BMJ Open

Enablers and barriers to a quaternary prevention approach: a qualitative study of field experts

Jessica Anneliese Otte ![ORCID] ,[1,2] Maria Llargués Pou[3,4]

[1]Department of Family Practice and Division of Palliative Care, The University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada
[2]Therapeutics Initiative, Department of Anesthesiology, Pharmacology & Therapeutics, The University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada
[3]Sta. Mª de Palautordera Primary Healthcare Center (CAP) - Baix Montseny Primary Healthcare Team (EAP), Institut Català de la Salut, Barcelona, Catalonia, Spain
[4]Emergency Department, University General Hospital of Granollers, Barcelona, Catalonia, Spain

Correspondence to
Dr Jessica Anneliese Otte;
Jessica.otte@ubc.ca

ABSTRACT

Objective There is a growing concern about the sustainability of healthcare and the impacts of 'overuse' on patients and systems. Quaternary prevention (P4), a concept promoting the protection of patients from medical interventions in which harms outweigh benefits, is well positioned to stimulate reflection and inspire solutions, yet has not been widely adopted. We sought to identify enablers and barriers to a P4 approach, according to field experts and advocates in one health system.

Design Qualitative methodology, using semistructured interviews and a grounded theory approach facilitated thematic analysis and development of a conceptual model.

Setting Virtual interviews, conducted in British Columbia, Canada.

Participants 12 field experts, recruited based on their interest and work related to P4 and related concepts.

Results Four factors were seen as promoting or hindering P4 efforts depending on context: relationship between patient and clinician, education of clinicians and the public, health system design and influencers. We extracted four broad enablers of P4: evidence-based medicine, personal experiences and questioning attitude, public P4 campaigns and experience in resource-poor contexts. There were six barriers: peer pressure between clinicians, awareness and screening campaigns, cognitive biases, cultural factors, complexity of the problem and industry influence.

Conclusions Elicited facilitators and impediments to the application of P4 were similar to those seen in existing literature but framed uniquely; our findings place increased emphasis on the clinician–patient relationship as central to decision-making and position other drivers as influencing this relationship. A transition to a model of care that explicitly integrates conscious protection of patients by reducing overtesting, overdiagnosis and overtreatment will require changes across health systems and society.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This was a qualitative study of a broad range of expert professional perspectives to learn about enablers and barriers of quaternary prevention (P4).
⇒ Results will contribute to a much-needed conversation which could inform recommendations for health system design that incorporates P4.
⇒ The study was limited by a geographical area and single health system, which may reduce generalisability to other health systems and cultures.
⇒ By using purposive and theoretical sampling techniques, our sample may have overly represented like-minded individuals.

INTRODUCTION

In an era of new disease labels and expanding arrays of healthcare interventions, a rethinking of the objectives and underlying philosophy of healthcare is warranted.[1]

Health systems are increasingly focusing on the issue of 'overuse' of health services and how to address it because of the far-reaching implications, from primary care to public health, equity and economics.[2] Overdiagnosis—the diagnosis of a condition that otherwise would not have caused symptoms or death[3]—and consequent overtreatment, remain difficult concepts to communicate to the public and most are unaware of the issue.[4 5] Yet, it is critical that society confronts this; overuse presents a daunting challenge to the sustainability of human health and health systems. Its causes—many of which originate with the best of intentions—are as complex and multifaceted as the potential solutions.[6]

In this setting, quaternary prevention (P4) is gaining importance. This relatively young concept was first described in 1986 by Jamoulle.[7] In 1999, it was accepted by the WONCA International Classification Committee and published in the WONCA Dictionary of General/Family Practice in 2003.[8] Quaternary prevention was originally defined as 'The action taken to identify a patient or a population at risk of overmedicalisation, to protect them from invasive medical interventions and provide for them care procedures which are ethically acceptable'[9 10] and supported with a diagram where all preventions were enlaced in the context of the physician and patient relationship.[11] Figure 1 demonstrates this.

The original definition of P4 arises from person-centred medicine; others emphasise an epidemiological model of undermedicalisation and overmedicalisation. A modern
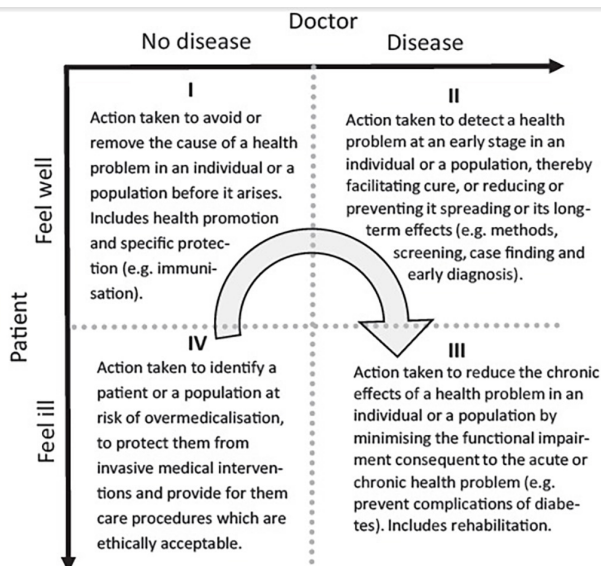
Figure 1 The four definitions of prevention. From: Jamoulle, M. Quaternary prevention, an answer of family doctors to overmedicalization. *Int J Health Policy Manag* 2015;4:61–4. doi:10.15171/ijhpm.2015.24. Used with permission.

movement proposes that P4 be redefined as 'Action taken to protect individuals (persons/patients) from medical interventions that are likely to cause more harm than good'.[12] This broadens the application of P4 from only people who feel sick but do not have measurable pathological processes, to any person in contact with healthcare. As illustrated in figure 2, it incorporates the need for evidence-based clinical practice and understanding of the patient's goals and experiences and asserts that each medical intervention must be analysed according to this paradigm.[13] [14] Precision medicine, which is also sometimes abbreviated as 'P4' to convey that it is predictive, preventive, personalised and participatory, is distinct and may even be in opposition to the approach of quaternary prevention (P4).[15] We refer only to the latter in our study.
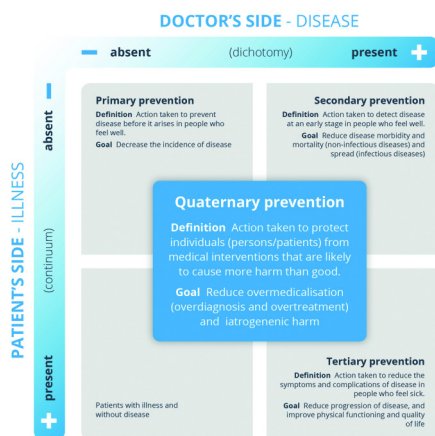

Figure 2 Quaternary prevention: the new definition and the new ramework. From*:* Martins C, Godycki-Cwirko M, Heleno B, *et al.* Quaternary prevention: an evidence-based concept aiming to protect patients from medical harm. *Br J Gen Pract* 2019. doi: 10.3399/bjgp19X706913. Used with permission.

The aim of ensuring patients get care that best fits their goals and needs and protects them from unnecessary medical interventions is also reflected in other initiatives such as Choosing Wisely, the BMJ's Too Much Medicine Campaign, and Preventing Overdiagnosis.[6] Care that fits the patient can prevent harm, reduce waste and allow redirection of resources to areas of unmet need in the same patient or in the health system in general; to be effective, the concept of P4 must be better understood and globally communicated.[16] [17]

Although terms such as P4, high-value care, preventing overdiagnosis, appropriate care—and their opposites—have nuanced meanings, they are sometimes interchanged because there is no international consensus terminology.

Australian, North American and European studies predominate the exploration of causes and potential solutions to the problem of ongoing use of medical interventions that cause more harm than good. Reviews, critical interpretive synthesis and other approaches identify drivers of overuse of tests, treatments and disease labels, including:

▶ Bias, discomfort with uncertainty or limitations in evidence application.[2 6 16–30]
▶ Lacking or dysfunctional patient–physician relationship.[2 17–19 23 25 27]
▶ Higher patient socioeconomic status.[31]
▶ Idolatry of specialists, higher ratio of specialists to primary care physicians.[30 31]
  Disease mongering, broadened disease definitions.[2 6 16–18 20 22 28–30]
▶ Indication creep.[17 19 22]
▶ Risk factor (predictive) medicine and screening programmes.[6 16 21 22 26 28 30 31]
▶ Defensive medicine (eg, fear of litigation).[2 6 17–25 28 31 32]
▶ Too complex to define, explain or measure overdiagnosis.[2 6 18 20 24 26]
  – Lack of validated scales for measuring medical overuse.[18 20 21 24 26]
▶ Advanced technology.[2 6 16 18–20 22 23 26 30]
▶ Financial conflicts of interest.[2 6 17–20 30]
▶ Culture around medicine, low health literacy (eg, 'more is better', patient expectations, biased media reporting).[2 6 16–20 22–26 29–31]
▶ Structural health system factors (eg, lack of primary care system, silos).[2 16 17 19 20 22 23 27 30 31]
  – Payment models, corruption.[2 6 16–19 22–24 27 29–31]
  – Insufficient time for consultations.[2 6 17 27 30]
▶ Complexity of care.[6 27]

Potential solutions for confronting overuse and promoting P4 include:
▶ System-wide approach including measurement and feedback.[2 18 21–24]
  – Interdisciplinary collaboration.[2 6 19 21 23 31]
▶ Government-led initiatives.[2 6 20 23 24 27]
  – Public campaigns (eg, Choosing Wisely).[2 6 18 20 22–24 29 31]

– Financial measures including those that increase time for patient–physician encounters.[2 6 18 19 22 27 30]
 – Reform of malpractice litigation.[6 24 30]
► Health technology (re)assessment, de-implementation.[2 6 18 19 21]
► Patient and medical education.[2 6 16 18 21–30]
 – Communication education for physicians.[18 23–25]
► Changes to the culture of the health professions.[6 18 19 22–24 26–28 31]
► More thoughtful disease definitions.[6 14 22]
► Relationship-based care, shared decision-making, minimally disruptive medicine.[6 16 18 19 22 23 25 27]
► The gatekeeper role of family physicians (FPs).[20 24]
 – Long professional experience.[20]
► Reducing conflicts of interest with industry; controlling corruption.[6 29]
► Narrative-based medicine.[27]

Interview-based qualitative studies obtain different results according to the population studied and the framing of the questions. For example, in a study of 22 journalists, frequent exposure to messaging about the benefits and importance of early testing, overdiagnosis as a difficult concept for readers to understand, and a lack of training of the journalists arose as important barriers to critical reporting on medical tests.[32] One German study of 13 FPs found their personal approach, medical expertise and working culture were direct influences; indirect barriers to P4 included organisational structures and compensation models, technological advancements and patient factors. A wait-and-see approach, the establishment of a trustful doctor–patient relationship and a primary care-centred healthcare model were among the proposed solutions.[33]

There are no consensus criteria for defining drivers and solutions and the full breadth of barriers and enablers of P4—and how they interact—may not yet be understood.[6] Interviewing individuals that interface with the same health system through different professional roles could broaden this knowledge. There are few North American studies and none that incorporate a mixture of health professionals, meaning that some drivers or ways of framing these drivers may be absent from literature to date. Accordingly, we studied a range of experts and advocates of a P4 approach to care in a Canadian context.

Healthcare is mostly organised provincially in Canada. Like most other provinces, British Columbia's health system includes a collection of public and private medical services, primarily publicly funded and organised into five regional health authorities, one provincial authority, and another with specific focus on meeting the needs of First Nation individuals. The majority of primary care is delivered in private clinics which are publicly funded. Access to primary care is not universal due to shortages of clinicians across the country; British Columbians are among the least likely to be attached to an FP.[34]

METHODS
Design
We used a grounded theory approach and constructivist paradigm, employing semistructured interviews to explore existing concepts and elicit new ideas. In this approach, the recruitment, data collection and analysis are non-linear and interrelated, allowing for deeper inquiry into concepts as they arise. This study is reported following Standards for Reporting Qualitative Research. We adapted the structure and interview script from a similar study of German FPs.[33] Main lines of questioning related to participants' professional backgrounds; their understanding of overuse, quaternary prevention and related terms; views on the drivers of overuse and factors that protect against this; issues specific to regional context; and thoughts on barriers to the spread of P4 and similar concepts.

Sampling and recruitment
Participants were recruited initially by a purposive sampling strategy through their participation in an interest group relating to Choosing Wisely in British Columbia, Canada. We approached six individuals who could provide expertise on P4 from unique perspectives; we explicitly sought diversity of profession to maximise the range of concepts elicited. We then used a theoretical sampling strategy to identify others who might build on themes that emerged in the initial wave of interviews and continued until theoretical saturation.

Potential participants were contacted via email with a study description and letter of initial contact, in accordance with the protocols of the University of British Columbia Behavioural Research Ethics Board. 15 email invitations were sent. One potential participant did not reply, and two (both medical students) indicated interest but were not able to participate within the study's time frame. 12 participants consented and were interviewed. They received no compensation. None withdrew.

Data collection
Interviews were all conducted in September 2022 and were approximately 45 min in length, led by an experienced facilitator (JAO) while MLP observed. All interviews were conducted virtually via Zoom software. We obtained participants' written consent to participate in advance of the interview and verbal consent for recording at the time of the interview. The script (online supplemental appendix 1) employed mostly open-ended questions and was followed with additional questions for clarification and to expand on concepts that arose in earlier interviews. The interviews were transcribed via Zoom and manually corrected by JAO.

Data analysis
After each interview, JAO and MLP discussed codes and categories arising and generated or appended theoretical memos. Constant comparison was used to adjust our existing concepts and revise perceived relationships

between codes and categories, in accordance with the techniques of Corbin and Strauss.[35] One researcher (MLP) read and coded the transcripts, first using open coding to identify a priori codes, and novel codes that arose from the data. JAO independently reviewed and adjusted the codes against transcripts. Coded text was collated, and codes were compared and consolidated. Axial coding was used to group codes into categories (causal drivers). Where our list of a priori codes lacked supporting data, or where novel codes arose, JAO and MLP discussed candidates for interview and invited participants with expertise that might help develop these codes. Finally, selective coding was used to arrive at a core category that could best describe and unify our findings.

Discrepancies were resolved through discussion and consensus. A conceptual model was developed to illustrate the relationship between the barriers and enablers of P4 that arose from the analysis. Member checking was performed on completion of the study.

Patient involvement

Patients were not involved in the study design. One patient advocate (PA) and one citizen advocate participated as experts.

RESULTS
Participant characteristics

12 field experts were interviewed, and their demographics are described in table 1. Interviewees self-identified primary roles and professions were pharmacy professor (PP), medical administrator (MA), health researcher (HR), economics researcher, FP (F1, F2), PA, microbiologist/antimicrobial steward (MB), researcher/journalist (RJ), citizen advocate/epidemiologist, surgeon/educator (SE) and pharmacology researcher (PR). Most had more than 15 years of professional experience. All were working in British Columbia and one-third had experience working in healthcare outside of Canada.

Table 1 Demographics of the interviewed participants

		N	%
Gender	Female	5	42
	Male	7	58
Professional experience	≤15 years	3	25
	>15 years	9	75
Current area of work	Urban	11	92
	Rural	0	0
	Both	1	8
University affiliation	Yes	9	75
	No	3	25
Experience working in health systems outside of British Columbia	Yes	4	33
	No	8	67

Main results

Thematic analysis elicited four variable factors that may both facilitate and impede P4, 4 enablers of P4 and six main barriers of P4. Each theme listed appeared at least once in the interviews, but the majority were cited by multiple participants.

Variable factors: barriers or enablers depending on context and application
Patient–clinician relationship

The relationship of the individual clinician (usually a primary care physician) and patient was considered the ultimate driver of low-value care (LVC) or high-value care, as the final decision as to whether to pursue a test or treatment rests in this dynamic.

> Patients are very eager to get and trust a health professional who can guide them through the vicissitudes of life… Let's not forget that that patients have relationships with their doctors that are among their most important relationships in their lives, right? (RJ)

Both the human interaction (eg, the clinician picking up on patient factors outside of a diagnostic algorithm) and the interface of this patient–clinician relationship with the system (eg, time per visit, clinician–patient ratio) were considered highly influential. Some participants explained that if this relationship is dysfunctional, or paternalism prevailed, it leads to distrust and tendency to overuse. Patient-centred care, shared decision-making, discussion of patients' goals and continuity of care were frequently listed facilitators of P4.

Participants recommended that when a patient's lifestyle and the complex milieu in which they live are taken into account, it leads to richer, more trusting interactions. A strong relationship permits both the patient and the clinician to safely challenge habitual medical practices and make thoughtful decisions over time.

> Quality is about understanding patients' goals and values and their comorbidities, and doing what's clinically appropriate… this is relationship-based care and a person-focused approach… [When discussing a test, patients] can get back to me, and I say, 'There's no rush on this. We can do it. You can change your mind' and that's I think, a big plug. That's a big vote for social public health care and longitudinal care in general. (F1)

Education of clinicians and the public

Misunderstanding the relative magnitude of benefits and harms was often cited as a problem for both patients and clinicians, and this was seen to arise from gaps or missteps in education.

Interviewees suggested that pathophysiological and 'fix it' approaches perpetuated by medical education create a distorted understanding of illness, encourage a desire to label things rather than live with uncertainty and place too much value on risk factors.

Maybe this is our granular, biochemical, very 'Cartesian' understanding of medicine, right? And it's simple, and it leads us to concrete answers and quick answers, which therefore imply straightforward treatments and tests to delineate. It's that 'find and fix model' that we that we work within, I think that's a bit of the issue… The germ theory, and when we found antibiotics, in some ways, changed profoundly the way we practice medicine because we felt like 'maybe there's a cure for everything.' (F2)

Misinformation, particularly as spread on social media and a lack of health literacy contribute to unrealistic patient expectations and perpetuate the practice of defensive medicine, leading to use of interventions which might immediately satisfy but eventually result in negative consequences. Clinical guidelines were explicitly noted to be problematic and sullied by industry conflicts of interest. They were seen as tending to promote action rather than inaction, the misinterpretation of statistical evidence, and a focus on disease entities rather than the people who have them.

Participants suggested that training clinicians in critical thinking, communication skills and P4 could reduce overordering of tests and treatments and lead to more deprescribing. Adjusting priorities to 'art of medicine' education and away from the pathophysiological model of disease, mentoring of clinicians, and increased health education for children was seen as necessary for contravening tendencies towards overuse.

Influential figures

Support groups, popular influencers, and family and friends were described as affecting a patient or clinician's decision to seek out or to question tests and treatments. The influence of organisations on P4 was described positively when funded publicly or independently, and negatively when sponsored by for-profit industry. Commercially funded patient support groups were seen as likely to convey misinformation due to vested interests.

Once [education and support groups] start marrying themselves with the commercial interest—whether it's pharma or whatever—those messages around safety and appropriateness and overdiagnosis just get washed away. (RJ)

Public figures who were not in the medical profession but who gave medical advice, such as encouraging the public to get a cancer screening test, may promote public uptake of low-value and inappropriate interventions. Pursuit of social cohesion can be at play; when friends and family experience and recommend specific medical interventions, an individual may feel more drawn towards doing the same. Likewise, those who experience a bad outcome or learn about the harms of overtesting or overtreating may inspire others to ask more questions or explore opportunities to protect themselves against iatrogenic harm.

Health system design

The front line… it's between the provider and the patient, and if the provider and the patient want to make changes, but the system isn't there to support them, it's not going to happen. (MA)

Participants stated that the design of the health system offers powerful tools for achieving P4. Government restrictions, such as making some drugs harder to prescribe or delisting certain procedures, would be effective; these would be most acceptable when targeting no-value and obviously harmful interventions, but caution must be given to unintended consequences, like impeding access to appropriate care. Variation in practice was seen as necessary but complex; regulations might reduce egregious outliers.

We need more room to create variation in terms of reflecting patients' goals. But we need less room for this unwarranted variation where there's no legitimate reason. (MB)

Silos within systems and keeping clinicians outside of decision-making structures both impede a shift of resources from interventions that harm patients to those that protect them. Team-based care was seen as facilitating P4; both patient and citizen advocates highlighted that matching a patient's needs with the right team member or setting might reduce the intensity of interventions. Informational continuity, via a common medical record, could also reduce redundancy in test ordering and reduce re-exposing patients to medications that caused them adverse events in the past.

The structure of the healthcare system incentivises doing rather than not doing, according to economist, patient and clinician perspectives; it takes more time and energy for a physician to explain why an X-ray is unnecessary or harmful than it does to order it. There is a financial disincentive to practising P4. Fee-for-service and pay-for-performance models drive throughput or care that does not fit the patient, whereas salaried and other models empower a slower and more patient-centred approach, ultimately facilitating P4. Aligning payment to incentivise appropriate care was seen as important but also outside the reach of individuals.

Time for clinicians and patients to interact was brought up by almost all interviewees. Limited time for clinical encounters inhibits discussion of complex choices, fully informed consent and questioning. It reduces joy in work for the clinician, and thus impacts sustainability of health systems.

I believe that most of them [medical students] truly want to help people and they want to take time with people. They want to think. They enjoy that process. And that's the currency. If somehow—and there are ways to do this—if somehow we can provide that currency, not money… that would increase the resilience of doctors and improve health care. (SE)

Health systems which create more time for encounters also permit time itself to be used as a therapy, protecting patients against harms of tests and treatments given when 'watchful waiting' might be an equal or better intervention.

Enablers of P4
Evidence-based medicine

Evidence-based medicine (EBM) was identified as a tool to both avoid use of low-value interventions and to facilitate the best quality care. Participants provided examples in which ignorance or failure to look critically at evidence led to adoption or perpetuated use of tests and treatments that are unnecessary and harmful. EBM creates a foundation for revisiting the utility of specific interventions and can make it easier for clinicians to discuss appropriate care with patients.

> Lots of stuff kind of falls apart when you start to look at the evidence… if a person is doing something that they wouldn't have been doing had they known the best available evidence, then that's overtreatment (PP)

Personal experiences, questioning attitudes

Personal experiences, sometimes epiphanies, transformed participants' views of healthcare and stoked interest in P4. Some experts who had been patients or caregivers noted that they only learnt about the harms of drugs after they witnessed or experienced them. Clinicians shared stories in which they suddenly realised they were causing harm in the pursuit of trying to help a patient.

> When the crisis has already happened, you want to prevent that from happening to other people. It's such a huge human motivator: when bad things happen, you don't want to see it happen to somebody else. (PA)

Curiosity, critical thinking and a questioning attitude were described as fortified after noticing harms from overuse; these traits subsequently made interviewees reconsider ordering or consenting to a particular intervention and engendered in them a desire to protect patients by way of P4.

Public P4 campaigns

Public institutions such as Choosing Wisely Canada were seen as supporting deimplementation efforts in British Columbia, helping clinicians to question existing practices, and positively influencing culture and consequently patients.

> Fifteen years ago we didn't have a 'Preventing Overdiagnosis' world like we do now. We didn't have something called 'Choosing Wisely'… And I think that is somewhat filtering down to the patients, and I think that it's causing people to be perhaps more skeptical and more discerning in the information that they get. (RJ)

Positive framing of P4 and related campaigns was felt to be critical to their success.

Experience in resource-poor contexts

Living or working in the context of resource shortages helps drive thinking about whether a test or treatment is truly useful and needed. Participants stated that, particularly in the rural environment, people think twice about pursuing interventions that are not easily accessible and may instead find a way to work without these. The crisis was seen as a driver of change; if a common resource—like tubes for blood tests—became temporarily unavailable, there was more thoughtful and limited use.

Barriers of P4
Clinician peer pressure

The pressure to conform to published guidelines and to match the style of care undertaken by others was described as powerful. Those trying to engage in a P4 approach might be dissuaded by the need to conform to the 'standard of care' and performance measures, even if they feel these are flawed or harmful to patients.

> My sense is that if you're not testing people on a regular basis for some things, then you would be considered, perhaps, by your peers as negligent or not going the hundredth mile for your patients. (RJ)

Awareness and screening campaigns

Corporate and health institution attempts to raise awareness about diseases were seen as contributing to patients seeking tests and labels that are unnecessary, while simultaneously failing to provide meaningful benefit to people with the highlighted disease.

> Awareness campaigns have been a huge lever on social media to have people self-define as being mentally ill, and also casting the net very, very wide and it's been proven that it does not change attitudes. You know the companies would say, 'Well, we're trying to reduce stigma.' Well, there [are] very few people that actually have mental health conditions that are caught in this net. (HR)

Interviewees explained that screening programmes and campaigns perpetuate the idea that more testing is better for everyone and do not accurately communicate the harms of screening tests.

Several of those interviewed described oversimplification of the medical reality: we are under the false impression that tests are either positive or negative, that they are either correct or incorrect, but not that they can be uncertain, unhelpful or harmful. We also tend to think, incorrectly, that reducing risk factors and surrogate markers reduces risk, and that treatments fix a problem completely or not at all.

10 of the 12 participants pointed to cognitive biases and problematic thinking as important reasons for ongoing use of unnecessary and harmful medical interventions.

Those pushing for such interventions were seen as not intentionally doing harm; instead, efforts to do good were misguided by problematic thinking processes. There were several subcategories within this theme:

► Fear of missing something or something being denied, fear of malpractice suits, and fear-mongering to scare patients into seeking more interventions.
► Novelty bias, described as patient interest, academic pursuit and funding of research disproportionately favouring new technologies even if they are unproven or inferior to older options
► Optimism bias, our tendency to overestimate the likelihood of positive outcomes and underestimate negative ones.

People have to understand that with any medical intervention there is some level of benefit, and there is some level of harm. It's that second piece that we seem to forget or think that's not important. It doesn't deserve our attention. It's part of our culture where we perhaps believe that we can only benefit… we're only ever going to win the lottery. We're not going to lose all our money. (RJ)

► Commission bias, a tendency to action even when there is no evidence supporting the action and not acting is likely to produce better outcomes for patients; opposite to the precautionary principle

It's much broader than the doctor feeling like they've got to order, it's the people believing that they have to have [something]… They don't know any other way, and it doesn't sit well to do nothing. (MB)

Cultural factors
Several acquired social norms, such as a cost taboo—the difficulty of talking about saving money in healthcare—were perceived to make practising P4 unpopular or difficult. Making cuts to health services is particularly challenging in Canadian society, in which healthcare, not just health, is viewed as a right.

Social attitudes accompanying ageing, particularly according to interviewees who had also been caregivers for elders, are a barrier to P4. Older people might experience more fear of medical problems because of social conditions like isolation, might not feel confident enough to challenge the medical establishment or may believe that being older means you need more medical entanglement. An 'instant' culture contributes to increasing demands for services; where normally a sequential or progressive approach could be taken to diagnosis or treatment, now the emphasis is on speed with disregard for utility or safety.

I think people are always looking for solutions, for something that will be the answer to their problem. A lot of people are looking for a quick fix… so patients are vulnerable to being treated inappropriately (PR)

Two interviewees highlighted Brandalini's law ('bullshit asymmetry principle') which states 'the amount of energy needed to refute bullshit is an order of magnitude larger than to produce it.'

It takes more time to stop medications or to not prescribe than it does to just do it …there is a romance of starting a medication and the painful divorce of stopping one. (F1)

A number of drivers contribute to the phenomenon of 'medicalisation,' including normalisation of polypharmacy and belief in a 'pill for every ill.' The idea that 'more is better' with respect to labels, tests and treatments, results from popular beliefs from parts of our lives outside of health, including capitalist norms. Indication creep is another problematic cultural manifestation, stemming from both industry influence and, in specific situations, the desire of clinicians to help as many people as they can.

Industry and marketing influence
The pharmaceutical and medical device industry was seen as providing some clinical benefit at huge cost, both financial and in terms of harms to patients. The ability for manufacturers to influence prescribers, clinical trials, guidelines, medical journal editors, governments and patient-support groups, and to market directly to the public, overwhelmingly promotes overuse and imposes dynamic obstruction to the practice of P4.

The main driver [of overdiagnosis] is money—to make money—and the most successful marketing is done by big pharma and big drug companies. (PR)

There's the whole culture of promotion of medications by pharmaceutical companies, pharmaceutical detailers visiting doctors, you know, 'Here's the new latest whatever,' 'Here's some samples'… [There is] wall to wall drug or supplement advertising, with beautiful pictures of people that don't have psoriasis anymore, and can go swimming in a pool. And of course they're all actors, and it's relentless. So I think that's a huge factor… setting the stage for seeing that drugs can just help with anything. (PA)

Complexity of the problem
Those interviewed described P4 as difficult for patients and even those in healthcare to understand and to accept. The multitude of reasons that overuse happens and uncertainty about how to make change add complexity. Recognising the harms of overuse requires acknowledging the awkward truth that in trying to help people, we may instead be hurting them.

[P4 doesn't spread because] it's hard, because it forces us to look critically on what we do. We're no longer saviors. Part of an evolution of us, our profession, is that the potential for us to do harm is probably higher now than it's ever been. (F2)
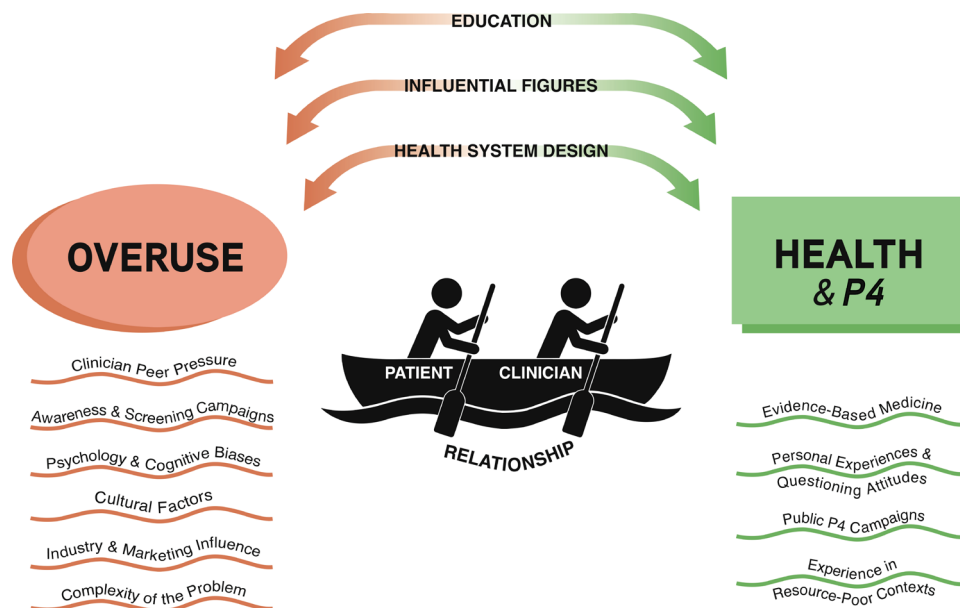
Figure 3 A visual interpretation of the interplay between drivers and barriers of P4 based on interviews of field experts in British Columbia.

While there are common priorities, the lack of globally accepted terminology and variety of uncoordinated initiatives (Choosing Wisely, Preventing Overdiagnosis, P4, etc) were seen as fragmenting efforts for change.

> I'm really convinced that health care providers are [quite] far away from the public; if the public doesn't get it—the public have to understand!—they need a simple word that may impact on them. I think health care providers need exactly the same word because I think there's an advantage to [being] consistent in the in the word that we're using for everybody. (PP)

The design of the conceptual model was based on selective coding and how participants described relationships between factors (figure 3). The centrality of the patient–clinician relationship was overwhelmingly clear, with all other factors having the ability to influence that relationship either towards or away from P4. Those factors seemed to be engaged in a push-pull on this relationship, much like tides or currents could alter the course of a boat. The metaphor of paddling a boat together seemed to best capture the emphasis from our participants that it is only in the shared dynamic between patient and clinician that P4 can be implemented or violated; the journey is undertaken together against or with aid from the outside influences.

DISCUSSION

Our qualitative approach elicited a rich tapestry of enablers and barriers to P4, and forces which could have either effect, depending on the situation. Interview participants shared that decisions relating to health interventions are predominantly made within the relationship between clinician and patient. The thoughts and actions that arise in this interface are influenced by the strength of that relationship, psychological factors such as cognitive biases, questioning attitudes, education and understanding of evidence-based medicine, and by outside factors like industry and the design of health systems. Although unnecessary medical interventions were viewed primarily as the result of good intentions gone wrong, financial conflicts of interest, as in industry sponsorship of education in medicine, were a notable exception.

Based on the results, we considered the patient–clinician relationship as fundamental in determining the ability of a patient to have care appropriate to their goals and context, and which minimises burdens and harms to them. Our conceptual model places this relationship at the centre, subject to influences within and without, driving the care towards or away from P4 and what represents 'health' for the patient. Unlike hierarchical or systematic models of factors driving or preventing overuse and LVC, our concept offers a unique vision which (1) permits an interplay between the factors and (2) illustrates the cumulative and variable impact of these factors on the foundation of care. This is in keeping with one perspective on P4 which posits that an approach beyond that of biomedicine, one that does not simply prevent unnecessary medicine but also offers the appropriate answer to patient's concerns, is based on relationships.[27] One practical framework similarly conceptualised patient–clinician interaction as the key determinant of overuse, but differs in that it emphasises aspects of that interaction rather than the relationship itself.[23] Interestingly, our experts' statements tended to reflect the patient-centred origins of Jamoulle's definition of P4, rather than the modern version which emphasises process improvement and omits the ethical context of care.

Many of the salient themes were consistent with existing literature, with a few notable differences. Perhaps because

we chose to interview experts within the field, we heard that personal stories were transformative and inspired inquisitiveness, a theme not strongly described in existing research.

In other models, driving and mitigating influences have been grouped into layers (eg, patients and public, healthcare professionals, industry and technology, health system, and culture),[6] domains (eg, money and finance; knowledge, bias and uncertainty; and power and human relationships).[17] A grounded theory study of primary care clinicians in Stockholm found that uncertainty, the perception of pressure from others, and the need to do some action to care for patients were three reasons that clinicians engaged in LVC. Like our study, their findings suggested that health systems influence physicians' use of interventions that are not in the best interests of patients. While their model suggested that 'the physicians have to work with reducing LVC on their own',[36] our findings emphasise that P4 is a shared responsibility between patients and clinicians, and that a P4 approach is facilitated or stymied by many factors which impact the discussions that occur within that relationship.

That our participants emphasised relational rather than transactional care is in keeping with the zeitgeist. The doctor–patient relationship is increasingly understood to be correlated with improved morbidity and mortality, but also the difficult-to-measure qualities of care, kindness, and love which sustain patients and clinicians alike.[37] Policy-makers and researchers may be persuaded to consider: which characteristics of these relationships matter most, and under which conditions do they thrive?

Strengths and limitations

This study builds on existing work and is the first to attempt to discover the enablers and barriers of P4 from experts who represented an array of professional perspectives. A small sample size and the potential for selection bias in recruiting participants may limit generalisability of the findings. While we sought to interview as many as 15, we recruited 12 and found diminishing ability of latter interviews to identify new concepts. This is consistent with the finding that other qualitative research tends to reach saturation of concepts around 12 interviews.[38]

Based on the grounded theory approach and an emerging theme of the nature of medical education, we sought to include one medical student participant but were unable to do so within the time frame of the study. The teaching and application of P4 requires special skills and knowledge and learners can be supported to build these specific competencies,[39] however, the nuanced journey and needs of students is not reflected in our study.

Both authors completed residencies in family medicine and this lens may have affected interpretation of themes and their connections. By choosing to interview people already intimately familiar with concepts related to P4, we had the benefit of their years of reflection and implementation. However, the participant group may be considered contaminated as participants and one facilitator (JAO) are all part of a small professional community with some pre-existing relationships. For the purposes of a theoretical exploration of ideas with experts, this was not avoidable.

Member-checking was used to improve accuracy and validity and our conceptual model could be strengthened by external validation with experts in other regions and interviews with those for whom the concept is novel. Additionally, our study emphasised overdiagnosis, overtreatment and overuse; whether the conceptual model could be adapted to underutilisation could be an area for further inquiry.

While there exist tools to measure continuity of care and compassion within healthcare relationships, given the challenges of measuring the concept of P4, and the philosophical question of whether it is even quantifiable, there are no studies yet that assess features of the clinician–patient relationships and the extent of P4 achieved.

CONCLUSIONS

While most of the salient enablers and barriers to P4 elicited in our study were consistent with existing research, our findings uniquely position the patient–clinician relationship at the centre of a shared journey, with cultural and systemic influences poised to alter its course.

Human resource limitations, environmental impacts, opportunity costs and harms to patients are increasingly prompting societies to confront the crises that arise from adopting a 'more is better' approach in contemporary industrialised healthcare. Transforming systems to cultivate the care within the crucial clinician–patient relationship may help us not only to implement P4, but also to improve sustainability and restore meaning to medicine.

ORCID iD
Jessica Anneliese Otte http://orcid.org/0009-0000-7598-7354

REFERENCES

1. Moynihan R, Brodersen J, Heath I, *et al*. Reforming disease definitions: a new primary care led, people-centred approach. *BMJ Evid Based Med* 2019;24:170–3.
2. Ellen ME, Wilson MG, Vélez M, *et al*. Addressing Overuse of health services in health systems: a critical interpretive synthesis. *Health Res Policy Sys* 2018;16:48.
3. Welch HG, Schwartz LM, Woloshin S. *Making people sick in the pursuit of health*. Boston, MA: Beacon Press, 2011.
4. Ghanouni A, Meisel SF, Renzi C, *et al*. Survey of public definitions of the term 'overdiagnosis' in the UK. *BMJ Open* 2016;6:e010723.
5. Kale MS, Korenstein D. Overdiagnosis in primary care: framing the problem and finding solutions BMJ. *BMJ* 2018;362:k2820.
6. Pathirana T, Clark J, Moynihan R. Mapping the drivers of Overdiagnosis to potential solutions BMJ. *BMJ* 2017;358:j3879.
7. Jamoulle M. Information et Informatisation en Médecine Générale. In: Berleur J, Loebt-Maris CI, Poswick RF, eds. *Les informa-G-iciens. Les professionnels de l'informatique dans leurs rapports avec les utilisateurs Actes des III°Journées de Réflexion sur l'Informatique (3°J.R.I.)*. Namur (BE): Presses Universitaires de Namur, 1986: 193–209.
8. Bentzen N, ed. *Wonca dictionary of general/family practice*. Copenhagen (DE): Maanedsskrift for Praktisk Laegegerning, 2003.
9. Jamoulle M, Tsoi G, Heath I, *et al*. Quaternary prevention, addressing the limits of medical practice [WONCA World Conference Prague]. 2013. Available: http://www.ph3c.org/PH3C/docs/27/000322/0000469.pdf
10. Jamoulle M. The four duties of family doctors: Quaternary prevention – first, do not harm. *Hong Kong Pract* 2014;36:72–9.
11. Jamoulle M. About Quaternary prevention: first, do no harm. In: *The world book of family medicine*. 2015. Available: https://orbi.uliege.be/bitstream/2268/187052/1/093%20–%20About%20Quaternary%20Prevention.pdf
12. Martins C, Godycki-Cwirko M, Heleno B, *et al*. Quaternary prevention: reviewing the concept. *Eur J Gen Pract* 2018;24:106–11.
13. Guyatt G, Rennie D, Meade MO, *et al*. *Users' guides to the medical literature: essentials of evidence-based clinical practice*.3rd edn. New York: McGraw-Hill Education, 2015. Available: https://jamaevidence.mhmedical.com/Book.aspx?bookId=847
14. Martins C, Godycki-Cwirko M, Heleno B, *et al*. Quaternary prevention: an evidence-based concept aiming to protect patients from medical harm. *Br J Gen Pract* 2019;69:614–5.
15. Vogt H, Hofmann B, Getz L. The new Holism: P4 systems medicine and the medicalization of health and life itself. *Med Health Care Philos* 2016;19:307–23.
16. Kale MS, Korenstein D. Overdiagnosis in primary care: framing the problem and finding solutions. *BMJ* 2018;362:k2820.
17. Saini V, Garcia-Armesto S, Klemperer D, *et al*. Drivers of poor medical care. *The Lancet* 2017;390:178–90.
18. Kherad O, Peiffer-Smadja N, Karlafti L, *et al*. The challenge of implementing less is more medicine: a European perspective. *Eur J Intern Med* 2020;76:1–7.
19. Hensher M, Tisdell J, Zimitat C. Too much medicine": insights and explanations from economic theory and research. *Social Science & Medicine* 2017;176:77–84.
20. Pausch M, Schedlbauer A, Weiss M, *et al*. Is it really always only the others who are to blame? GP's view on medical overuse. A questionnaire study. *PLoS One* 2020;15:e0227457.
21. Takada T, Heus P, van Doorn S, *et al*. Strategies to reduce the use of low-value medical tests in primary care: a systematic review. *Br J Gen Pract* 2020;70:e858–65.
22. Bandovas JP, Leal B, Reis-de-Carvalho C, *et al*. Broadening risk factor or disease definition as a driver for overdiagnosis: a narrative review. *J Intern Med* 2022;291:426–37.
23. Morgan DJ, Leppin AL, Smith CD, *et al*. A practical framework for understanding and reducing medical overuse: conceptualizing overuse through the patient-clinician interaction. *J Hosp Med* 2017;12:346–51.
24. Colla CH, Kinsella EA, Morden NE, *et al*. Physician perceptions of choosing wisely and drivers of overuse. *Am J Manag Care* 2016;22:337–43.
25. Jessup RL, Buchbinder R. What if I cannot choose wisely? Addressing suboptimal health literacy in our patients to reduce over-diagnosis and overtreatment. *Intern Med J* 2018;48:1154–7.
26. Brodersen J, Kramer BS, Macdonald H, *et al*. Focusing on overdiagnosis as a driver of too much medicine. *BMJ* 2018;362:k3494.
27. Widmer D. Care and do not harm: possible misunderstandings with quaternary prevention (P4): comment on "Quaternary prevention, an answer of family doctors to over medicalization. *Int J Health Policy Manag* 2015;4:561–3.
28. Chiolero A. Risk factor (predictive) medicine as a driver of fear and overdiagnosis. *BMJ* 2014;349:g7078.
29. Pathirana T, Wang Y, Martiny F, *et al*. Perspectives from China, India and Sri Lanka on the drivers and potential solutions to overuse and. *BMJ EBM* 2023;28:85–8.
30. Parmar MS. A systematic evaluation of factors contributing to overdiagnosis and overtreatment. *Southern Medical Journal* 2016;109:272–6.
31. McAlister FA, Lin M, Bakal J, *et al*. Frequency of low-value care in Alberta, Canada: a retrospective cohort study. *BMJ Qual Saf* 2018;27:340–6.
32. O'Keeffe M, Nickel B, Dakin T, *et al*. Journalists' views on media coverage of medical tests and overdiagnosis: a qualitative study. *BMJ Open* 2021;11:e043991.
33. Alber K, Kuehlein T, Schedlbauer A, *et al*. Medical overuse and quaternary prevention in primary care – A qualitative study with General practitioners. *BMC Fam Pract* 2017;18:99.
34. Li K, Frumkin A, Bi WG, *et al*. Biopsy of Canada's family physician shortage. *Fam Med Community Health* 2023;11:e002236.
35. Corbin JM, Strauss A. Grounded theory research: procedures, canons, and evaluative criteria. *Qual Sociol* 1990;13:3–21.
36. Ingvarsson S, Augustsson H, Hasson H, *et al*. Why do they do it? A grounded theory study of the use of low-value care among primary health care physicians. *Implement Sci* 2020;15:93.
37. Heath I, Montori VM. Responding to the crisis of care. *BMJ* 2023;380:464.
38. Guest G, Bunce A, Johnson L. How many interviews are enough? an experiment with data saturation and variability. *Field Methods* 2006;18:59–82.
39. Gomes LF, Gusso G, Jamoulle M. Teaching and learning quaternary prevention. *Rev Bras Med Fam Comunidade* 2015;10:1–14.

Supplemental material

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)

BMJ Open

Enablers and barriers to quaternary prevention from a range of perspectives: a qualitative study

Otte/Llargués

[Text written in italics will only be used as back-up questions/prompts, depending on the interview partner's fluency.]

Interview Script

Thank you for taking the time to join me for this interview. Today we are talking about your opinions on the topic of Quaternary Prevention, the process of preventing medical interventions likely to cause more harm than good.

1. To start, would you please tell me bit about your professional background or situation that put you in contact with this concept? What role gives you insights about the concept of overdiagnosis and overtreatment?

2. To follow up, I have some brief demographic questions. The responses won't be linked with any quotations, but may be used to look for patterns in thematic analysis.

    a. What would you say is your main, current Professional Role: _____
    b. For about how many years have you been in this role? _____
    c. Do you have an Academic (University) Affiliation? Yes/No
    d. What is the primary location of your work: Rural or Urban?
    e. Have you worked in a health system in another province or country? Yes/No, where ____
    f. What is your Gender? _____

3. Thank you. Now, I'm interested to know, how would you personally define medical overuse?

4. Some people know this concept by different terms. Have you heard of the term "Quaternary Prevention" before?
    a. *[If not, offer definition. P4 may refer to "actions taken to protect individuals (persons/patients) from medical interventions that are likely to cause more harm than good"]*
    b. What are other terms that you prefer to use to refer to your work around lessening overtesting and overtreatment?

5. What are the main drivers of or reasons for medical overuse, in your opinion?
    [What do you observe in your daily work? Are there economic reasons, lack of experience, status of /opinions about evidence-based medicine/guidelines, skills/personality, organisational structures, defensive medicine.]

6. Who drives overtesting and treatment? *[How and why is this the case?*
    a. *What is the role of patients?*

Supplemental material

BMJ Publishing Group Limited (BMJ) disclaims all liability and responsibility arising from any reliance placed on this supplemental material which has been supplied by the author(s)

BMJ Open

    b. *What about clinicians?*
    c. *And administrators or government?*
    d. *Are there other stakeholders*?]

7. We have been talking about examples and drivers of medical overuse in detail so far. What are the factors that protect against medical overuse or ensure that patients get the right amount of care? [*Features of health system, approach to care, patient factors, education, economic incentives, etc]*

8. *[Which stakeholders could help with preventing medical overuse?]*

9. What changes need to occur to help prevent the provision of unnecessary and harmful medical interventions? *[Doctor-patient-relationship, watchful waiting, evidence-based medicine/guidelines, re-allocation of resources*]

10. Are there any BC-specific factors that are particularly helpful for mitigating the prevalence of unnecessary or harmful interventions? Are there any unique drivers in BC that are making overuse worse?

11. The concepts we are talking about are not widely known. What are the main barriers to greater adoption of the "quaternary prevention" or "choosing wisely" approach?

12. We are almost at the end of this interview now. Is there anything missing in your opinion? Is there anything we haven't discussed?

Thank you very much for this interview and your time. If you think of a colleague that might like to participate in an interview, please invite them to contact us.