# Doctors' views on the impact of the absence of an in-person rheumatology service at a major New Zealand hospital

Sinead Donnelly, Yesim Ersoy, Rebecca Grainger


## ABSTRACT

**AIM:** To describe the views of doctors in one hospital service about the impact of the lack of an in-person rheumatology consultation service and to identify service improvements informed by those views and services at comparable district health boards (DHB).

**METHODS:** Qualitative study using focus groups of resident and senior medical officers (RMOs and SMOs) from the general medical service at Wellington Regional Hospital. A national survey of DHB heads of rheumatology was also used.

**RESULTS:** Three major categories emerged from the focus groups with 16 RMOs and 15 SMOs: 1) a negative impact on quality of patient care, which is inequitable to other nearby DHBs; 2) workarounds are found; and 3) doctors' knowledge of rheumatology and education opportunities suffer. Best practice was considered to be an in-person rheumatology consultation service, as offered at the six DHBs surveyed.

**CONCLUSIONS:** Lack of an in-person rheumatology consultation service in this large hospital had perceived negative impacts on patient care and doctors' education and competence. Providing an in-person consultation service seems highly desirable but would need more rheumatology capacity regionally. The themes identified may also be relevant to other hospital or specialist services that are not equitably accessible in other parts of the New Zealand health system and thus inform the transformation of the health system required by the Pae Ora (Healthy Futures) Bill 2022.


Rheumatology is a medical sub-speciality with specific expertise in assessing and managing inflammatory and auto-immune conditions. In hospital medicine, rheumatologists contribute to quality patient care by facilitating early diagnosis or initiating early management, including for common conditions like gout.[1–3] While rheumatic diseases often present with musculoskeletal symptoms, patients can be admitted with undifferentiated illness, systemic symptoms or symptoms of single or multiple organ dysfunction that benefit from the diagnostic expertise of a rheumatologist. Furthermore, people with established rheumatic disease are hospitalised for intercurrent illness or complications of rheumatic disease or its treatment and would benefit from rheumatologist review during their inpatient stay. In large hospitals up to 1% of admissions may have rheumatology service consultation, with most frequent disease concerns referred including vasculitis, systemic lupus erythematosus and gout.[4,5]

In the Wellington region, the regional rheumatology service has always been based at Hutt Hospital (Hutt Valley District Health Board (HVDHB)). It provides specialist rheumatology care to all patients domiciled in the HVDHB, the Capital and Coast DHB (CCDHB) and the Wairarapa DHB. There is, and to our knowledge has never been, a formal in-person specialist rheumatology consultative service at Wellington Regional Hospital (WRH), part of CCDHB, a tertiary referral centre servicing a population of about 320,000.[6] However, telephone advice is available from the on-call rheumatologist at HVDHB. The impact of the absence of an in-person rheumatology consultation service at Wellington Hospital on patient care is difficult to assess directly. Therefore, we undertook this study with the aims to: 1) explore the perceptions of doctors in the general medicine service on the impact of the absence of inpatient rheumatology consultation service at WRH and elicit their opinions on appropriate rheumatology service provision at WRH, and 2) describe the provision of rheumatology consultation for inpatients at comparable district health boards (DHB) in Aotearoa New Zealand.

## Methods

### Study setting

CCDHB provides care to people residing in Wellington to north of Waikanae, a population of 320,640.[6] Wellington Regional Hospital is the main

CCDHB hospital. The internal medicine inpatient service is staffed by 18 senior medical officers (SMO), who are physicians, comprising 12.6 full-time equivalents (FTE), and 19 full-time resident medical officers (RMO), excluding relievers. The service admits approximately 7,800 patients per year, with mean length of stay of 3.2 days.

### Data collection

We used focus groups of doctors on the internal medicine service to explore and understand their views of impacts of the absence of an in-person rheumatology consultation service at WRH and to elicit their opinions on appropriate rheumatology service provision at WRH. The internal medicine service was chosen as this service would be responsible for the care of medically unwell patients, with either symptoms that could be new onset rheumatic disease or people with established rheumatic disease diagnoses, admitted for reasons related or unrelated to that disease.

Physician SMOs and RMOs—generally postgraduate Year 1 and 2 doctors and medical registrars (RACP basic trainees)—were invited by email to participate in focus groups held at times convenient around service delivery. Participation was voluntary, and written informed consent was obtained. In addition, we invited potential participants unable to attend a focus group to offer responses to focus group questions via email.

Focus groups were audio-recorded using a secure digital device, transcribed and analysed using thematic analysis[7]. The focus group opening question was "*What are the impacts of the absence of an in-person rheumatology consultation service for inpatients under the medical teams at Wellington Hospital*". Follow-up questions were flexible depending on responses. Once no new ideas were elicited, we asked the following three questions to explore confidence in rheumatic disease management and opinions about how an appropriate rheumatology consultation service for this hospital would potentially be organised:

> *What is your confidence/experience with rheumatic disease assessment and management (e.g., rheumatoid arthritis, psoriatic arthritis, lupus, vasculitis)?*
>
> *What rheumatology consultation service would you feel is reasonable to expect at Wellington Hospital to provide adequate patient care to people admitted with potential or diagnosed rheumatic disease?*
>
> *What rheumatology consultation service would you feel is reasonable to expect at Wellington Hospital to provide optimal patient care to people admitted with potential or diagnosed rheumatic disease?*

The research method was qualitative descriptive with an inductive approach to analysis using an interpretive research lens.[8] Inductive analysis was most suited to this research as it allowed varied raw data text to be condensed into a brief summary format.[9] Furthermore, general inductive analysis establishes clear links between the research objectives and the summary findings derived from the raw data, and ensures that these links are both transparent and defensible.[9]

## Data analysis

Data collection and analysis occurred concurrently. The focus group transcripts were read and analysed to identify emerging codes, themes and categories.[10–12] Themes were derived, which encompassed similar codes. Analysis of and reflection on the themes led to the development of categories. Themes and categories gained further supporting evidence or reduction in weighting and outlying or possible deviance in the analysis noted. To avoid potential investigator bias and validate findings, the transcripts were reviewed by the three researchers together.

Reporting has followed COREQ guidelines[13] with a checklist provided in Appendix 1.

### Rheumatology inpatient consultation services at other DHBs

To describe rheumatology services at other DHBs, we invited the Clinical Directors/Clinical Heads of Department (CD/CHOD) at all DHBs accredited for rheumatology training with the Royal Australasian College of Physicians (RACP) to complete a short survey on Qualtrics about their DHB rheumatology service. Data included the number and total FTE of rheumatology SMO, the number of advanced trainees in rheumatology (registrars) and a free-text description of the inpatient consultation service, including an estimate of consultation requests each week.

### Ethics

Ethical approval was granted by the University of Otago Health Research Ethics Committee reference code 20/265.

## Results

### Doctors' views on the impact of the lack of in-person rheumatology consultation service

Of the 17 SMO physicians invited, 10 participated in a focus group and five provided email responses. Sixteen RMOs participated in a focus group, with 24 invited. The doctors' views on the impacts of no in-person rheumatology consultation service for medical inpatients organised into three categories: 1) a negative impact on quality of patient care, which is inequitable to other nearby DHBs; 2) workarounds are found; and 3) doctors' knowledge of rheumatology and education opportunities suffer. We present each of these and then summarise the suggestions offered for an appropriate rheumatology service at WRH.

### Negative impact on quality of patient care

In describing the impact of no in-person rheumatology service, doctors first outlined the shortcomings of the current telephone consultation service. While doctors knew they could seek rheumatology advice by telephone or refer a patient to the rheumatology outpatients clinic, both options were perceived as deficient. Doctors found it difficult to contact rheumatologists over the phone: "*They're difficult to get hold of; it's always a challenge to pin down the right person*" – SMO 2. Being unable to view the rheumatologist on-call roster at Hutt Hospital was frustrating. Telephone advice was considered inferior to in-person patient review, particularly for complex clinical situations: "*I don't think our current system of ad-hoc phone discussions is adequate*" – SMO 13. Only two of 15 SMOs considered the phone advice service satisfactory, and one SMO had never needed a rheumatological consultation.

Doctors viewed the wait time for patients to be seen at the rheumatology clinic as too long: "*If it was my mother or grandmother, I think I'd rather have them figure it out sooner*" – RMO 10; and "*A review in outpatients is a bit of a 'fire and forget' option*" – RMO 4. In addition, the referral process and lack of ready access to patient outcomes information were unsatisfactory: "*I just do some online referral that will disappear into a black hole*" – SMO 9.

Overall, doctors described the rheumatology service options as so limited, they were functionally non-existent, and the situation was also described as "*Completely negligent.…We are really not practising the best care for the patient*" – SMO 10. SMO 9 summarised, "*People are not getting expert care at the front door*". There was also perceived inequity of healthcare across the region: "*The people in Wellington have actually missed out badly*" – SMO 1. For example, doctors noted that patients of the HVDHB seen at Hutt Hospital have easy access to specialist rheumatology care with a rheumatology registrar, rheumatology clinics and rheumatologists on site.

## Doctors found workarounds

Doctors explained that they used other services to compensate for the absence of an in-person rheumatology consultation service. These services included orthopaedics, interventional radiology, immunology, renal medicine and dermatology. For example, orthopaedics were frequently consulted for diagnostic joint aspirations. However, orthopaedic staff were described as sometimes resisting these requests (quoting orthopaedics): "*We are not a joint aspiration service*" – SMO 11. This led to other referrals: "*This pushes it onto interventional radiology, it can be a lot harder to get a slot and can delay making a diagnosis*" – RMO 7. On other occasions, SMOs described revising techniques for joint aspiration using YouTube or, as RMO 1 said, "*I would just give it a go*".

Doctors explained that immunology was regularly consulted as a surrogate for rheumatology since immunologists were on-site with easily accessed follow-up clinics and documentation. Renal physicians were also consulted for rheumatic conditions: "*Currently I would speak to a renal physician, for someone with lupus or vasculitis. Often there's renal issues, and they're reasonably well placed to deal with the condition and medication*" – SMO 2. Dermatology were also consulted "*if its vascular type things and there's a rash, and we go to dermatology and they're like you should do this*" – RMO 5.

### Doctor's knowledge and education suffer

Most SMOs reported that their confidence in rheumatology was lacking or "about average", but this was considered insufficient: "*We're amateurs … skating on thin ice*" – SMO 1. There was uncertainty about knowledge of rheumatic diseases: "*I'm possibly not as up to date as I should be but of course I don't know that I'm not as up to date as I should be because I'm not asking for anyone else to help me.*" – SMO 7. This was viewed as a patient safety issue: "*It's possible that people are being harmed without us knowing because we just*

*don't have the expertise and we're not up to date*" – SMO 7. One SMO recounted missing a diagnosis of a rheumatological condition and worried "*that I don't think of it, because I'm not skilled in it. It's not my area of strength*" – SMO 2.

Doctors expressed a lack of confidence in several rheumatic disease assessment and management areas. These included aspirating and injecting joints, arranging diagnostic workup for giant cell arteritis, efficiently diagnosing vasculitis in patients with undifferentiated presentations, providing the best care for patients with complex gout, dealing with complications of rare illnesses such as scleroderma or lupus, and providing safe management for patients using disease-modifying anti-rheumatic drugs (DMARDS). The lack of confidence in managing established rheumatic disease in an admitted patient was also exemplified by the comment "*managing flare-ups and managing complications and even knowing that this is a complication of their drugs or their disease because actually in the last decade, rheumatology has changed significantly and so that's where I feel I'm probably under-experienced, I'm probably over-confident and under-experienced*" – SMO 5. An SMO (9) noted, "*we have specialists for a reason, just as I can get a neurosurgical consult or respiratory consult when you're at the bedside and its slick care and rheumatology is missing from the arsenal*".

Doctors spoke of the educational value of access to rheumatologists, with learning by observing or an apprenticeship model, particularly in using DMARDs and joint aspiration and injection. One SMO expressed, "*I think we learn a lot by rubbing shoulders with subspecialty colleagues, we're expected to keep up to date with a huge breadth of rapidly advancing medicine, and here I do that by going to the cardiology forum, by having frequent corridor conversations with the respiratory people, by going with the neurologist when they review my patients and picking stuff up that way. There's no hands-on. We're just so separated from rheumatology that we don't get that learning by osmosis*" – SMO 9. RMOs who had worked at Hutt Hospital where the regional rheumatology service is based also stated, "*They could be coming to do teaching sessions with the registrars sitting exams on their rheumatology patients, they could be engaged in our teaching service so that we all upskill which we just wouldn't have access to at the moment*" – RMO 4.

### *Suggestions for rheumatology service at WRH*

Both SMOs and RMOs clearly stated that an in-person rheumatologist service would be ideal: "*For excellent patient care I would expect an actual service on site with readily available appointments and input into our education programs*" – SMO 13; and "*The minimum should be the ability to have the bedside review within 24 hours during the week*" – SMO 9. Other options included an in-person rheumatology consultation within 48 hours or a rheumatology clinic half-day per week on-site at WRH with time allocated for rheumatologists to consult on inpatients. These approaches were viewed as also building relationships: "*I think having someone come for a short time like once a week or once every second week I think it would enhance the phone consult service know who you're talking to and can build a relationship with them and you think about them cause you see them*" – RMO 4.

Other recommendations about processes that could be improved included direct access to the rheumatology SMO on-call roster; having agreed and clearer diagnostic pathways for conditions such as giant cell arteritis; and rheumatology clinic letters from HVDHB available in the electronic record at WRH.

### DHB inpatient consultation services

Rheumatology services at the six DHBs surveyed all provide in-person advanced trainee inpatient review on the same day, within 48 hours, or another clinically appropriate time frame during the workdays of Monday to Friday (Table 1). All DHBs provide after-hours rheumatology consultation with a rheumatology SMO via telephone.

## Discussion

Doctors in the internal medical service at a large hospital described the lack of an in-person rheumatology service as having negative impacts on perceived quality of the patient care delivered. While these doctors found workarounds for diagnostic and management needs, these were sometimes problematic. These doctors described a lack of confidence in their knowledge of rheumatic conditions and reported that professional development and learning suffered, particularly for junior doctors. A variety of suggestions for improved access to specialist rheumatology care at the WRH site were offered, which all included some change in deployment of rheumatology staff to provide some in-person service onsite. In-person rheumatology consultation services are provided at the six large DHBs across Aotearoa New Zealand. The views of these doctors are concerning due to the perceived negative impact on

**Table 1:** Inpatient rheumatology consultation services at six other district health boards in Aotearoa New Zealand.

| DHB | | Rheumatologist | | AT | Referral management | Estimated consults per week (n=) |
|---|---|---|---|---|---|---|
| **Name** | **Population#** | **SMO** | **SMO FTE** | | | |
| Counties Manukau | 578,650 | 8 | 4 | 2 | AT review then SMO review within 24 hours. | 10–12 |
| Canterbury | 578,290 | 4 | 3.2 | 1 | AT review then SMO as required, within clinically appropriate time frame (available Monday–Friday). | 5–7 |
| Hutt Valley | 156,790 | 7 | 2.8 | 1 | AT phone advice for HVDHB and CCDHB. SMO review of HVDHB patients ad hoc. SMO review at CCDHB if on site and at discretion. | 1 |
| Auckland | 493,900 | 7 | 4.6 | 2 | AT reviews consults daily with SMO review at twice-weekly scheduled ward round. | 6–12 |
| Southern | 344,900 | 6* | 3.3* | 1 | AT review then SMO review within 24 hours if complex or new, and/or during twice-weekly scheduled ward round. | 2–10 |
| Waikato | 435,690 | 5 | 3.6 | 1 | AT review then SMO as required, within clinically appropriate time frame (available Monday–Friday). | 5–10 |
| Waitematā | 628,770 | 7 | 5.1 | 1 | AT review then SMO review within 24 hours as required. | 5 |

*When fully staffed – currently 2.5 FTE and five people. Weekly consults are estimates.
Abbreviations: AT = advanced trainee, or rheumatology registrar; DHB = district health board; FTE = full time equivalent; SMO = senior medical officer.
#Populations are for 2021/2022 and from https://www.health.govt.nz/new-zealand-health-system/my-dhb.

patient care and missed opportunities to maintain doctors' knowledge and skills in managing rheumatic disease.

There is relatively little literature examining the effects of inpatient rheumatology consultation on patient care and outcomes. Three retrospective studies of hospitalised patients with acute gout have reported that inpatient rheumatology consultation led to more frequent appropriate care. This included more frequent use of diagnostic aspirate and measurement of serum urate,[1,2,14] concordance with best practice therapy[1] and appropriate follow-up.[2,14] Another retrospective study in a New Zealand hospital reported patients with gout in hospital who had rheumatology consultation were more frequently initiated on urate-lowering therapy.[15] These data support the premise that rheumatology consultation is beneficial in achieving high quality patient care, even for gout. This is very relevant to Aotearoa New Zealand with its high prevalence of gout, particularly in Māori and Pacific peoples,[16] and where the quality of gout care is of sufficient priority to be reported on in the Atlas of Health care variation.[17] In a retrospective study of nearly 500 inpatient rheumatology consultations over 10 years in a geriatric hospital in Israel, arthrocentesis occurred in nearly half of consults and rheumatoid arthritis was diagnosed in 9% of consultations.[3] This suggests that rheumatologists undertaking consultations in inpatient hospital settings frequently perform diagnostic procedures or confirm important diagnoses. In a large hospital in the USA, rheumatology consultation occurred in 0.64–0.91% of all hospital admissions, with consultation rate increasing over time.[4] The doctors in our study were inventive in consulting other specialties to obtain diagnostic joint aspirate or management advice, however, they acknowledged that rheumatology consultation would have been preferrable.

Early diagnosis and specialist treatment are considered a critical part of high quality care of many rheumatic conditions[18,19] including rheumatoid arthritis[20] and giant cell arteritis.[21] Assessing a person while they are in hospital and at the time a rheumatic disease is considered seems a potentially efficient way to achieve this. Several studies in outpatient settings have shown that early brief assessment is an efficient mechanism for early diagnosis.[22,23] These data support the doctors' view that the lack of rheumatology consultation during inpatient stay may lead to lower quality patient care. Given improved access to the infrastructure for telemedicine, it is worth considering the role for remote rheumatologist assessment via telemedicine, with a co-located physician and remote rheumatologist. There are now regional evidence-informed guidelines for rheumatology telemedicine that may assist in establishing appropriate rheumatology telemedicine consultation services.[24] This type of service would also address access to specialised rheumatology care in regional or rural settings.

While our study suggested there was a need for inpatient access to rheumatologists to improve patient care and continuing education, there would need to be sufficient rheumatologists employed to provide both inpatient and ambulatory care. In 2018 in Aotearoa New Zealand, the public hospital rheumatology workforce had 0.59 FTE rheumatologist per 100,000 population or one full-time rheumatologist per 169,683 people.[25] This is well below the recommendations in the United Kingdom of one rheumatologist per 60,000–80 000[26] or 86,000 people,[27] which equates 1.16–1.67 full-time rheumatologists per 100,000 population. HVDHB employs approximately 0.55 FTE rheumatologists per 100,000 people in the catchment area of CCDHB, HVDHB and Wairarapa DHB for which rheumatology services are provided.[25] While rheumatology specialist care could be arranged differently to meet perceived (and likely actual) patient care needs, there will need to be an increase in overall DHB rheumatologist FTE to achieve this.

While only focussing on the absence of one medical subspecialty on internal medicine doctors in one hospital, these findings could also be relevant to any medical or surgical specialty that has limited or absent service in any large or smaller hospital in Aotearoa New Zealand. We could not find any similar studies describing the experiences of doctors in an urban hospital in Aotearoa New Zealand of delivering care without relevant specialty support. The experience of barriers to access to specialist services is common for patients and doctors in hospitals in regional or rural settings. People living with inflammatory bowel disease in regional New Zealand have described perceived delays in specialist referrals and unfavourable disparities in access to specialists.[28] In the West Coast of Aotearoa New Zealand's South Island careful consideration of patient and community health needs, and thoughtful organisation of rural and supporting urban regional hospital services has achieved better access to specialty care that is acceptable to patients and the health service pro-

viders.[29] Novel ways of addressing access to specialists in main centres, like telemedicine, have been successfully used in Aotearoa New Zealand to reduced variability of care in stoke thrombolysis.[30] Telemedicine literature in rheumatology is nascent and emerging, however, guidelines have been developed to guide appropriate deployment of telemedicine for rheumatology care.[24] In our study, simple changes in the organisation, like provision of on-call rosters and closing the loop on outcomes documentation may improve communication with specialist rheumatology services. This could also be addressed by improved digital infrastructure providing comprehensive access to clinical information across Aotearoa New Zealand.

Our study has some limitations. This qualitative study describes the perceptions of doctors in one service in one hospital. Since qualitative research studies investigate a specific issue or phenomenon in a certain group, of a focussed locality in a particular context, generalisability of qualitative research findings is usually not an expected attribute.[31] It cannot be assumed that the findings of this study represent the experiences of all internal medicine services in Aotearoa New Zealand. However, they may credibly reflect the experiences of these doctors at this location, given the high participation rate, with 31 out of a possible 41 doctors responding in person or by email. The reports of lower quality care are the doctors' perception only and no conclusions about the actual quality of care provided can be made from these data. Future similar studies could consider framing data collection around impact on quality of care for patients, rather than impact on services or care.

Our study is the first to describe the views of doctors in a New Zealand hospital on the impacts of the absence of an in-person specialty consultation service, which is provided in other comparable hospitals in Aotearoa New Zealand. These data are timely as the Pae Ora (Healthy Futures) Bill (1 July 2022) clearly articulates a key principle of the Aotearoa New Zealand health system is that it is equitable.[32] Specifically, Section 7 states that *"(a) the health sector should be equitable, which includes ensuring Māori and other population groups— (i) have access to services in proportion to their health needs; and (ii) receive equitable levels of service*".[32] Te Whatu Ora Health New Zealand is now tasked with designing a hospital and specialist service operating model that achieves the aspirations of Pae Ora. While our study is in only one hospital site, given the paucity of reported studies on the impact of variation in organisation of specialist services, it provides valuable insights that can be further explored in other specialist disciplines or sites. Our study suggests both high quality patient care and maintaining and enhancing skills and knowledge of health practitioners are benefits to be directly achieved by appropriate design of health services. Achieving equitable health outcomes for New Zealanders would seem to be dependant on equitable and appropriate access to specialist care.

**COMPETING INTERESTS**
The authors are employees of the health services discussed in this manuscript. There are no other conflicts to be declared.

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**Appendix 1:** COREQ (Consolidated criteria for Reporting Qualitative research) Checklist.

A checklist of items that should be included in reports of qualitative research. You must report on the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

| Topic | Item no. | Guide questions/description | Reported on page no. |
|---|---|---|---|
| **Domain 1: Research team and reflexivity** | | | |
| *Personal characteristics* | | | |
| Interviewer/facilitator | 1 | Which author/s conducted the interview on focus group? | Not possible on anonymous. |
| Credentials | 2 | What were the researcher's credentials? e.g., PhD, MD. | Title page. |
| Occupation | 3 | What was their occupation at the time of study? | Medical doctors. |
| Gender | 4 | Was the researcher female? | Female. |
| Experience and training | 5 | What experience or training did the researcher have? | Not possible on anonymous. |
| *Relationships with participants* | | | |
| Relationship established | 6 | Was a relationship established prior to study commencement? | Yes. |
| Participant knowledge of the interviewer | 7 | What did the participants know about the researcher? e.g., personal goals, reasons for doing research. | Participant information form. |
| Interviewer characteristics | 8 | What characteristics were reported about the interviewer/facilitator? e.g., bias, assumptions, reasons and interests in the topic. | Page 30 indicates researchers background in general medicine and rheumatology. |
| **Domain 2: Study design** | | | |
| *Theoretical framework* | | | |
| Methodological orientation and theory | 9 | What methodological orientation was stated to underpin the study? e.g., grounded theory, discourse analysis, ethnography, phenomenology, content analysis. | Page 24. |
| *Participant selection* | | | |
| Sampling | 10 | How were participants selected? e.g., purposive, convenience, consecutive, snowball. | Page 24. |
| Method of approach | 11 | How were participants approached? e.g., face-to-face, telephone, mail, email. | Page 24. |
| Sample size | 12 | How many participants were in the study? | Page 25. |

| Topic | Item no. | Guide questions/description | Reported on page no. |
|---|---|---|---|
| Non-participation | 13 | How many people refused to participate or dropped out? Reasons? | Page 25. |
| ***Setting*** | | | |
| Setting of data collection | 14 | Where was the data collected? e.g., home, clinic, workplace. | Workplace. |
| Presence of non-participants | 15 | Was anyone else present besides the partipants and researchers? | No. |
| Description of sample | 16 | What are the important characteristics of the sample? e.g., demographic data, date. | Page 25. |
| ***Data collection*** | | | |
| Interview guide | 17 | Were questions, prompts, guides provided by the authors? Was it pilot tested? | Page 24. |
| Repeat interviews | 18 | Were repeat interviews carried out? If yes, how many? | No. |
| Audio/visual recording | 19 | Did the research use audio or visual recording to collect the data? | Page 24. |
| Field notes | 20 | Were field notes made during and/or after the interview or focus group? | No. |
| Duration | 21 | What was the duration of the interviews or focus group? | 4 focus group interviews of between 19 mins 43 secs and 35 mins 50 secs |
| Data saturation | 22 | Was data saturation discussed? | Page 24. |
| Transcripts returned | 23 | Were transcripts returned to participants for comment and/or correction? | Presented to general medicine junior and senior doctors in person. |
| **Domain 3: Analysis and findings** | | | |
| ***Data analysis*** | | | |
| Number of data coders | 24 | How many data coders coded the data? | Page 24. |
| Description of the coding tree | 25 | Did authors provide a description of the coding tree? | No. |
| Derivation of themes | 26 | Were themes identified in advance or derived from the data? | Derived from data. |
| Software | 27 | What software, if applicable, was used to manage the data? | None. |
| Participant checking | 28 | Did participants provide feedback on the findings? | At oral presentation, feedback from the audience. |

| Topic | Item no. | Guide questions/description | Reported on page no. |
|---|---|---|---|
| *Reporting* | | | |
| Quotations presented | 29 | Were participant quotations presented to illustrate the themes/findings?<br>Was each quotation identified? e.g., participant number. | Page 25–26. |
| Data and findings consistent | 30 | Was there consistency between the data presented and the findings? | Page 25–26. |
| Clarity of major themes | 31 | Were major themes clearly presented in the findings? | Page 25–26. |
| Clarity of minor themes | 32 | Is there a description of diverse cases or discussion of minor themes? | Page 25. |

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007. Volume 19, Number 6: pp. 349–357