12 | 26.5 | 19-42 | 0.61 | 0.34, 1.11 | 0.11 |
| <i>Total paid work hours per week ²</i> | | | | | | |
| ≤37.5 | 97 | 22 | 15-38 | 1 | - | - |
| >37.5 | 93 | 16 | 6-29 | 1.25 | 0.88, 1.79 | 0.21 |
| <i>Number of work days per week</i> | | | | | | |
| <5 | 55 | 23 | 15-35 | 1 | 0.72, 1.39 | 0.98 |
| 5 | 116 | 19 | 10.5-33 | 1 | - | - |
| >5 | 19 | 13 | 6-31 | 1.28 | 0.77, 2.14 | 0.34 |
| <i>Sick leave taken for this problem in the last month</i> | | | | | | |
| No | 154 | 20 | 12-33 | 1 | - | - |
| Yes | 20 | 15 | 9.5-30 | 0.99 | 0.61, 1.60 | 0.95 |
| <i>Sick leave taken for another problem in the last month</i> | | | | | | |
| No | 152 | 19 | 10.5-31 | 1 | - | - |
| Yes | 18 | 30 | 21-42 | 0.67 | 0.41, 1.09 | 0.10 |
| <i>Received advice about return to work after surgery</i> | | | | | | |
| Yes | 134 | 19 | 12-31 | 1 | - | - |
| No | 53 | 22 | 14-41 | 0.92 | 0.67, 1.27 | 0.61 |
| <i>Required to work to tight deadlines ³</i> | | | | | | |
| No | 75 | 23 | 14-40 | 1 | - | - |
| Yes | 112 | 18 | 9.5-31 | 1.19 | 0.89, 1.61 | 0.24 |
| <i>Use power tools that make the hand/arm vibrate ³</i> | | | | | | |
| No | 145 | 19 | 12-32 | 1 | - | - |
| Yes | 38 | 22 | 14-42 | 0.68 | 0.44, 1.05 | 0.08 |
| <i>Work with hands above shoulder height for >1 hour ³</i> | | | | | | |
| No | 147 | 20 | 12-33 | 1 | - | - |
| Yes | 34 | 19.5 | 13-33 | 0.89 | 0.60, 1.32 | 0.56 |
| <i>Work with neck bent forward for >2 hours ³</i> | | | | | | |
| No | 114 | 21 | 13-39 | 1 | - | - |
| Yes | 73 | 18 | 8-31 | 1.19 | 0.88, 1.60 | 0.26 |
| <i>Work with neck twisted for >30 minutes ³</i> | | | | | | |
| No | 136 | 20 | 12-34 | 1 | - | - |
| Yes | 47 | 22 | 13-32 | 0.93 | 0.66, 1.32 | 0.70 |
| <i>Drive for >1 hour per day ³</i> | | | | | | |
| No | 115 | 21 | 13-38 | 1 | - | - |
| Yes | 70 | 16 | 7-31 | 1.22 | 0.88, 1.68 | 0.24 |

Total sample size n=195.

¹. Adjusted for age and sex.

². Dichotomised by the median for the sample population

³. As part of the normal working day [9].

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STROBE checklist (cohort study)

| Item | Recommendation | Location |
|-------------------------------|--|-------------------------------------|
| Title and abstract | | |
| <i>Title</i> | Indicate study design | Title |
| Introduction | | |
| <i>Background</i> | Explain scientific background and rationale | Introduction |
| <i>Objectives</i> | State objectives and any pre-specified hypotheses | Introduction |
| Methods | | |
| <i>Study design</i> | Present key elements of the study design early | Introduction & methods |
| <i>Setting</i> | Describe the setting, locations and relevant dates | Methods |
| <i>Participants</i> | Give eligibility criteria, sources and methods of selection of participants, and methods of follow-up | Methods & table 1 |
| <i>Variables</i> | Clearly define all outcomes, exposures, predictors, potential confounders and effect modifiers | Methods & supplementary files 1-2 |
| <i>Data sources</i> | Give sources of data and methods of assessment | Methods & tables 2-5 |
| <i>Bias</i> | Describe and effects to address potential sources of bias | Methods & discussion |
| <i>Study size</i> | Explain how the study size was determined | Methods |
| <i>Quantitative variables</i> | Described how quantitative variables were handled in the analyses | Tables 2-5 |
| <i>Statistical methods</i> | Described all statistical methods Explain how missing data were addressed Explain how lost to follow-up was addressed | Statistical methods & tables 2-5 |
| Results | | |
| <i>Participants</i> | Reported the number of individuals at each stage of the study Give reasons for non-participation | Figure 1 Figure 1 |
| <i>Descriptive data</i> | Give characteristics of study participants Indicate number of participants for each variables of interest Summarise follow-up time | Tables 2-5 Tables 2-5 Results |
| <i>Outcome data</i> | Report number of outcome events over time | Results |
| <i>Main results</i> | Give adjusted and unadjusted estimates and measures of precision. Make clear which confounders were adjusted for | Table 4 & supplementary file 3 |
| <i>Other analyses</i> | Reported any subgroup analyses | Table 4 & supplementary file 3 |

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| | |
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| Primary Subject Heading: | Surgery |
| Secondary Subject Heading: | Epidemiology, General practice / Family practice, Occupational and environmental medicine |
| Keywords: | Hand & wrist < ORTHOPAEDIC & TRAUMA SURGERY, PRIMARY CARE, OCCUPATIONAL & INDUSTRIAL MEDICINE |
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TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

ABSTRACT

Objectives: To describe when patients return to different types of work after elective carpal tunnel release (CTR) surgery and identify the factors associated with the duration of sickness absence.

Design: Multi-centre prospective observational cohort study.

Setting and participants: Participants were recruited pre-operatively from 16 UK centres and clinical, occupational and demographic information were collected. Participants completed a weekly diary and questionnaires at four and 12 weeks post-operatively.

Outcomes: The main outcome was duration of work absence from date of surgery to date of first return to work.

Results: 254 participants were enrolled in the study and 201 provided follow-up data. Median duration of sickness absence was 20 days (range 1-99). Earlier return to work was associated with having surgery in primary care and a self-reported work role involving more than four hours of daily computer use. Being female and entitlement to more than a month of paid sick leave were both associated with longer work absences. Duration of work absence was strongly associated with the expected duration of leave, as reported by participants before surgery. Earlier return to work was not associated with poorer clinical outcomes reported 12 weeks after CTR.

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3 **Conclusions:** There was wide variation in the duration of work absence after CTR across all
4 occupational categories. A combination of occupational, demographic and clinical factors was
5 associated with the duration of work absence, illustrating the complexity of return to work
6 decision-making. However, pre-operative expectations were strongly associated with the
7 actual duration of leave. We found no evidence that earlier return to work was harmful. Clear,
8 consistent advice from clinicians pre-operatively setting expectations of a prompt return to
9 work could reduce unnecessary sickness absence after CTR. To enable this, clinicians need
10 evidence-informed guidance about appropriate timescales for the safe return to different
11 types of work.
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27 **STRENGTHS AND LIMITATIONS OF THIS STUDY**

- 28 - This multi-centre, prospective study with a large sample size provides robust evidence to
29 understand return to work issues after carpal tunnel release surgery.
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- 32 - Participants were recruited from primary care, secondary care and private practice sites,
33 representing the breadth of locations where carpal tunnel release is performed in the UK.
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- 36 - Work absence was the primary outcome and a clear definition was used for its duration
37 with data collected contemporaneously to limit recall bias.
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- 40 - A standardised method was used to categorise occupations and measure occupational
41 exposures, although this relied on job title, which may not be a true reflection of actual
42 occupational activity.
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- 45 - All participants underwent open carpal tunnel release, however the method of carpal
46 tunnel syndrome diagnosis was not independently verified and different case definitions
47 for carpal tunnel syndrome may have been included.
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INTRODUCTION

Carpal tunnel syndrome (CTS) occurs when the median nerve becomes compressed within the carpal tunnel at the wrist. Typical sensory symptoms include pain, paraesthesia and/or numbness in the thumb, index, middle and radial half of the ring finger; and motor symptoms include progressive wasting of the thenar muscles. CTS is often associated with marked functional difficulty[1] and treatment is targeted at reducing the median nerve compression by splinting, corticosteroid injection or carpal tunnel release (CTR) surgery[2, 3].

Recent estimates suggest that more than 90,000 CTR procedures will be performed annually in the English NHS by 2025[4], and as the peak incidence for CTS falls within the working lifetime[5], many of these patients will need to return to work after their CTR. However, there is currently no evidence on which to base recommendations about when it might be safe to return to functional activities, including work, after carpal tunnel release (CTR). Our previous survey of UK hand surgeons, primary care surgeons and hand therapists found that clinicians recommended a wide range of times to return to three specified job roles after CTR: 0-30 days for desk-based work (e.g. keyboard, mouse, writing and telephone); 1-56 days for repetitive light manual work (driving, delivery, stacking); and 1-90 days for heavy manual work (e.g. construction)[6]. However, there has not previously been a prospective study of CTR patients in the UK in which time to return to work was the primary outcome. Therefore, it is not known when UK patients return to different occupational activities after CTR or what influences the duration of work absence. It is also unclear whether earlier return to work has a detrimental effect on post-operative clinical outcomes. Possible consequences of returning to work too soon after CTR include wound dehiscence, infection, and delayed healing. Conversely, delayed return to work may increase the risk of progression to long-term sick leave[7] and produce a financial burden for the individual, employer or state.

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5 A systematic review of the prognostic factors associated with return to work after CTR
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7 identified 11 studies which evaluated more than 90 potential prognostic factors[8]. Longer
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9 durations of work absence after CTR were found to be associated with: receipt of workers'
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11 compensation[9]; manual work[10-12]; longer expected durations of work absence[10]; being
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13 on sick leave before CTR surgery[13]; self-blame for the hand problem[13]; and beliefs that the
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15 symptoms were caused by work[12].
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22 Much of the existing research has been conducted at single sites and involved small numbers
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24 of participants. Furthermore, very few studies have specifically explored the influence of a
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26 range of occupational factors. The current multi-centre prospective cohort study was designed
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28 to explore when patients returned to different types of work after CTR and the demographic,
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30 clinical and occupational factors associated with duration of work absence. We also
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32 investigated whether earlier return to work was associated with poorer clinical outcomes
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34 assessed at 12 weeks after CTR.
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41 **METHODS**

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43 This was a prospective cohort study and a convenience sample of participants were recruited
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45 from 16 sites in England and Wales between March 2017 and August 2018 (ethics approval:
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47 IRAS 209840, 16/WA/0390). Recruitment took place before CTR surgery, either at the time of
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49 listing for surgery, during pre-operative screening, or on the day of surgery. At each site, the
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51 patient CTR pathway and treatment was carried out as usual. Sites were NHS secondary care
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53 (hospital setting), NHS primary care and private hand surgery facilities, representing the range
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55 of UK healthcare facilities where CTR is performed. Provision of CTR in the UK was explored
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57 through discussion with relevant national organisations (British Society for Surgery of the Hand
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and Association for Surgeons in Primary Care). Sites were recruited through National Institute for Health Research infrastructure.

Eligibility criteria are shown in Table 1. Baseline demographic, general health and occupational information was collected via self-completed questionnaire at the time of recruitment. The questionnaire also included standardised measures of CTS symptoms[14-16] and hand function[17]. Questionnaire content was informed by the clinical, demographic and occupational factors previously identified in a systematic review of prognostic factors for return to work after CTR[8], and developed in collaboration with our patient advisory group. The reasoning for item inclusion is provided in supplementary file 1.

TABLE 1. Study eligibility criteria

Self-selected by potential participants

1. Aged over 18 and referred for carpal tunnel release surgery
 2. Routinely work in paid employment for at least 20 hours per week
 3. Plan to return to work after carpal tunnel release surgery
 4. Have not previously had carpal tunnel release surgery on either hand
 5. Have not previously had a serious injury to the same wrist/hand
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Assessed by recruiting clinician

1. No planned surgical procedures for conditions other than carpal tunnel syndrome
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Follow-up questionnaires were completed four and 12 weeks after CTR and collected information about return to work, work functioning, scar symptoms, CTS symptoms, and hand function. Study questionnaires are provided as supplementary files 2-3. Participants were also asked to complete a short weekly diary from the day after surgery until return to work, detailing whether they had returned to work that week, and if so, the date of return. Steps were taken to minimise loss to follow-up after recruitment. To maximise retention, we

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incentivised with a shopping voucher on completion of the study (£10) and sent up to three reminders using a combination of post, email and text.

Surgical information was collected from the medical records by a member of the participant's clinical team. This included: date of CTR, operated hand(s), nature of anaesthetic, incision size, additional procedures, unexpected findings and suture material. Date, side of CTR and anaesthetic (general/local) were also reported by participants for cross-checking.

Public and patient involvement

This research was supported by a patient advisory group consisting of six individuals who had previously undergone CTR at different UK sites. Study questionnaires were developed in collaboration with the patient advisors and these individuals also provided their feedback on the preliminary findings.

Statistical methods

Comparisons were made between those who dropped out of the study before providing any follow-up data and those in the final study sample using pre-specified demographic, clinical and occupational variables (Table 2).

Manual and non-manual work was coded from job title and industry using the UK Standard Occupational Classification[18, 19]. Return to work time was calculated from the date of surgery to the date of first return to work (as reported by participants).

A Cox proportional hazards model was used to explore the factors associated with return to work time, and the assumptions of the model were tested. Baseline and operative variables

1
2 were assessed in univariable analyses and those which were significant ($p < 0.05$) were included
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4 as covariates in the final model. All regression analyses were adjusted for age and sex.
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10 Participants were defined as having a poor outcome if they reported one or more of the
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12 following: global rating of change score of “worse”, “unchanged” or “slightly improved” (12
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14 weeks after CTR)[20]; scar symptoms described as “unbearable”, “very troublesome” or “fairly
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16 troublesome” (12 weeks after CTR); use of antibiotics for an incision site infection after
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18 returning to work; and additional sick-leave related to the CTR after returning to work. The
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20 duration of work absence for those with/without poor outcomes were compared using
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22 Wilcoxon rank-sum test. In addition, participants were dichotomised to those who returned to
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24 work within/after seven, 14 and 28 days of surgery and the prevalence rates of poor outcomes
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26 were compared using χ^2 for each time period. These time points were based on the median
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28 clinician-recommended return to work time that we reported previously[6].
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There was no imputation for missing data. Missing values were coded as a separate category
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40 for each of the variables included, and participant numbers are provided for each variable in
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42 the accompanying tables.
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49 RESULTS

50 A total of 254 individuals completed the baseline questionnaire and 201 (79%) provided follow-
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52 up data. Participant numbers and loss to follow-up for each study component are shown in
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54 Figure 1. Participant demographics and comparisons between those who remained in the
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56 study and those who dropped out before follow-up are shown in Table 2.
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Figure 1. Participant numbers for each stage of the cohort study

TABLE 2. Participant demographics assessed at baseline in comparison with those lost to follow-up

| | Study participants n=201 (%) | Lost to follow-up n=53 (%) |
|---|---|---------------------------------------|
| Mean age in years (SD) | 52.0 (9.16) | 44.4 (9.55) |
| <i>Sex</i> | | |
| Male | 76 (37.8) | 20 (37.7) |
| Female | 125 (62.2) | 33 (62.3) |
| <i>Body mass index (kg/m²)</i> | | |
| Normal (18.5-24.9) | 48 (23.9) | 9 (17.0) |
| Overweight (25-29.9) | 66 (32.8) | 16 (30.2) |
| Obese (≥30) | 73 (36.3) | 22 (41.5) |
| <i>Smoking status</i> | | |
| Never smoked | 109 (54.2) | 26 (49.1) |
| Current/ex-smoker | 90 (44.8) | 27 (50.9) |
| <i>General health</i> | | |
| Excellent/very good/good | 174 (86.6) | 42 (79.3) |
| Fair/poor | 26 (12.9) | 11 (20.8) |
| <i>Number of comorbidities</i> | | |
| None | 54 (26.9) | 21 (39.6) |
| One | 70 (34.8) | 13 (24.5) |
| Two or more | 77 (38.3) | 19 (35.9) |
| <i>Number of disabling comorbidities</i> | | |
| None | 138 (68.7) | 35 (66.0) |
| One | 41 (20.4) | 9 (17.0) |
| Two or more | 22 (11.0) | 9 (17.0) |
| Mean SF-36 mental health score (SD) ^a | 65.6 (17.20) | 60.3 (20.41) |
| Mean bilateral CTS-6 score (SD) ^b | 2.8 (0.77) | 3.0 (0.73) |
| Mean MHQ bilateral activities of daily living score (SD) ^c | 68.8 (23.64) | 55.7 (28.62) |
| Mean MHQ work function score (SD) ^c | 66.1 (22.26) | 60.6 (22.61) |
| <i>Type of job contract</i> | | |
| Employed (permanent contract) | 164 (81.6) | 37 (69.8) |
| Self-employed | 31 (15.4) | 13 (24.5) |
| Employed (temporary or zero hours contract) | 5 (2.5) | 3 (5.7) |
| <i>Type of work</i> ^d | | |
| Manual | 77 (39) | 31 (58) |
| Non-manual | 123 (61) | 22 (42) |
| Median level of job demand on hands/wrists (IQR) ^e | 9 (7-10) | 10 (7-10) |
| <i>Job satisfaction</i> | | |
| Very satisfied | 87 (43.3) | 24 (45.3) |
| Satisfied/fairly satisfied | 92 (45.8) | 24 (45.3) |
| Dissatisfied/very dissatisfied | 20 (10.0) | 5 (9.4) |
| Median expected work absence in days (IQR) | 14 (7-28) | 14 (5-21) |
| <i>Expected availability of sick pay</i> | | |
| ≤1 month | 50 (24.9) | 21 (39.6) |
| >1 month | 94 (46.8) | 11 (20.8) |
| Unsure | 57 (28.4) | 21 (39.6) |

| <i>Study site</i> ^f | | |
|---------------------------------|------------|-----------|
| NHS primary care | 73 (36.3) | 13 (24.5) |
| NHS Secondary care | 101 (50.3) | 32 (60.4) |
| Private hand surgery facilities | 27 (13.4) | 8 (15.1) |

^a. SF-36 mental health score ranges from 0-100, higher scores indicate better mental health[21].

^b. CTS-6 symptom score ranges from 1-5, higher scores indicate more severe symptoms[14].

^c. Michigan Hand Questionnaire ranges from 0-100, higher scores indicate better functioning[17].

^d. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

^e. Job demand scale range 0-10, 10 indicating very demanding on hands/wrists[13].

^f. Location where the carpal tunnel release surgery was performed. Surgery in primary care was performed by General Practitioners who had completed additional training.

Eighty-six participants (43%) were recruited pre-operatively on the day of their CTR. For the remaining 115 participants, the median time between recruitment and CTR was 14 days (interquartile range [IQR] 5-40). The first follow-up questionnaire was completed a median of 32 days after CTR (IQR 29-38) and the final questionnaire was completed a median of 92 days after CTR (IQR 86-105). All participants underwent open CTR as a day case, and all but two had unilateral surgery. Another two participants required median nerve neurolysis, and one participant was noted to have a vascular abnormality. Sixty-two percent of participants (n=125) were expecting to have a CTR for their other hand in the future. Other baseline demographic and surgical factors are shown in Table 3.

TABLE 3. Participant demographic and surgical factors

| | Number of participants n=201 (%) |
|--------------------------------------|-------------------------------------|
| <i>Age (years)</i> | |
| 26-40 | 23 (11.4) |
| 41-55 | 101 (50.3) |
| ≥ 55 | 77 (38.3) |
| <i>Hand dominance</i> | |
| Right | 178 (88.6) |
| Left | 18 (9.0) |
| Ambidextrous | 5 (2.5) |
| <i>Side of surgery</i> ^a | |
| Dominant hand | 134 (66.7) |
| Non-dominant hand | 65 (32.3) |
| Bilateral surgery | 2 (1.0) |
| <i>Surgical speciality and grade</i> | |

| | |
|------------------------------------|------------|
| Consultant (plastics/orthopaedics) | 64 (31.8) |
| Registrar (plastics/orthopaedics) | 33 (16.4) |
| General practitioner | 62 (30.9) |
| Not reported | 42 (20.9) |
| <i>Incision type</i> ^b | |
| Mini open incision | 129 (64.2) |
| Traditional incision | 2 (1.0) |
| Not reported | 70 (34.8) |
| <i>Suture material</i> | |
| Absorbable | 24 (11.9) |
| Non-absorbable | 126 (62.7) |
| Not reported | 51 (24.4) |

^a. Considered as the non-dominant hand for those who reported ambidexterity.

^b. Mini open incision defined as distal to the distal wrist crease and traditional open excision extending proximally.

The majority of participants (62%) worked five days per week (range 2-7) and the median number of weekly paid work hours was 37.5 (IQR 31-45). Two participants (1%) did not return to work during the 12-week study period: one reported that they had been made redundant and the other that their job was no longer available. Four participants (2%) had incomplete data (missing return to work date or CTR date) meaning that the duration of work absence could not be calculated. These six individuals were not included in the analyses of return to work time, leaving a total sample size of 195. An additional five participants reported that they had not returned to work, but planned to do so in the future. These individuals were included in the return to work analysis, censored to the time of last follow-up.

The median duration of work absence after CTR was 20 days (IQR 12-33). Manual workers took longer to return than non-manual workers: 23.5 days (IQR 14-41) compared with 18 days (IQR 9-31). Those who were self-employed returned to work earlier than those who were employed: 13 days (IQR 6-19) compared with 22 days (IQR 14-38). Return to work times are shown in Figure 2. The majority of participants returned to work on a Monday (43%). Approximately 15% returned each day between Tuesday-Thursday, then ~5% returned each

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2 day from Friday-Sunday. More than half of participants (59%) reported that they needed to
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4 modify their work duties to some extent when they first returned to work. Of these, 62% had
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6 resumed full duties within five weeks.
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12 Univariable analyses of the relationship between baseline factors and the duration of work
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14 absence found 17 factors (age- and sex-adjusted) that were significantly associated with time
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16 to return to work and were entered into the multivariable model, in which five factors
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18 remained significant (Table 4). Sensitivity analyses confirmed that these factors remained
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20 independently significant in the model. Non-significant findings in the univariable analyses are
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22 provided in supplementary file 4. Having surgery in primary care and having a job with more
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24 than four hours of daily computer use were both associated with earlier return to work than
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26 their respective reference categories. Being female and having access to more than a month of
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28 paid sick leave were both associated with longer durations of work absence than their
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30 respected reference categories. Compared to those who expected to return within a week,
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32 there was a sequential increase in the likelihood of longer durations of work absence for those
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34 expecting to return between 7-14 days, 15-30 days and >30 days (Table 4), which showed a
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36 significant gradient effect ($p < 0.001$).
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TABLE 4. Cox proportional hazards analyses of the association between baseline demographic, clinical and occupational factors and the duration of work absence after carpal tunnel release

| | Univariable analyses | | | | | Multivariable analysis | | | |
|--|----------------------|----------------------------|----------------------|---------------|--------------------------|------------------------|----------------|--------------------------|------------------|
| | N | Median work absence (days) | Inter quartile range | Hazards ratio | 95% Confidence intervals | P value | Hazard s ratio | 95% Confidence intervals | P value |
| <i>Sex (censored: 5 females; no missing data)</i> | | | | | | | | | |
| Male | 72 | 17.5 | 8-31 | 1 | - | - | 1 | - | - |
| Female | 118 | 21.5 | 14-35 | 0.79 | 0.59, 1.06 | 0.12 | 0.56 | 0.36, 0.88 | 0.01 |
| <i>Age in years (censored: 1 aged 26-40, 3 aged 41-55, 1 aged >55; no missing data)</i> | | | | | | | | | |
| 26-40 | 21 | 20 | 15-30 | 1.01 | 0.63, 1.63 | 0.96 | 1.44 | 0.82, 2.55 | 0.21 |
| 41-55 | 94 | 20 | 9-33 | 1 | - | - | 1 | - | - |
| >55 | 75 | 17 | 12-35 | 1.03 | 0.76, 1.40 | 0.83 | 1.15 | 0.80, 1.65 | 0.44 |
| <i>Smoking status (censored: 1 never, 4 current/ex; 2 missing)</i> | | | | | | | | | |
| Never | 105 | 16 | 12-31 | 1 | - | - | 1 | - | - |
| Current/ex | 83 | 23 | 13-41 | 0.74 | 0.56, 1.00 | 0.046 | 0.75 | 0.51, 1.09 | 0.13 |
| <i>Site (censored: 5 NHS secondary care; no missing data)</i> | | | | | | | | | |
| NHS Primary care | 72 | 19.5 | 13-33 | 1.18 | 0.87, 1.62 | 0.29 | 1.54 | 1.05, 2.25 | 0.03 |
| NHS Secondary care | 92 | 20 | 12-39.5 | 1 | - | - | 1 | - | - |
| Private facilities | 26 | 20 | 7-28 | 1.63 | 1.04, 2.54 | 0.03 | 1.46 | 0.87, 2.44 | 0.15 |
| <i>Afraid of long-term hand problems^a (censored: 1 no, 4 yes; 3 missing)</i> | | | | | | | | | |
| No | 105 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| Yes | 82 | 20.5 | 13-42 | 0.69 | 0.51, 0.93 | 0.01 | 0.93 | 0.67, 1.30 | 0.68 |
| <i>CTS-6 score for side of surgery (tertiles)^b (censored: 2 intermediate, 3 poor; 8 missing)</i> | | | | | | | | | |
| Good (1-3.0) | 65 | 16 | 10-27 | 1 | - | - | 1 | - | - |
| Intermediate (3.2-3.8) | 58 | 21.5 | 14-35 | 0.77 | 0.54, 1.10 | 0.15 | 1.19 | 0.77, 1.84 | 0.44 |
| Poor (3.8-5) | 59 | 24 | 13-41 | 0.67 | 0.47, 0.97 | 0.03 | 1.04 | 0.65, 1.66 | 0.87 |
| <i>Type of work contract (censored: 5 employed, 1 missing)</i> | | | | | | | | | |
| Employed (permanent) | 154 | 22 | 14-38 | 1 | - | - | 1 | - | - |
| Self-employed | 30 | 13 | 6-19 | 1.72 | 1.13, 2.61 | 0.01 | 1.19 | 0.67, 2.14 | 0.55 |
| Zero hours/temporary | 5 | 12 | 3-31 | 2.01 | 0.81, 5.00 | 0.13 | 0.73 | 0.25, 2.14 | 0.56 |
| <i>Duration of available sick pay (censored: 4 >1 month, 1 unsure; no missing data)</i> | | | | | | | | | |
| ≤1 month | 49 | 16 | 12-29 | 1 | - | - | 1 | - | - |
| >1 month | 88 | 27 | 15-42 | 0.59 | 0.41, 0.85 | 0.004 | 0.46 | 0.28, 0.76 | 0.002 |
| Unsure | 53 | 16 | 10-23 | 1.19 | 0.80, 1.77 | 0.40 | 1.01 | 0.61, 1.66 | 0.97 |
| <i>Access to occupational health at work (censored: 1 no, 4 yes; 1 missing)</i> | | | | | | | | | |
| No | 110 | 15.5 | 9-29 | 1.77 | 1.31, 2.38 | <0.001 | 1.42 | 0.91, 2.19 | 0.12 |
| Yes | 79 | 25 | 16-42 | 1 | - | - | 1 | - | - |
| <i>Expected duration of leave after carpal tunnel release (days) (censored: 1 7-14, 2 15-29, 2 ≥30; no missing data)</i> | | | | | | | | | |
| <7 | 35 | 4 | 2-12 | 1 | - | - | 1 | - | - |
| 7-14 | 75 | 16 | 13-26 | 0.23 | 0.15, 0.36 | <0.001 | 0.27 | 0.16, 0.45 | <0.001 |
| 15-29 | 35 | 29 | 22-39 | 0.12 | 0.07, 0.19 | <0.001 | 0.19 | 0.10, 0.37 | <0.001 |
| ≥30 | 45 | 42 | 21-44 | 0.08 | 0.05, 0.14 | <0.001 | 0.12 | 0.06, 0.23 | <0.001 |
| <i>MHQ work functioning score (tertiles)^c (censored: 3 poor, 2 intermediate; no missing data)</i> | | | | | | | | | |
| Poor (0-55) | 67 | 20 | 13-35 | 0.68 | 0.47, 0.98 | 0.04 | 0.83 | 0.50, 1.40 | 0.49 |
| Intermediate (60-80) | 72 | 21 | 12.5-39.5 | 0.77 | 0.53, 1.10 | 0.15 | 0.81 | 0.50, 1.31 | 0.39 |
| Good (81-100) | 51 | 17 | 10-29 | 1 | - | - | 1 | - | - |
| <i>Job satisfaction^d (censored: 5 satisfied; 1 missing)</i> | | | | | | | | | |
| Satisfied | 169 | 19 | 11-31 | 1 | - | - | 1 | - | - |
| Dissatisfied | 19 | 38 | 21-43 | 0.61 | 0.38, 0.99 | 0.04 | 0.67 | 0.38, 1.16 | 0.15 |
| <i>Believe that the hand problem was caused by work^e (censored: 1 no, 4 yes; 2 missing)</i> | | | | | | | | | |
| No | 112 | 19 | 13-31 | 1 | - | - | 1 | - | - |
| Agree/strongly agree | 76 | 23 | 10-42 | 0.62 | 0.46, 0.85 | 0.003 | 0.82 | 0.57, 1.17 | 0.28 |
| <i>Job is demanding on hands/wrists^a (censored: 5 yes; no missing data)</i> | | | | | | | | | |
| No | 35 | 16 | 6-27 | 1 | - | - | 1 | - | - |
| Yes | 155 | 20 | 13-38 | 0.61 | 0.42, 0.89 | 0.01 | 0.68 | 0.42, 1.12 | 0.13 |

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|----|--|-----|------|----------|------|------------|--------|------|------------|-------------|
| 1 | | | | | | | | | | |
| 2 | <i>Type of work^f (censored: 2 non-manual, 3 manual; 1 missing)</i> | | | | | | | | | |
| 3 | Non-manual | 119 | 18 | 9-31 | 1 | - | - | 1 | - | - |
| 4 | | 70 | 23.5 | 14-41 | 0.66 | 0.48, 0.89 | 0.01 | 0.97 | 0.57, 1.64 | 0.90 |
| 5 | <i>Work involves target-driven pay^g (censored: 3 no, 2 yes; 10 missing)</i> | | | | | | | | | |
| 6 | No | 149 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| 7 | Yes | 31 | 22 | 13-45 | 0.61 | 0.41, 0.91 | 0.02 | 0.97 | 0.59, 1.61 | 0.91 |
| 8 | <i>Duration of computer use at work (hours)^g (censored: 5 <1; 4 missing)</i> | | | | | | | | | |
| 9 | <1 | 69 | 28 | 17-42 | 1 | - | - | 1 | - | - |
| 10 | >1 to <4 | 33 | 16 | 10-31 | 2.20 | 1.43, 3.38 | <0.001 | 1.01 | 0.56, 1.81 | 0.98 |
| 11 | ≥4 | 84 | 16 | 7-27 | 2.38 | 1.67, 3.38 | <0.001 | 1.85 | 1.08, 3.16 | 0.03 |
| 12 | <i>Work involves lifting or carrying ≥10 kg^g (censored: 4 no, 1 yes; 5 missing)</i> | | | | | | | | | |
| 13 | No | 108 | 18.5 | 11-30 | 1 | - | - | 1 | - | - |
| 14 | Yes | 77 | 24 | 13-40 | 0.61 | 0.42, 0.86 | 0.01 | 0.80 | 0.48, 1.33 | 0.39 |
| 15 | <i>Work involves pushing/pulling a heavy weight^g (censored: 2 no, 3 yes; 2 missing)</i> | | | | | | | | | |
| 16 | No | 104 | 16 | 8.5-28.5 | 1 | - | - | 1 | - | - |
| 17 | Yes | 83 | 26 | 16-42 | 0.51 | 0.37, 0.70 | <0.001 | 0.97 | 0.61, 1.55 | 0.90 |
| 18 | | | | | | | | | | |

19
20 Total sample size n=195. Median work absence relates to the 190 non-censored events. All analyses were adjusted for
21 age and sex. All significant variables in the univariable analyses (p<0.05) were entered into the multivariable model.

- 22 a. Reported on a 0-10 scale, dichotomised to no (0-6) and yes (7-10)[13].
23 b. CTS-6 score [14] with data driven tertiles.
24 c. Michigan Hand Questionnaire work performance subscale scored from 0-100, higher scores indicate better
25 perceived work performance[17]. Data driven tertiles.
26 d. Reported on a 5-point scale, dichotomised to satisfied (very satisfied/satisfied/fairly satisfied) and dissatisfied
27 (dissatisfied/very dissatisfied).
28 e. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor
29 disagree/disagree/disagree strongly[22].
30 f. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].
31 g. As part of the normal working day[23].
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Clinical outcomes after CTR are shown in Table 5. Using the definition outlined in the methods, a total of 46 participants (24%) were identified as having at least one poor outcome (CTS symptoms that were worse, unchanged or only slightly better; scar symptoms that were at least fairly troublesome; required post-operative antibiotics or had additional time off work after first return). Of these participants, the majority (n=38, 83%) reported only a single component of poor outcome. Three individuals defined as having a poor outcome had not returned to work at the point of last follow-up (as compared with two individuals in the rest of the study sample). For those who had returned to work, the median duration of work absence for those with a poor outcome was 22 days (IQR 12-42) compared with 19 days (IQR 12-32) for those without (Figure 2). This difference was not significant (Wilcoxon rank-sum, p=0.24).

TABLE 5. Clinical outcomes after carpal tunnel release

| | Mean score (standard deviation) | |
|---|---------------------------------|------------------------|
| | Before surgery | 12 weeks after surgery |
| CTS-6 (operated hand) ^a | 3.3 (0.87) | 1.2 (0.54) |
| MHQ function (operated hand) ^b | 50 (22.1) | 79 (19.4) |
| MHQ satisfaction with function (operated hand) ^b | 38 (25.7) | 82 (21.3) |
| MHQ bilateral activities of daily living ^b | 69 (23.7) | 88 (13.8) |
| MHQ activities of daily living (operated hand) ^b | 65 (28.1) | 87 (18.5) |
| | Number of participants (%) | |
| <i>Global rating of change score</i> | | |
| Completely cured | - | 65 (33.3) |
| Much better | - | 98 (50.3) |
| Slightly better | - | 13 (6.7) |
| Unchanged | - | 2 (1.0) |
| Worse | - | 5 (2.6) |
| <i>Scar symptom severity</i> | | |
| Not at all troublesome | - | 99 (50.8) |
| A little troublesome | - | 63 (32.3) |
| Fairly troublesome | - | 18 (9.2) |
| Very troublesome | - | 2 (1.0) |
| Unbearable | - | 0 |
| Required post-operative antibiotics | - | 10 (5.1) |
| Additional sick leave after first returning to work | - | 12 (6.2) |

Grey shading indicates the categories which were combined to define a poor surgical outcome.

^a. CTS-6 assessment of carpal tunnel syndrome symptoms[14]. Range 1-5: 1 equals no symptoms.

^b. MHQ Michigan Hand Questionnaire[17]. Range 0-100: 100 equals no deficit or dissatisfaction.

Figure 2. Duration of work absence after carpal tunnel release

There was no significant difference in the prevalence of a poor outcome among those who returned to work within or after seven days of CTR (20% versus 24%, Chi^2 $p=0.63$). Similarly, there was no significant difference in the prevalence of a poor outcome among those who returned to work within or after 14 days (19% versus 25%, Chi^2 $p=0.31$), or within or after 28 days of CTR (21% versus 27%, Chi^2 $p=0.33$).

DISCUSSION

In this multi-site prospective cohort study, the median duration of work absence was 20 days (range 1-99), a duration similar to that reported by other European studies[24]. Earlier return to work was associated with typing for ≥ 4 hours at work (as compared with more physical workplace tasks) and undergoing surgery in primary care (as compared with secondary care or private practice). Pre-operative expectations about return to work were important significant predictors of actual return to work times. We found no evidence of poorer clinical outcomes in the first 12 weeks amongst those who returned to work earlier. At each time point, fewer manual workers had returned to work than non-manual workers and fewer employed workers had returned than self-employed (Figure 2). Both findings have been reported previously[10, 11, 25, 26], however, neither the type of work (manual/non-manual) nor the type of work contract (employed/self-employed) were significantly associated with the duration of work absence in the mutually adjusted model. These results illustrate the importance of considering the range of relevant demographic, clinical and occupational factors, which may have been confounders, moderators or mediators in previous studies. The reported model does not look to predict the duration of work absence for future CTR patients, rather to explore the association between different risk factors and work absence.

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5 Five variables remained statistically significantly associated with longer duration of work
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7 absence in the final model. Two were occupational factors: infrequent computer use and
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9 availability of sick pay. Cowan et al.[10], recorded earlier return to work after CTR for desk-
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11 based workers and we have shown previously that UK hand surgeons and hand therapists
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13 report that they advise earlier return to desk-based workers[6]. The relationship between
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15 longer duration of work absence and availability of sick pay has also be reported previously for
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17 those with and without worker's compensation[9, 24]. It is plausible that financial necessity is
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19 driving earlier return to work for those with limited sick pay. Alternatively, those with access to
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21 paid leave might choose to take the maximum available duration.
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30 Only one clinical factor was significantly associated with the duration of work absence:
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32 participants who had their CTR surgery in primary care were more likely to return to work
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34 earlier than those whose procedure took place in an NHS hospital setting. One possible reason
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36 is that patients with more complex disease may be more commonly referred to secondary,
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38 rather than primary, care for their CTR and these patients may require longer off work after
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40 their surgery. However, in the current study the proportion and degree of comorbidities, and
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42 the extent of pre-operative symptoms reported by participants were similar across all settings.
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44 Another possibility is that the patients' expectations of the surgery may be different: CTR
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46 performed in a primary care setting might be perceived by patients as being more minor than
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48 surgery in a hospital operating theatre. Alternatively, the general practice surgeons may have
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50 recommended earlier return to work than those based in a hospital, although the median
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52 expected duration of work absence for participants in the current study was the same across
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54 all settings. The inclusion of CTR performed in primary care is a strength of the study. We
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3 acknowledge that hand surgeons may also provide CTR services in primary care, as visiting
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5 clinicians, however in the current study this was not the case. CTR and other surgical
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7 procedures, such as vasectomy and minor skin surgery, are regularly performed by trained
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9 general practitioners in the UK[27], and all primary care surgeons in the current study were
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11 general practitioners who already provided a CTR service.
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18 Only one demographic factor was statistically significant: women were more likely to take
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20 longer to return to work than men. Whilst we found inconsistent data about the effect of
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22 gender on return to work after CTR in the literature[28, 29], female gender has been
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24 associated with longer periods of work absence for other health conditions[30]. Researchers
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26 should continue to include sex as a covariate in analyses of return to work outcomes, although
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28 there is currently insufficient evidence to support any difference in return to work
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30 recommendations after CTR based on sex. Further qualitative investigation is required in order
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32 to understand the context for this.
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40 Finally, those who expected to return to work more quickly were significantly more likely to do
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42 so. It has been shown previously that patient expectations are a prominent determinant of
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44 return to work time, or other return to work outcomes, for musculoskeletal or mental health
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46 conditions[30-32]. The role of expectations on outcomes, including the expected and actual
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48 timing for return to work and driving after hand and wrist surgery, requires further
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50 exploration, particularly because expectations are a potentially modifiable characteristic which
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52 could be influenced by the advice provided by clinicians pre-operatively.
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3 In total, approximately a quarter of participants in this study were considered to have a poor
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5 outcome using our composite definition. We chose to use a multi-component definition which
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7 was deliberately very stringent to minimise the chances of missing any harm caused by early
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9 return to work. Our rates of poorer outcomes were in fact similar to those reported in other
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11 CTR populations[20, 33, 34]. Importantly, we found no relationship between earlier return to
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13 work and occurrence of poor outcomes within 12 weeks of CTR in this cohort study. We
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15 acknowledge that a longer follow-up duration would have aided the assessment of post-
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17 operative symptom resolution, however this was not possible with the resources available and
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19 was not a primary objective of the study.
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27 There are a number of limitations of the current study, including the reliance on self-reported
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29 data. Work absence is not logged on a national database in the UK and therefore could only be
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31 obtained through self-report. To minimise errors of recall, date of return to work was
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33 determined contemporaneously. The recall duration for measures of function and symptoms
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35 was limited to a maximum of four weeks, consistent with the outcome measures used[14, 17].
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37 We set out to recruit a large sample of working-aged adults undergoing CTR. Our prospectively
38
39 recruited sample from 16 sites is one of the largest reported in the literature to date, with a
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41 good follow up response rate (79%), but it remains possible that we were under-powered to
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43 detect some of the factors which may have been associated with delayed return to work.
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45 Specifically, this could result where some levels of categorical variables of interest have lower
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47 prevalence, for example, the type of work contract (>80% of participants reported that they
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49 had a permanent work contract, compared with ~15% who were self-employed). Furthermore,
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51 we acknowledge that the inclusion of a large number of variables in the development of the
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53 final model may result in model overfitting, thereby potentially limiting generalisability.
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2 We took the approach not to impute values where data were missing. Overall, the amount of
3 missing data was small and at the individual item-level (Table 4 and supplementary file 4).
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5 Missing data were coded as such, and included in the analysis. We acknowledge that the
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7 approach taken to missing data may have resulted in biased estimates, yet if such effects are
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9 present, they are likely to be minimal due to low levels of missing data.
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17 Following our *a priori* analysis plan, the association between each baseline variable and the
18 duration of work absence was individually assessed in separate age- and sex-adjusted analyses.
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20 Only those variables which reached significance at the 5% level ($p < 0.05$) were included in the
21
22 multivariable model. In order to test the stability of our model, and to identify whether any
23
24 potential associations had been missed, this was tested using 1% and 20% cut-offs. In both test
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26 scenarios, the findings were similar to those presented in our final model (Table 4), suggesting
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28 that our model is robust. However, we acknowledge that alternative methods of selecting
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30 variables for inclusion (such as forward inclusion or backward elimination) may have yielded
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32 slightly different results, particularly for variables that were close to our significance cut-off of
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34 5%.
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44 The findings may not be generalisable to working populations in regions outside of central and
45 southern England and Wales, who are employed in other industries, or managed with a
46
47 different CTR patient pathway. Steps were taken to include the main settings where CTR is
48
49 performed in the UK, but we acknowledge that CTR may also be performed by other
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51 specialities. Individuals who chose to participate in the study may not be fully representative of
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53 the wider CTR population, and the observed differences between those who completed the
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3 study and those who were lost to follow-up (younger, poorer mental health, more likely
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5 manual workers) also limit generalisability.
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10 Endoscopic CTR has been associated with earlier return to work than open CTR [35], however it
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12 was not possible to assess this in the current study. At present, endoscopic CTR is not routinely
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14 performed in the UK[6]. Anecdotally, most providers will not fund the extra cost of endoscopic
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16 CTR, which requires extra equipment, longer operating times and more experienced surgeons.
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18 Recruitment to the current study was not limited to patients undergoing open CTR, but no
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20 endoscopic procedures were performed during the study at any of our sites.
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27 All participants were presumed to have CTS as diagnosed by their treating clinician. Many
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29 studies of CTS include nerve conduction study (NCS) findings as part of their eligibility criteria,
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31 although this was not possible in the current study because NCS are not routinely
32
33 recommended for pre-operative diagnosis of CTS in the UK[2]. Our eligibility criteria required
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35 that only people undergoing their first CTR were included and reported upon in this study (so
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37 that previous experiences with CTR were not potential confounders). However, more than
38
39 three quarters of the cohort reported bilateral symptoms. The possible impact of persisting
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41 CTS symptoms in the non-operated hand on return to work also needs to be considered.
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49 For the current study, we considered both occupational title and self-reported occupational
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51 exposures collected in a standardised questionnaire format[13, 18, 19, 23]. Categorisation
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53 based on job title and industry may not accurately reflect the physical and/or psychosocial
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55 aspects of job role. Furthermore, co-occurrence of occupational exposures may be more
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3 common in some types of jobs than in others, for example lifting >10kg and pushing or pulling
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5 a heavy weight.
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10 There is a need for an agreed approach to identifying and recording key physical demands and
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12 psychosocial exposures of jobs to enable consistent exploration of their impact on work and
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14 clinical outcomes following surgery or other intervention. Approaches such as job exposure
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16 matrices[36] could facilitate this in future research.
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22 In summary, this large multi-centre prospective cohort study investigated when participants
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24 return to work after CTR. Expectations about return to work (reported before surgery) were
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26 strongly associated with actual work absence, regardless of the job role or self-reported upper
27
28 limb activities involved. Patient expectations can be influenced by many factors, but one of the
29
30 most important is the advice provided by clinicians, in particular the surgeon. This suggests
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32 that clear, consistent advice could have an important effect on duration of sick leave. To date
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34 there is no evidence-based guidance informing clinicians what to advise about returning to
35
36 different types of work after CTR. Further research is required to reach a consensus and
37
38 explore whether the provision of targeted, consistent and standardised advice can alter the
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40 expected duration of work absence, reducing unnecessary sick leave, without causing adverse
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42 effects on clinical outcomes.
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17 **Conflicts of interest**

18
19 LN was supported by a National Institute for Health Research (NIHR) Doctoral Research
20 Fellowship, grant number DRF-2015-08-056. GN was supported by funding from the MRC
21 Versus Arthritis Centre for Musculoskeletal Health and Work. The authors declare no other
22 conflicts of interest.
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37 the authors and not necessarily those of the funders, the NHS, the NIHR or the Department of
38 Health.
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49 **Informed consent**

50
51 Written informed consent was obtained from the patient(s) for their anonymised information
52 to be published in this article.
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58 **Ethics approval**

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2
3 Full ethics approval was granted by the NHS Health Research Authority (IRAS 209840:
4
5 16/WA/0390) and University of Southampton (ERGO 25757) Ethics Committees.
6
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8
9

10 **Contributorship**

11
12 The study was devised by LN, KWB, JA, DW and DC. LN completed data collection and analysis,
13
14 with assistance from GN and KWB. All authors contributed to the interpretation of the data. LN
15
16 wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and
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18 approved the final version.
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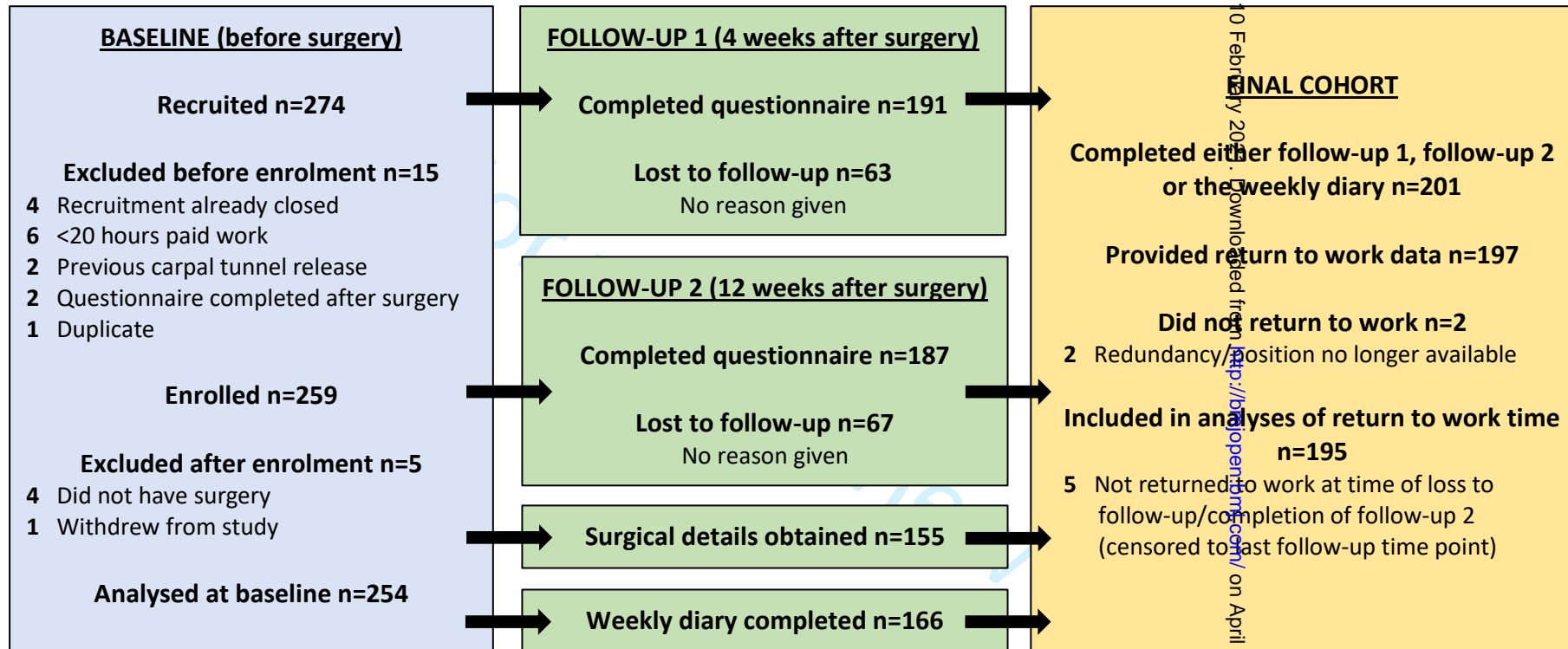
26
27 The authors would like to thank and acknowledge all the study participants who gave up their
28
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30
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38
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11
12 recruit to the REACTS study.
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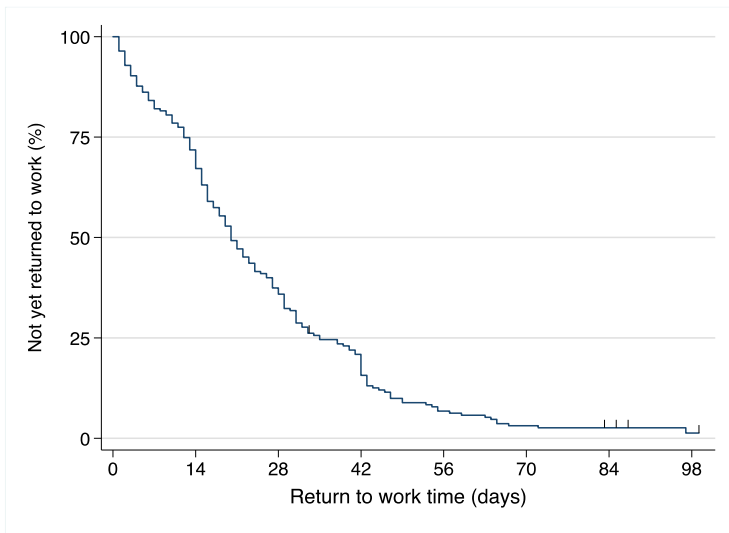
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Figure 1. Participant numbers for each stage of the cohort study

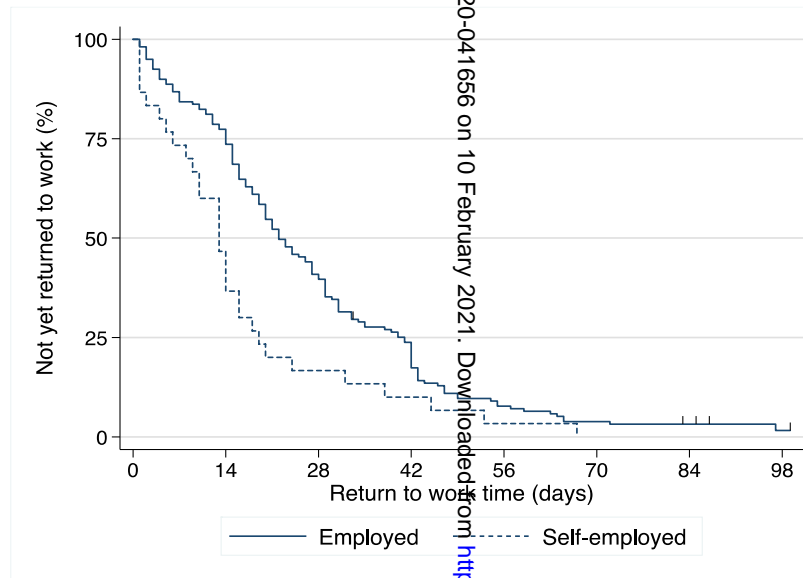


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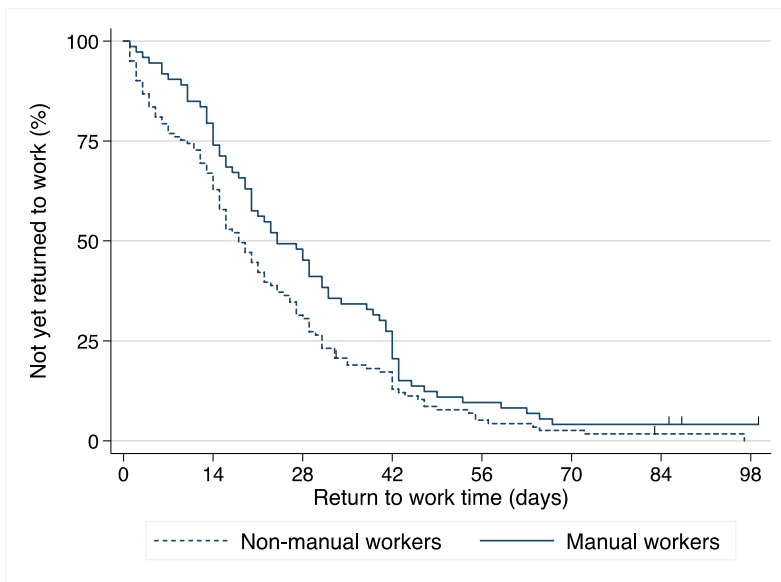
Figure 2. Duration of work absence after carpal tunnel release



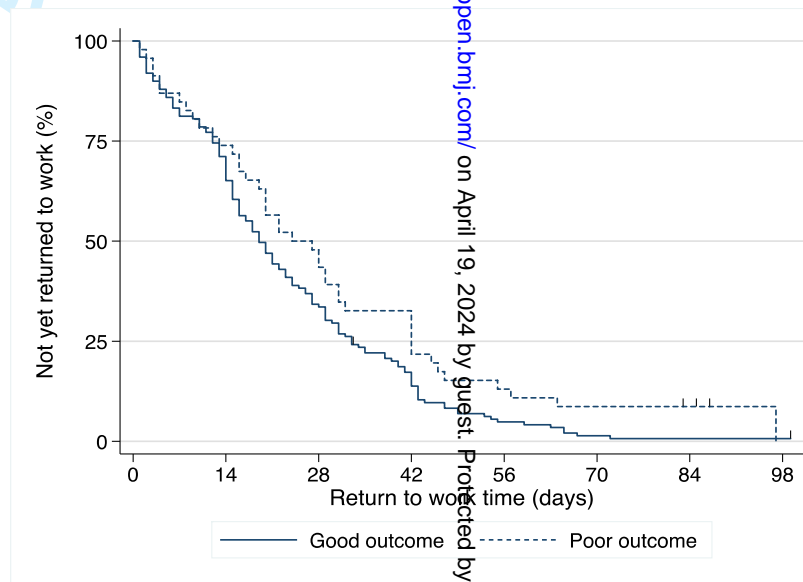
A. Whole cohort



B. Employed versus self-employed workers



C. Non-manual versus manual workers



D. With versus without a poor outcome

Vertical lines indicate right censoring for those who had not returned to work at the point of last follow-up

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Development of the REACTS study questionnaire: Reasoning for item inclusion

Questions were chosen to capture information on variables that might be expected to influence return to work after CTR.

Demographic factors

General demographic information was requested including date of birth, sex and hand dominance. Other studies have found that older age was associated with poorer work outcomes after CTR [1, 2], while no clear sex effect has been shown [3, 4]. Hand dominance in relation to side of surgery is rarely reported in CTR studies, however, surgery to the non-dominant hand has been linked to quicker and more complete resolution of CTS symptoms [5].

Carpal tunnel release planning

Information was collected on the expected date of CTR, side of surgery, availability of occupational health services and the patient's expectations about time off work post-surgery. Expected duration of work absence has been identified as a determinant of return to work time in previous CTR studies [2, 6].

Occupational factors

Participants were asked to list their main occupation and the industry in which they work (examples were provided to facilitate the response). This information was processed using the UK Office for National Statistics Standard Occupational Classification [7] and Computer Assisted Structured Coding tool (Cascot) [8] to generate manual and non-manual categories. Cases where the coding match was confirmed as less than 64% were reviewed by the lead researcher and coded by hand [8]. This was checked by the department data manager and any queries resolved through discussion.

Participants were asked to categorise their employment type as: employed (permanent contract), employed (temporary/renewable contract), zero hours contract and self-employed. Our systematic review found earlier return to work times for self-employed individuals compared to those who were employed [9]; but this was only investigated in two

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3 studies [10, 11]. The additional sub-categories for employment type listed above and a
4
5 separate question about sick-pay entitlement were included to allow the impact of work
6
7 contract type to be explored [12]. Participants were also asked how many hours they usually
8
9 worked each week and over how many days; this information was collected for the
10
11 participant's main job and any other routine paid work. The total number of work hours per
12
13 week was calculated by combining the hours for main and additional jobs.
14
15

16 Occupational activities that load the upper limb and potential work stressors were asked as
17
18 a series of yes/no questions following the format of a recent multi-centre RCT exploring
19
20 management of non-specific distal arm pain [13]. These questions originated in the Job
21
22 Content Questionnaire, designed to assess psychological and physical aspects of work [14].
23
24 Activities included: computer use, tasks involving repeated wrist/finger movement, holding
25
26 vibrating tools, lifting more than 5 or 10kgs, pushing/pulling a heavy weight, working with
27
28 the neck flexed or rotated, and driving. Our systematic review found that manual workers
29
30 took longer to return to work than non-manual workers [9] and these questions were used
31
32 to determine the self-reported level of upper limb manual activity involved in each
33
34 participant's job.
35

36 Potential psychosocial work stressors were also assessed. These included piecemeal work,
37
38 activity targets and bonuses, and tight deadlines. As the first three items all concerned
39
40 payment for results, these were combined for the analyses. Participants were also asked
41
42 whether they found their main job demanding on their hands/wrist and whether their
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44 boss/colleagues were supportive. Both questions were scored on a 0-10 scale as reported
45
46 previously in a study of sick leave duration after endoscopic CTR [15]. These were
47
48 dichotomised as supportive (7-10) and neutral/unsupportive (0-6). A question about general
49
50 job satisfaction was also included later in this section of the questionnaire, with the Likert
51
52 response options: very satisfied, satisfied/fairly satisfied, dissatisfied and very dissatisfied
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54 [15, 16]. The last two options were condensed to give three categories for the analyses.
55

56 To assess self-reported work function, participants were asked to complete the work
57
58 performance section of the Michigan Hand Questionnaire (MHQ) [17]. This patient reported
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60 outcome measure is frequently used in upper limb clinical practice and research and has

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1
2
3 been validated for use with CTS and CTR populations [18]. Permission was granted for the
4 MHQ to be used in the study. The questionnaire asked participants to recall how much
5 difficulty they had with general work tasks over the past four weeks in relation to problems
6 with their hands/wrists, for example: needing to shorten their working day, taking longer to
7 complete tasks or needing to take breaks. Using the standard scoring, each question was
8 completed on a Likert scale of: always, often, sometimes, rarely and never, and combined to
9 give a score from 0-100, with 100 representing no problems with work functioning [19].
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11 Participants were also asked whether they had taken any periods of sickness absence from
12 work over the previous four weeks, both related to the hand/wrist problem, or for any
13 other problem.
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23 **General health**

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25 Seven general health questions were included to capture information on comorbidities,
26 physical and mental health and somatisation. Self-reported health was assessed using the
27 first SF-36 question: In general, would you say your health is – excellent, very good, good,
28 fair, poor [20]. This was taken from the original SF-36 version, which is free from licence
29 charges and was dichotomised as excellent/very good/good and fair/poor for the analyses.
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36 Participants were asked their height and weight to enable the calculation of BMI (body mass
37 index; weight in kilograms/height in metres squared). This was categorised using standard
38 WHO classification: underweight (BMI <18.5), normal weight (BMI 18.5-24.9), overweight
39 (BMI 25.0-29.9) and obese (BMI ≥30.0) [21]. Smoking status was categorised as those who
40 have never smoked regularly, those who have smoked in the past and those who regularly
41 smoke, with the latter two categories combined for the analyses. Previous studies have
42 found that obesity (BMI ≥30) was linked to poorer work outcomes [1] and smoking was
43 linked to poorer clinical outcomes after CTR [22].
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52 A list of common health problems and their impact on general activities was assessed using
53 the Self-Administered Comorbidity Questionnaire [23]. Participants were asked first to
54 select whether they have any of the 14 medical conditions and if so whether this limited
55 their activities. All medical conditions were worded in an accessible format, as evaluated by
56 the patient advisory group. Responses were analysed as the number of comorbidities and
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the number of disabling comorbidities using the scale: 0, 1, ≥ 2 . Mental health was assessed using the mental health and vitality questions from the licence-free version of the SF-36 [20]. One modification was made to change the wording of the question 'Did you feel full of pep?' to 'Did you feel full of get-up-and-go?' for the UK rather than US setting. The questions were used to calculate the summary score from 0-100 (where 100 represents no disability).

Somatisation was assessed using a subset of five questions from the Four-Dimensional Symptom Questionnaire [24] as previously reported in UK cohort studies of health and employment [25] and upper limb pain in primary care [26]. The number of symptoms that were rated by the participant as at least moderately distressing were used to create the analysis categories of: 0, 1, ≥ 2 symptoms.

Hand and wrist symptoms and function

Katz & Stirrat hand diagrams were included for the participants to indicate where on their hand(s) they experience pain and/or tingling and numbness [27]. This self-administered tool can be used clinically as part of the CTS diagnosis process using the scoring system modified by Calfee et al. [28]. A question on symptom duration was also included and categorised as less than 3 months, 3-6 months, 6-12 months and more than a year. This was dichotomised to ≤ 1 year and > 1 year for analysis. All participants were expected to have clinically diagnosed CTS as they were undergoing CTR, but participants were asked to answer for both hands, so that symptoms in the non-operated hand were also assessed. This was used to define bilateral or unilateral symptoms. Hand diagram scores were dichotomised according to a stringent definition of CTS (classic and probable) and unlikely CTS (possible and unlikely).

The CTS-6 questionnaire was included to assess the severity of CTS symptoms [29]. This tool is a shorter version of the Boston Carpal Tunnel Questionnaire [30] and has been assessed for use pre- and post CTR surgery. The six questions explore the severity of pain and numbness, whether this occurs during the daytime or at night, and whether this wakes the individual. Participants were asked to complete these questions separately for each hand using a 5-point Likert scale. Using the standard scoring criteria, responses for each item

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3 were combined to give a mean score ranging from 1-5, with 5 representing the highest
4 severity of symptoms. If one response was missing (per hand) this was imputed using the
5 mean score of the remaining responses [29].
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10 Hand function was assessed using the MHQ sub-sections on unilateral hand function (asked
11 for each hand), satisfaction with hand function (asked for each hand), and ability to perform
12 unilateral and bilateral activities of daily living (ADLs) [17]. The MHQ summary question
13 relating to the level of satisfaction with the appearance of each hand was also included. All
14 questions were scored on the 5-point Likert scales provided and used the standard wording
15 and scoring to enable comparison with other study populations. Possible scores for each
16 sub-section range from 1-100, with 100 representing no problems or the highest level of
17 satisfaction. Missing data were imputed according to the MHQ guidelines, which allow the
18 scale to be calculated if more than 50% of the questions for each sub-section have been
19 completed [19].
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30 **Health beliefs**

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32 The remaining questions related to health beliefs. Beliefs about the cause of symptoms and
33 likely prognosis have been identified as key themes in health-seeking behaviour for CTS [31]
34 and upper limb pain [26], and blaming oneself for the hand problem has been associated
35 with long durations of sick leave after endoscopic CTR [15]. The participant's expectations
36 for being able to use the affected hand normally within 3 months of surgery, fear of long-
37 term hand problems, blaming oneself for the hand problem and the perceived level of
38 support available from friends and family were assessed. Responses were rated on a 0-10
39 scale as reported by Hansen et al. [15]. All responses were converted to a unidirectional
40 scale with 10 being the best outcome, and were dichotomised as neutral/negative response
41 0-6 and positive response 7-10.
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52 Participants were also asked to agree/disagree (via a 5-point Likert scale) with a series of
53 seven questions about the believed cause of their symptoms. Using previously reported
54 methods, the responses were dichotomised to those who agreed (agree/strongly agree) and
55 those who did not agree (neither agree nor disagree/disagree/disagree strongly) with each
56 statement [26]. The first two questions were combined to generate six items: 1) I think I was
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born with a weakness in this part of my body/problems like this run in my family; 2) my problem was caused by work; 3) my problem probably wasn't caused by work, but work made it worse; 4) I have a lot of stress in my life and that has made my problem a lot worse; 5) a lack of exercise probably contributed to my problem; 6) as you get older, parts of the body wear out and problems like mine are likely [26].

Finally, the abbreviated Pain Catastrophizing Scale was included, which provides insight about the participant's pain beliefs [32]. Responses were dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions, and those who did not.

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Before Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

Preprint

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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CONSENT FORM (IRAS reference: 209840)

You should complete this form after you have read the Participant Information Sheet.

REACTS: Return to employment after carpal tunnel release surgery

Thank you for considering taking part in this research. If you have any questions arising from the Participant Information Sheet, please ask the research team before you decide whether to take part.

Please initial the boxes if you agree with each statement

1. I have read the Participant Information Sheet (version 2.0; 06.12.16) and have had the opportunity to ask questions about the study.
2. I meet the criteria for being involved in this study:
 - Aged over 18 and referred for carpal tunnel release surgery
 - Routinely work in paid employment for at least 20 hours per week
 - Plan to return to work after carpal tunnel release surgery
 - Have not previously had carpal tunnel release surgery on either hand
 - Have not previously had a serious injury to the same wrist/hand that will have the carpal tunnel release operation
3. I agree to take part in this research and agree for my data to be used for the purposes explained in the Participant Information Sheet (version 2.0; 06.12.16). I understand that this information will be handled in accordance with the terms of the UK Data Protection Act 1998.
 - a. I agree for the REACTS research team to access pre-operative test results concerning my hand and wrist symptoms. No other information will be accessed.
 - b. I agree for the REACTS research team to access my carpal tunnel release surgical record. No other information will be accessed.
4. I understand that if I decide at any time during the research that I no longer wish to take part, I can notify the researchers and withdraw from the study immediately, without giving a reason. If I do, I understand that I can ask for any contribution I have already made to be removed from the study, up to the time when I have completed the final questionnaire.

Signature _____ Date ____ / ____ / ____

Name _____ Phone _____
(please print) (only to be used if we lose touch)

Postal address _____

Email address _____
(please print)



ADDITIONAL QUESTIONS

Please circle one response for each question

I prefer to receive the next two questionnaires by **Post** **Email** **Don't mind**

I prefer to receive correspondence about the study by **Post** **Email** **Don't mind**

I would like to be notified of the findings from this research **Yes** **No**

I am happy to be contacted about the next stage of the research, which will involve a one-off discussion with the lead researcher **Yes** **No**

I am happy to be contacted about other studies related to this research **Yes** **No**

When the research team receives your completed questionnaire and consent form, we will sign it below and return a copy to you for your records.

Researcher signature _____ Date ____ / ____ / ____

Researcher name _____

University of Southampton research supervisors:
Professor Karen Walker-Bone | Professor Jo Adams | Professor David Warwick

SECTION A: BACKGROUND

1 What is your date of birth?

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| d | d | m | m | y | y |

2 Are you:

Male Female Other

3 Are you:

Right handed Left handed Both

4 Do you routinely carry out paid work for 20 hours or longer in a given week?

Yes No

*If no, thank you for your interest in our study, however, we are only looking for individuals who carry out paid work for at least 20 hours per week. You **do not** need to complete the rest of the questionnaire, but please return it using the pre-paid envelope provided.*

5 When do you expect to have your carpal tunnel surgery?

Please enter the exact date if known, or provide the approximate month and year if unsure.

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| d | d | m | m | y | y |

6 Which hand will be operated on?

If both hands please answer Question 6.1; if one hand, please move on to Question 7.

Right Left Both

6.1 If both hands, which side will be operated on first?

Right Left Both sides operated
on the same day Unsure

7 Do you have access to an occupational health service through your place of work?

Yes No Unsure

8 Do you expect to take any time off work following your surgery?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No Unsure

8.1 If you do expect to take time off work, how long do you expect to take?

Please complete using days, weeks or months; whichever applies.

Days Weeks Months

SECTION A: BACKGROUND

9 Have you been given any information about your operation?

If yes, please answer Question 9.1; if no, please move on to Question 10.

Yes No

9.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
- b) Hospital nurse
- c) GP or practice nurse
- d) Hand therapist
- e) Physiotherapist or occupational therapist
- f) Occupational health nurse or doctor
- g) Employer
- h) Friend or family member
- i) Internet
- j) Other (*please specify*)

10 Have you been given any information about returning to work after your surgery?

If yes, please answer the rest of Question 10; if no, please move on to Question 11.

Yes No

10.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
- b) Hospital nurse
- c) GP or practice nurse
- d) Hand therapist
- e) Physiotherapist or occupational therapist
- f) Occupational health nurse or doctor
- g) Employer
- h) Friend or family member
- i) Internet
- j) Other (*please specify*)

10.2 What advice were you given?

If this advice came from more than one source, please indicate who advised what.

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SECTION B: WORK

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12 What is your MAIN occupation at the moment (e.g. secretary, teacher, builder etc.)?

13 And in what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc)?

14 Which of the following best describes your present work situation for your MAIN occupation? Please tick one box.

- a) Employed (permanent contract) d) Self-employed
 b) Employed (temporary/renewable contract) e) Other (*please specify*)
 c) Zero hours contract

15 On average, how many hours per week do you normally work in your main occupation?

hours

16 On average, how many days per week do you normally work in your main occupation?

days

17 Do you have any other paid work?

If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, on average, how many hours a week do you work in other paid jobs? hours

18 Does an average day at work in your MAIN job normally involve any of the following? Please tick one box for each question.

- | | Yes | No |
|---|--------------------------|--------------------------|
| a) Piecework in which you are paid according to the number of articles or tasks you or your team make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| b) A target number of articles or tasks that you or your team are expected to make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Payment of a bonus if you make or finish more than an agreed number of articles/tasks in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Working to tight deadlines | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Use of a computer keyboard or mouse for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION B: WORK

| | Yes | No |
|--|--------------------------|--------------------------|
| f) Use of a computer keyboard or mouse for longer than 4 hours in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Other tasks involving repeated movements of the wrist or fingers for longer than 4 hours in total? <i>(Please indicate which tasks)</i> | <input type="checkbox"/> | <input type="checkbox"/> |
| ----- | | |
| ----- | | |
| h) Working with a powered tool that makes your hand(s) or arm(s) vibrate (e.g. chain saw, pneumatic drill)? | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Working with your hand(s) above shoulder height for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Lifting or carrying weights of 5 kg (11 lbs) or more in one hand (e.g. a tool bag or heavy briefcase)? | <input type="checkbox"/> | <input type="checkbox"/> |
| k) Lifting or carrying a weight of 10 kg (22 lbs) or more? | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Tasks involving pushing or pulling a heavy weight? | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Working for longer than two hours in total with your neck bent forward? | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Working for longer than half an hour in total with your neck twisted e.g. when looking to one side? | <input type="checkbox"/> | <input type="checkbox"/> |
| o) Driving for more than an hour? | <input type="checkbox"/> | <input type="checkbox"/> |

19 Do you find your MAIN job demanding on your hands/wrists?

Please circle one number, where 0 represents not at all, and 10 represents very much.

| | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|----|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Not at all | | | | | | | | | | | Very much |

20 Does your MAIN employer (or boss/colleagues if self-employed) know about your hand/wrist problem?

If yes, please answer Question 20.1; if no, or not applicable, please move on to Question 21.

Yes No N/A self-employed and work alone

20.1 Is your MAIN employer (or boss/colleagues if self-employed) supportive of your hand/wrist problem?

Please circle one number, where 0 represents not at all, and 10 represents very much

| | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|----|-----------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Not at all | | | | | | | | | | | Very much |

SECTION B: WORK

The following questions refer to how you did in your MAIN job during the past 4 weeks.

21 weeks.

Please tick one box for each question.

| | Always | Often | Sometimes | Rarely | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| How much of the time during the past 4 weeks ... | | | | | |
| a) Were you unable to do your work because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Did you have to shorten your work day because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Did you have to take breaks at work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Did you get less done because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you take longer to do the tasks in your work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 **During the past 4 weeks, how much time have you missed from your MAIN job for the following reasons?**

Please write 0 if you have not missed any time from work during this period. You can answer in days or hours, whichever applies.

- a) Time missed because of the problem with your hand(s)/wrist(s) Days **or** Hours
- b) Time missed because of any other problem Days **or** Hours

23 **If you fell ill and were off work, how long could you get your normal full pay (excluding bonuses)?**

Please tick the option that best represents your MAIN job.

- | | |
|--|--|
| a) Less than one week <input type="checkbox"/> | d) More than 6 months <input type="checkbox"/> |
| b) 1 – 4 weeks <input type="checkbox"/> | e) Not sure <input type="checkbox"/> |
| c) 1 – 6 months <input type="checkbox"/> | |

24 **How satisfied are you with your MAIN job as a whole, taking everything into consideration?** This includes your salary, career possibilities, management, colleagues etc. Please tick one box.

- | | |
|--|---|
| a) Very satisfied <input type="checkbox"/> | c) Dissatisfied <input type="checkbox"/> |
| b) Satisfied/fairly satisfied <input type="checkbox"/> | d) Very dissatisfied <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

25 In general, would you say your health is:

- a) Excellent d) Fair
- b) Very good e) Poor
- c) Good

26 What is your height? Please answer in either feet and inches or centimetres.

feet inches *or* cms

27 What is your weight? Please answer in either stones and pounds or kilograms.

stones lbs *or* kgs

28 Do you, or have you ever, smoked regularly? Please tick one box.

- a) I have never smoked regularly c) I regularly smoke
- b) I have smoked in the past, but do not currently smoke regularly

29 The following is a list of common health problems. Please indicate if you currently have, or don't have, the problem listed in part 1. If you have the problem, please answer the corresponding question in part 2. Please answer all questions in part 1.

| HEALTH PROBLEM | PART 1 | | PART 2 | |
|-----------------------------------|----------------------------------|--------------------------|--------------------------------|--------------------------|
| | Do you have the problem? | | Does it limit your activities? | |
| | NO | YES | NO | YES |
| | <i>(if yes move to part 2)</i> → | | | |
| a) Heart disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) High blood pressure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Lung disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Diabetes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Ulcer or stomach disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Kidney disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Liver disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Thyroid disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Anaemia or other blood disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

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| HEALTH PROBLEM continued... | Do you have the problem? | | Does it limit your activities? | |
|-----------------------------|--------------------------|--------------------------|--------------------------------|--------------------------|
| | NO | YES | NO | YES |
| k) Depression | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Osteoarthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Back pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Rheumatoid arthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

(if yes move to part 2) →

29.1 Please list any other medical problems that have not been mentioned.

| | Does it limit your activities? | |
|----------|--------------------------------|--------------------------|
| | NO | YES |
| o) | <input type="checkbox"/> | <input type="checkbox"/> |
| p) | <input type="checkbox"/> | <input type="checkbox"/> |
| q) | <input type="checkbox"/> | <input type="checkbox"/> |

30 The following questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling. Please tick one box for each row.

| How much of the time during the past 4 weeks ... | All of the time | Most of the time | A good bit of the time | Some of the time | A little bit of the time | None of the time |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Did you feel full of 'get-up-and-go'? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Have you been a very nervous person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Have you felt so down in the dumps that nothing could cheer you up? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Have you felt calm and peaceful? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you have a lot of energy? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Have you felt downhearted and blue? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Did you feel worn out? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Have you been a happy person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Did you feel tired? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

31 Below is a list of problems that people sometimes have. Please read each one carefully and tick the box that best describes how much that problem has distressed or bothered you during the *past 7 days*, including today?
Please tick one box for each row.

| | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Faintness or dizziness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pains in the heart or chest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Nausea or upset stomach | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Trouble getting your breath | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hot or cold spells | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **RIGHT** hand or wrist?

32 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 34.



Pain



Tingling or numbness

RIGHT HAND



33 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **LEFT** hand or wrist?

34 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 36.

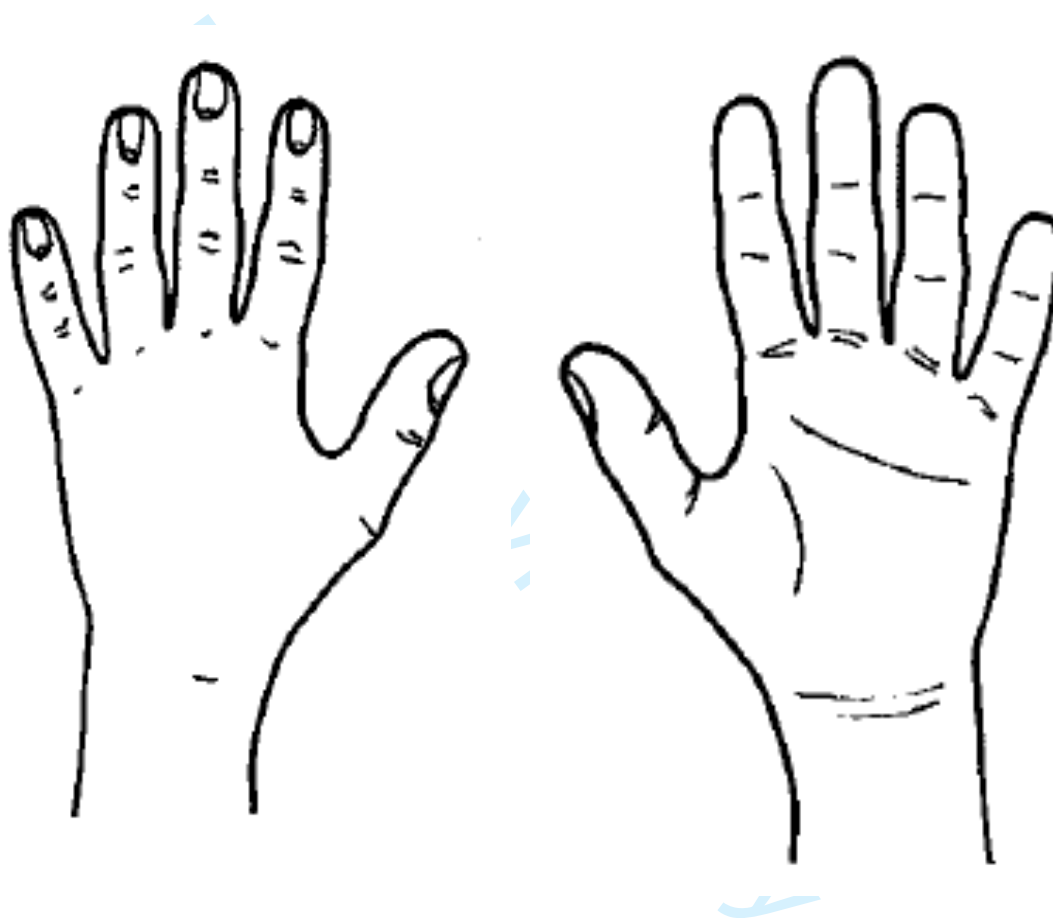


Pain



Tingling or numbness

LEFT HAND



35 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your symptoms over the ***last 7 days***.

36 Please answer for each hand, even if you only have problems with one side.
Please tick one box for each row.

| 36.1 | How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|-------------|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) | Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) | Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) | Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) | Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|----|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) | Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) | Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 36.2 | How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|-------------|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) | Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) | Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) | Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) | Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|----|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) | Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) | Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

37 This question refers to the appearance (look) of your hand during the ***past 7 days***. Please tick one box for each hand.

| | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|----|--|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) | I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) | I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

38 Please answer the following questions on a scale of 0-10, where 0 represents not at all, and 10 represents very much. Please circle one number for each question.

38.1 Do you think that you will be able to use your hand normally 3 months after the operation?

0 1 2 3 4 5 6 7 8 9 10

38.2 Are you afraid of having long-term problems with your hand?

0 1 2 3 4 5 6 7 8 9 10

38.3 Do you blame yourself for your hand problem?

0 1 2 3 4 5 6 7 8 9 10

38.4 Are your family and friends supportive of your hand problem?

0 1 2 3 4 5 6 7 8 9 10

39 The following statements describe people's beliefs about their health problems. Please indicate whether you agree or disagree with them in relation to the problems you have with your hand(s) or wrist(s). Please tick the box which most closely reflects how you feel for each statement.

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly Disagree |
|---|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| a) Problems like this run in my family | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I think I was born with a weakness or underlying problem in this part of my body | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) My problem was caused by work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Work probably didn't cause my problem, but it made it worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) I have a lot of stress in my life and that has made my problem a lot worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) I think a lack of exercise probably contributed to my problem | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) As you get older, parts of the body start to wear out and problems like mine are likely to occur | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

40 We are interested in the types of thoughts and feelings that you have when you are in pain. The following statements describe different thoughts and feelings that may be associated with pain. Please indicate the degree to which you have these thoughts and feelings when you are experiencing pain. Please tick one box for each statement.

| | Not at all | To a slight degree | To a moderate degree | To a great degree | All of the time |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) I keep thinking about how badly I want the pain to stop | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) It's terrible and I think it's never going to get any better | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I become afraid that the pain may get worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I anxiously want the pain to go away | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the function of your hands/wrists during the **past 7 days**. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 41 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your right hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your right fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your right wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 42 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your left hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your left fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your left wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the ability of your hands to do certain tasks during the **past 7 days**. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

43 How difficult was it for you to perform the following activities using your RIGHT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

44 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

45 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question

46 How satisfied were you with your RIGHT hand/wrist during the past 7 days?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

47 How satisfied were you with your LEFT hand/wrist during the past 7 days?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions, or would like any additional information, please contact Lisa Newington on:

ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

For peer review only - <http://hmgopen.bmj.com/site/about/guidelines.xhtml>



REACTS ID:

One Month After Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

only

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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SECTION A: ABOUT YOUR OPERATION

Please fill in today's date

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

1 What was the date of your carpal tunnel release surgery?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

2 Which side was operated on? Please tick one box.

Right Left Both

3 What type of anaesthetic did you have? Please tick one box.

- a) General anaesthetic (you were sent to sleep)
- b) Local or regional anaesthetic (your arm was made numb, but you were still awake)
- c) Other (*please specify*)
-
- d) Unsure

4 How long did you need to stay in the hospital/clinic after your operation? Please tick one box (and specify the number of nights, if applicable).

- a) I went home the same day
 - b) I needed to stay overnight (one night only)
 - c) I needed to stay for more than one night
- (*Please specify for how long*) nights

SECTION A: ABOUT YOUR OPERATION

5 Have you used any of the following services specifically for your operated hand(s) since your surgery?

Please give the number of visits for each service, and the date(s) attended, if known.

| | I used this service in the NHS | | I used this service privately | |
|--|--------------------------------|--------------------------|-------------------------------|--------------------------|
| | Number of visits | Dates attended, if known | Number of visits | Dates attended, if known |
| a) Your surgeon, or one of the surgical team | | | | |
| b) GP or practice nurse | | | | |
| c) Hospital nurse | | | | |
| d) Pharmacist | | | | |
| e) Hand therapist | | | | |
| f) Other physiotherapist or occupational therapist | | | | |
| g) Chiropractor or osteopath | | | | |
| h) Occupational health nurse or doctor | | | | |
| i) Accident and emergency (A&E) or minor injuries unit | | | | |
| j) Other (<i>please specify</i>) | | | | |

SECTION A: ABOUT YOUR OPERATION

6 Have you taken any antibiotics for an infection in your surgical wound?

Please do not include any antibiotics you were prescribed at the time of your operation.

Yes

No

If yes, what date did you start taking the antibiotics?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7 Have you been admitted to hospital because of a problem with your operated hand(s)? If yes, please answer the rest of Question 7; if no, please move on to Question 8.

Yes

No

7.1 If yes, when were you first admitted?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7.2 How many nights did you stay in hospital?

Please answer 0 if you didn't stay overnight.

nights

7.3 Did you require another operation?

Yes No

8 Have you been advised that you may need a carpal tunnel release for your other hand in the future?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes

No

8.1 If yes, when are you expecting to have this surgery? Please tick one box.

a) In less than 2 months

c) In 6-11 months

e) Unsure

b) In 2-5 months

d) In more than a year

9 If you would like to give us any other information about your operation, or the healthcare services you have used, please do so here:

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SECTION B: WORK

10 Compared to before your surgery, which of the following best describes your current work situation? Please tick one box.

- a) Returned to the same job, work duties and hours – **please go to Question 14**
- b) Returned to the same job, with altered duties or hours – **please go to Question 14**
- c) Started a new job – **please go to Question 11**
- d) Not yet returned to work, but plan to return in the future – **please go to Question 12**
- e) Do not plan to return to work – **please go to Question 13**

11 Thinking about your new job:

11.1 What is your main occupation now (e.g. secretary, teacher, builder etc.)?

11.2 In what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc.)?

11.3 Did you change jobs because of your hand/wrist problem?
Please tick one box.

- a) Yes, my hand/wrist problem was the main reason for my job change
- b) Yes, my hand/wrist problem was one of several reasons for my job change
- c) No, my job change was nothing to do with my hand/wrist problem
- d) Other, please specify

Please go to Question 14

SECTION B: WORK

13 If you do not plan to return to work, what is the main reason for this decision? Please tick one box.

- a) Retirement
- b) Redundancy
- c) Position/work no longer available
- d) Unable to do your work because of your problem with your hand(s)/wrist(s)
- e) Unable to do your work because of any other problem
- f) Other (*please specify*)
-
-
-

13.1 Have you been advised not to return to work by anyone? If yes, please answer Question 13.2; if no, please move on to Question 21.

Yes No

13.2 If yes, who by? Please tick all that apply.

- | | | | |
|--|--------------------------|---|--------------------------|
| a) Your surgeon or a member of the surgical team | <input type="checkbox"/> | f) Occupational health nurse or doctor | <input type="checkbox"/> |
| b) Hospital nurse | <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) | <input type="checkbox"/> |
| c) GP or practice nurse | <input type="checkbox"/> | h) Friend or family member | <input type="checkbox"/> |
| d) Hand therapist | <input type="checkbox"/> | i) Other (<i>please specify</i>) | <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist | <input type="checkbox"/> | | |
| | | | |

Please go to Question 21

SECTION B: WORK

14 When did you first return to work after your carpal tunnel release surgery?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

15 How much work-time did you miss between the date of your surgery and the date you first returned to work?

Please include all work-time missed, even if this had been pre-arranged with your employer, or was taken as annual leave. You can answer in hours, days or weeks, whichever applies.

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

15.1 Was any of this time paid?

Please tick one box (and provide the amount of time, if applicable).

- a) Yes, all of my time away from work was paid
- b) Yes, some of my time away from work was paid
(please specify how much time was paid, you can use hours, days or weeks, whichever applies)

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

- c) No, none of my time off was paid
- d) Not sure

16 Since your surgery, have you discussed when to return to work with anyone?

If yes, please answer the rest of Question 16; if no, please move on to Question 17.

Yes No

16.1 If yes, who did you discuss this with? Please tick all that apply.

- | | |
|---|--|
| a) Your surgeon or a member of the surgical team <input type="checkbox"/> | f) Occupational health nurse or doctor <input type="checkbox"/> |
| b) Hospital nurse <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) <input type="checkbox"/> |
| c) GP or practice nurse <input type="checkbox"/> | h) Friend or family member <input type="checkbox"/> |
| d) Hand therapist <input type="checkbox"/> | i) Other <i>(please specify)</i> <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist <input type="checkbox"/> | |
| | |

SECTION B: WORK

16.2 Please list any advice you have been given (since your surgery) about when and how to return to work?
This could include any activities to avoid or timescales to follow. If this advice came from more than one place, please indicate who advised what.

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17 Since returning to work after your operation, have you needed to take any time off work because of a problem with your operated hand(s)/wrist(s)?
If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, how much time did you take off work?
Please answer in days or hours, whichever applies.

hours days weeks

18 When you first returned to work after your surgery, did you work shorter hours than would be normal for your job as a direct result of your operation?
If yes, please answer the rest of Question 18; if no, please move on to Question 19.

Yes No

18.1 Have you since gone back to working full hours?
If yes, please answer Question 18.2; if no, please move on to Question 19.

Yes No

18.2 If yes, when did you return to full working hours?
If you do not know the exact date, approximately how many weeks did you work reduced hours?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week c) More than 2 weeks, but less than 3 weeks
- b) 1 – 2 weeks d) 3 weeks or longer

SECTION B: WORK

19 When you first returned to work after your surgery, did you need to alter or avoid any of your usual work duties as a direct result of your operation?

If yes, please answer the rest of Question 19; if no, please move on to Question 20.

Yes No

19.1 Have you since gone back to full duties?

If yes, please answer Question 19.2; if no, please move on to Question 20.

Yes No

If yes, when did you return to full working duties?

19.2 If you do not know the exact date, approximately how many weeks did you have altered work duties?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week
- b) 1 – 2 weeks
- c) More than 2 weeks, but less than 3 weeks
- d) 3 weeks or longer

20 If you would like to give us any additional information about returning to work, please do so here:

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SECTION C: HAND AND WRIST SYMPTOMS

21 The following questions refer to your symptoms over the last 7 days. Please answer for each hand. Please tick one box for each row.

| 21.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 21.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 This question refers to the appearance (look) of your hands during the past 7 days. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: HAND AND WRIST SYMPTOMS

23 How do you rate your symptoms in your operated hand(s) now, compared to before your surgery? Please tick one box.

- a) Completely cured c) Unchanged e) Worse
 b) Much better d) Slightly better

24 The following questions ask specifically about your scar. Please think about your scar over the ***past 7 days***.

24.1 Has your scar been itchy?

If yes, please continue; if no, please move on to Question 24.2

Yes No

Yes, it was itchy: Sometimes Often Always

And when it was itchy, it was: Slightly itchy Fairly itchy Very itchy

24.2 Has your scar caused you pain?

If yes, please continue; if no, please move on to Question 24.3

Yes No

Yes, it was painful: Sometimes Often Always

And when it hurt, it was: Slightly painful Fairly painful Very painful

24.3 Has your scar been uncomfortable?

If yes, please continue; if no, please move on to Question 24.4

Yes No

Yes, it was uncomfortable: Sometimes Often Always

And when it was uncomfortable, it was: Slightly uncomfortable Fairly uncomfortable Very uncomfortable

SECTION C: HAND AND WRIST SYMPTOMS

24.4 Has your scar felt numb?

If yes, please continue; if no, please move on to Question 24.5

Yes No

Yes, it was numb: Sometimes Often Always

And when it felt numb, it was: Slightly numb Fairly numb Very numb

24.5 Have you had odd sensations in your scar e.g. tightening, pulling or pins and needles? If yes, please continue; if no, please move on to Question 24.6

Yes No

Yes, I have had odd sensations: Sometimes Often Always

24.6 Has your scar caught on things e.g. clothing?

If yes, please continue; if no, please move on to Question 24.7

Yes No

Yes, it has caught on things: Sometimes Often Always

24.7 Overall, how troublesome are the symptoms from your scar?

Please tick one box.

Not at all troublesome A little troublesome Fairly troublesome Very troublesome Unbearable

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the function of your hands/wrists during the ***past 7 days***. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 25 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>right</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>right</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>right</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 26 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>left</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>left</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>left</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the ability of your hands to do certain tasks during the ***past 7 days***. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

| 27 How difficult was it for you to perform the following activities using your RIGHT HAND? | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|---|-----------------------------|---------------------------|---------------------------|-----------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

28 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

29 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question.

30 How satisfied were you with your RIGHT hand/wrist during the **past 7 days**?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

31 How satisfied were you with your LEFT hand/wrist during the *past 7 days*?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

32 If you would like to give us any additional information about your hand and wrist function, please do so here:

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.....

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**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions or would like any additional information, please contact Lisa Newington on:
In@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

SUPPLEMENTARY TABLES

1. Cox proportional hazards univariate analyses of the association between demographic and general health factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Body mass index (kg/m²) (censored 1 normal, 1 overweight, 2 obese; 13 missing)</i> | | | | | | |
| Normal (18.5-24.9) | 47 | 20 | 12-33 | 1 | - | - |
| Over (25.0-29.9) | 64 | 19 | 12.5-29 | 0.98 | 0.65, 1.46 | 0.91 |
| Obese (≥30) | 67 | 21 | 10-40 | 0.88 | 0.60, 1.28 | 0.50 |
| <i>Surgery to dominant hand ² (censored 3 yes, 2 no; no missing data)</i> | | | | | | |
| Yes | 128 | 19.5 | 12-33 | 1 | - | - |
| No | 62 | 22 | 12-35 | 0.83 | 0.61, 1.14 | 0.25 |
| <i>General health status (censored 5 excellent; 1 missing)</i> | | | | | | |
| Excellent/very good/ good | 165 | 19 | 12-32 | 1 | - | - |
| Fair/poor | 24 | 28.5 | 12.5-42 | 0.74 | 0.47, 1.16 | 0.19 |
| <i>Number of comorbidities ³ (censored 3 none, 1 one; 1 missing)</i> | | | | | | |
| None | 49 | 18 | 7-32 | 1 | - | - |
| One | 67 | 24 | 14-42 | 0.87 | 0.59, 1.27 | 0.47 |
| Two or more | 74 | 19.5 | 10-29 | 1.11 | 0.76, 1.62 | 0.60 |
| <i>Number of disability comorbidities ³ (censored 3 none, 2 one; no missing data)</i> | | | | | | |
| None | 130 | 19 | 9-33 | 1 | - | - |
| One | 39 | 26 | 13-31 | 0.75 | 0.52, 1.08 | 0.12 |
| Two or more | 21 | 20 | 14-31 | 0.81 | 0.50, 1.32 | 0.40 |
| <i>Number of somatising symptoms ⁴ (censored 1 none, 1 one, 3 two or more; 1 missing)</i> | | | | | | |
| None | 96 | 19 | 10.5-35 | 1 | - | - |
| One | 51 | 22 | 13-34 | 0.98 | 0.70, 1.38 | 0.91 |
| Two or more | 42 | 19.5 | 14-31 | 0.84 | 0.58, 1.22 | 0.36 |
| <i>SF36 Mental health score (tertiles) ⁵ (censored 2 poor, 1 intermediate, 2 good; 2 missing)</i> | | | | | | |
| Poor (22.2-57.8) | 60 | 24 | 16-39 | 0.71 | 0.50, 1.03 | 0.07 |
| Intermediate (60.0-75.6) | 68 | 18.5 | 11-36.5 | 0.88 | 0.62, 1.25 | 0.48 |
| Good (77.8-97.8) | 60 | 16.5 | 7-30 | 1 | - | - |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Considered and the non-dominant hand for those who reported ambidexterity (n=4) and dominant hand for those undergoing simultaneous bilateral surgery (n=2).

³. Adapted from the self-administered co-morbidity questionnaire [1].

⁴. Adapted from the four-dimensional symptom questionnaire [2].

⁵. Taken from the SF-36 with data-driven tertiles [3].

2. Cox proportional hazards univariate analyses of the association between health beliefs and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Believe will be unable to use hand normally in 3 months ² (censored 5 no; 2 missing)</i> | | | | | | |
| No | 168 | 20 | 12-32.5 | 1 | - | - |
| Yes | 20 | 20.5 | 14.5-40 | 1.04 | 0.65, 1.67 | 0.87 |
| <i>Blames self for hand problem ² (censored 5 no; 2 missing)</i> | | | | | | |
| No | 162 | 20 | 12-35 | 1 | - | - |
| Yes | 26 | 22 | 14-31 | 1.08 | 0.70, 1.66 | 0.73 |
| <i>Lack of support from family/friends ² (censored 4 no, 1 yes; 2 missing)</i> | | | | | | |
| No | 156 | 20 | 12-32.5 | 1 | - | - |
| Yes | 32 | 19.5 | 13-40 | 0.88 | 0.60, 1.29 | 0.51 |
| <i>Problem runs in the family/born with a weakness ³ (censored 3 no, 2 agree/strongly agree; 2 missing)</i> | | | | | | |
| No | 134 | 20 | 12-35 | 1 | - | - |
| Agree/strongly agree | 54 | 23 | 12-31 | 0.88 | 0.63, 1.21 | 0.42 |
| <i>Stress made the problem worse ³ (censored 5 no; 2 missing)</i> | | | | | | |
| No | 169 | 20 | 12-33 | 1 | - | - |
| Agree/strongly agree | 19 | 28 | 14-40 | 0.79 | 0.48, 1.28 | 0.33 |
| <i>Lack of exercise contributed to the problem ³ (censored 5 no; 2 missing)</i> | | | | | | |
| No | 172 | 20 | 13-33 | 1 | - | - |
| Agree/strongly agree | 16 | 15 | 10.5-34.5 | 1.23 | 0.73, 2.06 | 0.43 |
| <i>Getting older contributes to the problem ³ (censored 3 no, 2 yes; 3 missing)</i> | | | | | | |
| No | 79 | 26 | 14-42 | 1 | - | - |
| Agree/strongly agree | 108 | 16 | 10-29 | 1.28 | 0.94, 1.74 | 0.11 |
| <i>Work probably didn't cause the problem, but made it worse ³ (censored 2 no, 3 yes; 4 missing)</i> | | | | | | |
| No | 100 | 20.5 | 12-35 | 1 | - | - |
| Agree/strongly agree | 86 | 19.5 | 13-31 | 1.01 | 0.75, 1.35 | 0.95 |
| <i>Pain catastrophisation to at least a moderate degree ⁴ (censored 3 no, 2 yes; missing 2)</i> | | | | | | |
| No | 133 | 19 | 10-33 | 1 | - | - |
| Yes | 55 | 22 | 15-31 | 0.81 | 0.59, 1.12 | 0.21 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Reported on a 0-10 scale and dichotomised to no (0-6) and yes (7-10) [4].

³. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor disagree/disagree/disagree strongly [5].

⁴. Pain catastrophizing scale dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions and those who did not [6].

3. Cox proportional hazards univariate analyses of the association between clinical and surgical factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Katz hand diagram score for side of surgery</i> ² (censored 3 classics/probable, 2 possible/unlikely; 4 missing) | | | | | | |
| Classic/probable | 126 | 22 | 14-38 | 1 | - | - |
| Possible/unlikely | 60 | 16.5 | 9.5-30.5 | 1.10 | 0.81, 1.51 | 0.54 |
| <i>Duration of symptoms</i> (censored 1 ≤ 1 year, 4 > 1 year; 2 missing) | | | | | | |
| ≤ 1 year | 47 | 19 | 10-31 | 1 | - | - |
| > 1 year | 141 | 20 | 13-34 | 0.86 | 0.62, 1.21 | 0.38 |
| <i>Nerve conduction studies performed</i> (censored 3 no, 2 yes; 40 missing) | | | | | | |
| No | 71 | 21 | 14-35 | 1 | - | - |
| Yes | 79 | 20 | 11-33 | 1.14 | 0.83, 1.58 | 0.41 |
| <i>Type of suture material</i> (censored 4 non-absorbable; 49 missing) | | | | | | |
| Non-absorbable | 119 | 21 | 12-38 | 1 | - | - |
| Absorbable | 23 | 20 | 13-29 | 1.15 | 0.73, 1.83 | 0.55 |
| <i>MHQ function score for side of surgery</i> (tertiles) ³ (censored 3 poor, 1 intermediate, 1 good; 2 missing) | | | | | | |
| Poor (0-40) | 79 | 20 | 13-41 | 0.80 | 0.57, 1.12 | 0.19 |
| Intermediate (44-55) | 48 | 19.5 | 13.5-33 | 0.81 | 0.55, 1.19 | 0.29 |
| Good (60-100) | 61 | 20 | 7-29 | 1 | - | - |
| <i>MHQ bilateral activities of daily living score</i> (tertiles) ³ (censored 1 poor, 4 intermediate; 1 missing) | | | | | | |
| Poor (0-61) | 72 | 19 | 12.5-33.5 | 0.96 | 0.66, 1.38 | 0.81 |
| Intermediate (64-82) | 55 | 21 | 13-38 | 0.70 | 0.49, 1.01 | 0.06 |
| Good (83-100) | 62 | 20 | 10-31 | 1 | - | - |
| <i>MHQ activities of daily living score, side of surgery</i> (tertiles) ³ (censored 2 poor, 3 intermediate; 1 missing) | | | | | | |
| Poor (0-55) | 63 | 20 | 12-42 | 0.81 | 0.56, 1.18 | 0.27 |
| Intermediate (58-80) | 63 | 20 | 14-35 | 0.86 | 0.61, 1.23 | 0.42 |
| Good (85-100) | 63 | 20 | 9-32 | 1 | - | - |
| <i>MHQ satisfaction score for side of surgery</i> (tertiles) ³ (censored 3 poor, 2 intermediate; no missing data) | | | | | | |
| Poor (0-25) | 88 | 21.5 | 13-42 | 0.78 | 0.55, 1.11 | 0.16 |
| Intermediate (29-50) | 49 | 18 | 14-29 | 0.87 | 0.59, 1.28 | 0.48 |
| Good (54-100) | 53 | 20 | 9-31 | 1 | - | - |
| <i>Satisfaction with appearance for side of surgery</i> ⁴ (censored 2 satisfied, 3 dissatisfied; 1 missing) | | | | | | |
| Satisfied | 136 | 20 | 10.5-31.5 | 1 | - | - |
| Dissatisfied | 53 | 20 | 13-40 | 0.84 | 0.61, 1.16 | 0.29 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Adapted from Calfee et al. [7].

³. Michigan Hand Questionnaire [8]. Data-driven tertiles.

⁴. Reported on a 5-point scale in response to the statement: I am satisfied with the appearance (look) of my hand. Dichotomised as satisfied (strongly agree/agree) and dissatisfied (neither agree nor disagree, disagree, strongly disagree).

4. Cox proportional hazards univariate analyses of the association between occupational factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Have more than one paid job (censored 4 no, 1 yes; 1 missing)</i> | | | | | | |
| No | 177 | 20 | 12-32 | 1 | - | - |
| Yes | 12 | 26.5 | 19-42 | 0.61 | 0.34, 1.11 | 0.11 |
| <i>Total paid work hours per week ² (censored 4 ≤37.5, 1 >37.5; no missing data)</i> | | | | | | |
| ≤37.5 | 97 | 22 | 15-38 | 1 | - | - |
| >37.5 | 93 | 16 | 6-29 | 1.25 | 0.88, 1.79 | 0.21 |
| <i>Number of work days per week (censored 1 <5, 4 5; no missing data)</i> | | | | | | |
| <5 | 55 | 23 | 15-35 | 1 | 0.72, 1.39 | 0.98 |
| 5 | 116 | 19 | 10.5-33 | 1 | - | - |
| >5 | 19 | 13 | 6-31 | 1.28 | 0.77, 2.14 | 0.34 |
| <i>Sick leave taken for this problem in the last month (censored 5 no; 16 missing)</i> | | | | | | |
| No | 154 | 20 | 12-33 | 1 | - | - |
| Yes | 20 | 15 | 9.5-30 | 0.99 | 0.61, 1.60 | 0.95 |
| <i>Sick leave taken for another problem in the last month (censored 4 no, 1 yes; 20 missing)</i> | | | | | | |
| No | 152 | 19 | 10.5-31 | 1 | - | - |
| Yes | 18 | 30 | 21-42 | 0.67 | 0.41, 1.09 | 0.10 |
| <i>Received advice about return to work after surgery (censored 5 yes; 3 missing)</i> | | | | | | |
| Yes | 134 | 19 | 12-31 | 1 | - | - |
| No | 53 | 22 | 14-41 | 0.92 | 0.67, 1.27 | 0.61 |
| <i>Required to work to tight deadlines ³ (censored 3 no, 2 yes; missing 3)</i> | | | | | | |
| No | 75 | 23 | 14-40 | 1 | - | - |
| Yes | 112 | 18 | 9.5-31 | 1.19 | 0.89, 1.61 | 0.24 |
| <i>Use power tools that make the hand/arm vibrate ³ (censored 5 no; missing 7)</i> | | | | | | |
| No | 145 | 19 | 12-32 | 1 | - | - |
| Yes | 38 | 22 | 14-42 | 0.68 | 0.44, 1.05 | 0.08 |
| <i>Work with hands above shoulder height for >1 hour ³ (censored 4 no, 1 yes; missing 9)</i> | | | | | | |
| No | 147 | 20 | 12-33 | 1 | - | - |
| Yes | 34 | 19.5 | 13-33 | 0.89 | 0.60, 1.32 | 0.56 |
| <i>Work with neck bent forward for >2 hours ³ (censored 3 no, 2 yes; missing 3)</i> | | | | | | |
| No | 114 | 21 | 13-39 | 1 | - | - |
| Yes | 73 | 18 | 8-31 | 1.19 | 0.88, 1.60 | 0.26 |
| <i>Work with neck twisted for >30 minutes ³ (censored 4 no, 1 yes; missing 7)</i> | | | | | | |
| No | 136 | 20 | 12-34 | 1 | - | - |
| Yes | 47 | 22 | 13-32 | 0.93 | 0.66, 1.32 | 0.70 |
| <i>Drive for >1 hour per day ³ (censored 5 no; missing 5)</i> | | | | | | |
| No | 115 | 21 | 13-38 | 1 | - | - |
| Yes | 70 | 16 | 7-31 | 1.22 | 0.88, 1.68 | 0.24 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Dichotomised by the median for the sample population

³. As part of the normal working day [9].

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STROBE checklist (cohort study)

| Item | Recommendation | Location |
|-------------------------------|--|-------------------------------------|
| Title and abstract | | |
| <i>Title</i> | Indicate study design | Title |
| Introduction | | |
| <i>Background</i> | Explain scientific background and rationale | Introduction |
| <i>Objectives</i> | State objectives and any pre-specified hypotheses | Introduction |
| Methods | | |
| <i>Study design</i> | Present key elements of the study design early | Introduction & methods |
| <i>Setting</i> | Describe the setting, locations and relevant dates | Methods |
| <i>Participants</i> | Give eligibility criteria, sources and methods of selection of participants, and methods of follow-up | Methods & table 1 |
| <i>Variables</i> | Clearly define all outcomes, exposures, predictors, potential confounders and effect modifiers | Methods & supplementary files 1-2 |
| <i>Data sources</i> | Give sources of data and methods of assessment | Methods & tables 2-5 |
| <i>Bias</i> | Describe and effects to address potential sources of bias | Methods & discussion |
| <i>Study size</i> | Explain how the study size was determined | Methods |
| <i>Quantitative variables</i> | Described how quantitative variables were handled in the analyses | Tables 2-5 |
| <i>Statistical methods</i> | Described all statistical methods Explain how missing data were addressed Explain how lost to follow-up was addressed | Statistical methods & tables 2-5 |
| Results | | |
| <i>Participants</i> | Reported the number of individuals at each stage of the study Give reasons for non-participation | Figure 1 Figure 1 |
| <i>Descriptive data</i> | Give characteristics of study participants Indicate number of participants for each variables of interest Summarise follow-up time | Tables 2-5 Tables 2-5 Results |
| <i>Outcome data</i> | Report number of outcome events over time | Results |
| <i>Main results</i> | Give adjusted and unadjusted estimates and measures of precision. Make clear which confounders were adjusted for | Table 4 & supplementary file 3 |
| <i>Other analyses</i> | Reported any subgroup analyses | Table 4 & supplementary file 3 |

BMJ Open

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

| | |
|---------------------------------|--|
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| Primary Subject Heading: | Surgery |
| Secondary Subject Heading: | Epidemiology, General practice / Family practice, Occupational and environmental medicine |
| Keywords: | Hand & wrist < ORTHOPAEDIC & TRAUMA SURGERY, PRIMARY CARE, OCCUPATIONAL & INDUSTRIAL MEDICINE |
| | |

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TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

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Carpal tunnel syndrome, carpal tunnel release, return to work, advice, sickness absence, cohort study

Word count: 4,042

TITLE

Sickness absence after carpal tunnel release: a multi-centre prospective cohort study

ABSTRACT

Objectives: To describe when patients return to different types of work after elective carpal tunnel release (CTR) surgery and identify the factors associated with the duration of sickness absence.

Design: Multi-centre prospective observational cohort study.

Setting and participants: Participants were recruited pre-operatively from 16 UK centres and clinical, occupational and demographic information were collected. Participants completed a weekly diary and questionnaires at four and 12 weeks post-operatively.

Outcomes: The main outcome was duration of work absence from date of surgery to date of first return to work.

Results: 254 participants were enrolled in the study and 201 provided follow-up data. Median duration of sickness absence was 20 days (range 1-99). Earlier return to work was associated with having surgery in primary care and a self-reported work role involving more than four hours of daily computer use. Being female and entitlement to more than a month of paid sick leave were both associated with longer work absences. Duration of work absence was strongly associated with the expected duration of leave, as reported by participants before surgery. Earlier return to work was not associated with poorer clinical outcomes reported 12 weeks after CTR.

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3 **Conclusions:** There was wide variation in the duration of work absence after CTR across all
4 occupational categories. A combination of occupational, demographic and clinical factors was
5 associated with the duration of work absence, illustrating the complexity of return to work
6 decision-making. However, pre-operative expectations were strongly associated with the
7 actual duration of leave. We found no evidence that earlier return to work was harmful. Clear,
8 consistent advice from clinicians pre-operatively setting expectations of a prompt return to
9 work could reduce unnecessary sickness absence after CTR. To enable this, clinicians need
10 evidence-informed guidance about appropriate timescales for the safe return to different
11 types of work.
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27 **STRENGTHS AND LIMITATIONS OF THIS STUDY**

- 28 - This multi-centre, prospective study with a large sample size provides robust evidence to
29 understand return to work issues after carpal tunnel release surgery.
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- 32 - Participants were recruited from primary care, secondary care and private practice sites,
33 representing the breadth of locations where carpal tunnel release is performed in the UK.
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- 36 - Work absence was the primary outcome and a clear definition was used for its duration
37 with data collected contemporaneously to limit recall bias.
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- 40 - A standardised method was used to categorise occupations and measure occupational
41 exposures, although this relied on job title, which may not be a true reflection of actual
42 occupational activity.
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- 45 - All participants underwent open carpal tunnel release, however the method of carpal
46 tunnel syndrome diagnosis was not independently verified and different case definitions
47 for carpal tunnel syndrome may have been included.
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INTRODUCTION

Carpal tunnel syndrome (CTS) occurs when the median nerve becomes compressed within the carpal tunnel at the wrist. Typical sensory symptoms include pain, paraesthesia and/or numbness in the thumb, index, middle and radial half of the ring finger; and motor symptoms include progressive wasting of the thenar muscles. CTS is often associated with marked functional difficulty[1] and treatment is targeted at reducing the median nerve compression by splinting, corticosteroid injection or carpal tunnel release (CTR) surgery[2, 3].

Recent estimates suggest that more than 90,000 CTR procedures will be performed annually in the English NHS by 2025[4], and as the peak incidence for CTS falls within the working lifetime[5], many of these patients will need to return to work after their CTR. However, there is currently no evidence on which to base recommendations about when it might be safe to return to functional activities, including work, after carpal tunnel release (CTR). Our previous survey of UK hand surgeons, primary care surgeons and hand therapists found that clinicians recommended a wide range of times to return to three specified job roles after CTR: 0-30 days for desk-based work (e.g. keyboard, mouse, writing and telephone); 1-56 days for repetitive light manual work (driving, delivery, stacking); and 1-90 days for heavy manual work (e.g. construction)[6]. However, there has not previously been a prospective study of CTR patients in the UK in which time to return to work was the primary outcome. Therefore, it is not known when UK patients return to different occupational activities after CTR or what influences the duration of work absence. It is also unclear whether earlier return to work has a detrimental effect on post-operative clinical outcomes. Possible consequences of returning to work too soon after CTR include wound dehiscence, infection, and delayed healing. Conversely, delayed return to work may increase the risk of progression to long-term sick leave[7] and produce a financial burden for the individual, employer or state.

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5 A systematic review of the prognostic factors associated with return to work after CTR
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7 identified 11 studies which evaluated more than 90 potential prognostic factors[8]. Longer
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9 durations of work absence after CTR were found to be associated with: receipt of workers'
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11 compensation[9]; manual work[10-12]; longer expected durations of work absence[10]; being
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13 on sick leave before CTR surgery[13]; self-blame for the hand problem[13]; and beliefs that the
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15 symptoms were caused by work[12].
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22 Much of the existing research has been conducted at single sites and involved small numbers
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24 of participants. Furthermore, very few studies have specifically explored the influence of a
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26 range of occupational factors. The current multi-centre prospective cohort study was designed
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28 to explore when patients returned to different types of work after CTR and the demographic,
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30 clinical and occupational factors associated with duration of work absence. We also
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32 investigated whether earlier return to work was associated with poorer clinical outcomes
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34 assessed at 12 weeks after CTR.
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41 **METHODS**

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43 This was a prospective cohort study and a convenience sample of participants were recruited
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45 from 16 sites in England and Wales between March 2017 and August 2018 (ethics approval:
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47 IRAS 209840, 16/WA/0390). Recruitment took place before CTR surgery, either at the time of
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49 listing for surgery, during pre-operative screening, or on the day of surgery. At each site, the
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51 patient CTR pathway and treatment was carried out as usual. Sites were NHS secondary care
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53 (hospital setting), NHS primary care and private hand surgery facilities, representing the range
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55 of UK healthcare facilities where CTR is performed. Provision of CTR in the UK was explored
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57 through discussion with relevant national organisations (British Society for Surgery of the Hand
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and Association for Surgeons in Primary Care). Sites were recruited through National Institute for Health Research infrastructure.

Eligibility criteria are shown in Table 1. Baseline demographic, general health and occupational information was collected via self-completed questionnaire at the time of recruitment. The questionnaire also included standardised measures of CTS symptoms[14-16] and hand function[17]. Questionnaire content was informed by the clinical, demographic and occupational factors previously identified in a systematic review of prognostic factors for return to work after CTR[8], and developed in collaboration with our patient advisory group. The reasoning for item inclusion is provided in supplementary file 1.

TABLE 1. Study eligibility criteria

Self-selected by potential participants

1. Aged over 18 and referred for carpal tunnel release surgery
 2. Routinely work in paid employment for at least 20 hours per week
 3. Plan to return to work after carpal tunnel release surgery
 4. Have not previously had carpal tunnel release surgery on either hand
 5. Have not previously had a serious injury to the same wrist/hand
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Assessed by recruiting clinician

1. No planned surgical procedures for conditions other than carpal tunnel syndrome
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Follow-up questionnaires were completed four and 12 weeks after CTR and collected information about return to work, work functioning, scar symptoms, CTS symptoms, and hand function. Study questionnaires are provided as supplementary files 2-3. Participants were also asked to complete a short weekly diary from the day after surgery until return to work, detailing whether they had returned to work that week, and if so, the date of return. Steps were taken to minimise loss to follow-up after recruitment. To maximise retention, we

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incentivised with a shopping voucher on completion of the study (£10) and sent up to three reminders using a combination of post, email and text.

Surgical information was collected from the medical records by a member of the participant's clinical team. This included: date of CTR, operated hand(s), nature of anaesthetic, incision size, additional procedures, unexpected findings and suture material. Date, side of CTR and anaesthetic (general/local) were also reported by participants for cross-checking.

Public and patient involvement

This research was supported by a patient advisory group consisting of six individuals who had previously undergone CTR at different UK sites. Study questionnaires were developed in collaboration with the patient advisors and these individuals also provided their feedback on the preliminary findings.

Statistical methods

Comparisons were made between those who dropped out of the study before providing any follow-up data and those in the final study sample using pre-specified demographic, clinical and occupational variables (Table 2).

Manual and non-manual work was coded from job title and industry using the UK Standard Occupational Classification[18, 19]. Return to work time was calculated from the date of surgery to the date of first return to work (as reported by participants).

A Cox proportional hazards model was used to explore the factors associated with return to work time, and the assumptions of the model were tested. Baseline and operative variables

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2 were assessed in univariable analyses and those which were significant ($p < 0.05$) were included
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4 as covariates in the final model. All regression analyses were adjusted for age and sex.
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10 Participants were defined as having a poor outcome if they reported one or more of the
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12 following: global rating of change score of “worse”, “unchanged” or “slightly improved” (12
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14 weeks after CTR)[20]; scar symptoms described as “unbearable”, “very troublesome” or “fairly
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16 troublesome” (12 weeks after CTR); use of antibiotics for an incision site infection after
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18 returning to work; and additional sick-leave related to the CTR after returning to work. The
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20 duration of work absence for those with/without poor outcomes were compared using
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22 Wilcoxon rank-sum test. In addition, participants were dichotomised to those who returned to
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24 work within/after seven, 14 and 28 days of surgery and the prevalence rates of poor outcomes
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26 were compared using χ^2 for each time period. These time points were based on the median
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28 clinician-recommended return to work time that we reported previously[6].
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There was no imputation for missing data. Missing values were coded as a separate category
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40 for each of the variables included, and participant numbers are provided for each variable in
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42 the accompanying tables.
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49 RESULTS

50 A total of 254 individuals completed the baseline questionnaire and 201 (79%) provided follow-
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52 up data. Participant numbers and loss to follow-up for each study component are shown in
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54 Figure 1. Participant demographics and comparisons between those who remained in the
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56 study and those who dropped out before follow-up are shown in Table 2.
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Figure 1. Participant numbers for each stage of the cohort study

TABLE 2. Participant demographics assessed at baseline in comparison with those lost to follow-up

| | Study participants n=201 (%) | Lost to follow-up n=53 (%) |
|---|---|---------------------------------------|
| Mean age in years (SD) | 52.0 (9.16) | 44.4 (9.55) |
| <i>Sex</i> | | |
| Male | 76 (37.8) | 20 (37.7) |
| Female | 125 (62.2) | 33 (62.3) |
| <i>Body mass index (kg/m²)</i> | | |
| Normal (18.5-24.9) | 48 (23.9) | 9 (17.0) |
| Overweight (25-29.9) | 66 (32.8) | 16 (30.2) |
| Obese (≥30) | 73 (36.3) | 22 (41.5) |
| <i>Smoking status</i> | | |
| Never smoked | 109 (54.2) | 26 (49.1) |
| Current/ex-smoker | 90 (44.8) | 27 (50.9) |
| <i>General health</i> | | |
| Excellent/very good/good | 174 (86.6) | 42 (79.3) |
| Fair/poor | 26 (12.9) | 11 (20.8) |
| <i>Number of comorbidities</i> | | |
| None | 54 (26.9) | 21 (39.6) |
| One | 70 (34.8) | 13 (24.5) |
| Two or more | 77 (38.3) | 19 (35.9) |
| <i>Number of disabling comorbidities</i> | | |
| None | 138 (68.7) | 35 (66.0) |
| One | 41 (20.4) | 9 (17.0) |
| Two or more | 22 (11.0) | 9 (17.0) |
| Mean SF-36 mental health score (SD) ^a | 65.6 (17.20) | 60.3 (20.41) |
| Mean bilateral CTS-6 score (SD) ^b | 2.8 (0.77) | 3.0 (0.73) |
| Mean MHQ bilateral activities of daily living score (SD) ^c | 68.8 (23.64) | 55.7 (28.62) |
| Mean MHQ work function score (SD) ^c | 66.1 (22.26) | 60.6 (22.61) |
| <i>Type of job contract</i> | | |
| Employed (permanent contract) | 164 (81.6) | 37 (69.8) |
| Self-employed | 31 (15.4) | 13 (24.5) |
| Employed (temporary or zero hours contract) | 5 (2.5) | 3 (5.7) |
| <i>Type of work</i> ^d | | |
| Manual | 77 (39) | 31 (58) |
| Non-manual | 123 (61) | 22 (42) |
| Median level of job demand on hands/wrists (IQR) ^e | 9 (7-10) | 10 (7-10) |
| <i>Job satisfaction</i> | | |
| Very satisfied | 87 (43.3) | 24 (45.3) |
| Satisfied/fairly satisfied | 92 (45.8) | 24 (45.3) |
| Dissatisfied/very dissatisfied | 20 (10.0) | 5 (9.4) |
| Median expected work absence in days (IQR) | 14 (7-28) | 14 (5-21) |
| <i>Expected availability of sick pay</i> | | |
| ≤1 month | 50 (24.9) | 21 (39.6) |
| >1 month | 94 (46.8) | 11 (20.8) |
| Unsure | 57 (28.4) | 21 (39.6) |

| <i>Study site</i> ^f | | |
|---------------------------------|------------|-----------|
| NHS primary care | 73 (36.3) | 13 (24.5) |
| NHS Secondary care | 101 (50.3) | 32 (60.4) |
| Private hand surgery facilities | 27 (13.4) | 8 (15.1) |

^a. SF-36 mental health score ranges from 0-100, higher scores indicate better mental health[21].

^b. CTS-6 symptom score ranges from 1-5, higher scores indicate more severe symptoms[14].

^c. Michigan Hand Questionnaire ranges from 0-100, higher scores indicate better functioning[17].

^d. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].

^e. Job demand scale range 0-10, 10 indicating very demanding on hands/wrists[13].

^f. Location where the carpal tunnel release surgery was performed. Surgery in primary care was performed by General Practitioners who had completed additional training.

Eighty-six participants (43%) were recruited pre-operatively on the day of their CTR. For the remaining 115 participants, the median time between recruitment and CTR was 14 days (interquartile range [IQR] 5-40). The first follow-up questionnaire was completed a median of 32 days after CTR (IQR 29-38) and the final questionnaire was completed a median of 92 days after CTR (IQR 86-105). All participants underwent open CTR as a day case, and all but two had unilateral surgery. Another two participants required median nerve neurolysis, and one participant was noted to have a vascular abnormality. Sixty-two percent of participants (n=125) were expecting to have a CTR for their other hand in the future. Other baseline demographic and surgical factors are shown in Table 3.

TABLE 3. Participant demographic and surgical factors

| | Number of participants n=201 (%) |
|--------------------------------------|-------------------------------------|
| <i>Age (years)</i> | |
| 26-40 | 23 (11.4) |
| 41-55 | 101 (50.3) |
| ≥ 55 | 77 (38.3) |
| <i>Hand dominance</i> | |
| Right | 178 (88.6) |
| Left | 18 (9.0) |
| Ambidextrous | 5 (2.5) |
| <i>Side of surgery</i> ^a | |
| Dominant hand | 134 (66.7) |
| Non-dominant hand | 65 (32.3) |
| Bilateral surgery | 2 (1.0) |
| <i>Surgical speciality and grade</i> | |

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|------------------------------------|------------|
| Consultant (plastics/orthopaedics) | 64 (31.8) |
| Registrar (plastics/orthopaedics) | 33 (16.4) |
| General practitioner | 62 (30.9) |
| Not reported | 42 (20.9) |
| <i>Incision type</i> ^b | |
| Mini open incision | 129 (64.2) |
| Traditional incision | 2 (1.0) |
| Not reported | 70 (34.8) |
| <i>Suture material</i> | |
| Absorbable | 24 (11.9) |
| Non-absorbable | 126 (62.7) |
| Not reported | 51 (24.4) |

^a. Considered as the non-dominant hand for those who reported ambidexterity.

^b. Mini open incision defined as distal to the distal wrist crease and traditional open excision extending proximally.

The majority of participants (62%) worked five days per week (range 2-7) and the median number of weekly paid work hours was 37.5 (IQR 31-45). Two participants (1%) did not return to work during the 12-week study period: one reported that they had been made redundant and the other that their job was no longer available. Four participants (2%) had incomplete data (missing return to work date or CTR date) meaning that the duration of work absence could not be calculated. These six individuals were not included in the analyses of return to work time, leaving a total sample size of 195. An additional five participants reported that they had not returned to work, but planned to do so in the future. These individuals were included in the return to work analysis, censored to the time of last follow-up.

The median duration of work absence after CTR was 20 days (IQR 12-33). Manual workers took longer to return than non-manual workers: 23.5 days (IQR 14-41) compared with 18 days (IQR 9-31). Those who were self-employed returned to work earlier than those who were employed: 13 days (IQR 6-19) compared with 22 days (IQR 14-38). Return to work times are shown in Figure 2. The majority of participants returned to work on a Monday (43%). Approximately 15% returned each day between Tuesday-Thursday, then ~5% returned each

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2 day from Friday-Sunday. More than half of participants (59%) reported that they needed to
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4 modify their work duties to some extent when they first returned to work. Of these, 62% had
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6 resumed full duties within five weeks.
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12 Univariable analyses of the relationship between baseline factors and the duration of work
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14 absence found 17 factors (age- and sex-adjusted) that were significantly associated with time
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16 to return to work and were entered into the multivariable model, in which five factors
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18 remained significant (Table 4). Sensitivity analyses confirmed that these factors remained
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20 independently significant in the model. Non-significant findings in the univariable analyses are
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22 provided in supplementary file 4. Having surgery in primary care and having a job with more
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24 than four hours of daily computer use were both associated with earlier return to work than
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26 their respective reference categories. Being female and having access to more than a month of
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28 paid sick leave were both associated with longer durations of work absence than their
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30 respected reference categories. Compared to those who expected to return within a week,
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32 there was a sequential increase in the likelihood of longer durations of work absence for those
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34 expecting to return between 7-14 days, 15-30 days and >30 days (Table 4), which showed a
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36 significant gradient effect ($p < 0.001$). The assessment of R^2 indicated that 46% of variation in
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38 the duration of work absence was explained by the model ($R^2 = 0.46$, 95% CI 0.37-0.53).
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TABLE 4. Cox proportional hazards analyses of the association between baseline demographic, clinical and occupational factors and the duration of work absence after carpal tunnel release

| | Univariable analyses | | | | | Multivariable analysis | | | |
|--|----------------------|----------------------------|----------------------|---------------|--------------------------|------------------------|----------------|--------------------------|------------------|
| | N | Median work absence (days) | Inter quartile range | Hazards ratio | 95% Confidence intervals | P value | Hazard s ratio | 95% Confidence intervals | P value |
| <i>Sex (censored: 5 females; no missing data)</i> | | | | | | | | | |
| Male | 72 | 17.5 | 8-31 | 1 | - | - | 1 | - | - |
| Female | 118 | 21.5 | 14-35 | 0.79 | 0.59, 1.06 | 0.12 | 0.56 | 0.36, 0.88 | 0.01 |
| <i>Age in years (censored: 1 aged 26-40, 3 aged 41-55, 1 aged >55; no missing data)</i> | | | | | | | | | |
| 26-40 | 21 | 20 | 15-30 | 1.01 | 0.63, 1.63 | 0.96 | 1.44 | 0.82, 2.55 | 0.21 |
| 41-55 | 94 | 20 | 9-33 | 1 | - | - | 1 | - | - |
| >55 | 75 | 17 | 12-35 | 1.03 | 0.76, 1.40 | 0.83 | 1.15 | 0.80, 1.65 | 0.44 |
| <i>Smoking status (censored: 1 never, 4 current/ex; 2 missing)</i> | | | | | | | | | |
| Never | 105 | 16 | 12-31 | 1 | - | - | 1 | - | - |
| Current/ex | 83 | 23 | 13-41 | 0.74 | 0.56, 1.00 | 0.046 | 0.75 | 0.51, 1.09 | 0.13 |
| <i>Site (censored: 5 NHS secondary care; no missing data)</i> | | | | | | | | | |
| NHS Primary care | 72 | 19.5 | 13-33 | 1.18 | 0.87, 1.62 | 0.29 | 1.54 | 1.05, 2.25 | 0.03 |
| NHS Secondary care | 92 | 20 | 12-39.5 | 1 | - | - | 1 | - | - |
| Private facilities | 26 | 20 | 7-28 | 1.63 | 1.04, 2.54 | 0.03 | 1.46 | 0.87, 2.44 | 0.15 |
| <i>Afraid of long-term hand problems^a (censored: 1 no, 4 yes; 3 missing)</i> | | | | | | | | | |
| No | 105 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| Yes | 82 | 20.5 | 13-42 | 0.69 | 0.51, 0.93 | 0.01 | 0.93 | 0.67, 1.30 | 0.68 |
| <i>CTS-6 score for side of surgery (tertiles)^b (censored: 2 intermediate, 3 poor; 8 missing)</i> | | | | | | | | | |
| Good (1-3.0) | 65 | 16 | 10-27 | 1 | - | - | 1 | - | - |
| Intermediate (3.2-3.8) | 58 | 21.5 | 14-35 | 0.77 | 0.54, 1.10 | 0.15 | 1.19 | 0.77, 1.84 | 0.44 |
| Poor (3.8-5) | 59 | 24 | 13-41 | 0.67 | 0.47, 0.97 | 0.03 | 1.04 | 0.65, 1.66 | 0.87 |
| <i>Type of work contract (censored: 5 employed, 1 missing)</i> | | | | | | | | | |
| Employed (permanent) | 154 | 22 | 14-38 | 1 | - | - | 1 | - | - |
| Self-employed | 30 | 13 | 6-19 | 1.72 | 1.13, 2.61 | 0.01 | 1.19 | 0.67, 2.14 | 0.55 |
| Zero hours/temporary | 5 | 12 | 3-31 | 2.01 | 0.81, 5.00 | 0.13 | 0.73 | 0.25, 2.14 | 0.56 |
| <i>Duration of available sick pay (censored: 4 >1 month, 1 unsure; no missing data)</i> | | | | | | | | | |
| ≤1 month | 49 | 16 | 12-29 | 1 | - | - | 1 | - | - |
| >1 month | 88 | 27 | 15-42 | 0.59 | 0.41, 0.85 | 0.004 | 0.46 | 0.28, 0.76 | 0.002 |
| Unsure | 53 | 16 | 10-23 | 1.19 | 0.80, 1.77 | 0.40 | 1.01 | 0.61, 1.66 | 0.97 |
| <i>Access to occupational health at work (censored: 1 no, 4 yes; 1 missing)</i> | | | | | | | | | |
| No | 110 | 15.5 | 9-29 | 1.77 | 1.31, 2.38 | <0.001 | 1.42 | 0.91, 2.19 | 0.12 |
| Yes | 79 | 25 | 16-42 | 1 | - | - | 1 | - | - |
| <i>Expected duration of leave after carpal tunnel release (days) (censored: 1 7-14, 2 15-29, 2 ≥30; no missing data)</i> | | | | | | | | | |
| <7 | 35 | 4 | 2-12 | 1 | - | - | 1 | - | - |
| 7-14 | 75 | 16 | 13-26 | 0.23 | 0.15, 0.36 | <0.001 | 0.27 | 0.16, 0.45 | <0.001 |
| 15-29 | 35 | 29 | 22-39 | 0.12 | 0.07, 0.19 | <0.001 | 0.19 | 0.10, 0.37 | <0.001 |
| ≥30 | 45 | 42 | 21-44 | 0.08 | 0.05, 0.14 | <0.001 | 0.12 | 0.06, 0.23 | <0.001 |
| <i>MHQ work functioning score (tertiles)^c (censored: 3 poor, 2 intermediate; no missing data)</i> | | | | | | | | | |
| Poor (0-55) | 67 | 20 | 13-35 | 0.68 | 0.47, 0.98 | 0.04 | 0.83 | 0.50, 1.40 | 0.49 |
| Intermediate (60-80) | 72 | 21 | 12.5-39.5 | 0.77 | 0.53, 1.10 | 0.15 | 0.81 | 0.50, 1.31 | 0.39 |
| Good (81-100) | 51 | 17 | 10-29 | 1 | - | - | 1 | - | - |
| <i>Job satisfaction^d (censored: 5 satisfied; 1 missing)</i> | | | | | | | | | |
| Satisfied | 169 | 19 | 11-31 | 1 | - | - | 1 | - | - |
| Dissatisfied | 19 | 38 | 21-43 | 0.61 | 0.38, 0.99 | 0.04 | 0.67 | 0.38, 1.16 | 0.15 |
| <i>Believe that the hand problem was caused by work^e (censored: 1 no, 4 yes; 2 missing)</i> | | | | | | | | | |
| No | 112 | 19 | 13-31 | 1 | - | - | 1 | - | - |
| Agree/strongly agree | 76 | 23 | 10-42 | 0.62 | 0.46, 0.85 | 0.003 | 0.82 | 0.57, 1.17 | 0.28 |
| <i>Job is demanding on hands/wrists^a (censored: 5 yes; no missing data)</i> | | | | | | | | | |
| No | 35 | 16 | 6-27 | 1 | - | - | 1 | - | - |
| Yes | 155 | 20 | 13-38 | 0.61 | 0.42, 0.89 | 0.01 | 0.68 | 0.42, 1.12 | 0.13 |

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| 1 | | | | | | | | | | |
| 2 | <i>Type of work^f (censored: 2 non-manual, 3 manual; 1 missing)</i> | | | | | | | | | |
| 3 | Non-manual | 119 | 18 | 9-31 | 1 | - | - | 1 | - | - |
| 4 | | 70 | 23.5 | 14-41 | 0.66 | 0.48, 0.89 | 0.01 | 0.97 | 0.57, 1.64 | 0.90 |
| 5 | <i>Work involves target-driven pay^g (censored: 3 no, 2 yes; 10 missing)</i> | | | | | | | | | |
| 6 | No | 149 | 19 | 12-31 | 1 | - | - | 1 | - | - |
| 7 | Yes | 31 | 22 | 13-45 | 0.61 | 0.41, 0.91 | 0.02 | 0.97 | 0.59, 1.61 | 0.91 |
| 8 | <i>Duration of computer use at work (hours)^g (censored: 5 <1; 4 missing)</i> | | | | | | | | | |
| 9 | <1 | 69 | 28 | 17-42 | 1 | - | - | 1 | - | - |
| 10 | >1 to <4 | 33 | 16 | 10-31 | 2.20 | 1.43, 3.38 | <0.001 | 1.01 | 0.56, 1.81 | 0.98 |
| 11 | ≥4 | 84 | 16 | 7-27 | 2.38 | 1.67, 3.38 | <0.001 | 1.85 | 1.08, 3.16 | 0.03 |
| 12 | <i>Work involves lifting or carrying ≥10 kg^g (censored: 4 no, 1 yes; 5 missing)</i> | | | | | | | | | |
| 13 | No | 108 | 18.5 | 11-30 | 1 | - | - | 1 | - | - |
| 14 | Yes | 77 | 24 | 13-40 | 0.61 | 0.42, 0.86 | 0.01 | 0.80 | 0.48, 1.33 | 0.39 |
| 15 | <i>Work involves pushing/pulling a heavy weight^g (censored: 2 no, 3 yes; 2 missing)</i> | | | | | | | | | |
| 16 | No | 104 | 16 | 8.5-28.5 | 1 | - | - | 1 | - | - |
| 17 | Yes | 83 | 26 | 16-42 | 0.51 | 0.37, 0.70 | <0.001 | 0.97 | 0.61, 1.55 | 0.90 |
| 18 | | | | | | | | | | |

19
20 Total sample size n=195. Median work absence relates to the 190 non-censored events. All analyses were adjusted for
21 age and sex. All significant variables in the univariable analyses (p<0.05) were entered into the multivariable model.

- 22 a. Reported on a 0-10 scale, dichotomised to no (0-6) and yes (7-10)[13].
23 b. CTS-6 score [14] with data driven tertiles.
24 c. Michigan Hand Questionnaire work performance subscale scored from 0-100, higher scores indicate better
25 perceived work performance[17]. Data driven tertiles.
26 d. Reported on a 5-point scale, dichotomised to satisfied (very satisfied/satisfied/fairly satisfied) and dissatisfied
27 (dissatisfied/very dissatisfied).
28 e. Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor
29 disagree/disagree/disagree strongly[22].
30 f. Classified using the Office for National Statistics Standard Occupational Classification 2010[18, 19].
31 g. As part of the normal working day[23].
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Clinical outcomes after CTR are shown in Table 5. Using the definition outlined in the methods, a total of 46 participants (24%) were identified as having at least one poor outcome (CTS symptoms that were worse, unchanged or only slightly better; scar symptoms that were at least fairly troublesome; required post-operative antibiotics or had additional time off work after first return). Of these participants, the majority (n=38, 83%) reported only a single component of poor outcome. Three individuals defined as having a poor outcome had not returned to work at the point of last follow-up (as compared with two individuals in the rest of the study sample). For those who had returned to work, the median duration of work absence for those with a poor outcome was 22 days (IQR 12-42) compared with 19 days (IQR 12-32) for those without (Figure 2). This difference was not significant (Wilcoxon rank-sum, p=0.24).

TABLE 5. Clinical outcomes after carpal tunnel release

| | Mean score (standard deviation) | |
|---|---------------------------------|------------------------|
| | Before surgery | 12 weeks after surgery |
| CTS-6 (operated hand) ^a | 3.3 (0.87) | 1.2 (0.54) |
| MHQ function (operated hand) ^b | 50 (22.1) | 79 (19.4) |
| MHQ satisfaction with function (operated hand) ^b | 38 (25.7) | 82 (21.3) |
| MHQ bilateral activities of daily living ^b | 69 (23.7) | 88 (13.8) |
| MHQ activities of daily living (operated hand) ^b | 65 (28.1) | 87 (18.5) |
| | Number of participants (%) | |
| <i>Global rating of change score</i> | | |
| Completely cured | - | 65 (33.3) |
| Much better | - | 98 (50.3) |
| Slightly better | - | 13 (6.7) |
| Unchanged | - | 2 (1.0) |
| Worse | - | 5 (2.6) |
| <i>Scar symptom severity</i> | | |
| Not at all troublesome | - | 99 (50.8) |
| A little troublesome | - | 63 (32.3) |
| Fairly troublesome | - | 18 (9.2) |
| Very troublesome | - | 2 (1.0) |
| Unbearable | - | 0 |
| Required post-operative antibiotics | - | 10 (5.1) |
| Additional sick leave after first returning to work | - | 12 (6.2) |

Grey shading indicates the categories which were combined to define a poor surgical outcome.

^a. CTS-6 assessment of carpal tunnel syndrome symptoms[14]. Range 1-5: 1 equals no symptoms.

^b. MHQ Michigan Hand Questionnaire[17]. Range 0-100: 100 equals no deficit or dissatisfaction.

Figure 2. Duration of work absence after carpal tunnel release

There was no significant difference in the prevalence of a poor outcome among those who returned to work within or after seven days of CTR (20% versus 24%, Chi^2 $p=0.63$). Similarly, there was no significant difference in the prevalence of a poor outcome among those who returned to work within or after 14 days (19% versus 25%, Chi^2 $p=0.31$), or within or after 28 days of CTR (21% versus 27%, Chi^2 $p=0.33$).

DISCUSSION

In this multi-site prospective cohort study, the median duration of work absence was 20 days (range 1-99), a duration similar to that reported by other European studies[24]. Earlier return to work was associated with typing for ≥ 4 hours at work (as compared with more physical workplace tasks) and undergoing surgery in primary care (as compared with secondary care or private practice). Pre-operative expectations about return to work were important significant predictors of actual return to work times. We found no evidence of poorer clinical outcomes in the first 12 weeks amongst those who returned to work earlier. At each time point, fewer manual workers had returned to work than non-manual workers and fewer employed workers had returned than self-employed (Figure 2). Both findings have been reported previously[10, 11, 25, 26], however, neither the type of work (manual/non-manual) nor the type of work contract (employed/self-employed) were significantly associated with the duration of work absence in the mutually adjusted model. These results illustrate the importance of considering the range of relevant demographic, clinical and occupational factors, which may have been confounders, moderators or mediators in previous studies. The reported model has not been developed to predict the duration of work absence for future CTR patients, rather to explore and identify important risk factors for consideration in future research.

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5 Five variables remained statistically significantly associated with longer duration of work
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7 absence in the final model. Two were occupational factors: infrequent computer use and
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9 availability of sick pay. Cowan et al.[10], recorded earlier return to work after CTR for desk-
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11 based workers and we have shown previously that UK hand surgeons and hand therapists
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13 report that they advise earlier return to desk-based workers[6]. The relationship between
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15 longer duration of work absence and availability of sick pay has also be reported previously for
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17 those with and without worker's compensation[9, 24]. It is plausible that financial necessity is
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19 driving earlier return to work for those with limited sick pay. Alternatively, those with access to
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21 paid leave might choose to take the maximum available duration.
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30 Only one clinical factor was significantly associated with the duration of work absence:
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32 participants who had their CTR surgery in primary care were more likely to return to work
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34 earlier than those whose procedure took place in an NHS hospital setting. One possible reason
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36 is that patients with more complex disease may be more commonly referred to secondary,
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38 rather than primary, care for their CTR and these patients may require longer off work after
39
40 their surgery. However, in the current study the proportion and degree of comorbidities, and
41
42 the extent of pre-operative symptoms reported by participants were similar across all settings.
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44 Another possibility is that the patients' expectations of the surgery may be different: CTR
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46 performed in a primary care setting might be perceived by patients as being more minor than
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48 surgery in a hospital operating theatre. Alternatively, the general practice surgeons may have
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50 recommended earlier return to work than those based in a hospital, although the median
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52 expected duration of work absence for participants in the current study was the same across
53
54 all settings. The inclusion of CTR performed in primary care is a strength of the study. We
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3 acknowledge that hand surgeons may also provide CTR services in primary care, as visiting
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5 clinicians, however in the current study this was not the case. CTR and other surgical
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7 procedures, such as vasectomy and minor skin surgery, are regularly performed by trained
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9 general practitioners in the UK[27], and all primary care surgeons in the current study were
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11 general practitioners who already provided a CTR service.
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18 Only one demographic factor was statistically significant: women were more likely to take
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20 longer to return to work than men. Whilst we found inconsistent data about the effect of
21
22 gender on return to work after CTR in the literature[28, 29], female gender has been
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24 associated with longer periods of work absence for other health conditions[30]. Researchers
25
26 should continue to include sex as a covariate in analyses of return to work outcomes, although
27
28 there is currently insufficient evidence to support any difference in return to work
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30 recommendations after CTR based on sex. Further qualitative investigation is required in order
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32 to understand the context for this.
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40 Finally, those who expected to return to work more quickly were significantly more likely to do
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42 so. It has been shown previously that patient expectations are a prominent determinant of
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44 return to work time, or other return to work outcomes, for musculoskeletal or mental health
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46 conditions[30-32]. The role of expectations on outcomes, including the expected and actual
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48 timing for return to work and driving after hand and wrist surgery, requires further
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50 exploration, particularly because expectations are a potentially modifiable characteristic which
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52 could be influenced by the advice provided by clinicians pre-operatively.
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3 In total, approximately a quarter of participants in this study were considered to have a poor
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5 outcome using our composite definition. We chose to use a multi-component definition which
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7 was deliberately very stringent to minimise the chances of missing any harm caused by early
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9 return to work. Our rates of poorer outcomes were in fact similar to those reported in other
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11 CTR populations[20, 33, 34]. Importantly, we found no relationship between earlier return to
12
13 work and occurrence of poor outcomes within 12 weeks of CTR in this cohort study. We
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15 acknowledge that a longer follow-up duration would have aided the assessment of post-
16
17 operative symptom resolution, however this was not possible with the resources available and
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19 was not a primary objective of the study.
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27 There are a number of limitations of the current study, including the reliance on self-reported
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29 data. Work absence is not logged on a national database in the UK and therefore could only be
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31 obtained through self-report. To minimise errors of recall, date of return to work was
32
33 determined contemporaneously. The recall duration for measures of function and symptoms
34
35 was limited to a maximum of four weeks, consistent with the outcome measures used[14, 17].
36
37 We set out to recruit a large sample of working-aged adults undergoing CTR. Our prospectively
38
39 recruited sample from 16 sites is one of the largest reported in the literature to date, with a
40
41 good follow up response rate (79%), but it remains possible that we were under-powered to
42
43 detect some of the factors which may have been associated with delayed return to work.
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45 Specifically, this could result where some levels of categorical variables of interest have lower
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47 prevalence, for example, the type of work contract (>80% of participants reported that they
48
49 had a permanent work contract, compared with ~15% who were self-employed). Furthermore,
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51 we acknowledge that the inclusion of a large number of variables in the development of the
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53 final model may result in model overfitting, thereby potentially limiting generalisability.
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2 We took the approach not to impute values where data were missing. Overall, the amount of
3 missing data was small and at the individual item-level (Table 4 and supplementary file 4).
4
5 Missing data were coded as such, and included in the analysis. We acknowledge that the
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7 approach taken to missing data may have resulted in biased estimates, yet if such effects are
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9 present, they are likely to be minimal due to low levels of missing data.
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17 Following our *a priori* analysis plan, the association between each baseline variable and the
18 duration of work absence was individually assessed in separate age- and sex-adjusted analyses.
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20 Only those variables which reached significance at the 5% level ($p < 0.05$) were included in the
21
22 multivariable model. In order to test the stability of our model, and to identify whether any
23
24 potential associations had been missed, this was tested using 1% and 20% cut-offs. In both test
25
26 scenarios, the findings were similar to those presented in our final model (Table 4), suggesting
27
28 that our model is robust. However, we acknowledge that alternative methods of selecting
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30 variables for inclusion (such as forward inclusion or backward elimination) may have yielded
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32 slightly different results, particularly for variables that were close to our significance cut-off of
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34 5%.
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44 The findings may not be generalisable to working populations in regions outside of central and
45 southern England and Wales, who are employed in other industries, or managed with a
46
47 different CTR patient pathway. Steps were taken to include the main settings where CTR is
48
49 performed in the UK, but we acknowledge that CTR may also be performed by other
50
51 specialities. Individuals who chose to participate in the study may not be fully representative of
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53 the wider CTR population, and the observed differences between those who completed the
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55 study and those who were lost to follow-up (younger, poorer mental health, more likely
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3 manual workers) also limit generalisability. Furthermore, we acknowledge that our model
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5 explained only 46% of variation in the duration of work absence.
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10 Endoscopic CTR has been associated with earlier return to work than open CTR [35], however it
11
12 was not possible to assess this in the current study. At present, endoscopic CTR is not routinely
13
14 performed in the UK[6]. Anecdotally, most providers will not fund the extra cost of endoscopic
15
16 CTR, which requires extra equipment, longer operating times and more experienced surgeons.
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18 Recruitment to the current study was not limited to patients undergoing open CTR, but no
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20 endoscopic procedures were performed during the study at any of our sites.
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27 All participants were presumed to have CTS as diagnosed by their treating clinician. Many
28
29 studies of CTS include nerve conduction study (NCS) findings as part of their eligibility criteria,
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31 although this was not possible in the current study because NCS are not routinely
32
33 recommended for pre-operative diagnosis of CTS in the UK[2]. Our eligibility criteria required
34
35 that only people undergoing their first CTR were included and reported upon in this study (so
36
37 that previous experiences with CTR were not potential confounders). However, more than
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39 three quarters of the cohort reported bilateral symptoms. The possible impact of persisting
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41 CTS symptoms in the non-operated hand on return to work also needs to be considered.
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49 For the current study, we considered both occupational title and self-reported occupational
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51 exposures collected in a standardised questionnaire format[13, 18, 19, 23]. Categorisation
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53 based on job title and industry may not accurately reflect the physical and/or psychosocial
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55 aspects of job role. Furthermore, co-occurrence of occupational exposures may be more
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3 common in some types of jobs than in others, for example lifting >10kg and pushing or pulling
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5 a heavy weight.
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10 There is a need for an agreed approach to identifying and recording key physical demands and
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12 psychosocial exposures of jobs to enable consistent exploration of their impact on work and
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14 clinical outcomes following surgery or other intervention. Approaches such as job exposure
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16 matrices[36] could facilitate this in future research.
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22 In summary, this large multi-centre prospective cohort study investigated when participants
23
24 return to work after CTR. Expectations about return to work (reported before surgery) were
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26 strongly associated with actual work absence, regardless of the job role or self-reported upper
27
28 limb activities involved. Patient expectations can be influenced by many factors, but one of the
29
30 most important is the advice provided by clinicians, in particular the surgeon. This suggests
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32 that clear, consistent advice could have an important effect on duration of sick leave. To date
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34 there is no evidence-based guidance informing clinicians what to advise about returning to
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36 different types of work after CTR. Further research is required to reach a consensus and
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38 explore whether the provision of targeted, consistent and standardised advice can alter the
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40 expected duration of work absence, reducing unnecessary sick leave, without causing adverse
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42 effects on clinical outcomes.
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17 **Conflicts of interest**

18
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38 Health.
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49 **Informed consent**

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51 Written informed consent was obtained from the patient(s) for their anonymised information
52 to be published in this article.
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58 **Ethics approval**

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3 Full ethics approval was granted by the NHS Health Research Authority (IRAS 209840:
4
5 16/WA/0390) and University of Southampton (ERGO 25757) Ethics Committees.
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10 **Contributorship**

11
12 The study was devised by LN, KWB, JA, DW and DC. LN completed data collection and analysis,
13
14 with assistance from GN and KWB. All authors contributed to the interpretation of the data. LN
15
16 wrote the first draft of the manuscript. All authors reviewed and edited the manuscript and
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18 approved the final version.
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32
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34
35 assistance with the initial research idea, and to the Association of Surgeons in Primary Care
36
37 and British Society for Surgery of the Hand for supporting the study.
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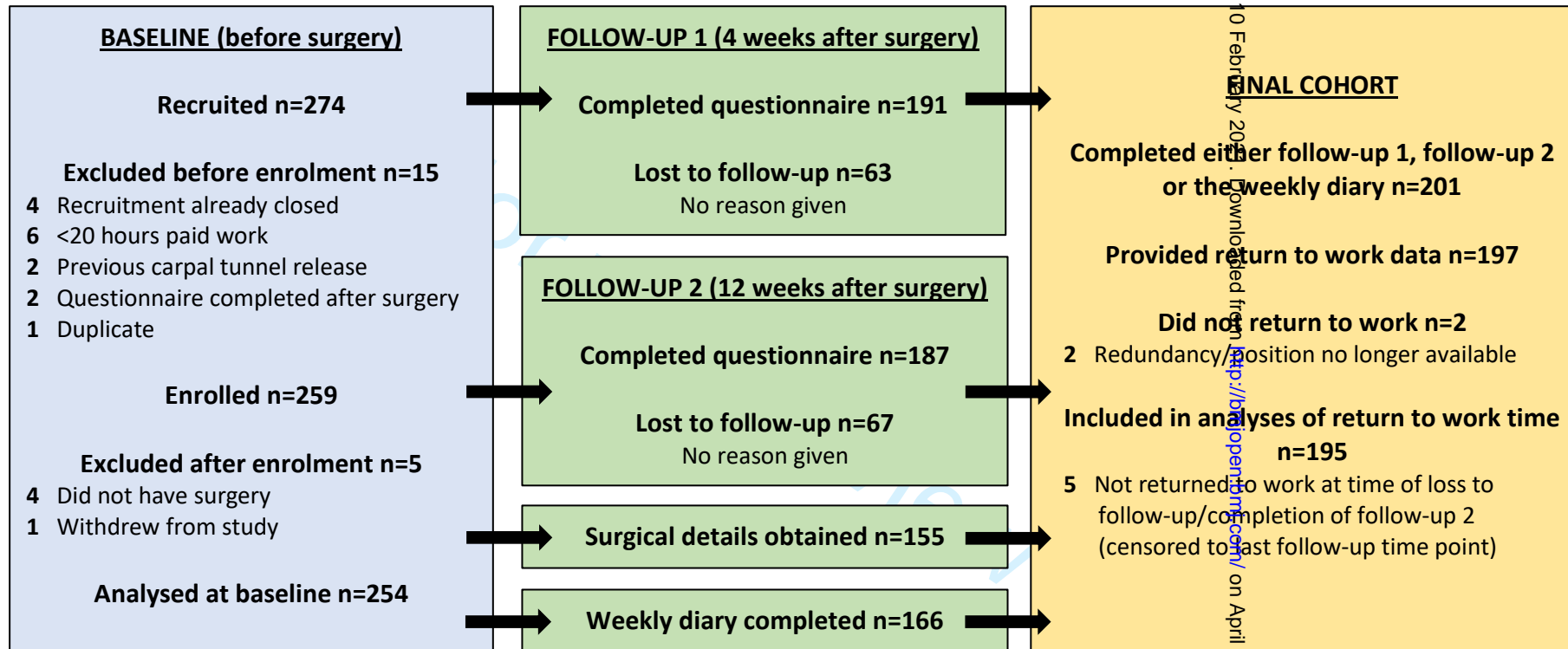
43 Thank you to the study sites and local principal investigators: Jeremy Bland at East Kent
44
45 Hospitals University NHS Foundation Trust; Darren Roberts at Portsmouth Hospitals NHS Trust;
46
47 Mike Taylor and Claire Zweifel at Mid Essex Hospital Services NHS Trust; Frances Clark at
48
49 Tollgate Clinic; Will Mason at Gloucester Hospitals NHS Foundation Trust; Vasileios Kefalas and
50
51 Petros Mikalef at Care UK Southampton NHS Treatment Centre; Peter Sharpe at Salisbury
52
53 Medical Practice; David Warwick at University Hospital Southampton NHS Foundation Trust
54
55 and Nuffield Health Wessex Hospital; Alistair Phillips at Southern Health NHS Foundation Trust;
56
57 Nanda Pillai at St Luke's Surgery, Walsall; Tim Halsey and Effie Katsarma at Chelsea and
58
59
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2
3 Westminster Hospital NHS Foundation Trust; Claire Middleton at Royal Berkshire NHS
4
5 Foundation Trust; Duncan Avis and Ian MacLeod at Hampshire Hospital NHS Foundation Trust;
6
7 Nick Gape and Lisa Small at Cardiff and Vale University Health Board; Kristin Francis at HCA
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9
10 Healthcare London Hand and Wrist Unit; and to all local team members who helped set up and
11
12 recruit to the REACTS study.
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16 **Data availability statement**

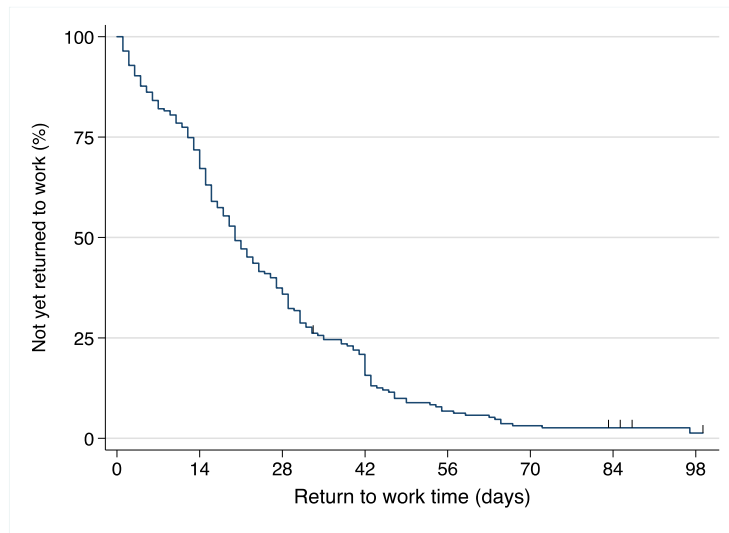
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19 Data are available on reasonable request. Deidentified participant data are available from the
20
21 Data Manager, MRC Lifecourse Epidemiology Unit, University of Southampton (email:
22
23 mrclou@mrc.soton.ac.uk). The study protocol and statistical analysis plans are available from:
24
25 <https://eprints.soton.ac.uk/438720/>.
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Figure 1. Participant numbers for each stage of the cohort study

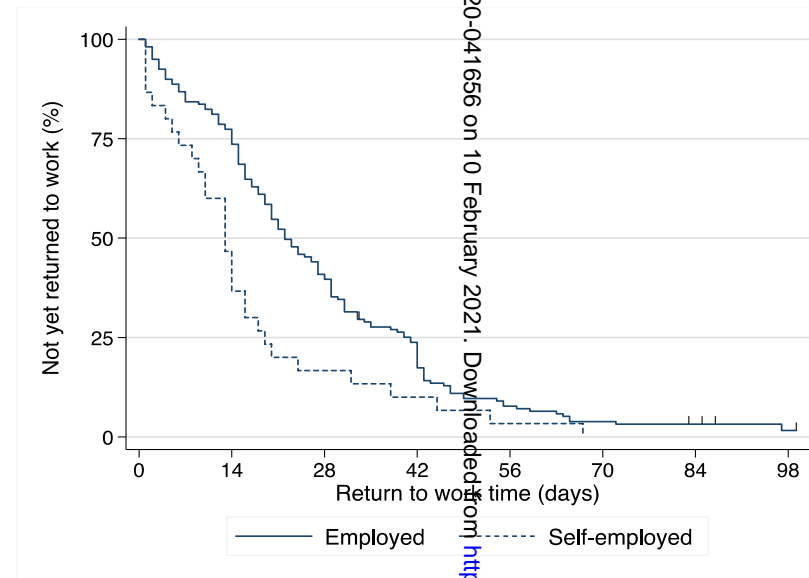


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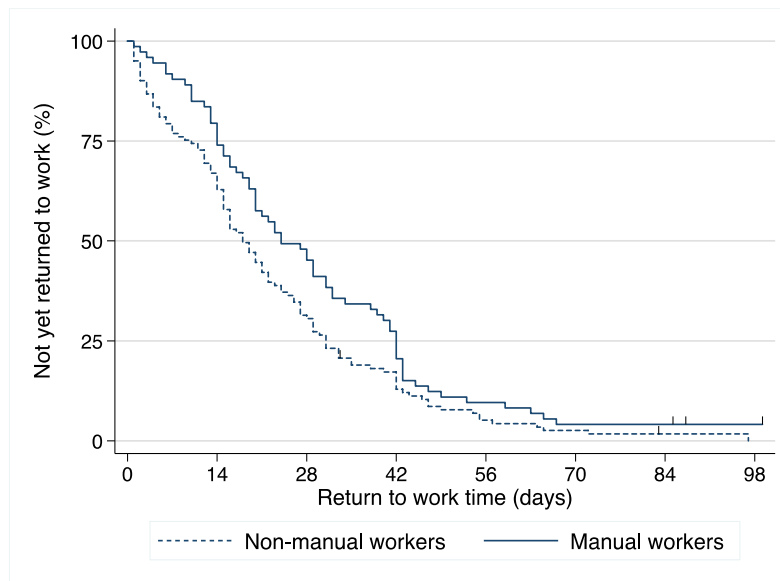
Figure 2. Duration of work absence after carpal tunnel release



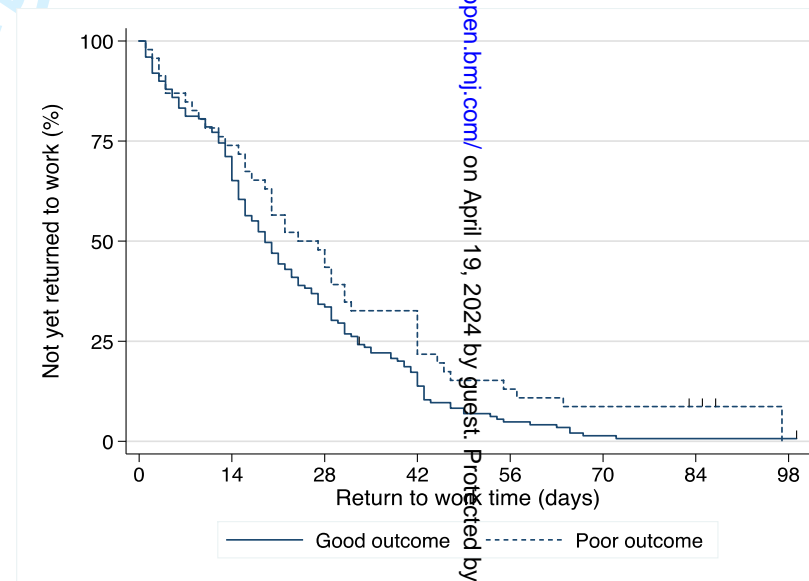
A. Whole cohort



B. Employed versus self-employed workers



C. Non-manual versus manual workers



D. With versus without a poor outcome

Vertical lines indicate right censoring for those who had not returned to work at the point of last follow-up

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Development of the REACTS study questionnaire: Reasoning for item inclusion

Questions were chosen to capture information on variables that might be expected to influence return to work after CTR.

Demographic factors

General demographic information was requested including date of birth, sex and hand dominance. Other studies have found that older age was associated with poorer work outcomes after CTR [1, 2], while no clear sex effect has been shown [3, 4]. Hand dominance in relation to side of surgery is rarely reported in CTR studies, however, surgery to the non-dominant hand has been linked to quicker and more complete resolution of CTS symptoms [5].

Carpal tunnel release planning

Information was collected on the expected date of CTR, side of surgery, availability of occupational health services and the patient's expectations about time off work post-surgery. Expected duration of work absence has been identified as a determinant of return to work time in previous CTR studies [2, 6].

Occupational factors

Participants were asked to list their main occupation and the industry in which they work (examples were provided to facilitate the response). This information was processed using the UK Office for National Statistics Standard Occupational Classification [7] and Computer Assisted Structured Coding tool (Cascot) [8] to generate manual and non-manual categories. Cases where the coding match was confirmed as less than 64% were reviewed by the lead researcher and coded by hand [8]. This was checked by the department data manager and any queries resolved through discussion.

Participants were asked to categorise their employment type as: employed (permanent contract), employed (temporary/renewable contract), zero hours contract and self-employed. Our systematic review found earlier return to work times for self-employed individuals compared to those who were employed [9]; but this was only investigated in two

Newington et al. (2020). Sickness absence after carpal tunnel release: a multicentre prospective cohort study
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2
3 studies [10, 11]. The additional sub-categories for employment type listed above and a
4
5 separate question about sick-pay entitlement were included to allow the impact of work
6
7 contract type to be explored [12]. Participants were also asked how many hours they usually
8
9 worked each week and over how many days; this information was collected for the
10
11 participant's main job and any other routine paid work. The total number of work hours per
12
13 week was calculated by combining the hours for main and additional jobs.

14
15
16 Occupational activities that load the upper limb and potential work stressors were asked as
17
18 a series of yes/no questions following the format of a recent multi-centre RCT exploring
19
20 management of non-specific distal arm pain [13]. These questions originated in the Job
21
22 Content Questionnaire, designed to assess psychological and physical aspects of work [14].
23
24 Activities included: computer use, tasks involving repeated wrist/finger movement, holding
25
26 vibrating tools, lifting more than 5 or 10kgs, pushing/pulling a heavy weight, working with
27
28 the neck flexed or rotated, and driving. Our systematic review found that manual workers
29
30 took longer to return to work than non-manual workers [9] and these questions were used
31
32 to determine the self-reported level of upper limb manual activity involved in each
33
34 participant's job.

35
36 Potential psychosocial work stressors were also assessed. These included piecemeal work,
37
38 activity targets and bonuses, and tight deadlines. As the first three items all concerned
39
40 payment for results, these were combined for the analyses. Participants were also asked
41
42 whether they found their main job demanding on their hands/wrist and whether their
43
44 boss/colleagues were supportive. Both questions were scored on a 0-10 scale as reported
45
46 previously in a study of sick leave duration after endoscopic CTR [15]. These were
47
48 dichotomised as supportive (7-10) and neutral/unsupportive (0-6). A question about general
49
50 job satisfaction was also included later in this section of the questionnaire, with the Likert
51
52 response options: very satisfied, satisfied/fairly satisfied, dissatisfied and very dissatisfied
53
54 [15, 16]. The last two options were condensed to give three categories for the analyses.

55
56 To assess self-reported work function, participants were asked to complete the work
57
58 performance section of the Michigan Hand Questionnaire (MHQ) [17]. This patient reported
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60 outcome measure is frequently used in upper limb clinical practice and research and has

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1
2
3 been validated for use with CTS and CTR populations [18]. Permission was granted for the
4 MHQ to be used in the study. The questionnaire asked participants to recall how much
5 difficulty they had with general work tasks over the past four weeks in relation to problems
6 with their hands/wrists, for example: needing to shorten their working day, taking longer to
7 complete tasks or needing to take breaks. Using the standard scoring, each question was
8 completed on a Likert scale of: always, often, sometimes, rarely and never, and combined to
9 give a score from 0-100, with 100 representing no problems with work functioning [19].
10
11 Participants were also asked whether they had taken any periods of sickness absence from
12 work over the previous four weeks, both related to the hand/wrist problem, or for any
13 other problem.
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23 **General health**

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25 Seven general health questions were included to capture information on comorbidities,
26 physical and mental health and somatisation. Self-reported health was assessed using the
27 first SF-36 question: In general, would you say your health is – excellent, very good, good,
28 fair, poor [20]. This was taken from the original SF-36 version, which is free from licence
29 charges and was dichotomised as excellent/very good/good and fair/poor for the analyses.
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36 Participants were asked their height and weight to enable the calculation of BMI (body mass
37 index; weight in kilograms/height in metres squared). This was categorised using standard
38 WHO classification: underweight (BMI <18.5), normal weight (BMI 18.5-24.9), overweight
39 (BMI 25.0-29.9) and obese (BMI ≥30.0) [21]. Smoking status was categorised as those who
40 have never smoked regularly, those who have smoked in the past and those who regularly
41 smoke, with the latter two categories combined for the analyses. Previous studies have
42 found that obesity (BMI ≥30) was linked to poorer work outcomes [1] and smoking was
43 linked to poorer clinical outcomes after CTR [22].
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52 A list of common health problems and their impact on general activities was assessed using
53 the Self-Administered Comorbidity Questionnaire [23]. Participants were asked first to
54 select whether they have any of the 14 medical conditions and if so whether this limited
55 their activities. All medical conditions were worded in an accessible format, as evaluated by
56 the patient advisory group. Responses were analysed as the number of comorbidities and
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the number of disabling comorbidities using the scale: 0, 1, ≥ 2 . Mental health was assessed using the mental health and vitality questions from the licence-free version of the SF-36 [20]. One modification was made to change the wording of the question 'Did you feel full of pep?' to 'Did you feel full of get-up-and-go?' for the UK rather than US setting. The questions were used to calculate the summary score from 0-100 (where 100 represents no disability).

Somatisation was assessed using a subset of five questions from the Four-Dimensional Symptom Questionnaire [24] as previously reported in UK cohort studies of health and employment [25] and upper limb pain in primary care [26]. The number of symptoms that were rated by the participant as at least moderately distressing were used to create the analysis categories of: 0, 1, ≥ 2 symptoms.

Hand and wrist symptoms and function

Katz & Stirrat hand diagrams were included for the participants to indicate where on their hand(s) they experience pain and/or tingling and numbness [27]. This self-administered tool can be used clinically as part of the CTS diagnosis process using the scoring system modified by Calfee et al. [28]. A question on symptom duration was also included and categorised as less than 3 months, 3-6 months, 6-12 months and more than a year. This was dichotomised to ≤ 1 year and > 1 year for analysis. All participants were expected to have clinically diagnosed CTS as they were undergoing CTR, but participants were asked to answer for both hands, so that symptoms in the non-operated hand were also assessed. This was used to define bilateral or unilateral symptoms. Hand diagram scores were dichotomised according to a stringent definition of CTS (classic and probable) and unlikely CTS (possible and unlikely).

The CTS-6 questionnaire was included to assess the severity of CTS symptoms [29]. This tool is a shorter version of the Boston Carpal Tunnel Questionnaire [30] and has been assessed for use pre- and post CTR surgery. The six questions explore the severity of pain and numbness, whether this occurs during the daytime or at night, and whether this wakes the individual. Participants were asked to complete these questions separately for each hand using a 5-point Likert scale. Using the standard scoring criteria, responses for each item

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were combined to give a mean score ranging from 1-5, with 5 representing the highest severity of symptoms. If one response was missing (per hand) this was imputed using the mean score of the remaining responses [29].

Hand function was assessed using the MHQ sub-sections on unilateral hand function (asked for each hand), satisfaction with hand function (asked for each hand), and ability to perform unilateral and bilateral activities of daily living (ADLs) [17]. The MHQ summary question relating to the level of satisfaction with the appearance of each hand was also included. All questions were scored on the 5-point Likert scales provided and used the standard wording and scoring to enable comparison with other study populations. Possible scores for each sub-section range from 1-100, with 100 representing no problems or the highest level of satisfaction. Missing data were imputed according to the MHQ guidelines, which allow the scale to be calculated if more than 50% of the questions for each sub-section have been completed [19].

Health beliefs

The remaining questions related to health beliefs. Beliefs about the cause of symptoms and likely prognosis have been identified as key themes in health-seeking behaviour for CTS [31] and upper limb pain [26], and blaming oneself for the hand problem has been associated with long durations of sick leave after endoscopic CTR [15]. The participant's expectations for being able to use the affected hand normally within 3 months of surgery, fear of long-term hand problems, blaming oneself for the hand problem and the perceived level of support available from friends and family were assessed. Responses were rated on a 0-10 scale as reported by Hansen et al. [15]. All responses were converted to a unidirectional scale with 10 being the best outcome, and were dichotomised as neutral/negative response 0-6 and positive response 7-10.

Participants were also asked to agree/disagree (via a 5-point Likert scale) with a series of seven questions about the believed cause of their symptoms. Using previously reported methods, the responses were dichotomised to those who agreed (agree/strongly agree) and those who did not agree (neither agree nor disagree/disagree/disagree strongly) with each statement [26]. The first two questions were combined to generate six items: 1) I think I was

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born with a weakness in this part of my body/problems like this run in my family; 2) my problem was caused by work; 3) my problem probably wasn't caused by work, but work made it worse; 4) I have a lot of stress in my life and that has made my problem a lot worse; 5) a lack of exercise probably contributed to my problem; 6) as you get older, parts of the body wear out and problems like mine are likely [26].

Finally, the abbreviated Pain Catastrophizing Scale was included, which provides insight about the participant's pain beliefs [32]. Responses were dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions, and those who did not.

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Before Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

Preprint

In@mrc.soton.ac.uk | 023 8077 7624

Arthritis Research UK – MRC Centre for Musculoskeletal Health and Work
MRC Lifecourse Epidemiology Unit, University of Southampton
Southampton General Hospital (MP 95), SO16 6YD

IRAS reference: 209840

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For peer review only

CONSENT FORM (IRAS reference: 209840)

You should complete this form after you have read the Participant Information Sheet.

REACTS: Return to employment after carpal tunnel release surgery

Thank you for considering taking part in this research. If you have any questions arising from the Participant Information Sheet, please ask the research team before you decide whether to take part.

Please initial the boxes if you agree with each statement

1. I have read the Participant Information Sheet (version 2.0; 06.12.16) and have had the opportunity to ask questions about the study.
2. I meet the criteria for being involved in this study:
 - Aged over 18 and referred for carpal tunnel release surgery
 - Routinely work in paid employment for at least 20 hours per week
 - Plan to return to work after carpal tunnel release surgery
 - Have not previously had carpal tunnel release surgery on either hand
 - Have not previously had a serious injury to the same wrist/hand that will have the carpal tunnel release operation
3. I agree to take part in this research and agree for my data to be used for the purposes explained in the Participant Information Sheet (version 2.0; 06.12.16). I understand that this information will be handled in accordance with the terms of the UK Data Protection Act 1998.
 - a. I agree for the REACTS research team to access pre-operative test results concerning my hand and wrist symptoms. No other information will be accessed.
 - b. I agree for the REACTS research team to access my carpal tunnel release surgical record. No other information will be accessed.
4. I understand that if I decide at any time during the research that I no longer wish to take part, I can notify the researchers and withdraw from the study immediately, without giving a reason. If I do, I understand that I can ask for any contribution I have already made to be removed from the study, up to the time when I have completed the final questionnaire.

Signature _____ Date ____ / ____ / ____

Name _____ Phone _____
(please print) (only to be used if we lose touch)

Postal address _____

Email address _____
(please print)



ADDITIONAL QUESTIONS

Please circle one response for each question

I prefer to receive the next two questionnaires by **Post** **Email** **Don't mind**

I prefer to receive correspondence about the study by **Post** **Email** **Don't mind**

I would like to be notified of the findings from this research **Yes** **No**

I am happy to be contacted about the next stage of the research, which will involve a one-off discussion with the lead researcher **Yes** **No**

I am happy to be contacted about other studies related to this research **Yes** **No**

When the research team receives your completed questionnaire and consent form, we will sign it below and return a copy to you for your records.

Researcher signature _____ Date ____ / ____ / ____

Researcher name _____

University of Southampton research supervisors:
Professor Karen Walker-Bone | Professor Jo Adams | Professor David Warwick

SECTION A: BACKGROUND

1 What is your date of birth?

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

2 Are you:

Male Female Other

3 Are you:

Right handed Left handed Both

4 Do you routinely carry out paid work for 20 hours or longer in a given week?

Yes No

*If no, thank you for your interest in our study, however, we are only looking for individuals who carry out paid work for at least 20 hours per week. You **do not** need to complete the rest of the questionnaire, but please return it using the pre-paid envelope provided.*

5 When do you expect to have your carpal tunnel surgery?

Please enter the exact date if known, or provide the approximate month and year if unsure.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| d | d | m | m | y | y |

6 Which hand will be operated on?

If both hands please answer Question 6.1; if one hand, please move on to Question 7.

Right Left Both

6.1 If both hands, which side will be operated on first?

Right Left Both sides operated
on the same day Unsure

7 Do you have access to an occupational health service through your place of work?

Yes No Unsure

8 Do you expect to take any time off work following your surgery?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes No Unsure

8.1 If you do expect to take time off work, how long do you expect to take?

Please complete using days, weeks or months; whichever applies.

Days Weeks Months

SECTION A: BACKGROUND

9 Have you been given any information about your operation?

If yes, please answer Question 9.1; if no, please move on to Question 10.

Yes No

9.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
- b) Hospital nurse
- c) GP or practice nurse
- d) Hand therapist
- e) Physiotherapist or occupational therapist
- f) Occupational health nurse or doctor
- g) Employer
- h) Friend or family member
- i) Internet
- j) Other (please specify)

10 Have you been given any information about returning to work after your surgery?

If yes, please answer the rest of Question 10; if no, please move on to Question 11.

Yes No

10.1 If yes, who provided this information? Please tick all that apply.

- a) Your surgeon or a member of the surgical team
- b) Hospital nurse
- c) GP or practice nurse
- d) Hand therapist
- e) Physiotherapist or occupational therapist
- f) Occupational health nurse or doctor
- g) Employer
- h) Friend or family member
- i) Internet
- j) Other (please specify)

10.2 What advice were you given?

If this advice came from more than one source, please indicate who advised what.

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SECTION B: WORK

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12 What is your MAIN occupation at the moment (e.g. secretary, teacher, builder etc.)?

13 And in what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc.)?

14 Which of the following best describes your present work situation for your MAIN occupation? Please tick one box.

- a) Employed (permanent contract) d) Self-employed
 b) Employed (temporary/renewable contract) e) Other (please specify)
 c) Zero hours contract

15 On average, how many hours per week do you normally work in your main occupation?

hours

16 On average, how many days per week do you normally work in your main occupation?

days

17 Do you have any other paid work?

If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, on average, how many hours a week do you work in other paid jobs? hours

18 Does an average day at work in your MAIN job normally involve any of the following? Please tick one box for each question.

- | | Yes | No |
|---|--------------------------|--------------------------|
| a) Piecework in which you are paid according to the number of articles or tasks you or your team make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| b) A target number of articles or tasks that you or your team are expected to make or finish in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Payment of a bonus if you make or finish more than an agreed number of articles/tasks in the day? | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Working to tight deadlines | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Use of a computer keyboard or mouse for longer than 1 hour in total? | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION B: WORK

The following questions refer to how you did in your MAIN job during the past 4 weeks.

21 weeks.

Please tick one box for each question.

| | Always | Often | Sometimes | Rarely | Never |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| How much of the time during the past 4 weeks ... | | | | | |
| a) Were you unable to do your work because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Did you have to shorten your work day because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Did you have to take breaks at work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Did you get less done because of problems with your hand(s) / wrist(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you take longer to do the tasks in your work because of problems with your hand(s) / wrists(s)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 **During the past 4 weeks, how much time have you missed from your MAIN job for the following reasons?**

Please write 0 if you have not missed any time from work during this period. You can answer in days or hours, whichever applies.

- a) Time missed because of the problem with your hand(s)/wrist(s) Days **or** Hours
- b) Time missed because of any other problem Days **or** Hours

23 **If you fell ill and were off work, how long could you get your normal full pay (excluding bonuses)?**

Please tick the option that best represents your MAIN job.

- | | |
|--|--|
| a) Less than one week <input type="checkbox"/> | d) More than 6 months <input type="checkbox"/> |
| b) 1 – 4 weeks <input type="checkbox"/> | e) Not sure <input type="checkbox"/> |
| c) 1 – 6 months <input type="checkbox"/> | |

24 **How satisfied are you with your MAIN job as a whole, taking everything into consideration?** This includes your salary, career possibilities, management, colleagues etc. Please tick one box.

- | | |
|--|---|
| a) Very satisfied <input type="checkbox"/> | c) Dissatisfied <input type="checkbox"/> |
| b) Satisfied/fairly satisfied <input type="checkbox"/> | d) Very dissatisfied <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

25 In general, would you say your health is:

- a) Excellent d) Fair
- b) Very good e) Poor
- c) Good

26 What is your height? Please answer in either feet and inches or centimetres.

feet inches *or* cms

27 What is your weight? Please answer in either stones and pounds or kilograms.

stones lbs *or* kgs

28 Do you, or have you ever, smoked regularly? Please tick one box.

- a) I have never smoked regularly c) I regularly smoke
- b) I have smoked in the past, but do not currently smoke regularly

29 The following is a list of common health problems. Please indicate if you currently have, or don't have, the problem listed in part 1. If you have the problem, please answer the corresponding question in part 2. Please answer all questions in part 1.

| HEALTH PROBLEM | PART 1 | | PART 2 | |
|-----------------------------------|----------------------------------|--------------------------|--------------------------------|--------------------------|
| | Do you have the problem? | | Does it limit your activities? | |
| | NO | YES | NO | YES |
| | <i>(if yes move to part 2)</i> → | | | |
| a) Heart disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) High blood pressure | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Lung disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Diabetes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Ulcer or stomach disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Kidney disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Liver disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Thyroid disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Anaemia or other blood disease | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| j) Cancer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

| HEALTH PROBLEM continued... | Do you have the problem? | | Does it limit your activities? | |
|-----------------------------|--------------------------|--------------------------|--------------------------------|--------------------------|
| | NO | YES | NO | YES |
| k) Depression | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| l) Osteoarthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| m) Back pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| n) Rheumatoid arthritis | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

(if yes move to part 2) →

29.1 Please list any other medical problems that have not been mentioned.

| | Does it limit your activities? | |
|----------|--------------------------------|--------------------------|
| | NO | YES |
| o) | <input type="checkbox"/> | <input type="checkbox"/> |
| p) | <input type="checkbox"/> | <input type="checkbox"/> |
| q) | <input type="checkbox"/> | <input type="checkbox"/> |

30 The following questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the answer that comes closest to the way you have been feeling. Please tick one box for each row.

| How much of the time during the past 4 weeks ... | All of the time | Most of the time | A good bit of the time | Some of the time | A little bit of the time | None of the time |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Did you feel full of 'get-up-and-go'? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Have you been a very nervous person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Have you felt so down in the dumps that nothing could cheer you up? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Have you felt calm and peaceful? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Did you have a lot of energy? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Have you felt downhearted and blue? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Did you feel worn out? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| h) Have you been a happy person? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| i) Did you feel tired? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: GENERAL HEALTH

31 Below is a list of problems that people sometimes have. Please read each one carefully and tick the box that best describes how much that problem has distressed or bothered you during the *past 7 days*, including today?
Please tick one box for each row.

| | Not at all | A little bit | Moderately | Quite a bit | Extremely |
|--------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Faintness or dizziness | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pains in the heart or chest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Nausea or upset stomach | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Trouble getting your breath | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hot or cold spells | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **RIGHT** hand or wrist?

32 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 34.



Pain



Tingling or numbness

RIGHT HAND



33 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

In the ***past 7 days***, have you experienced any pain, tingling (pins and needles) or numbness (loss of sensation) in your **LEFT** hand or wrist?

34 Please mark where on your hand/wrist you experienced these symptoms using the key below.

If you do not have any symptoms in your right hand, please move on to Question 36.

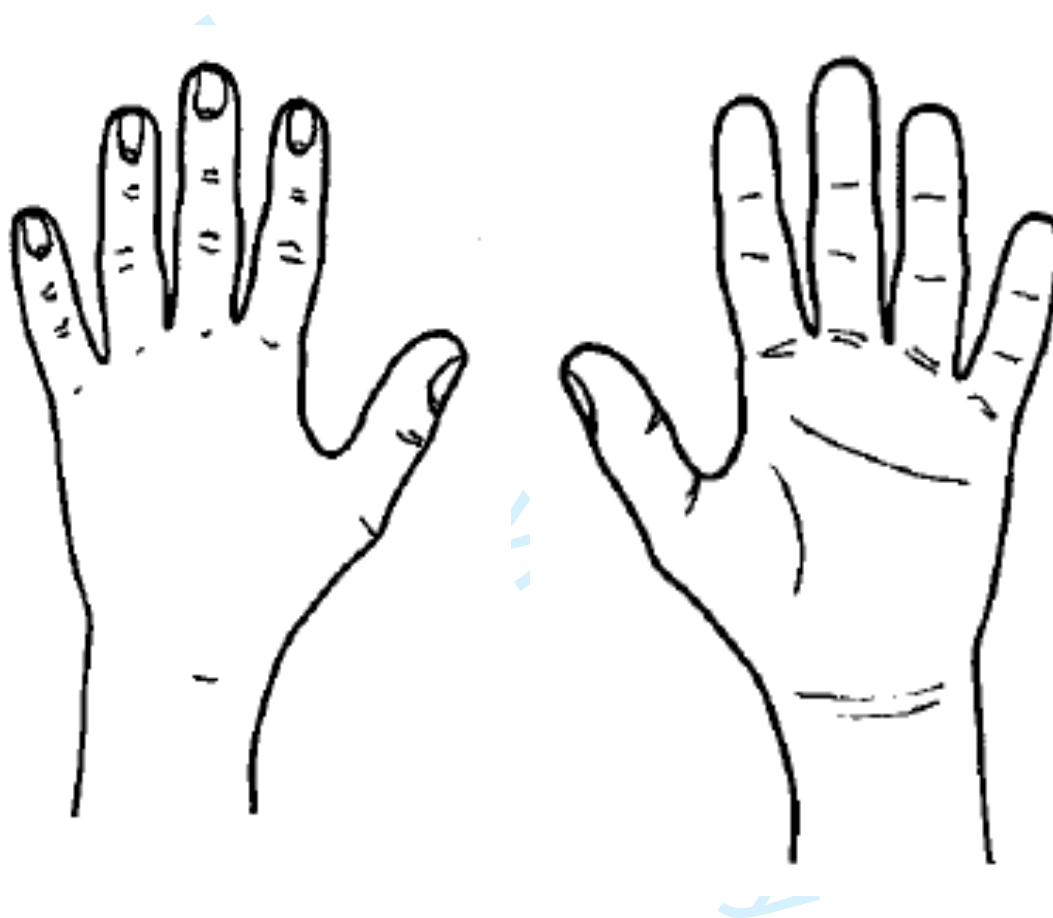


Pain



Tingling or numbness

LEFT HAND



35 How long ago did the first of these symptoms begin? Please tick one box.

a) Less than 3 months

c) 6 – 12 months

b) 3 – 6 months

d) More than a year

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your symptoms over the ***last 7 days***.

36 Please answer for each hand, even if you only have problems with one side.
Please tick one box for each row.

| 36.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 36.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

37 This question refers to the appearance (look) of your hand during the ***past 7 days***. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

38 Please answer the following questions on a scale of 0-10, where 0 represents not at all, and 10 represents very much. Please circle one number for each question.

38.1 Do you think that you will be able to use your hand normally 3 months after the operation?

0 1 2 3 4 5 6 7 8 9 10

38.2 Are you afraid of having long-term problems with your hand?

0 1 2 3 4 5 6 7 8 9 10

38.3 Do you blame yourself for your hand problem?

0 1 2 3 4 5 6 7 8 9 10

38.4 Are your family and friends supportive of your hand problem?

0 1 2 3 4 5 6 7 8 9 10

39 The following statements describe people's beliefs about their health problems. Please indicate whether you agree or disagree with them in relation to the problems you have with your hand(s) or wrist(s). Please tick the box which most closely reflects how you feel for each statement.

| | Strongly agree | Agree | Neither agree or disagree | Disagree | Strongly Disagree |
|---|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| a) Problems like this run in my family | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I think I was born with a weakness or underlying problem in this part of my body | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) My problem was caused by work | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Work probably didn't cause my problem, but it made it worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) I have a lot of stress in my life and that has made my problem a lot worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) I think a lack of exercise probably contributed to my problem | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) As you get older, parts of the body start to wear out and problems like mine are likely to occur | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

40 We are interested in the types of thoughts and feelings that you have when you are in pain. The following statements describe different thoughts and feelings that may be associated with pain. Please indicate the degree to which you have these thoughts and feelings when you are experiencing pain. Please tick one box for each statement.

| | Not at all | To a slight degree | To a moderate degree | To a great degree | All of the time |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) I keep thinking about how badly I want the pain to stop | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) It's terrible and I think it's never going to get any better | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) I become afraid that the pain may get worse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) I anxiously want the pain to go away | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the function of your hands/wrists during the **past 7 days**. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 41 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your right hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your right fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your right wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your right hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 42 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your left hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your left fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your left wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your left hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the ability of your hands to do certain tasks during the **past 7 days**. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

43 How difficult was it for you to perform the following activities using your RIGHT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

44 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

45 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question

46 How satisfied were you with your RIGHT hand/wrist during the past 7 days?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

47 How satisfied were you with your LEFT hand/wrist during the past 7 days?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions, or would like any additional information, please contact Lisa Newington on:

ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

For peer review only - <http://hmgopen.bmj.com/site/about/guidelines.xhtml>



REACTS ID:

One Month After Your Carpal Tunnel Release Surgery



Return to Employment After Carpal Tunnel Release Surgery (REACTS)

only

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SECTION A: ABOUT YOUR OPERATION

Please fill in today's date

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

1 What was the date of your carpal tunnel release surgery?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| d | d | m | m | y | y | y | y |

2 Which side was operated on? Please tick one box.

Right Left Both

3 What type of anaesthetic did you have? Please tick one box.

- a) General anaesthetic (you were sent to sleep)
- b) Local or regional anaesthetic (your arm was made numb, but you were still awake)
- c) Other (*please specify*)
-
- d) Unsure

4 How long did you need to stay in the hospital/clinic after your operation? Please tick one box (and specify the number of nights, if applicable).

- a) I went home the same day
 - b) I needed to stay overnight (one night only)
 - c) I needed to stay for more than one night
- (*Please specify for how long*) nights

SECTION A: ABOUT YOUR OPERATION

5 Have you used any of the following services specifically for your operated hand(s) since your surgery?

Please give the number of visits for each service, and the date(s) attended, if known.

| | I used this service in the NHS | | I used this service privately | |
|--|--------------------------------|--------------------------|-------------------------------|--------------------------|
| | Number of visits | Dates attended, if known | Number of visits | Dates attended, if known |
| a) Your surgeon, or one of the surgical team | | | | |
| b) GP or practice nurse | | | | |
| c) Hospital nurse | | | | |
| d) Pharmacist | | | | |
| e) Hand therapist | | | | |
| f) Other physiotherapist or occupational therapist | | | | |
| g) Chiropractor or osteopath | | | | |
| h) Occupational health nurse or doctor | | | | |
| i) Accident and emergency (A&E) or minor injuries unit | | | | |
| j) Other (<i>please specify</i>) | | | | |

SECTION A: ABOUT YOUR OPERATION

6 Have you taken any antibiotics for an infection in your surgical wound?

Please do not include any antibiotics you were prescribed at the time of your operation.

Yes

No

If yes, what date did you start taking the antibiotics?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7 Have you been admitted to hospital because of a problem with your operated hand(s)? If yes, please answer the rest of Question 7; if no, please move on to Question 8.

Yes

No

7.1 If yes, when were you first admitted?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

7.2 How many nights did you stay in hospital?

Please answer 0 if you didn't stay overnight.

nights

7.3 Did you require another operation?

Yes No

8 Have you been advised that you may need a carpal tunnel release for your other hand in the future?

If yes, please answer Question 8.1; if no, please move on to Question 9.

Yes

No

8.1 If yes, when are you expecting to have this surgery? Please tick one box.

a) In less than 2 months

c) In 6-11 months

e) Unsure

b) In 2-5 months

d) In more than a year

9 If you would like to give us any other information about your operation, or the healthcare services you have used, please do so here:

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SECTION B: WORK

10 Compared to before your surgery, which of the following best describes your current work situation? Please tick one box.

- a) Returned to the same job, work duties and hours – **please go to Question 14**
- b) Returned to the same job, with altered duties or hours – **please go to Question 14**
- c) Started a new job – **please go to Question 11**
- d) Not yet returned to work, but plan to return in the future – **please go to Question 12**
- e) Do not plan to return to work – **please go to Question 13**

11 Thinking about your new job:

11.1 What is your main occupation now (e.g. secretary, teacher, builder etc.)?

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11.2 In what industry do you work (e.g. farming, shipyard, car factory, shoe shop, hospital, insurance office etc.)?

.....

11.3 Did you change jobs because of your hand/wrist problem?
Please tick one box.

- a) Yes, my hand/wrist problem was the main reason for my job change
- b) Yes, my hand/wrist problem was one of several reasons for my job change
- c) No, my job change was nothing to do with my hand/wrist problem
- d) Other, please specify
-
-

Please go to Question 14

SECTION B: WORK

13 If you do not plan to return to work, what is the main reason for this decision? Please tick one box.

- a) Retirement
- b) Redundancy
- c) Position/work no longer available
- d) Unable to do your work because of your problem with your hand(s)/wrist(s)
- e) Unable to do your work because of any other problem
- f) Other (*please specify*)
-
-
-

13.1 Have you been advised not to return to work by anyone? If yes, please answer Question 13.2; if no, please move on to Question 21.

Yes No

13.2 If yes, who by? Please tick all that apply.

- | | | | |
|--|--------------------------|---|--------------------------|
| a) Your surgeon or a member of the surgical team | <input type="checkbox"/> | f) Occupational health nurse or doctor | <input type="checkbox"/> |
| b) Hospital nurse | <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) | <input type="checkbox"/> |
| c) GP or practice nurse | <input type="checkbox"/> | h) Friend or family member | <input type="checkbox"/> |
| d) Hand therapist | <input type="checkbox"/> | i) Other (<i>please specify</i>) | <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist | <input type="checkbox"/> | | |
| | | | |

Please go to Question 21

SECTION B: WORK

14 When did you first return to work after your carpal tunnel release surgery?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

15 How much work-time did you miss between the date of your surgery and the date you first returned to work?

Please include all work-time missed, even if this had been pre-arranged with your employer, or was taken as annual leave. You can answer in hours, days or weeks, whichever applies.

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

15.1 Was any of this time paid?

Please tick one box (and provide the amount of time, if applicable).

- a) Yes, all of my time away from work was paid
- b) Yes, some of my time away from work was paid
(please specify how much time was paid, you can use hours, days or weeks, whichever applies)

| | | | | | |
|--|-------|---|------|---|-------|
| <input type="text"/> <input type="text"/> <input type="text"/> | hours | <input type="text"/> <input type="text"/> | days | <input type="text"/> <input type="text"/> | weeks |
|--|-------|---|------|---|-------|

- c) No, none of my time off was paid
- d) Not sure

16 Since your surgery, have you discussed when to return to work with anyone?

If yes, please answer the rest of Question 16; if no, please move on to Question 17.

Yes No

16.1 If yes, who did you discuss this with? Please tick all that apply.

- | | |
|---|--|
| a) Your surgeon or a member of the surgical team <input type="checkbox"/> | f) Occupational health nurse or doctor <input type="checkbox"/> |
| b) Hospital nurse <input type="checkbox"/> | g) Employer or manager (or colleagues if self-employed) <input type="checkbox"/> |
| c) GP or practice nurse <input type="checkbox"/> | h) Friend or family member <input type="checkbox"/> |
| d) Hand therapist <input type="checkbox"/> | i) Other <i>(please specify)</i> <input type="checkbox"/> |
| e) Physiotherapist or occupational therapist <input type="checkbox"/> | |
| | |

SECTION B: WORK

16.2 Please list any advice you have been given (since your surgery) about when and how to return to work?
This could include any activities to avoid or timescales to follow. If this advice came from more than one place, please indicate who advised what.

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17 Since returning to work after your operation, have you needed to take any time off work because of a problem with your operated hand(s)/wrist(s)?
If yes, please answer Question 17.1; if no, please move on to Question 18.

Yes No

17.1 If yes, how much time did you take off work?
Please answer in days or hours, whichever applies.

hours days weeks

18 When you first returned to work after your surgery, did you work shorter hours than would be normal for your job as a direct result of your operation?
If yes, please answer the rest of Question 18; if no, please move on to Question 19.

Yes No

18.1 Have you since gone back to working full hours?
If yes, please answer Question 18.2; if no, please move on to Question 19.

Yes No

18.2 If yes, when did you return to full working hours?
If you do not know the exact date, approximately how many weeks did you work reduced hours?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week c) More than 2 weeks, but less than 3 weeks
- b) 1 – 2 weeks d) 3 weeks or longer

SECTION B: WORK

19 When you first returned to work after your surgery, did you need to alter or avoid any of your usual work duties as a direct result of your operation?

If yes, please answer the rest of Question 19; if no, please move on to Question 20.

Yes No

19.1 Have you since gone back to full duties?

If yes, please answer Question 19.2; if no, please move on to Question 20.

Yes No

If yes, when did you return to full working duties?

19.2 If you do not know the exact date, approximately how many weeks did you have altered work duties?

| | | | | | | | |
|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| d | d | m | m | y | y | y | y |

- a) Less than a week
- b) 1 – 2 weeks
- c) More than 2 weeks, but less than 3 weeks
- d) 3 weeks or longer

20 If you would like to give us any additional information about returning to work, please do so here:

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SECTION C: HAND AND WRIST SYMPTOMS

21 The following questions refer to your symptoms over the last 7 days. Please answer for each hand. Please tick one box for each row.

| 21.1 How severe were the following symptoms in your <u>RIGHT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>RIGHT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 21.2 How severe were the following symptoms in your <u>LEFT</u> hand? | None | Mild | Moderate | Severe | Very severe |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Pain at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pain during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Numbness or tingling at night | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Numbness or tingling during the daytime | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| How often did the following symptoms in your <u>LEFT</u> hand wake you up at night? | Never | Once | 2 or 3 times | 4 or 5 times | More than 5 times |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| e) Pain | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Numbness or tingling | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22 This question refers to the appearance (look) of your hands during the past 7 days. Please tick one box for each hand.

| | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|--------------------------|--------------------------|----------------------------|--------------------------|--------------------------|
| a) I am satisfied with the appearance (look) of my <u>RIGHT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) I am satisfied with the appearance (look) of my <u>LEFT</u> hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION C: HAND AND WRIST SYMPTOMS

23 How do you rate your symptoms in your operated hand(s) now, compared to before your surgery? Please tick one box.

- a) Completely cured c) Unchanged e) Worse
 b) Much better d) Slightly better

24 The following questions ask specifically about your scar. Please think about your scar over the ***past 7 days***.

24.1 Has your scar been itchy?

If yes, please continue; if no, please move on to Question 24.2

Yes No

Yes, it was itchy: Sometimes Often Always

And when it was itchy, it was: Slightly itchy Fairly itchy Very itchy

24.2 Has your scar caused you pain?

If yes, please continue; if no, please move on to Question 24.3

Yes No

Yes, it was painful: Sometimes Often Always

And when it hurt, it was: Slightly painful Fairly painful Very painful

24.3 Has your scar been uncomfortable?

If yes, please continue; if no, please move on to Question 24.4

Yes No

Yes, it was uncomfortable: Sometimes Often Always

And when it was uncomfortable, it was: Slightly uncomfortable Fairly uncomfortable Very uncomfortable

SECTION C: HAND AND WRIST SYMPTOMS

24.4 Has your scar felt numb?

If yes, please continue; if no, please move on to Question 24.5

Yes No

Yes, it was numb: Sometimes Often Always

And when it felt numb, it was: Slightly numb Fairly numb Very numb

24.5 Have you had odd sensations in your scar e.g. tightening, pulling or pins and needles? If yes, please continue; if no, please move on to Question 24.6

Yes No

Yes, I have had odd sensations: Sometimes Often Always

24.6 Has your scar caught on things e.g. clothing?

If yes, please continue; if no, please move on to Question 24.7

Yes No

Yes, it has caught on things: Sometimes Often Always

24.7 Overall, how troublesome are the symptoms from your scar?

Please tick one box.

Not at all troublesome A little troublesome Fairly troublesome Very troublesome Unbearable

SECTION D: HAND AND WRIST FUNCTION

The following questions refer to the function of your hands/wrists during the ***past 7 days***. Please answer all questions for the right and left sides, even if you do not experience any problems. Please tick one box for each question.

| 25 RIGHT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>right</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>right</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>right</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>right</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| 26 LEFT SIDE | Very well | Well | Adequately | Poorly | Very poorly |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Overall, how well did your <i>left</i> hand work? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) How well did your <i>left</i> fingers move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) How well did your <i>left</i> wrist move? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Very good | Good | Fair | Poor | Very poor |
| d) How was the strength in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) How was the sensation (feeling) in your <i>left</i> hand? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to the ability of your hands to do certain tasks during the ***past 7 days***. If you do not do a certain task, please estimate the difficulty you would have in performing it. Please tick one box for every activity.

| 27 How difficult was it for you to perform the following activities using your RIGHT HAND? | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|---|-----------------------------|---------------------------|---------------------------|-----------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

28 How difficult was it for you to perform the following activities using your LEFT HAND?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Turn a door knob | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Pick up a coin | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Hold a glass of water | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Turn a key in a lock | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Hold a frying pan | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

29 How difficult was it for you to perform the following activities using BOTH HANDS?

| | Not at all difficult | A little difficult | Somewhat difficult | Moderately difficult | Very difficult |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| a) Open a jar | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Button a shirt/blouse | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Eat with a knife/fork | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Carry a grocery bag | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Wash dishes | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Wash your hair | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| g) Tie shoelaces/knots | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

The following questions refer to your satisfaction with your hands/wrists during the **past 7 days**. Please tick one box for each question.

30 How satisfied were you with your RIGHT hand/wrist during the **past 7 days**?

| RIGHT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

SECTION D: HAND AND WRIST FUNCTION

31 How satisfied were you with your LEFT hand/wrist during the *past 7 days*?

| LEFT HAND | Very satisfied | Somewhat satisfied | Neither satisfied or dissatisfied | Somewhat dissatisfied | Very dissatisfied |
|-------------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| a) Overall function of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Movement of the fingers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c) Movement of your wrist | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d) Strength of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e) Pain level of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f) Sensation (feeling) of your hand | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

32 If you would like to give us any additional information about your hand and wrist function, please do so here:

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**Thank you for completing this questionnaire!
Please return it to the REACTS team
using the pre-paid envelope.**



If you have any questions or would like any additional information, please contact Lisa Newington on:
ln@mrc.soton.ac.uk | 023 8077 7624 | 07866 997732

SUPPLEMENTARY TABLES

1. Cox proportional hazards univariate analyses of the association between demographic and general health factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Body mass index (kg/m²) (censored 1 normal, 1 overweight, 2 obese; 13 missing)</i> | | | | | | |
| Normal (18.5-24.9) | 47 | 20 | 12-33 | 1 | - | - |
| Over (25.0-29.9) | 64 | 19 | 12.5-29 | 0.98 | 0.65, 1.46 | 0.91 |
| Obese (≥30) | 67 | 21 | 10-40 | 0.88 | 0.60, 1.28 | 0.50 |
| <i>Surgery to dominant hand ² (censored 3 yes, 2 no; no missing data)</i> | | | | | | |
| Yes | 128 | 19.5 | 12-33 | 1 | - | - |
| No | 62 | 22 | 12-35 | 0.83 | 0.61, 1.14 | 0.25 |
| <i>General health status (censored 5 excellent; 1 missing)</i> | | | | | | |
| Excellent/very good/ good | 165 | 19 | 12-32 | 1 | - | - |
| Fair/poor | 24 | 28.5 | 12.5-42 | 0.74 | 0.47, 1.16 | 0.19 |
| <i>Number of comorbidities ³ (censored 3 none, 1 one; 1 missing)</i> | | | | | | |
| None | 49 | 18 | 7-32 | 1 | - | - |
| One | 67 | 24 | 14-42 | 0.87 | 0.59, 1.27 | 0.47 |
| Two or more | 74 | 19.5 | 10-29 | 1.11 | 0.76, 1.62 | 0.60 |
| <i>Number of disability comorbidities ³ (censored 3 none, 2 one; no missing data)</i> | | | | | | |
| None | 130 | 19 | 9-33 | 1 | - | - |
| One | 39 | 26 | 13-31 | 0.75 | 0.52, 1.08 | 0.12 |
| Two or more | 21 | 20 | 14-31 | 0.81 | 0.50, 1.32 | 0.40 |
| <i>Number of somatising symptoms ⁴ (censored 1 none, 1 one, 3 two or more; 1 missing)</i> | | | | | | |
| None | 96 | 19 | 10.5-35 | 1 | - | - |
| One | 51 | 22 | 13-34 | 0.98 | 0.70, 1.38 | 0.91 |
| Two or more | 42 | 19.5 | 14-31 | 0.84 | 0.58, 1.22 | 0.36 |
| <i>SF36 Mental health score (tertiles) ⁵ (censored 2 poor, 1 intermediate, 2 good; 2 missing)</i> | | | | | | |
| Poor (22.2-57.8) | 60 | 24 | 16-39 | 0.71 | 0.50, 1.03 | 0.07 |
| Intermediate (60.0-75.6) | 68 | 18.5 | 11-36.5 | 0.88 | 0.62, 1.25 | 0.48 |
| Good (77.8-97.8) | 60 | 16.5 | 7-30 | 1 | - | - |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Considered and the non-dominant hand for those who reported ambidexterity (n=4) and dominant hand for those undergoing simultaneous bilateral surgery (n=2).

³. Adapted from the self-administered co-morbidity questionnaire [1].

⁴. Adapted from the four-dimensional symptom questionnaire [2].

⁵. Taken from the SF-36 with data-driven tertiles [3].

2. Cox proportional hazards univariate analyses of the association between health beliefs and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Believe will be unable to use hand normally in 3 months ² (censored 5 no; 2 missing)</i> | | | | | | |
| No | 168 | 20 | 12-32.5 | 1 | - | - |
| Yes | 20 | 20.5 | 14.5-40 | 1.04 | 0.65, 1.67 | 0.87 |
| <i>Blames self for hand problem ² (censored 5 no; 2 missing)</i> | | | | | | |
| No | 162 | 20 | 12-35 | 1 | - | - |
| Yes | 26 | 22 | 14-31 | 1.08 | 0.70, 1.66 | 0.73 |
| <i>Lack of support from family/friends ² (censored 4 no, 1 yes; 2 missing)</i> | | | | | | |
| No | 156 | 20 | 12-32.5 | 1 | - | - |
| Yes | 32 | 19.5 | 13-40 | 0.88 | 0.60, 1.29 | 0.51 |
| <i>Problem runs in the family/born with a weakness ³ (censored 3 no, 2 agree/strongly agree; 2 missing)</i> | | | | | | |
| No | 134 | 20 | 12-35 | 1 | - | - |
| Agree/strongly agree | 54 | 23 | 12-31 | 0.88 | 0.63, 1.21 | 0.42 |
| <i>Stress made the problem worse ³ (censored 5 no; 2 missing)</i> | | | | | | |
| No | 169 | 20 | 12-33 | 1 | - | - |
| Agree/strongly agree | 19 | 28 | 14-40 | 0.79 | 0.48, 1.28 | 0.33 |
| <i>Lack of exercise contributed to the problem ³ (censored 5 no; 2 missing)</i> | | | | | | |
| No | 172 | 20 | 13-33 | 1 | - | - |
| Agree/strongly agree | 16 | 15 | 10.5-34.5 | 1.23 | 0.73, 2.06 | 0.43 |
| <i>Getting older contributes to the problem ³ (censored 3 no, 2 yes; 3 missing)</i> | | | | | | |
| No | 79 | 26 | 14-42 | 1 | - | - |
| Agree/strongly agree | 108 | 16 | 10-29 | 1.28 | 0.94, 1.74 | 0.11 |
| <i>Work probably didn't cause the problem, but made it worse ³ (censored 2 no, 3 yes; 4 missing)</i> | | | | | | |
| No | 100 | 20.5 | 12-35 | 1 | - | - |
| Agree/strongly agree | 86 | 19.5 | 13-31 | 1.01 | 0.75, 1.35 | 0.95 |
| <i>Pain catastrophisation to at least a moderate degree ⁴ (censored 3 no, 2 yes; missing 2)</i> | | | | | | |
| No | 133 | 19 | 10-33 | 1 | - | - |
| Yes | 55 | 22 | 15-31 | 0.81 | 0.59, 1.12 | 0.21 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹ Adjusted for age and sex.

² Reported on a 0-10 scale and dichotomised to no (0-6) and yes (7-10) [4].

³ Reported on a 5-point scale and dichotomised to agree/strongly agree and neither agree nor disagree/disagree/disagree strongly [5].

⁴ Pain catastrophizing scale dichotomised to those who reported catastrophizing pain thoughts and feelings to at least a moderate degree in response to all questions and those who did not [6].

3. Cox proportional hazards univariate analyses of the association between clinical and surgical factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|---|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Katz hand diagram score for side of surgery</i> ² (censored 3 classics/probable, 2 possible/unlikely; 4 missing) | | | | | | |
| Classic/probable | 126 | 22 | 14-38 | 1 | - | - |
| Possible/unlikely | 60 | 16.5 | 9.5-30.5 | 1.10 | 0.81, 1.51 | 0.54 |
| <i>Duration of symptoms</i> (censored 1 ≤ 1 year, 4 > 1 year; 2 missing) | | | | | | |
| ≤ 1 year | 47 | 19 | 10-31 | 1 | - | - |
| > 1 year | 141 | 20 | 13-34 | 0.86 | 0.62, 1.21 | 0.38 |
| <i>Nerve conduction studies performed</i> (censored 3 no, 2 yes; 40 missing) | | | | | | |
| No | 71 | 21 | 14-35 | 1 | - | - |
| Yes | 79 | 20 | 11-33 | 1.14 | 0.83, 1.58 | 0.41 |
| <i>Type of suture material</i> (censored 4 non-absorbable; 49 missing) | | | | | | |
| Non-absorbable | 119 | 21 | 12-38 | 1 | - | - |
| Absorbable | 23 | 20 | 13-29 | 1.15 | 0.73, 1.83 | 0.55 |
| <i>MHQ function score for side of surgery</i> (tertiles) ³ (censored 3 poor, 1 intermediate, 1 good; 2 missing) | | | | | | |
| Poor (0-40) | 79 | 20 | 13-41 | 0.80 | 0.57, 1.12 | 0.19 |
| Intermediate (44-55) | 48 | 19.5 | 13.5-33 | 0.81 | 0.55, 1.19 | 0.29 |
| Good (60-100) | 61 | 20 | 7-29 | 1 | - | - |
| <i>MHQ bilateral activities of daily living score</i> (tertiles) ³ (censored 1 poor, 4 intermediate; 1 missing) | | | | | | |
| Poor (0-61) | 72 | 19 | 12.5-33.5 | 0.96 | 0.66, 1.38 | 0.81 |
| Intermediate (64-82) | 55 | 21 | 13-38 | 0.70 | 0.49, 1.01 | 0.06 |
| Good (83-100) | 62 | 20 | 10-31 | 1 | - | - |
| <i>MHQ activities of daily living score, side of surgery</i> (tertiles) ³ (censored 2 poor, 3 intermediate; 1 missing) | | | | | | |
| Poor (0-55) | 63 | 20 | 12-42 | 0.81 | 0.56, 1.18 | 0.27 |
| Intermediate (58-80) | 63 | 20 | 14-35 | 0.86 | 0.61, 1.23 | 0.42 |
| Good (85-100) | 63 | 20 | 9-32 | 1 | - | - |
| <i>MHQ satisfaction score for side of surgery</i> (tertiles) ³ (censored 3 poor, 2 intermediate; no missing data) | | | | | | |
| Poor (0-25) | 88 | 21.5 | 13-42 | 0.78 | 0.55, 1.11 | 0.16 |
| Intermediate (29-50) | 49 | 18 | 14-29 | 0.87 | 0.59, 1.28 | 0.48 |
| Good (54-100) | 53 | 20 | 9-31 | 1 | - | - |
| <i>Satisfaction with appearance for side of surgery</i> ⁴ (censored 2 satisfied, 3 dissatisfied; 1 missing) | | | | | | |
| Satisfied | 136 | 20 | 10.5-31.5 | 1 | - | - |
| Dissatisfied | 53 | 20 | 13-40 | 0.84 | 0.61, 1.16 | 0.29 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Adapted from Calfee et al. [7].

³. Michigan Hand Questionnaire [8]. Data-driven tertiles.

⁴. Reported on a 5-point scale in response to the statement: I am satisfied with the appearance (look) of my hand. Dichotomised as satisfied (strongly agree/agree) and dissatisfied (neither agree nor disagree, disagree, strongly disagree).

4. Cox proportional hazards univariate analyses of the association between occupational factors and the duration of work absence after carpal tunnel release (non-significant findings)

| | N | Median time to return to work (days) | Inter quartile range | Hazards ratio ¹ | 95% Confidence intervals | P value |
|--|-----|--------------------------------------|----------------------|----------------------------|--------------------------|---------|
| <i>Have more than one paid job (censored 4 no, 1 yes; 1 missing)</i> | | | | | | |
| No | 177 | 20 | 12-32 | 1 | - | - |
| Yes | 12 | 26.5 | 19-42 | 0.61 | 0.34, 1.11 | 0.11 |
| <i>Total paid work hours per week ² (censored 4 ≤37.5, 1 >37.5; no missing data)</i> | | | | | | |
| ≤37.5 | 97 | 22 | 15-38 | 1 | - | - |
| >37.5 | 93 | 16 | 6-29 | 1.25 | 0.88, 1.79 | 0.21 |
| <i>Number of work days per week (censored 1 <5, 4 5; no missing data)</i> | | | | | | |
| <5 | 55 | 23 | 15-35 | 1 | 0.72, 1.39 | 0.98 |
| 5 | 116 | 19 | 10.5-33 | 1 | - | - |
| >5 | 19 | 13 | 6-31 | 1.28 | 0.77, 2.14 | 0.34 |
| <i>Sick leave taken for this problem in the last month (censored 5 no; 16 missing)</i> | | | | | | |
| No | 154 | 20 | 12-33 | 1 | - | - |
| Yes | 20 | 15 | 9.5-30 | 0.99 | 0.61, 1.60 | 0.95 |
| <i>Sick leave taken for another problem in the last month (censored 4 no, 1 yes; 20 missing)</i> | | | | | | |
| No | 152 | 19 | 10.5-31 | 1 | - | - |
| Yes | 18 | 30 | 21-42 | 0.67 | 0.41, 1.09 | 0.10 |
| <i>Received advice about return to work after surgery (censored 5 yes; 3 missing)</i> | | | | | | |
| Yes | 134 | 19 | 12-31 | 1 | - | - |
| No | 53 | 22 | 14-41 | 0.92 | 0.67, 1.27 | 0.61 |
| <i>Required to work to tight deadlines ³ (censored 3 no, 2 yes; missing 3)</i> | | | | | | |
| No | 75 | 23 | 14-40 | 1 | - | - |
| Yes | 112 | 18 | 9.5-31 | 1.19 | 0.89, 1.61 | 0.24 |
| <i>Use power tools that make the hand/arm vibrate ³ (censored 5 no; missing 7)</i> | | | | | | |
| No | 145 | 19 | 12-32 | 1 | - | - |
| Yes | 38 | 22 | 14-42 | 0.68 | 0.44, 1.05 | 0.08 |
| <i>Work with hands above shoulder height for >1 hour ³ (censored 4 no, 1 yes; missing 9)</i> | | | | | | |
| No | 147 | 20 | 12-33 | 1 | - | - |
| Yes | 34 | 19.5 | 13-33 | 0.89 | 0.60, 1.32 | 0.56 |
| <i>Work with neck bent forward for >2 hours ³ (censored 3 no, 2 yes; missing 3)</i> | | | | | | |
| No | 114 | 21 | 13-39 | 1 | - | - |
| Yes | 73 | 18 | 8-31 | 1.19 | 0.88, 1.60 | 0.26 |
| <i>Work with neck twisted for >30 minutes ³ (censored 4 no, 1 yes; missing 7)</i> | | | | | | |
| No | 136 | 20 | 12-34 | 1 | - | - |
| Yes | 47 | 22 | 13-32 | 0.93 | 0.66, 1.32 | 0.70 |
| <i>Drive for >1 hour per day ³ (censored 5 no; missing 5)</i> | | | | | | |
| No | 115 | 21 | 13-38 | 1 | - | - |
| Yes | 70 | 16 | 7-31 | 1.22 | 0.88, 1.68 | 0.24 |

Total sample size n=195. Median duration of work absence relates to the 190 non-censored events.

¹. Adjusted for age and sex.

². Dichotomised by the median for the sample population

³. As part of the normal working day [9].

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STROBE checklist (cohort study)

| Item | Recommendation | Location |
|-------------------------------|--|-------------------------------------|
| Title and abstract | | |
| <i>Title</i> | Indicate study design | Title |
| Introduction | | |
| <i>Background</i> | Explain scientific background and rationale | Introduction |
| <i>Objectives</i> | State objectives and any pre-specified hypotheses | Introduction |
| Methods | | |
| <i>Study design</i> | Present key elements of the study design early | Introduction & methods |
| <i>Setting</i> | Describe the setting, locations and relevant dates | Methods |
| <i>Participants</i> | Give eligibility criteria, sources and methods of selection of participants, and methods of follow-up | Methods & table 1 |
| <i>Variables</i> | Clearly define all outcomes, exposures, predictors, potential confounders and effect modifiers | Methods & supplementary files 1-2 |
| <i>Data sources</i> | Give sources of data and methods of assessment | Methods & tables 2-5 |
| <i>Bias</i> | Describe and effects to address potential sources of bias | Methods & discussion |
| <i>Study size</i> | Explain how the study size was determined | Methods |
| <i>Quantitative variables</i> | Described how quantitative variables were handled in the analyses | Tables 2-5 |
| <i>Statistical methods</i> | Described all statistical methods Explain how missing data were addressed Explain how lost to follow-up was addressed | Statistical methods & tables 2-5 |
| Results | | |
| <i>Participants</i> | Reported the number of individuals at each stage of the study Give reasons for non-participation | Figure 1 Figure 1 |
| <i>Descriptive data</i> | Give characteristics of study participants Indicate number of participants for each variables of interest Summarise follow-up time | Tables 2-5 Tables 2-5 Results |
| <i>Outcome data</i> | Report number of outcome events over time | Results |
| <i>Main results</i> | Give adjusted and unadjusted estimates and measures of precision. Make clear which confounders were adjusted for | Table 4 & supplementary file 3 |
| <i>Other analyses</i> | Reported any subgroup analyses | Table 4 & supplementary file 3 |