

# BMJ Open Nursing contributions to virtual models of care in primary care: a scoping review protocol

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## ABSTRACT

**Introduction** Since the onset of the COVID-19 pandemic, virtual care has gained increased attention, particularly in primary care for the ongoing delivery of routine services. Nurses have had an increased presence in virtual care and have contributed meaningfully to the delivery of team-based care in primary care; however, their exact contributions in virtual models of primary care remain unclear. The Nursing Role Effectiveness Model, applied in a virtual care and primary care context, outlines the association between structural variables, nursing roles and patient outcomes. The aim of this scoping review is to identify and synthesise the international literature surrounding nurse contributions to virtual models of primary care.

**Methods and analysis** The Joanna Briggs Institute scoping review methodology will guide this review. We performed preliminary searches in April 2022 and will use CINAHL, MEDLINE, Embase and APA PsycInfo for the collection of sources for this review. We will also consider grey literature, such as dissertations/theses and organisational reports, for inclusion. Studies will include nurses across all designations (ie, nurse practitioners, registered nurses, practical nurses). To ensure studies capture roles, nurses should be actively involved in healthcare delivery. Sources require a virtual care and primary care context; studies involving the use of digital technology without patient–provider interaction will be excluded. Following a pilot test, trained reviewers will independently screen titles/abstracts for inclusion and extract relevant data. Data will be organised using the Nursing Role Effectiveness Model, outlining the virtual care and primary care context (structure component) and the nursing role concept (process component).

**Ethics and dissemination** This review will involve the collection and analysis of secondary sources that have been published and/or are publicly available. Therefore, ethics approval is not required. Scoping review findings will be published in a peer-reviewed journal and presented at relevant conferences, targeting international primary care stakeholders.

## INTRODUCTION

Since the beginning of the COVID-19 pandemic, virtual care (also known as telehealth) has gained significant attention in healthcare delivery and its use has increased

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This protocol is in accordance with the Joanna Briggs Institute methodology for scoping reviews, providing rigorous direction for the development of this timely review.
- ⇒ International literature will be compiled to generate an understanding of nursing presence in virtual healthcare delivery throughout various models of primary care.
- ⇒ Only English and French sources will be included, which may limit the generalisability of findings across all primary care contexts.
- ⇒ This review will provide evidence related to nursing across all designations.

considerably across healthcare systems. Virtual care is defined as ‘any interaction between patients and/or members of their circle of care, occurring remotely, using any forms of communication or information technologies with the aim of facilitating or maximising the quality and effectiveness of patient care’.<sup>1</sup> Virtual care goes beyond the use of telephone and video to include the use of other digital technologies in healthcare, such as text messaging.<sup>2</sup> Virtual models of care aim to improve access to care, provide timely and convenient care, enhance continuity of care and reduce healthcare costs.<sup>2–4</sup> There are also challenges to consider when using virtual care, such as limited access to technology (eg, telephone, internet), lack of virtual care training among providers and low levels of technical literacy among patients.<sup>5</sup>

Primary care practices have relied heavily on virtual care during the pandemic to maintain the delivery of routine healthcare services (eg, chronic disease management, sexual healthcare, screening, patient education) while minimising risks of infection to clinicians and patients.<sup>6,7</sup> There were, however, routine services that may have required an in-person physical assessment (eg, high-risk prenatal care, cervical screening interventions) and



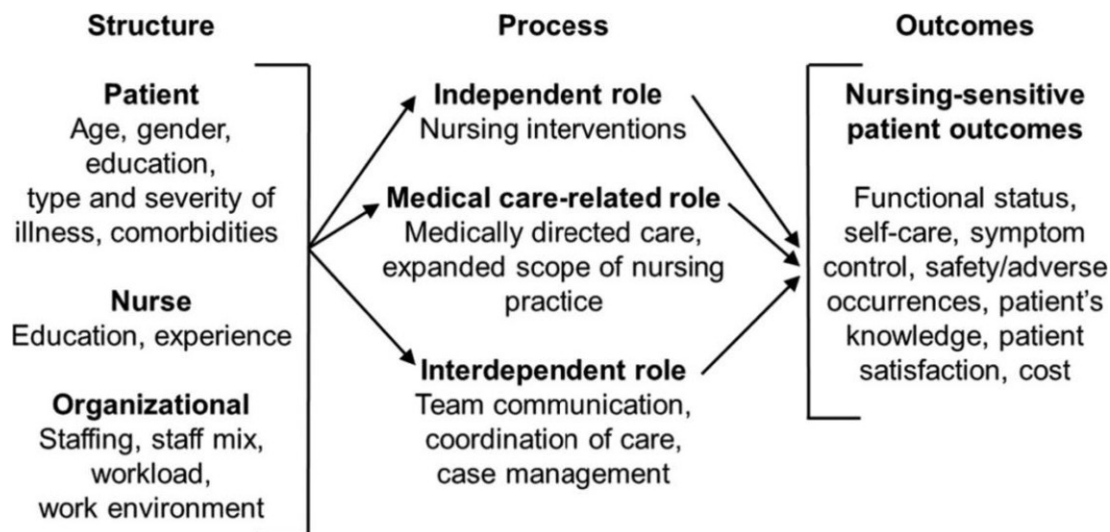
were encouraged to be assessed for appropriateness prior to using virtual care.<sup>8</sup> In the province of Ontario, Canada, between 2019 and 2020, virtual visits in primary care increased from 1.2% to 71.1% across a 7-month period (based on physician billing data).<sup>9</sup> Similarly, survey data from a Quebec study indicated a significant increase in the use of telephone consultations in primary care during the pandemic compared with pre-pandemic use.<sup>10</sup> Nurses practising in primary care, including nurse practitioners (NPs), registered nurses (RNs) and licensed practical nurses (LPNs) (referred to as registered practical nurses (RPNs) in Ontario), have the ability within their scopes of practice to contribute to primary care using virtual modalities. Also, in community health nursing, which encompasses primary care, public health and home care nursing, nurses deliver primary care services as part of their community health practice responsibilities, often in rural/remote areas. Some of these nurses practise in community health centres and are referred to using a more specific title, such as community health nurse (in addition to their designation-specific title, eg, RN).<sup>11</sup> Collectively, nurse contributions to virtual models of primary care are poorly defined, and it is unclear how the organisational attributes of primary care practices support the optimisation of nurses in virtual care delivery and indirectly influence patient outcomes.<sup>12 13</sup>

Primary care, also referred to as general practice or family practice in some jurisdictions, is the initial point of contact patients have with the healthcare system to address their healthcare needs and is delivered in a variety of settings such as clinics, general practitioner offices and health centres.<sup>14</sup> In Canada, practitioners in primary care initiate referrals to specialty care, a model implemented to manage specialist shortages and healthcare costs.<sup>15</sup> There is an ongoing focus on primary care reform to shift care delivery from hospitals to community and promote the development of interdisciplinary, collaborative teams.<sup>16</sup> Nurses contribute to the delivery of services in primary care, either as independent practitioners or collaborative team members alongside other healthcare workers (eg, family physicians, social workers). Strides have been made in Canada to strengthen the integration of nurses in primary care and clarify their roles and functions in team-based care by developing national competencies for RNs in primary care<sup>17</sup> and expanding their scope of practice (eg, increased prescribing authority for NPs).<sup>18</sup> To date, nurses have contributed considerable knowledge and skills to the effectiveness of team-based care in primary care settings.<sup>19</sup> Similarly, their skills and knowledge can be leveraged in the virtual delivery of services.

Nursing involvement in virtual care across healthcare sectors in Canada has expanded with up to a ninefold increase from 2017 to 2020 (ie, email communication, video consultation, facilitation of video consultation with another practitioner).<sup>20</sup> The international literature from Australia and the USA has identified that nurses contribute meaningfully to virtual care delivery in primary care settings, particularly since the onset of

the COVID-19 pandemic.<sup>21 22</sup> In Canada, selected provinces have provided guidance for virtual nursing practice.<sup>23–26</sup> For instance, the College of Registered Nurses of Newfoundland and Labrador outlined virtual practice expectations for RNs/NPs<sup>27</sup>; and the College of Nurses of Ontario provided an overview of practice standards and guidelines specific to virtual care (or telepractice) for RNs/NPs/RPNs.<sup>24</sup> Nonetheless, nurse contributions to virtual modalities require further clarification, in particular their roles in virtual models of primary care. Within a primary care context, defining these roles may be challenging considering the variability that exists in nursing roles across primary care settings, influenced by individual knowledge, scopes of practice and primary care funding models.<sup>12</sup> In Canada, healthcare systems and nurses are both regulated by province/territory,<sup>28</sup> which will directly lead to variation in nurse roles across virtual care models and in primary care, more broadly. Notably, the roles of nurses in these models may mimic their existing in-person roles in primary care and the shift in practice contributions may not be in their specific roles but rather in the modality (ie, virtual) through which these roles are carried out.

The Nursing Role Effectiveness Model (NREM) (figure 1) will be used as a conceptual framework to guide this study. Although this model was developed for acute care, it has been proposed for use in primary care.<sup>29</sup> This model aims to recognise the influence of structure (ie, patient, nurse, organisation) and process (ie, roles) variables on patient and system outcomes.<sup>30</sup> Nursing-sensitive outcomes, which are highlighted in this model, refer to outcomes that result (based on evidence) from nursing interventions or action within their scope of practice.<sup>31</sup> Roles are described as independent, dependent (eg, requires physician order) or interdependent (ie, collaborative delivery with other practitioners). Dependent roles can also be referred to as medical care-related roles; the term 'dependent' will be used to describe these roles throughout. For the purpose of this study, roles will be defined as the responsibilities, activities and tasks carried out by nurses in their involvement with virtual care interventions, programmes and/or initiatives in primary care.<sup>32 33</sup> Within the context of primary care, nursing roles may include chronic disease management, care coordination and pharmaceutical management<sup>34</sup>; however, it remains unclear whether these same roles are carried out virtually by nurses in primary care. The NREM is appropriate for use in this review because it allows nursing roles (or processes) to be considered in relation to both structures and outcomes.<sup>30</sup> This review will not analyse patient outcomes specifically, rather the focus will be on the structure and process components of this model to extract data related to roles in the context of virtual primary care nursing. The contributions of structures and roles need to be clarified to understand how these elements influence patient outcomes to allow virtual nursing practice in primary care to be supported, integrated and sustained.



**Figure 1** Adapted from the Nursing Role Effectiveness Model.<sup>25 26</sup> Medical care-related roles will be referred to as ‘dependent’ roles throughout this study.

National nursing associations, such as the Canadian Nurses Association and the Canadian Nursing Informatics Association, are committed to expanding virtual care access and strengthening the contribution of nurses to virtual care.<sup>35</sup> Nurse leaders have recognised that the use of digital technology in nursing is imperative to the post-pandemic future of the profession as healthcare providers who are integral to the delivery of quality healthcare.<sup>36 37</sup> With ongoing attention on primary care reforms, and an increased focus on virtual care optimisation,<sup>3 4</sup> there is incredible need to generate a clear understanding of nurse contributions to virtual care delivery in primary care practice. To facilitate advancements in nursing informatics, we require a foundation of knowledge that identifies the current state of virtual nursing practice in primary care, and the potential for future integration of nurses in virtual care roles throughout primary care settings.

The aim of this scoping review is to identify and synthesise the international literature surrounding nurse contributions to virtual models of care within primary care settings.

Specifically, the research objectives of this review are to: (a) describe the attributes of virtual models of care within primary care settings that involve nurses (structure); (b) outline the nursing roles that are carried out through virtual delivery (in comparison to in-person) within primary care settings (process) and (c) identify barriers/facilitators to the implementation of virtual models of care (that involve nurses) within primary care settings. For each objective, we will compare urban and rural/remote settings. A scoping review is the chosen methodology when addressing a gap in knowledge and providing a scope of the literature in an emerging area of research.<sup>38</sup> There is limited published literature on virtual care use in primary care within a nursing context; therefore, a scoping review is the most appropriate methodology to gather both scholarly and grey literature to accomplish the objectives of this study.<sup>38</sup> We conducted

a preliminary search of CINAHL, Joanna Briggs Institute (JBI) Evidence Synthesis, Cochrane Database of Systematic Reviews, Google Scholar and Embase to screen for existing systematic or scoping reviews on this topic that have been completed or are underway (search performed 5 April 2022) and found no published protocols or reviews on this topic.

## METHODS AND ANALYSIS

We will conduct the proposed scoping review between July 2022 and June 2023 in accordance with the JBI methodology for scoping reviews.<sup>38</sup> We will use Covidence software to manage literature throughout each step of the review process and facilitate a team approach to screening, as described below. We will use the methodological framework proposed by Arksey and O’Malley<sup>39</sup> to guide the development of this review; and will refer the four stages of the framework to build the protocol: (1) identifying the research question; (2) identifying relevant studies; (3) study selection and (4) charting the data. We will use the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for Scoping Reviews (PRISMA-ScR) checklist to guide the reporting of this review to improve methodological rigour and use appropriate language throughout.<sup>40</sup>

## Patient and public involvement

We will involve patient partners throughout each stage of the review process. We recruited patient partners and involved them in the initial conceptualisation of this project. Both provided insight on the research question and its relevance, and reviewed the methodological process outlined in this protocol, such as the inclusion criteria, search strategy and data extraction approach. They will participate in the analysis process to interpret the findings from a patient perspective. To aid in this process, they will be provided lay summaries to review the

results. Additionally, patient partners will provide feedback on each draft of the review prepared for publication and on all knowledge translation materials prior to their dissemination. Contributions from patient partners may evolve throughout the research process.

### Stage 1: identifying the research question

This scoping review will answer the following research questions: What roles and activities do nurses perform to contribute to the delivery of virtual models of care within primary care settings? What are the key characteristics of virtual models of care within primary care settings that involve nurses? What barriers or facilitators influence the implementation of virtual models of care in primary care and the involvement of nurses in these models of care? How do virtual models of care and nurse contributions to these models of care differ across urban and rural/remote primary care settings?

### Stage 2: identifying relevant studies

#### Inclusion criteria

#### Participants

In this review, we will consider studies that involve nurses practising in primary care. We will include studies if they involve nurses from any professional designation (ie, in Canada these include: NP, RN, LPN/RPN), including community health nurses in rural/remote settings. Notably, nurses practising in primary care may carry an additional title specific to this practice area (eg, general practice nurse); these job titles and professional designations (or protected titles) may differ across countries.<sup>41</sup> We will consider studies that do not specify nurse designation to capture a full understanding of primary care nursing in virtual care. The search strategy will use various terms to capture all generic and primary care-specific nurse titles. Nurses must be licensed/practising; we will exclude any studies focused on student nurses.

#### Concept

We will include data related to nursing roles in the provision or coordination of services in primary care settings using virtual care (with nurse–patient interaction). This concept will be captured by including studies that involve nursing action and interdisciplinary collaboration. Action may involve interventions that are independent, dependent or interdependent (as per the NREM); this labelling of roles may vary across nurse designations, whereby independent roles for NPs may be dependent roles for RNs or LPNs. Roles will vary in complexity as scopes of practice differ widely across nurse designations. NP roles (as primary providers) may be more advanced than RN or LPN roles; for example, NPs may diagnose and treat patients independently while LPNs may be tasked with coordinating care or performing patient follow-up under the direction of a primary provider. Studies must explicitly identify roles that are delivered by nurses in primary care and not by specialist nurses (eg, foot care nurse). We will exclude

studies that provide unclear description of nurse contributions to virtual care delivery (eg, refer to roles of healthcare providers collectively). Nurse roles should be explicitly stated or interpreted based on the virtual care services being delivered. For example, an NP following up with a patient with diabetes after initiating a medication change may be classified as an independent role delivering chronic disease management services. Studies will not be required to discuss virtual care effectiveness or patient outcomes to be included.

#### Context

We will include studies performed within the context of virtual care and primary care in this review. Virtual care, as defined in this review, requires provider–patient interaction. We recognise that virtual care may be referred using other terms (eg, telehealth, remote healthcare, digital health), and each of these terms will be captured in the search strategy. Studies should involve nurse–patient interaction in the virtual care context to be included. For example, we will exclude studies that involve the use of digital healthcare without provider–patient interaction (eg, using electronic medical records, using simulation for clinical-based training/education). Nurses should be actively involved in the virtual service being delivered, where the virtual care modality is situated in the primary care setting. Similarly, various terms will be used in the search strategy to capture primary care as it is referred in other jurisdictions (ie, family practice, general practice, primary healthcare). The search will not be limited by country; rather all studies situated in primary care (that meet the other inclusion criteria for this review) will be included. We will exclude studies that are situated in another area of community health nursing, such as home care or public health (eg, communicable disease management); however, we will include studies if a primary care context can be inferred despite the study setting labelled broadly as community health (eg, rural/remote settings with community health nurses).<sup>11</sup>

#### Types of sources

In this review, we will consider qualitative studies including, but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research. We will also consider both experimental and quasi-experimental quantitative studies, (eg, randomised controlled trials, non-randomised controlled trials, before and after studies, interrupted time-series studies). In addition, we will consider analytical observational studies, including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies; and descriptive observational studies including case series, individual case reports and descriptive cross-sectional studies for inclusion. Lastly, we will exclude text/opinion pieces and conference abstracts. Systematic reviews with research questions that align with the aim of this scoping review will not be included; rather, we will hand search

**Table 1** Search strategy for CINAHL database

#	Query	Results
S1	MH "Nurses+" OR TI nurs* OR AB nurs*	698 556
S2	MH "Primary Health Care" OR MH "Family Practice" OR MH "Office Nursing" OR MH "Family Nursing" OR "primary care" OR "primary health care" OR "primary healthcare" OR "general practice" OR "family practice" OR "family nursing"	157 253
S3	MH "Telehealth+" OR telehealth OR "tele health" OR telenursing OR "tele nursing" OR "telepractice" OR "digital health care" OR "digital healthcare" OR "virtual care" OR "virtual health care" OR "virtual healthcare" OR "virtual consult*" OR "virtual appointment*" OR "virtual visit*" OR "remote care" OR "remote health care" OR "remote healthcare" OR "remote consult*" OR "remote appointment*" OR "remote visit*" OR "online care" OR "online health care" OR "online healthcare" OR "online consult*" OR "online appointment*" OR "online visit*" OR MH "Text Messaging" OR "text messag*" OR "instant messag*" OR "short message service" OR "SMS"	41 257
S4	S1 AND S2 AND S3	541

their reference lists to identify relevant primary studies to consider for inclusion.

### Search strategy

The search strategy will aim to locate both published and unpublished sources using a three-step process.<sup>38</sup> We undertook an initial limited search of CINAHL and MEDLINE to identify relevant articles and review text words contained in the titles and abstracts, and index terms used to describe the articles. These text words and index terms were used to develop a full search strategy for CINAHL (table 1), MEDLINE, Embase and APA PsycInfo in consultation with a librarian (MS). The search strategy, including all identified keywords and index terms, will be adapted for each included database and/or information source. We will screen relevant systematic reviews to assess the validity of the search and key words and identify primary studies that were not located from other information sources. Additionally, we will screen the reference list of all included sources for other appropriate studies; and will use the descendancy approach to identify relevant articles that referenced an earlier, key study included in this review. If titles indicate relevance to the topic, abstracts will be searched and reviewed to improve the relevancy of studies included using these approaches. Studies published in English and French will be included. Due to the recency of digital healthcare advancements and primary care reforms, there will be no date limitation placed on the search.

### Information sources

The databases to be searched include CINAHL, MEDLINE, Embase and APA PsycInfo. Sources of unpublished grey literature to be searched include, but are not limited to, dissertations/theses, organisational/government reports and nursing-specific policies. Databases to be searched for grey literature include ProQuest Dissertations and Theses Global and Google Scholar, in addition to website searches of national nursing organisations (eg, Canadian Nurses Association, Australian Primary Health Care Nurses Association), digital health-focused organisations (eg, Digital Health Canada) and primary care

networks/centres. This is not an exhaustive list as website searches for unpublished sources may evolve throughout the duration of the data collection process.

### Stage 3: study selection

Following the search, we will collate and upload all identified citations into Covidence and remove duplicates. Trained reviewers will perform a pilot test following a framework for pilot testing, proposed by JBI.<sup>38</sup> First, a random sample of 5%–10% of identified articles will be selected and reviewers will screen the titles/abstracts against the inclusion criteria for this review. Any discrepancies will be discussed between reviewers and the inclusion/exclusion criteria will be modified accordingly. Reviewers will require 75% agreement in the pilot test to initiate the source selection process for the review.

Once the pilot test is complete, Covidence software will facilitate a collaborative team approach for screening among trained reviewers. We will screen titles/abstracts for assessment against the inclusion criteria for this review. Potentially relevant sources will be retrieved in full and assessed in detail against the inclusion criteria by two independent reviewers. We will record and report reasons for exclusion of sources when screening full texts if they go beyond the pre-determined inclusion/exclusion criteria. Any disagreements that arise between the reviewers at each stage of the selection process will be resolved through discussion, or with an additional reviewer. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a PRISMA-ScR flow diagram.<sup>40</sup>

### Stage 4: charting the data

#### Data extraction

Two independent reviewers will extract data from papers included in the scoping review using a data extraction tool developed by the reviewers. The data extracted will include specific details about the participants, concept, context, study design, methods and key findings relevant to the review objectives. Each reviewer will use a data extraction table to collect data from studies that meet inclusion criteria. In addition to study details (eg, design,

**Table 2** Data extraction table template

Source details	Citation Country Document type Design Purpose/aim Methods Results
Primary care context	Setting Model of care Geographical region, community type/characteristics Team composition
Virtual care context	Type of intervention (if applicable) Patient population/needs being addressed Delivery source Barriers/facilitators
Nurse contributions	Demographic information Professional designation Role(s) Role type

methods, results), primary care practice context will be described (eg, urban/rural/unspecified, availability of community supports/resources, practice model). As well, we will describe the attributes of virtual models of care, including type of intervention (eg, consultation, prescription renewal), target patient population (eg, demographics, disease group), delivery source (eg, telephone, video) and any barriers or facilitators that contributed to virtual care delivery. Nursing data will include demographic details (eg, level of education/specialty training), professional designation and activity/task (or role) performed. Role type will be extracted in adherence with the NREM which identifies roles (or processes) as independent, dependent (eg, requires physician order) or interdependent (ie, collaborative delivery with other practitioners).<sup>30</sup> Each reviewer will independently pilot test the extraction of descriptive data on five sources to ensure all relevant data are being extracted consistently across studies.

We will revise the draft data extraction tool (table 2) based on the pilot tests and acknowledge any modifications in the scoping review. Any disagreements that arise between the reviewers will be resolved through discussion, or with an additional reviewer. If appropriate, authors of papers will be contacted to request missing or additional data.

### Data analysis and presentation

We will use the NREM to descriptively map review findings in tabular format. That is, data describing the virtual care/primary care context and nurse demographics will create the structure component and the nursing roles concept will describe the process component. In a figure/table, we will visually present virtual models of care as they relate to both primary care and nursing. Roles may be

further reduced/analysed by designation (ie, RN, NP, LPN/RPN) and/or role type (ie, independent, dependent, interdependent). Quantitatively, we will analyse certain characteristics of both the structure (ie, virtual care/primary care context) and process (ie, nurse roles) components (eg, virtual care interventions, patient population, roles) by providing frequency counts. In addition to figures/tables of qualitative/quantitative analyses, we will provide a narrative summary of the findings, as they relate to the research questions/objectives.

### Nursing practice, policy, research implications

Digital technology is becoming a relied on resource across healthcare systems, including primary care. Nurses are key providers in the delivery of primary care services, requiring nursing-specific evidence and guidance to support the optimisation of their roles in new, virtual modalities of healthcare delivery. This scoping review has the potential to portray the current state of virtual primary care nursing and promote growth in this area of nursing practice. As well, findings from this review may guide the development of policy to create a more structured, evidence-informed, patient-centred practice. This is an introductory study in the area of virtual primary care nursing; therefore, next steps for future-related research will be identified.

### ETHICS AND DISSEMINATION

This review will involve the collection of published and/or publicly available sources for secondary analysis; therefore, ethics approval is not required. To optimise the reach and visibility of this scoping review, results will be published in an international peer-reviewed journal and presented at national and international conferences in the presence of global primary care stakeholders.

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**Contributors** CV contributed to conceptualisation; methodology; writing – original draft; writing – review & editing; funding acquisition. JL contributed to conceptualisation; methodology; writing – review & editing; funding acquisition; supervision. MM contributed to methodology; writing – review & editing. LH contributed to methodology; writing – review & editing. M-EP contributed to methodology; writing – review & editing. SA contributed to methodology, writing – review & editing; funding acquisition. MS contributed to methodology, writing – review & editing. DR contributed to methodology; writing – review & editing.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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