

Factors Affecting Primary Care Physician Decision-Making for Patients with Complex Multimorbidity: A Qualitative Study

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Abstract

Background

Patients with multiple chronic conditions (multimorbidity) and additional psychosocial complexity are at higher risk of adverse outcomes. Establishing treatment or care plans for these patients must account for their disease interactions, finite self-management abilities, and even conflicting treatment recommendations from clinical practice guidelines. Despite existing insight into how primary care physicians (PCPs) approach care decisions for their patients in general, less is known about how PCPs make care planning decisions for more complex populations. We therefore sought to describe factors affecting physician decision-making when care planning for complex patients with multimorbidity

Methods

This was a qualitative study involving semi-structured telephone interviews with PCPs working $\geq 40\%$ time in a team-based, patient-centered medical home setting in the integrated healthcare system of the U.S. Department of Veterans Affairs, the Veterans Health Administration (VHA). Interviews were conducted from April to July, 2020. Content was analyzed with inductive thematic analysis.

Results

25 physicians participated in interviews; most were MDs ($n = 21$) and worked in hospital-affiliated clinics ($n = 14$) across all regions of the VHA's national clinic network. Seven major themes emerged for factors affecting decision-making for complex patients with multimorbidity. Physicians described collaborating on care plans with their care team; considering impacts from patient access and resources on care plans; the boundaries provided by organizational structures; tailoring decisions to individual patients; making decisions in keeping with an underlying internal style or habit; working towards an overarching goal for care; and impacts on decisions from their own emotions and relationship with patient.

Conclusions

PCPs described individual, relationship-based, and environmental factors affecting their care planning for high-risk and complex patients with multimorbidity in the VHA. Findings offer useful strategies employed by physicians to effectively conduct care planning for complex patients, such as delegation of follow-up within care teams, optimizing visit time vs frequency, and deliberate investment in patient relationship building to gain buy-in to care plans.

Background

Patients with multiple chronic conditions are growing in prevalence⁽¹⁾ and primary care physicians (PCPs) expend significant effort and time in caring for these patients.^(2, 3) These patients are at greater risk for adverse outcomes, arising from illness burden, polypharmacy, or care fragmentation.^(4–8) Physician decision-making is a critical part of person-centered, evidence-based care planning for these patients. However, for patients with multimorbidity and increased psychosocial complexity,⁽⁹⁾ PCPs must often make care decisions in the absence of clear clinical practice guidelines or with a minimum of relevant clinical evidence for support.^(5, 10, 11) Providing high-quality, person-centered care requires individualizing care plans for these patients that account for their health conditions, psychosocial context, and preferences.

Conceptual frameworks examining clinician decision-making have been previously described.^(12, 13) The clinical decision-making process is dynamic, entailing understanding and prioritizing a patient's care concerns, deciding on diagnostic testing, interpreting medical information, recommending a care plan, and getting feedback on treatment response. While general aspects of decision-making govern most medical encounters, complex patients with multimorbidity have unique aspects to consider. For example, decisions for these patients must account for disease interactions, conflicting disease recommendations, patient capacity for self-management, and impacts from treatment burden.^(9, 14, 15)

Improving clinical decision-making in the pursuit of quality and person-centeredness requires a clear understanding of relevant factors. While effort has gone into understanding this topic for a broader patient population,^(16–19) it is relatively unexplored for a more complex multimorbid population. We sought to clarify this evidence gap by conducting qualitative interviews with primary care physicians.

Methods

Study overview and setting

This qualitative study sought to understand the experiences of PCPs making care decisions for patients with multimorbidity and increased psychosocial complexity. Physicians participated in one-on-one, semi-structured telephone interviews from April to July 2020. Data were analyzed using inductive thematic analysis. We followed the standards for reporting qualitative research (SRQR) guidelines.⁽²⁰⁾

The healthcare system of the U.S. Department of Veterans Affairs, the Veterans Health Administration (VHA) is an integrated health system with over 900 primary care clinics serving almost 9 million veterans. Primary care is delivered within a patient-centered medical home model consisting of a primary care provider, nurse care manager, clinical associate, and administrative assistant, with affiliated interdisciplinary support members including mental health, pharmacy, and social work. In accordance with the policy of the U.S. Department of Veterans Affairs, the national VHA Office of Research and Development allows a designation of work to be formally designated as quality improvement non-research. This exempts the work from further VHA Institutional Review Board (IRB) review. Documentation of this process and approving official review of the preparation to research and pre-

publication review can be provide upon reasonable request. Verbal informed consent to participate and be recorded was obtained from all participants; written informed consent not required if a study has been reviewed and received IRB exemption.

Participants

We conducted interviews with primary care physicians within the VHA (MD, DO, or equivalent physician license). We purposively sampled attending physicians working clinically at least 40%, stratifying 1:1 between those in VHA medical center-affiliated vs. community-based clinics. Participant email addresses and demographics were from VHA administrative data.(21) A total of 475 physicians were sent recruitment emails; 25 responded. Initial emails were from the project lead (LS, a VHA PCP) and specified that input was being sought on how PCPs approach care decisions for patients with multimorbidity.

Interviews and data collection

A trained qualitative interviewer with experience interviewing clinicians (CS) conducted semi-structured telephone interviews. Audio-recorded interviews were approximately 20–30 minutes long and transcribed verbatim by project staff. The 12-question interview guide (Additional File 1) asked physicians to think about decision-making from a recent encounter for a complex patient with more than two chronic diseases for either physical or mental health diagnoses (complexity was self-defined according to the physician). Questions were based on pre-defined conceptual models of complex multimorbidity and delivery of patient-centered care.(9, 22) The interviewer (CS) and lead (LS) met weekly to discuss fidelity to the project objective and review within-interview accuracy checks (paraphrasing, interpretive statements). After reaching the anticipated minimum of 20 interviews,(23) CS and LS reviewed every 2–3 interviews for thematic saturation.(24) Twenty-five interviews were conducted, two were discarded prior to analysis due to unsalvageable audio. Thematic saturation was reached after 23 interviews were analyzed.

Data analysis

Transcripts were analyzed using an inductive thematic approach.(25) One team member (SHS) using de-identified transcripts coded all segments related to factors and pulled relevant segments into a summary template format. Segments were reviewed by two team members (SHS, LS) independently to develop inductive codes. The team then met to reach consensus and develop a final codebook. A final transcript review for additional codes was conducted by one team member (SHS). Visual mapping of interactions was reviewed to ensure minimal conceptual overlap between codes. Inductive thematic analysis was conducted independently by two team members (SHS, LS), reaching consensus for final themes. MAXQDA software(26) was used for coding and data management, with additional processing (e.g., codebook development) using Microsoft Excel.

Results

Of 23 participating physicians, most were MDs (n = 21) in hospital-affiliated clinics (n = 14). Interviews were conducted with physicians across all regions of the VHA. Demographics of the participants are in Table 1. Emergent themes for factors affecting decision-making for complex patients with multimorbidity are described below; Table 2 provides additional representative quotes.

Table 1
Demographics of participating physicians completing qualitative interviews.

Demographics	No. (N = 23)	%
Female sex	14	61
Non-MD degree (DO, MBBS)	2	9
Clinic location		
VA medical center affiliated	14	61
Community affiliated	7	30
Other	2	9
Region		
Midwest	7	30
Southeast	7	30
West	5	22
Northeast	2	9
Southwest	2	9
Medical practice type		
General primary care	17	74
Women's clinic	4	17
Homeless care clinic	1	4
Home-based primary care	1	4
Time devoted to clinical role, Mean (SD)	78% (21%)	-
Years in practice after residency, Mean (SD)	20.5 (11.3)	-

Factors affecting decision making: Major themes

Theme #1: Care planning for complex patients is collaborative in primary care.

Many physicians described working in teams to decide on or carry out recommendations for their complex patients. In response to high volumes of care needs, they described dividing up tasks among available team members and using their team to extend follow-through for ongoing needs. Physicians also described relying on collateral input from their team to care plan.

"Usually I would talk to my nurse. She seems to have a lot more ideas. If we can't get anywhere, we will talk to social work" (P01).

Specific areas of care for complex patients, however, were felt to fall outside the scope of primary care. Mental health was felt by some physicians to be a particularly siloed domain, and others felt that there were some care needs which were the responsibility of specialists.

"I just found a psychiatrist and invited them to please help me, because I really think this is your job" (P13).

Theme #2. Patient access to resources impacts care plans.

Physicians considered potential limitations on patient access to care when deciding care plans, including resources, matching needs with available options, and travel time burden on patients with multimorbidity.

"We have no lab, we have no x-ray, we have no nothing. It's just me in a room, that's it" (P12).

"When the traffic is good, and it [the drive] could be even up to two hours. So I've been trying to get him imaging outside [the clinic]" (P15).

Many physicians considered time tradeoffs in prioritizing issues to address at visits. They recognized that the number of issues per encounter was limited by time, and not addressing some needs would mean bringing patients back to clinic more often. Some responded either by opting to extend visits or setting patient expectations. Several also described how more frequent visits weren't always permissible in the VHA.

"Let's face it: you get the first two or three [issues] and make sure there's nothing acute going on otherwise and then see him back in a month or two to catch the rest of it" (P21).

"I really feel that the more complex patients, we need to be able to see them more often" (P23).

Some physicians discussed proactive outreach to deal with the volume of care needs and for keeping ahead of needs of patients. One described this process (referencing the Care Assessment Need score, a VHA risk score predicting adverse outcomes of utilization or mortality):(27)

"About every quarter, my nurse [...], just pulls the CAN score list and anybody with an elevated CAN score she just cold calls him" (P03).

Finally, some physicians decided their care plans more reactively, in response to their perception of a patient's goals as beneficial to health, likelihood of follow-up, or (in)ability to carry out plans.

"If patients are wishing to, say continue tobacco use, I'm certainly less likely to try to give them quicker refills on some of their inhaler medication" (P16).

Theme #3. Organizational structures provide boundaries.

Several physicians felt care decisions were dictated by system features or idiosyncrasies. This included physicians trying to match decisions to the visit format (e.g., in-person or telehealth), and being aware of VHA performance metrics.

"My plan is to do everything I can at one visit that requires me to examine them" (P01). "Most of the time with this patient, their priorities and my priorities and the quality metrics of the watchdogs are all going to match" (P23).

A few physicians noted how decisions were affected by the (lack of) availability of information about a patient. Some felt this stemmed from COVID-19 restrictions on bringing patients into the office, while others described how complex patients refused or were unable to make needed disclosures under some circumstances.

"By telephone, with all this going on, especially right now, it's a lot easier for them to say nothing's wrong, and you're just going, 'Oh, I don't know if I believe you or not'" (P23).

Theme #4. Decisions are tailored to individual patients.

Physicians considered unique patient characteristics and their interactions when care planning. Many talked about how the severity of the patient's health or acuity of care needs dictated decisions, feeling the need to account for changes in the patient's health status, and acknowledged an awareness of interactions between health and the patient's psychosocial context.

"What's going to kill him the quickest. What, if this went wrong, would lead to the most imminent demise. And that was the prioritization" (P16).

"I'll start by asking them how they're doing, if anything has recently changed, if there's any new stressors in their lives that would potentially interfere with their ability to effectively manage their medicine" (P11).

Besides acuity, most physicians articulated that they prioritized among care needs based on concrete or observable data from complex patients, such as age, finances, mental health, decision-making capacity, labs, or vital signs.

"I always look to see if they have had recent lab[s] and I look for lab abnormalities, as I'm kind of talking with them, I look at their vital signs and if they've kept a chart for me, that's good, and I look at that. [...] I look at all the data that's available" (P21).

A few physicians, however, felt there was no to generalize how they made decisions for complex patients.

"When you asked me what sets the agenda, the answer is it's this deeply matrixed thing" (P07).

Theme #5. An underlying style or habit guides decisions.

Clinician style impacts care decisions. For example, some alluded to wanting to 'do no harm' or minimize unnecessary care for vulnerable patients.

"Trying to determine the most innocuous care plan that takes into consideration his additional comorbidities" (P24).

"Polypharmacy is a big problem... I was like, wow, is there a way that we can consolidate, or does he really need this?" (P13).

Some physicians relied on systematic approaches in care planning for complex patients, such as a habit of always arranging follow-up appointments for continuity or pre-visit preparation for efficient interactions. Several described the role of documentation, noting how their care decisions were guided by past records and using the health record to communicate plans to other team members.

"The first thing I do is I have very good notes, so [the care team] can rely on those. And they're also organized in a way that you can exactly tell what I'm thinking about" (P21).

Theme #6. Care planning for an overarching goal for care.

Most physicians felt that maintaining the stability or status-quo of complex patients dictated decisions. Safety was also described as a major goal.

"First priority is clinical stability. That's very important of course. Things that may tip the patient into less clinical stability" (P17).

Care decisions often prioritized the priorities and concerns of complex patients, frequently focusing on symptoms or function.

"He has chronic back and leg pain that we discuss pretty much every time I see him, because that's one of his primary concerns" (P12).

Many discussed deliberately balancing their own and the patient's goals, and some recognized that family, caregiver, or other healthcare staff goals were influential. Some physicians also described how they tried to obtain goal alignment before being able to advance care plans.

"My usual way of prioritizing is to find out what the most important thing to the patient is, but for him, both the patient and the spouse, and go through their list of priorities and then try to hit my priorities" (P19).

"I may have an agenda, but if my agenda doesn't match up with my patient's agenda, then we may not make any progress" (P19).

Theme #7. Decisions are affected by dynamic patient relationships.

Physicians considered their relationship with complex patients and tried to achieve trust and gain treatment buy-in from patients.

"You have to make your patients feel like you care about them. You should care about them, but you also have to convey that to them, that you do care and their needs and their concerns and what's important to them, it's also important to you" (P19).

"When I first met her, it was just laying down the groundwork and essentially I attempted to build a rapport and lay out what the issues are and asked her to consider how we could hopefully come to some communal ground" (P08).

A few physicians described how they emotionally reacted to some complex patients or had self-imposed boundaries that influenced their decisions.

"He's a lovely man and it's great to hang out with him and enjoy the experience of meeting with him, but also try and make sure that he really does understand what you are suggesting, and want to make the kinds of changes you're talking about" (P07).

Physicians also reflected on how decision-making may have evolved in response to prior patient behavior.

"I used to automatically refill his medication just to make sure he had them, and then I realized that didn't let me assess what he was actually taking, so I stopped doing that" (P14).

Table 2. Representative Quotes of Themes and Subthemes

Key take-away	Key Quote
Team collaborates on workload and provides collateral	"You have to feel it out at first, just be cautious, and as the clinical situation develops, then you just get a good sense of what's going on. That's what I did in that scenario, just bring in multiple players and... you can see them in the home, the social workers getting the social aspect of it, and then you just really go with your gut feeling." (P03)
Primary care has a defined scope	"Specialty care needs to take care of the consults. Stop putting patients on primary care all the time and follow up on that." (P04)
<i>Theme #2. Patient access to resources constrains care plans.</i>	
Time tradeoffs are inherent	"Either you address the main concern [...] and have them come back later. Or, if you can address everything in one visit, then you're bringing [them] back less times." (P04)
Resource availability	"Some of these patients, they come from really far away and we don't have an MRI and CT where we're at, we're like a peripheral site. I wanted some imaging of his back, [but] it means driving down even further." (P15)
<i>Theme #3. Organizational structures provide boundaries.</i>	
Tasks pair to visit modality	"We need to be able to maybe see the complex ones more often so that we can uncomplex them. Once they're stabilized, twice a year is fine, but a lot of these, you've got to be seen a lot more often – and a lot of it needs to be face to face; it's not going to work by phone." (P23)
Organizational peculiarities	"Sometimes patients get mixed messages, they get a different message from me and a different message from [...] their civilian provider." (P19)
<i>Theme #4. Decisions are tailored to individual patients.</i>	
Severity of concern/health	"I first prioritize what the veteran's goal of the visit is, but I also look at what would be most threatening, in terms of their long-term health. If the issue at that time is that the COPD or asthma is uncontrolled, and they're wheezing and short of breath, I'd be more likely to address that." (P00)
Response to observable data	"You prioritize with your vitals – if [...] his blood pressure is extremely high, got to really address that; if his sugars are really extremely high. I actually usually do address both of those." (P13)
Decisions are unique	"For some people their struggle is [...] clinical. For other people their struggling is social. For other people it's economic. For other people it's mental health." (P17)
<i>Theme #5. An underlying style or habit guides decisions.</i>	
Physicians have a style or preferred approach	"Part of my job is to be the coach and encourager and know that this is a lifelong process. You've got to make small changes that are permanent, but you can't try and make everything change all at once" (P11)
Documentation is bidirectional with care decisions	"If you have time to prep, that's always a good thing, because you can either go over the home monitoring stuff or like I said, go back to your previous notes: "OK, I know I needed to ask about this, because I made a note about it in my last note."" (P06)
<i>Theme #6. Care planning for an overarching goal for care.</i>	

Stability or status-quo	"I ask him: 'Are you status-quo today or is there something different going on?' And then I look to these others [to] make sure that's stable." (P21)
Patient goals, acute needs take priority	"Whatever the patient feels to be the absolute necessary to address, but there are times we start examining them and other things take over because they absolutely need to be addressed. [Then anything else like chronic disease that needs to be addressed." (P01)
<i>Theme #7. Decisions are affected by dynamic patient relationships.</i>	
Advance trust and buy-in	"She wanted to stop smoking, lose weight, use CPAP, because she had sleep apnea, and eat better. Those are big, and so I had to get her to see how her current lifestyle was preventing her from being able to do that, so therefore I got more buy-in." (P08)
Physician internal state	"I explained that that was my reason for not saying that he was legally blind, but he wanted me to change the form anyways [...]. I don't know if that affected care; it affected me as a provider – I felt like it was another layer of drama and frustration in trying to provide care for him." (P09)

Discussion

We conducted a qualitative study of primary care physicians within the VHA to ascertain decision-making factors for care planning for complex patients with multimorbidity. We found that physician decision-making for these patients was governed by environmental, individual (patient- and physician-specific), and relationship factors. Physicians in our study described collaborative, team-based decision-making for complex patients, but perceived clear boundaries with practice scope and health system structures. The volume of care needs for complex patients was important and cut across several themes, necessitating varied approaches and styles to prioritization and organization. We found that care planning for complex patients was matched by equally complex decision-making; physicians made goal-directed decisions incorporating patient health data and psychosocial context, but also responding to their own emotional state and relationship with the patient.

Few studies have explored the intricacies of physician decision-making for complex patients with multimorbidity. Prior work describing this process more globally found that decisions are highly varied, with few generalizable conclusions for multimorbidity.(28, 29) In one review, nearly two-thirds of the studies excluded patients with multimorbidity.(29) Heterogeneity in the literature may also due to an emphasis on care coordination in multimorbidity care,(30, 31) which requires input from other care team members than physicians. Lack of consensus on decision-making factors may also arise from the inadequacies of clinical practice guidelines and a dearth of evidence applicable to multimorbidity.(32) To some extent, our findings echo these elements, both in that our physicians recognized a diversity of factors governing their decisions and in recognizing the importance of other decision-makers to care planning.

Some of our findings echo prior research, adding to our study transferability. As we found, longer encounter times have been described as integral to addressing the multiple care needs of complex

patients.(28) We found that tension arising from contrasting goals for care are common among different stakeholders, including between more organ or disease-specific specialists and “holistic” PCPs,(28) and between patients prioritizing symptoms and clinicians focusing on long-term prognosis.(33) Clinicians try to resolve these tensions by compromising on conflicting care goals, which our participants also described.(28) Finally, patient factors that affect care planning were also acknowledged by our physicians. Limited patient capacity to conduct disease self-management has been described,(34, 35) particularly among those with cognitive impairment, comorbid mental health diagnoses, or low social support.(28) Adherence to care plans, recognition of the importance of polypharmacy and medication reconciliation, and the burden of treatment have all been described as important considerations when care planning for these patients.(28, 29, 34, 35)

Our study has important practice implications. First, we found physicians employed clear strategies when effectively care planning for complex patients. High volumes of care needs are a known issue with complex patients.(36) In our sample, physicians responded by conducting proactive outreach to anticipate needs, delegating tasks, using other team members (nurses, pharmacists) to conduct follow-up for residual needs, and efficiently gathering collateral information through the team. Accepting that tradeoffs exist in what can be realistically addressed in visits is also described in the literature for complex patients.(37) We found physicians used varied approaches in response, including using longer vs more frequent visits, matching tasks to visit formats (e.g., in-person) and logistics (e.g., travel time), or relying on pre-visit preparation. Beyond these strategies, our study also highlights the intricacies of physician decision-making for complex patients – while illustrating individual factors, the themes collectively represent interacting elements impacting care planning. Individual context, team dynamics, and organizational structures contribute to the “deep matrix” of physician decision-making for complex patients with multimorbidity and reinforce that care planning is itself a complex system.(38) Adaptive, shared electronic health records or greater collaborative care infrastructure could assist with this style of decision-making for these patients.

Our national sample, data collection until thematic saturation was reached, and convergence with prior literature adds to the trustworthiness of our findings. Limitations include that we used physicians working in an integrated health system (VHA) specifically with veteran patients. Additionally, our physicians were highly experienced – with prior average practice experience of over two decades, which could affect their reflections on care planning for complex patients. Our study also took place at the onset of the coronavirus pandemic (COVID-19), which may have impacted experiences of frontline physicians caring for vulnerable patients. We have no data on the non-responders to our email recruitment.

Conclusions

This qualitative study of primary care physicians in the integrated VHA describes factors affecting care planning decisions for complex patients with multimorbidity. Physicians in our study described external, individual, and relationship-based factors; these insights offer opportunities and practical strategies for

health systems and leaders seeking to improve the patient-centeredness and quality of clinical decision-making for complex patients.

Abbreviations

CAN – Care Assessment Need score

COVID – SARs-CoV-2 coronavirus

PCP – primary care physician

VHA – Veterans Health Administration

Declarations

Ethics approval and consent to participate: This project was conducted as quality improvement under the national evaluation efforts for VHA primary care and was not subject to IRB review or waiver. Verbal informed consent to participate and be recorded was obtained from all physicians.

Consent for publication: Not applicable.

Availability of data and materials: The datasets generated and/or analysed during the current study are not publicly available due to study nature as healthcare operations but are available from the corresponding author on reasonable request.

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Authors' contributions: LS: conceptualized the study, developed the methodology, supervised data collection and transcription, conducted the analysis, interpreted results, and wrote the original manuscript. SHS: conducted the analysis, validated, and interpreted results. CS: scheduled and conducted interviews for data collection. JR and AMR: contributed to the study conceptualization and interpretation of results. KN: contributed to the conceptualization and interpretation of results and contributed to funding procurement. JL: contributed to results interpretation. GS: contributed to the conceptualization of the study and methodology development. All authors contributed to the final manuscript.

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References

1. Cassell A, Edwards D, Harshfield A, Rhodes K, Brimicombe J, Payne R, et al. The epidemiology of multimorbidity in primary care: a retrospective cohort study. *Br J Gen Pract*. 2018;68(669):e245–51.
2. Chang ET, Zulman DM, Nelson KM, Rosland A-M, Ganz DA, Fihn SD, et al. Use of general primary care, specialized primary care, and other Veterans Affairs services among high-risk veterans. *JAMA Netw Open*. 2020;3(6):e208120.
3. Hwang AS, Atlas SJ, Hong J, Ashburner JM, Zai AH, Grant RW, et al. Defining team effort involved in patient care from the primary care physician's perspective. *J Gen Intern Med*. 2017;32(3):269–76.
4. Vaure CB du, Ravaud P, Baron G, Barnes C, Gilberg S, Boutron I. Potential workload in applying clinical practice guidelines for patients with chronic conditions and multimorbidity: a systematic analysis. *BMJ Open*. 2016;6(3):e010119.
5. Tinetti ME, Bogardus STJr, Agostini JV. Potential pitfalls of disease-specific guidelines for patients with multiple conditions. *N Engl J Med*. 2004;351(27):2870–4.
6. Warren JL, Klabunde CN, Mariotto AB, Meekins A, Topor M, Brown ML, et al. Adverse events after outpatient colonoscopy in the Medicare population. *Ann Intern Med*. 2009;150(12):849–57, W152.
7. Fried TR, Tinetti ME, Towle V, O'Leary JR, Iannone L. Effects of benefits and harms on older persons' willingness to take medication for primary cardiovascular prevention. *Arch Intern Med*. 2011;171(10):923-8.
8. Dinh TA, Alperin P, Walter LC, Smith R. Impact of comorbidity on colorectal cancer screening cost-effectiveness study in diabetic populations. *J Gen Intern Med*. 2012;27(6):730–8.
9. Zullig LL, Whitson HE, Hastings SN, Beadles C, Kravchenko J, Akushevich I, et al. A systematic review of conceptual frameworks of medical complexity and new model development. *J Gen Intern Med*. 2016;31(3):329–37.
10. Zulman DM, Sussman JB, Chen X, Cigolle CT, Blaum CS, Hayward RA. Examining the evidence: a systematic review of the inclusion and analysis of older adults in randomized controlled trials. *J Gen Intern Med*. 2011;26(7):783–90.
11. Jadad AR. Consideration of multiple chronic diseases in randomized controlled trials. *JAMA*. 2011;306(24):2670.
12. Reschovsky JD, Rich EC, Lake TK. Factors contributing to variations in physicians' use of evidence at the point of care: a conceptual model. *J Gen Intern Med*. 2015;30(S3):555–61.
13. Alfandre D. Clinical recommendations in medical practice: a proposed framework to reduce bias and improve the quality of medical decisions. *J Clin Ethics*. 2016;27(1):21–7.
14. Bernheim SM, Ross JS, Krumholz HM, Bradley EH. Influence of patients' socioeconomic status on clinical management decisions: a qualitative study. *Ann Fam Med*. 2008;6(1):53–9.
15. Lutfey KE, Campbell SM, Renfrew MR, Marceau LD, Roland M, McKinlay JB. How are patient characteristics relevant for physicians' clinical decision making in diabetes? An analysis of qualitative results from a cross-national factorial experiment. *Soc Sci Med*. 2008;67(9):1391–9.

16. Djulbegovic B, Hozo I, Beckstead J, Tsalatsanis A, Pauker SG. Dual processing model of medical decision-making. *BMC Med Inform Decis Mak.* 2012;12(1):94.
17. Featherston R, Downie LE, Vogel AP, Galvin KL. Decision making biases in the allied health professions: a systematic scoping review. *PLoS ONE.* 2020;15(10):e0240716.
18. Hajjaj F, Salek M, Basra M, Finlay A. Non-clinical influences on clinical decision-making: a major challenge to evidence-based practice. *J R Soc Med.* 2010;103(5):178–87.
19. Bate L, Hutchinson A, Underhill J, Maskrey N. How clinical decisions are made: how clinical decisions are made. *Br J Clin Pharmacol.* 2012;74(4):614–20.
20. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med.* 2014;89(9):1245–51.
21. Price LE, Shea K, Gephart S. The Veterans Affairs's Corporate Data Warehouse: uses and implications for nursing research and practice. *Nurs Adm Q.* 2015;39(4):311–8.
22. Scholl I, Zill JM, Härter M, Dirmaier J. An integrative model of patient-centeredness – a systematic review and concept analysis. *PLoS ONE.* 2014;9(9):e107828.
23. Morse JM. Determining sample size. *Qual Health Res.* 2000;10(1):3–5.
24. Morse JM. "Data were saturated . . ." *Qual Health Res.* 2015;25(5):587–8.
25. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol.* 2006;3(2):77–101.
26. MAXQDA. VERBI Software, Berlin. 2019. maxqda.com. Accessed June 25, 2021.
27. Fihn SD, Box T. Care Assessment Need (CAN) score and the Patient Care Assessment System (PCAS): tools for care management. VA National Cyberseminar Series. 2013. https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/713-notes.pdf. Accessed June 25, 2021.
28. Sinnott C, Mc Hugh S, Browne J, Bradley C. GPs' perspectives on the management of patients with multimorbidity: systematic review and synthesis of qualitative research. *BMJ Open.* 2013;3(9):e003610.
29. Xu X, Mishra GD, Jones M. Evidence on multimorbidity from definition to intervention: an overview of systematic reviews. *Ageing Res Rev.* 2017;37:53–68.
30. Bleich SN, Sherrod C, Chiang A, Boyd C, Wolff J, Chang E, et al. Systematic review of programs treating high-need and high-cost people with multiple chronic diseases or disabilities in the United States, 2008–2014. *Prev Chronic Dis.* 2015;12:150275.
31. Smith SM, Wallace E, O'Dowd T, Fortin M. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev.* 2016;3:CD006560.
32. Wyatt KD, Stuart LM, Brito JP, Carranza Leon B, Domecq JP, Prutsky GJ, et al. Out of context: clinical practice guidelines and patients with multiple chronic conditions. *Med Care.* 2014;52:S92–100.
33. Sathanapally H, Sidhu M, Fahami R, Gillies C, Kadam U, Davies MJ, et al. Priorities of patients with multimorbidity and of clinicians regarding treatment and health outcomes: a systematic mixed

- studies review. *BMJ Open*. 2020;10(2):e033445.
34. Harris MF, Dennis S, Pillay M. Multimorbidity: negotiating priorities and making progress. *Aust Fam Physician*. 2013;42(12):850–4.
 35. Cohen-Stavi CJ, Key C, Molcho T, Yacobi M, Balicer RD, Shadmi E. Mixed methods evaluation of reasons why care deviates from clinical guidelines among patients with multimorbidity. *Med Care Res Rev*. 2020;107755872097554.
 36. Smith SM, O’Kelly S, O’Dowd T. GPs’ and pharmacists’ experiences of managing multimorbidity: a ‘Pandora’s box.’ *Br J Gen Pract*. 2010;60(576):e285–94.
 37. Kowalski CP, McQuillan DB, Chawla N, Lyles C, Altschuler A, Uratsu CS, et al. ‘The hand on the doorknob’: visit agenda setting by complex patients and their primary care physicians. *J Am Board Fam Med*. 2018;31(1):29–37.
 38. Sturmberg JP, Martin CM, Katerndahl DA. Systems and complexity thinking in the general practice literature: an integrative, historical narrative review. *Ann Fam Med*. 2014;12(1):66–74.

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