

APPENDIX 1: SUMMARY OF INCLUDED PAPERS

Year	Author(s)	Study type	Study design	Population	Sample size (response rate if available/applicable)	Objectives	Findings
2020	S. Ansell, J. Read, M. Bryce (36)	Qualitative	Focus groups	Doctors in final year of GP training in the UK	16	To identify challenges to wellbeing experienced by GP postgraduate trainees and explore how they respond	Challenges to well-being included dysfunctional relationships with colleagues and patients, workload, perceived lack of support at work and physical environment.
2019	D. Bhugra, S. Sauerteig, D. Bland et al. (56)	Quantitative	Survey by BMA	Doctors and medical students in the UK	4347	To study prevalence of burnout, mental wellbeing, and psychiatric disorder among doctors and medical students in the UK	Doctors working the longest hours appeared most vulnerable. Medical students and junior doctors reported highest rate of formally diagnosed mental health condition in last 12 months. Junior doctors least likely to be aware of how to access support.
2019	British Medical Association (76)	Grey literature	Narrative interviews	Junior doctors in the UK	10	To explore lived experiences of doctors in training dealing with mental illness and make recommendations regarding support	Doctors in training are reluctant to take sick leave and work when they know they are unwell. They are concerned their illness will be disclosed, and struggle to access support. Returning to work can be difficult.

2020	B. Caesar, A. Barakat, C. Bernard et al. (64)	Quantitative	Questionnaire	Doctors of all grades in a UK hospital	165 (77.6%)-46 registrars, 71 doctors below registrar level	To assess degree of burnout among physicians of different grades and specialties in a major trauma centre	93% of respondents demonstrated moderate or high levels of burnout. Junior doctors had highest overall burnout score. Work-related factors contribute more to occurrence of burnout than patient-related factors or doctor-patient interactions.
2019	A. Carpenter, S. Vora, S. Kestenbaum et al. (57)	Mixed	Survey	Junior doctors (below registrar level) in the UK	172 (63%)	To assess prevalence of afternoon ward rounds and effect on those undertaking them	Approximately 1/3 of doctors did afternoon ward rounds. They contributed to late finishes, delayed patient discharge, reduced team efficiency and reduced job satisfaction. 80% felt less likely to consider a hospital medicine career as a result.
2020	E. Chandler, E. Briggs, H. Whitfield (78)	Quantitative	Survey	Foundation doctors in the UK	448	To assess whether foundation doctors had been influenced by recent history (strikes and Bawa-Garba case), and whether they feel prepared to deal with medico-legal issues	Some doctors were unaware of the need for malpractice indemnity cover. The Bawa-Garba case had had a significant impact on career intentions. Nearly 40% of respondents had been bullied.
2016	J. Cleland, P. Johnston, V. Watson et al. (65)	Quantitative	Discrete choice experiment	Junior doctors in the UK	1323	To investigate strength of UK junior doctors' preferences for training post characteristics in terms of monetary value	Good working conditions were the most influential characteristics, followed by opportunities for spouse/partner and desirable geographical location.

2016	J. Curran, P. Baker (66)	Mixed	Questionnaire and focus group	Medical students and foundation doctors in the UK	94 medical students and doctors	To identify reasons for unfilled foundation training posts in a hospital within an oversubscribed foundation school	Location identified as single biggest factor affecting where foundation applicants applied. Free/heavily subsidised accommodation or offer of additional qualifications in leadership/teaching identified as main incentives that would have a positive effect on applications.
2019	I. Gafson, K. Sharma, A. Griffin (74)	Qualitative	Focus groups	Junior doctors in a UK hospital	16	To establish what educational support junior doctors need to effectively raise concerns	Most participants dissatisfied with the teaching received on raising concerns. Current systems thought to be good for patient safety issues but not concerns about staff behaviour.
2019	General Medical Council (47)	Grey literature	Survey	Junior doctors in the UK plus trainers	>75,000 junior doctors (94.8%)	To obtain views of trainees on their training and the environments where they work, and views of trainers on their experience	Trainees highly rate quality of their clinical supervision, experience, and teaching they receive. There are signs that fewer trainees are working beyond their rostered hours.
2018	General Medical Council (58)	Grey literature	Telephone interviews with junior doctors and supervisors, focus groups with junior doctors	Junior doctors and supervisors in the UK	1008 junior doctors plus 18 supervisors	To explore the reasons, motivations and experiences of doctors taking a break in training	A break in training does not mean a break from medicine. Reasons for taking a break related to health and wellbeing, uncertainty about career direction, and dissatisfaction with the training environment. Need to prevent or recover from burnout is a key driver.

2017	A. Goddard (49)	Commentary	Personal reflection	UK medical registrar	1	To consider whether working conditions and future prospects for medical registrars have changed since the RCP report 'The medical registrar: empowering the unsung heroes of patient care'	There has been progress since the report, but not as much as many would have hoped.
2017	S. Gregory, C. Demartini (50)	Quantitative	Used data from 4 GMC National Training Surveys	Junior doctors in the UK	173,652 observations (97%) (some observations will be for the same doctors in different years)	To consider the training environment factors affecting satisfaction of trainee doctors with their training	Key factors that determine trainee satisfaction are strong clinical supervision, frequent and useful feedback meetings, an adequate workload and a supportive environment.
2016	R. Harries, M. Rashid, P. Smitham et al. (51)	Mixed	Questionnaire	Junior doctors in the UK	3603	To obtain a focused perspective on the proposed reforms from doctors in training	Trainees support some recommendations of the Shape of Training Review but one size does not fit all. Most trainees want to provide a specialist service on a generalist background.
2017	Health Education England (28)	Grey literature	Focus groups with junior doctors plus information	Junior doctors in England	Not stated	To address non-contractual issues that arose during the	Lack of support, feeling valued and autonomy are key issues. There is unequivocal evidence on low morale and

			from postgraduate deans			junior doctors' contract negotiation	this document presents a strategy for how to improve it.
2020	A. Hollis, J. Streeter, C. Van Hamel et al. (52)	Qualitative	Semi-structured interviews	F2 doctors in the UK who had not applied to specialty training	16	To explore the reasons why the number of UK foundation doctors choosing to go straight into specialty training has fallen	Reasons foundation doctors are choosing not to go straight into speciality training centre around themes of feeling undervalued, career uncertainty and a new cultural norm.
2018	G. Iacobucci (77)	Commentary	Summary of round table event at Nuffield health policy summit	Panel included a GP trainee (also national medical director's clinical fellow)	1 junior doctor included	To discuss how the NHS can do more to attract, enthuse and hold on to young doctors	Key points from trainee include not feeling valued, new cultural norms, and a recommendation to promote socialising within teams.
2018	C. Kirwan, A. Ali, N. McCarten (53)	Mixed	Review of routine data (exception reports) plus survey	Junior doctors in the UK	201	To reflect on exception reporting, its impact on trainees, and the views/opinions of trainees working under the new contract	Exception reporting works and is felt to be positive. Most reports are done by F1s. Trainees are not happy with the new contract due to concerns that it has generated a less safe environment for patients and doctors.
2018	S. Lachish, M. Goldacre, T. Lambert (71)	Mixed	Survey	Doctors 3 years after graduation in the UK	3390 (48.2%)	To assess doctor's views on the timing of choosing a clinical specialty	Most doctors agreed they had had to choose a specialty too early. Doctors felt rushed due to insufficient exposure to range of specialties, desire for greater

							breadth of experience, and inadequate career advice.
2016	S. Lachish, M. Goldacre, T. Lambert (70)	Quantitative	Survey	F1 doctors in the UK	2324 (45%)	To examine whether perceived level of support received by new medical graduates from their employer influences attitudes towards first postgraduate year	Strong positive associations between perceived institutional support and enjoyment of F1 year exist. Doctors who reported lower levels of support were significantly less likely to express intentions to continue practising medicine in the UK.
2018	T. Lambert, F. Smith, M. Goldacre (54)	Qualitative	Survey	UK doctors 3 years after graduation	5291 (46.2%)	To report the reasons why doctors are considering leaving medicine or the UK	For those considering working in medicine abroad, the most commonly cited reasons were to gain wider experience, that things would be 'better' elsewhere and a negative view of the NHS. For those considering leaving medicine, the main reason was a negative view of the NHS.
2016	F. Laskaratos, D. Parry, H. El-Mileik (55)	Mixed	Questionnaire and semi-structured interviews	Higher specialty trainees in medicine in a UK hospital	18	To investigate perceptions of post-take ward rounds (PTWR) among higher specialty trainees	Most felt that the focus of PTWRs was service provision. There was little time devoted to teaching and feedback was rare. Main barriers to teaching were time pressures, workload and interruptions.
2017	J. Lefroy, S. Yardley, R. Kinston et al. (37)	Qualitative	Logbooks, audio diaries, interviews, focus groups	Medical students and junior doctors in the UK	32 medical students (11 followed through to first	To identify causal chains of contextual factors and mechanisms that lead to a trainee being capable of	Transition is a step change in responsibility for which total preparedness is not achievable. Building self-efficacy for tasks was important. During transition, the key

					postgraduate role) plus 70 junior doctors	completing tasks for the first time	contextual factor was the provision of appropriate support from colleagues.
2016	K. Mattick, K. Kaufhold, N. Kelly et al. (72)	Qualitative	Interviews	F1 doctors, other trainee doctors, other stakeholders including deans and public	77 junior doctors, plus 188 other stakeholders	To explore UK stakeholders' views about the proposal that full registration is aligned with medical school graduation	This policy change would require considerable planning and preliminary work. Issues include the F1 year as a safety net, implications for undergraduate education and F1 working practices, and financial/political/structural implications.
2017	L. McClelland, J. Holland, J. Lomas et al. (38)	Mixed	Survey	Trainee anaesthetists in the UK	2231 (59%)	To assess the incidence and effects of fatigue on anaesthetic trainees	Fatigue is prevalent amongst anaesthetic trainees and has effects on physical health, psychological wellbeing and personal relationships. Night shift work is the most problematic.
2018	R. Penfold (11)	Commentary	Literature review and personal reflection	Junior doctor in the UK	1	To discuss why junior doctors need more autonomy in order to have improved morale	To tackle low morale, strategies must empower doctors in training by giving them more control over tasks and their working environment.
2016	A. Rich, R. Viney, S. Needleman et al. (59)	Qualitative	Semi-structured focus groups and interviews	Junior doctors and trainers in the UK	96 trainees, 41 trainers	To investigate the work-life balance of UK doctors in training from the perspectives of trainees and trainers	Lack of work-life balance in training negatively impacts on learning and wellbeing. Women with children are particularly affected.

2019	C. Rizan, J. Montgomery, C. Ramage et al. (39)	Qualitative	In-depth interviews	Doctors taking a break after F2 year ('F3')	14	To explore the reasons why F2 doctors are choosing to take a year out of training and the impact on future career choices	Exhaustion and stress; requiring more time to make specialty decisions and prepare portfolios; and feeling a loss of control all result in need for a break. Doctors returning to NHS posts brought valuable experience.
2016	Royal College of Physicians (40)	Grey literature	Survey plus round table discussion	Trainee physicians in the UK	528	To explore the challenges that face the NHS from the perspective of junior doctors	Being a junior doctor is intense, rewarding and challenging. Issues include workforce pressures, the working environment, wellbeing and training. The profession is under pressure and patient safety is at risk.
2018	C. Ryan, E. Ward, M. Jones (41)	Mixed	Online survey (closed and free-text questions)	Core and higher speciality physician trainees in Scotland	846	To understand the influences on career choice and retention of trainee physicians	70% of trainees stated experience prior to current role had a positive impact on career choice. Core trainees were less likely to report enjoying their job than higher speciality trainees. Uncertainty regarding job location and inability to demonstrate professional ability were key complaints.
2018	B. Sahib (63)	Grey literature	Ideas based on personal experience	Junior doctor in the UK	1	To discuss potential 'quick wins' which could help to improve the morale of junior doctors	Suggestions include improved rota planning, induction, rest facilities, out-of-hours support and debriefs.
2018	G. Scanlan, J. Cleland, P.	Quantitative	Discrete choice experiment	F2 doctors in Scotland	677	To investigate the relative value of UK doctors'	Location was the most influential characteristic of a training post, followed

	Johnston et al. (67)					preferences for different training post characteristics	by supportive culture and then working conditions.
2018	G. Scanlan, J. Cleland, K. Walker et al. (42)	Qualitative	Semi-structured interviews	Foundation doctors in the UK	21	To explore what a supportive culture means to early career doctors and how perceptions of support may influence career decision making	Support influenced job satisfaction and engagement. Feeling valued was important. Perceiving a poor level of support from the organisation and its representatives had a detrimental impact on intentions to stay working in the NHS.
2020	G. Scanlan, P. Johnston, K. Walker et al. (60)	Quantitative	Discrete choice experiment	F2 doctors in the UK	5005 (73%)	To examine the strength of work-related preferences in male and female doctors	The relative value of each attribute was similar for males and females, with location most valued and familiarity with specialty least valued.
2019	R. Singh, J. Kirtley, J. Minhas et al. (43)	Mixed	Survey	Junior doctors in a UK hospital	402 (42.6%)	To identify and explore factors affecting junior doctor morale in a UK teaching hospital	Overall morale score was 6/10 (IQR 5-8). The score for feeling supported was higher than feeling valued or autonomous. Diverse themes affect morale.
2018	S. Smith, V. Tallentire, L. Pope et al. (44)	Qualitative	Semi-structured interviews	F2 doctors in Scotland considering leaving UK medicine after foundation training	17	To explore the reasons for doctors choosing to leave UK medicine after their foundation years	Reasons given were similar to those for other professionals considering a career change. Medicine-specific factors included needing to choose specialty in F2, workplace bullying and difficulty raising concerns. Most viewed it as a temporary break rather than permanent job change.

2017	S. Spooner, J. Gibson, D. Rigby et al. (61)	Mixed	Survey and interviews	F2 doctors in England	816 (12.6%)	To examine the extent and nature of the impact of the proposed new contract on junior doctors' career decisions	Doctors reported that contract-related issues have affected their career plans. Most notable effect is a move from acute to community-based specialities, with the former perceived as more negatively affected by proposed changes.
2017	S. Spooner, E. Pearson, J. Gibson et al. (45)	Qualitative	Narrative interviews	F2 doctors in England	20	To examine how experiences of medical work and perceptions of specialty training shape junior doctors' career decisions	Junior doctors' preferences and perceptions about work are influenced by multiple intrinsic and extrinsic factors and experiences. Achievement of work-life balance was a key priority.
2016	E. Stratta, D. Riding, P. Baker (46)	Qualitative	Semi-structured interviews	F1 doctors from a UK hospital	9	To understand whether UK foundation doctors perceived ethical erosion and empathy decline during their initial year of work, and if so, why	F1 doctors experience ethical erosion and notice it in their colleagues as they start clinical practice. This has serious implications for patient care. Improving working conditions could help reverse this.
2020	UK Foundation Programme (3)	Grey literature	Survey	F2 doctors in the UK	6864 (93.1%)	To determine the career aspirations and planned career destinations of F2 trainees	The percentage of foundation trainees remaining in the UK to work as a doctor in service or training posts is slightly higher than 2018 (55.6%). The number of F2s choosing to progress directly to specialty training in the UK is continuing to decline.
2019	G. Vance, S. Jandial, J.	Mixed	Survey, semi-structured	Foundation doctors in the UK plus staff	3697 foundation doctors	To examine what activities make up the work of a foundation doctor	Junior doctors indicated their work constituted three roles: 'support' of ward and team, 'independent practitioner' and

	Scott et al. (62)		interviews and focus groups	who work with them	surveyed (~25%), 21 foundation doctors interviewed		'learner'. The support function dominated work but conflicted with stereotyped expectations of what 'being a doctor' would be.
2017	R. Viney, A. Rich, S. Needleman et al. (68)	Qualitative	Semi-structured interviews and focus groups	Junior doctors and trainers in the UK	96 junior doctors, 41 trainers	To understand trainee doctors' and trainers' perceptions of the annual review of competence progression (ARCP)	There is understanding of need for assessment but criticism of ARCP for perceived tick-box nature and assessment of clerical over clinical ability. ARCP is poor at identifying struggling trainees and discourages excellence.
2019	D. Wainwright, M. Harris, E. Wainwright (79)	Qualitative	Semi-structured telephone interviews	F2 doctors in the UK	24	To explore how recently qualified doctors make sense of banter	Trainees are commonly exposed to banter about the merits of different specialties and those who work in them, but these messages are not decisive in determining career choice. Other factors are often believed to be more significant.
2017	E. Wainwright, F. Fox, T. Breffni et al. (75)	Qualitative	In-depth telephone interviews	Junior doctors in the UK	8	To generate qualitative insight into how the Professional Support Unit (PSU) provided by one UK Deanery is experienced by the trainees who access it.	There was initial reluctance to seek help from the PSU, as acknowledging difficulties spoiled identity as a competent doctor. However, the PSU has a role in repairing medical identity by offering different and acceptable ways to be a doctor.

2016	C. White (69)	Commentary	Discussion with doctors	1 junior doctor and 6 other doctors	7	To understand how the job of a junior doctor now compares with the past	Various views from doctors who trained at different times regarding pros and cons of the style of medical training now compared to in the past.
2016	K. Woolf, A. Rich, R. Viney et al. (73)	Qualitative	Semi-structured focus group and interviews	Junior doctors and trainers in the UK	96 trainees, 41 trainers	To explore trainee doctors' experiences of postgraduate training and fairness in relation to ethnicity and country of primary medical qualification	BME UK graduates and international medical graduates could face difficulties that affected their learning and performance including relationships with senior doctors, cultural differences and lack of trust. Workplace-based assessment and recruitment considered vulnerable to bias.
2019	A. Zhou, A. Money, P. Bower et al. (48)	Qualitative	Focus groups	Junior doctors in the UK	44	To explore the determinants, coping mechanisms and effects of stress in trainee doctors	A range of determinants contribute to stress and a range of mechanisms are used to cope. Stress in working lives can also affect wellbeing and careers.