

BMJ Open Identifying threshold concepts in postgraduate general practice training: a focus group, qualitative study

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To cite: Hall K, Chae A.

Identifying threshold concepts in postgraduate general practice training: a focus group, qualitative study. *BMJ Open* 2022;**12**:e060442. doi:10.1136/bmjopen-2021-060442

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-060442>).

Received 22 December 2021

Accepted 31 May 2022

ABSTRACT

Objective To identify threshold concepts (TCs) for physicians undergoing postgraduate medical education (PGME) in general practice.

Design An explorative, qualitative study with 65 min focus group interviews and thematic analysis was used. Participants were asked to describe their most transformative learning experiences. Heuristical TCs were identified from the thematic analysis.

Setting Aotearoa/New Zealand (A/NZ).

Participants Fifty participants, mostly comprising current trainees and educators from urban centres, and of NZ/European ethnicity.

Results Twenty TCs covering many aspects of postgraduate general practice experience were derived from themes identified in the data. Presented in medical proverbial form for ease of recollection, these included: Money makes the practice go round; Be a legal eagle; Manage time or it will manage you; Guidelines, GPs' little helpers; Right tool, right word, right place; The whole of the practice is greater than the sum of the parts; The personal enhances the professional; Beat biases by reflection; Chew the Complexity, Unpredictability, Diversity; Embrace the uncertainty; Not knowing is knowing; Seek and you shall find; Waiting and seeing, waiting and being; Look, listen, think between the lines; Treat the patient beyond the disease; No patient is an island; Words work wonders; Hearing is healing; Being you and being there; and; The relationship is worth a thousand consults. These TCs mapped onto core competencies in A/NZ's PGME in general practice curriculum.

Conclusions Participants readily identified transformative and troublesome moments in their PGME in general practice. These findings confirmed evidence for a wide range of TCs with many newly identified in this study. All TCs were fundamentally based on the doctor–patient relationship, although often involving the context and culture of general practice. Actively incorporating and teaching these identified TCs in PGME in general practice may enable trainees to grasp these important learning thresholds earlier and more easily and aid in identity and role formation.

INTRODUCTION

Meyer and Land developed threshold concepts (TCs) to describe crucial, profound shifts in students' learning.¹ This is often accompanied by an affective sense

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A major strength of this study was its sample size of 50 participants.
- ⇒ Another strength was the inclusion of both trainees and experts in the focus groups allowing for a greater range of threshold concepts from all levels of experience to be discussed and identified.
- ⇒ A further strength was that the study was performed by two authors in the field of general practice which enhanced the depth of focus group discussion and analysis and interpretation of results.
- ⇒ A limitation of our study was that most participants came from urban centres and were of New Zealand European/Pākehā ethnicity.
- ⇒ Another limitation was the format of our focus groups whereby the later speakers could be influenced by earlier speakers leading to potential bias.

of intellectual growth (an 'Aha! moment) and relief at having travelled past a previous blockage. Eight TC characteristics have been identified; transformative, troublesome, irreversible, integrative, bounded, discursive, reconstitutive and liminal.² Although not all are required for a piece of learning to be deemed a TC, 'transformative' is considered the mandatory feature.³

TCs have been identified in various disciplines such as nursing,^{4–7} dentistry,^{8,9} occupational therapy,^{10–13} pharmacy¹⁴ and physiotherapy.¹⁵ Some TCs are shared by multiple healthcare professions; 'caring',¹⁶ 'role of touch',¹⁷ 'intraprofessional and interprofessional',^{18,19} 'holistic approach', 'uncertainty', 'complexity of care', 'consider the whole person', 'collective competence' and 'patient-centredness'.²⁰ TCs identified in undergraduate medical teaching include; 'understanding of pain',²¹ 'the nature of evidence', 'homeostasis', 'empathy', 'embodied shared care',²² 'identity formation', 'becoming an agentic learner', 'comfort with uncertainty',²³ and those regarding professional identity formation.²⁴ Discipline-specific TCs have been



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identified in pathology,²⁵ anaesthetics,²⁶ cardiothoracic surgery,²⁷ geriatrics,^{28 29} neurology,³⁰ palliative care³¹ and psychiatry.³²

Neve²⁰ explored the potential for identifying TCs in postgraduate primary care, and Gupta and Howden²³ described TCs identified in undergraduate primary care teaching. Although other studies have described specific, important or difficult aspects of primary care - such as the role of touch and uncertainty—these were not defined as TCs by the authors.^{33 34} Only two studies have explored TCs in postgraduate medical education (PGME) in general practice in Aotearoa/New Zealand (A/NZ), using ‘vocational thresholds’, a construct derived from TCs.^{35 36} We felt further, detailed exploration of PGME in general practice was needed.

An important tool used in this study to aid the understanding of TCs and facilitate discussion and identification of TCs from our participants was the Te Whare Tapa Whā Māori model of health.³⁷ Te Whare Tapa Whā is an integral and mainstream part of the curriculum in both undergraduate and PGME in general practice in A/NZ.³⁸ The four domains of Te Whare Tapa Whā, all connected to the land (whenua), include; physical health (taha tinana), mental and emotional health (taha hinengaro), social and family health (taha whānau) and spiritual health (taha wairua), underpinned by connection to the land.³⁹ These principles align well with other holistic approaches to health, including the biopsychosocial model,⁴⁰ the WHO’s definition of health,⁴¹ the acknowledgement that health relates to the physical environment,⁴² and is relevant to all ethnic groups in A/NZ.⁴³

AIMS

The primary aim of this study was to identify TCs experienced by general practice trainees via the General Practice Education Programme (GPEP), endorsed and run by the Royal New Zealand College of General Practitioners. GPEP is a 3-year postgraduate specialist general practice training programme involving a formal examination in the first year with 3 years of practical supervision. On graduation the trainee becomes a Fellow of the College. Conditions for entry into GPEP are a minimum of 2 years hospital internship after completion of 6 years undergraduate medical training. Our secondary aim was to consider future incorporation of TCs into the GPEP.

METHODOLOGY

Research design

An explorative, qualitative study using focus group discussions and experiential thematic analysis was performed, underpinned with critical realist ontological and contextualistic epistemological perspectives.⁴⁴ Inductive approaches, employing ‘detailed readings of raw data to derive concepts, themes or a model... from the frequent, dominant or significant themes inherent in raw data’⁴⁵

are ideal for establishing research where little prior information exists.

Participant recruitment and inclusion criteria

Historically, TCs were constructed by experts within a discipline, but recent research suggests that students may be better at identifying TCs than teachers due to recall efficiency.^{31 46} Initially, we only recruited trainees, but due to slow recruitment we expanded the inclusion criteria to also include Fellows within 5 years of gaining their Fellowship and GPEP Medical Educators (ME). After ethics approval has been received, advertisements for recruitment were placed via relevant email lists, newsletters and relevant Facebook pages throughout NZ.^{47 48} Following written, informed consent, participants were organised into Zoom focus groups in the order of their enrolment and their availability to attend, on a first-in-first-served basis. The minimum group number was four participants per focus group.

Focus groups

Apart from the pilot study (see below) which was held in-person, Zoom focus groups were chosen for pragmatic reasons as this research took place during multiple lockdowns due to the COVID-19 pandemic, restricting travel and making face-to-face interviews impossible with participants scattered all across the country. They were held after-hours in the evenings according to participants’ preferences. Focus group sessions began with an original power-point presentation on TCs (see online supplemental material file), finishing with a summary slide of questions to help participants recognise their experience of TCs and facilitate discussion. This presentation was trialled with our department’s Qualitative Research Group and two established researchers in TCs. After minor modifications, the presentation was piloted in an initial focus group with six general practitioners (GPs) and one GPEP trainee. As no modifications were required following feedback from this group, their results are included in this study. The focus groups lasted 65 min, with an initial introduction and power-point presentation (30 min), brainstorming time (5 min) and group discussion time (30 min). Participants were asked to present any transformative or ‘Aha!’ moments in their learning experience which might underlie or identify a TC.

Data collection and analysis

Data were collected over a 5-month period (March–August 2021) via audiotaping and transcribing participants’ responses during the focus groups, with concurrent data analysis until saturation occurred. Transcription was performed by a professional service who had a presigned confidentiality contract with our University. Results were analysed separately by each author using standardised thematic analysis⁴⁴ and NVivo V.12 software (QSR International, Melbourne, Australia). Data were protected using password-protected computer hardware and software. Only one researcher (AC) was aware of the identity

of the participants. Triangulation occurred with both researchers initially coding separately, then comparing results and resolving differences by discussion and analysis. This was a reiterative, integrative process resulting in multiple, repeated cycles. Coding rules, with inclusion and exclusion criteria, were defined to ensure consistent classification. The first author brought lenses of thirty years of clinical experience, including PGME in general practice, academic research in bioethics, uncertainty, decision-making and ancient medical history, and NZ/European ethnicity. The second author's lenses were those of a Korean/NZ in their second GPEP year of training. Triangulation (member checking) of results was performed by asking participants to check the analysis and provide clarification where necessary. Pseudonyms were chosen by the participants. TCs were constructed by the authors after close, repeated readings of the final thematic analysis of coded data.

Patient and public involvement

Nil.

RESULTS

Demographics

Demographics are presented in [table 1](#). Fifty participants were recruited with eight focus group sessions of four to eight participants each (median 5.5). Two smaller interviews, using the same presentation as for the focus groups, were held with three very late enrolments, primarily to help confirm data saturation.

Thematic analysis

Three meta-themes identified were the physician's role, the patient's role and the physician-patient interaction. These were further classified into themes and subthemes, presented with their coding rules (see [table 2](#)).

Physician's role

Within the administrative, aspects theme were three subthemes. The financial subtheme identified that GPs required an acceptance that in A/NZ, charging patients was necessary and ethically permissible. This differed from hospital-based services where no point-of-care charging occurred, while in general practice successful financial management meant maximising every dollar for the patients' benefit.

The legal subtheme related to the importance of clear communication, proper management and documentation of medicolegal aspects. The time management subtheme proved at times to be a complex task, but one which could be improved by being highly organised, reviewing old notes, adhering to a structure, actively focusing on patients and sometimes deferring issues to the future.

The consultation tools theme was essential in dealing with the breadth of information required in general practice. The management guidelines subtheme included

Table 1 Demographics

Variable	No
Participants	50
Focus groups	8
Median size of focus group	5.5
Age	
20–30	31
40–50	16
60	3
Ethnicity	
NZ/European	29
Asian	17
Middle Eastern	2
Māori	1
African	1
Level of training	
Year 1	3
Year 2	17
Year 3	11
Fellows within 5 years	5
Fellows greater than 5 years	3
Medical educators	10
Non-training GP	1
Area of work	
Urban	47
Rural	3

GP, general practitioner.

online resources which provided clarity, helped avoid errors, assisted integrating new therapies and aided the appropriate ordering of tests. Other sources of guidance included conferring with hospital or GP colleagues, while keeping in mind their limitations also.

Communication techniques was the other subtheme which identified useful consultation strategies including formal Māori-oriented introductions such as *pepeha*⁴⁹ and/or *whakawhanaungatanga*,⁵⁰ actively inviting family presence and using open questions. Participants reported the advantage of asking patients directly about their ideas, concerns and expectations and were pleased to find these techniques learnt for their examinations also worked in real practice. These helped to improve patient engagement, time management and communication.

Intraprofessional and interprofessional aspects was another important theme portraying GPs' awareness of the differences in dynamics between general practice and hospital-based medicine. Team structure appeared more stable and family-like in general practice, as opposed to switching between hospital wards. Hence general practice required a different approach to team relationships with increased inter-dependence and the sharing of workload

Table 2 Thematic analysis with coding rules

TE WHARE TAPA WHĀ			
Meta-theme	Theme	Sub-theme	Coding rules
Physician's role	Administrative aspects		Quotations relating to administrative components involved in the running of general practice
		Financial	Quotations relating to financial, economic, funding and resource aspects (including limitations) of general practice
		Legal	Quotations relating to legal aspects of general practice
		Time management	Quotations relating to the management of general practice duties within its time constraints
	Consultation tools		Quotations relating to tools, resources and strategies used during consultations regarding history taking, examination and management
		Management guidelines	Quotations relating to evidence-based protocols and guidance used in the management of general practice cases
		Communication techniques	Quotations relating to formally taught skills and strategies used to improve communication including verbal and non-verbal techniques
	Intraprofessional and interprofessional aspects		Quotations relating to interactions between GPs, other practice staff, specialists and the multidisciplinary team
	Personal experiences		Quotations relating to personal life experiences, subsequently found useful in professional general practice
	Professional biases		Quotations relating to biases into ways of dealing with professional issues
	Uncertainty		Quotations relating to aspects of general practice which cause uncertainty
		Sources of uncertainty	Quotations relating to the origins and causes of uncertainty in general practice
		Reactions to uncertainty	Quotations relating to the cognitive and emotional reactions dealing with uncertainties arising in general practice
Management of uncertainty		Quotations relating to managing uncertain or unknown cases in general practice	
Patient's role	Patient needs		Quotations relating to patient expectations and preferences including those which are often hidden or misunderstood. (Excludes specific references to Ideas, concerns, expectations, see communication techniques)
	Patient adherence		Quotations relating to aspects that impact on patient understanding and adherence to management
	Patient context		Quotations relating to factors that make up the whole patient and their holistic well-being
Physician-patient interaction	Consult-as-therapy		Quotations relating to the therapeutic benefit obtained from the consultative process
		Explanation	Quotations relating to the therapeutic benefit the patient receives from the consultation via explanations given by the GP
		Listening	Quotations relating to the therapeutic benefit the patient receives from the consultation via the act of listening by the GP
	Presence	Quotations relating to the therapeutic benefit the patient receives from the consultation via the presence of a trusted GP	
	Relationship		Quotations relating to the connections between the doctor and patient based on mutual knowledge, trust and respect for each other

GP, general practitioner.

between each other, rather than the GP having sole responsibility.

The personal experiences theme was not specifically sought for by the researchers but arose spontaneously from participants to form professionally useful TCs. These TCs related to how being a parent, patient and/or ME impacted on the GPs way and view of their practice. Becoming a patient reminded GPs of what it was like to

be one, and teaching also provided challenges and unexpected TCs.

The professional biases theme was identified via self-reflection which encouraged insights into personal and professional biases, with several relating to a complaint process due to communication issues. Cases of misdiagnoses also impacted on ways of practice such as a tendency for over-investigation. Cultural assumptions, the

emotional toll of empathy, childhood trauma affecting adult patients, strategies to avoid burnout, acceptance of not being able to please everyone and the generalist role of a GP were all causes of self-reflection.

Uncertainty was a major theme with several subthemes. Sources of uncertainty as a subtheme arose due to the often daunting breadth and complexity of general practice with its many cases of unknown aetiology. Another subtheme was participants' reactions to uncertainty which were generally positive as they gradually learnt to accept and mentally deal with uncertainties. Sometimes, however, even with time and experience some participants expressed the level of uncertainty could remain too much.

Management of uncertainty was the third subtheme identified. Confrontation with uncertainty could lead to seeking for occult illnesses, such as always checking the ears and urine in the febrile child, and expanding one's diagnostic capability, for example, by acquiring an ultrasound. Sometimes resolving uncertainty was not required by a patient and this could be revelatory for some participants. Another way of managing uncertainty was realising that there may be several different answers or ways of managing the same issue. Using time to help manage uncertainty was a specific strategy utilising the longitudinal physician–patient relationship unique to general practice. This highlighted the benefits of being able to journey with patients while watching and waiting, with appropriate follow-up and safety netting, and checking patients were reassured and satisfied with the plan throughout their journey.

Patient's role

The patient needs theme revealed the importance of understanding the distinction between the physicians' and the patients' agenda; for example, realising that ticket-to-entry consultations were not a waste of the physician's time, but a way for the physician to earn trust and enabling patients to then reveal their deeper concerns. It was also important to understand that what the patient wanted may be different to what the GP thought the patient would or should want. Aspects that seemed minor to the GP could be highly significant to the patient.

The patient adherence theme highlighted the importance of attending to patients' adherence to treatment. Checking medication boxes, eliciting reasons for non-adherence (such as lack of transport, treatment preferences or language barriers) and being non-judgemental were crucial.

Patient context was the third key theme of the patient's role which involved recognising that deeply understanding one's patient was impossible without knowing their context. The social layers surrounding the patient are many and at least some knowledge and engagement with these was essential for good patient care. Understanding this bigger picture reduced blaming the patient for their condition or ordering expensive and

unnecessary tests. It could also prevent misdiagnosis and aided cultural awareness.

Physician–patient interaction

Within the consult-as-therapy theme, there were three subthemes. Explanation was the first subtheme and an important component of the consultation as GPs are required to be able to inform and reassure patients. Listening was an essential subtheme as patients found being well listened to therapeutic. Simply being silent, listening and, by this stillness, normalising situations could help to reduce anxiety, diffuse strong emotions, such as anger and fear, and help patients and physicians become aligned. Furthermore, the presence subtheme highlighted the therapeutic value that patients gained in being in the presence of a trusted professional, that the persona of the doctor held therapeutic value in and of itself.

Finally, the relationship theme was considered pivotal by participants to general practice. Maintaining this relationship took precedence over almost everything else, even if at times it meant that the GP might have to bracket their own beliefs in order to gain the trust which would then gradually allow them to help the patient. Creating this partnership began with careful consideration of the opening question, with focused attention, human-to-human connection and the monitoring of ones' own emotions.

Identifying TCs

Twenty TCs reflecting these significant and transformative moments were identified. We attempted to distill the essence of each theme (if no subthemes) or subtheme into a single TC with one exception: the management of uncertainty required three TCs to adequately capture the range of responses nested within this subtheme. Each TC acts as a heuristical device, concentrating the essence of the experiential wisdom into a simple, memorable medical proverb for ease of recollection (see [table 3](#)).

TCs in the GPEP curriculum

[Table 4](#) shows how the identified TCs relate to the six domains of core competencies in GPEP.³⁸ All TCs could be mapped onto at least one core competency, with two TCs ('The relationship is worth a thousand consults' and 'Guidelines, GPs little helper') mapping onto two core competencies, and two TCs ('Money makes the practice go round' and 'The whole of the practice is greater than the sum of its parts') mapping onto three.

DISCUSSION

The key findings of this study were that TCs arose from many aspects of learning about general practice, encompassing the context and culture of the specialty as well as the immediate clinical work. Notwithstanding this, however, all TCs fundamentally involved the doctor-patient relationship, being grounded in the meta-themes

Table 3 Identified threshold concepts and participant quotes

TE WHARE TAPA WHĀ			
Theme	Subtheme	Threshold concepts	Participant quotes
Administrative Aspects	Financial	Money makes the practice go round.	'A big moment for me, having to get used to it... that money changes hands.' (Eloise).
	Legal	Be a legal eagle.	'Most complaints are very easily dealt with just by apologising and doing nothing else.' (Lucy)
	Time Management	Manage time or it will manage you.	'There's all sort of different information coming at you...there's these multi-layered different things, and the task of trying to sort of manage all those balls...is a very complex task. And I don't think we really teach that.' (Claire)
Consultation Tools	Management Guidelines	Guidelines, GPs' little helpers.	'There's always resources and help available. So I have a few go-to bookmarks on my Google Chrome so I know where to go and look for things.' (Sam)
	Communication Techniques	Right tool, right word, right place.	'Really, really opening up right at the start'. (Eloise) 'At the beginning to ask them what brings then in and then listening.' (Anne) Techniques from exams do work in real life'. (Ruby)
Intra- and Interprofessional Aspects		The whole of the practice is greater than the sum of the parts.	'In the hospital you are in a broad ocean and moving/roaming around onto different wards...But the primary care setting is similar to an office, you've got these little work whānau [family], with sometimes the spectrum of characters that you have in your own whānau, so that struck me...the importance of understanding yourself and your interactions in different environments.' (Apme) '[The GP] not being the one that has to fix everything.' (Lani)
Personal experiences		The personal enhances the professional.	'Before I was a parent...I just had no idea what I was doing' (Anne) 'Moving into that role as a teacher [is] quite a confronting thing...it really does make you go away and think about things...I found that to be quite transformative.' (Sarah)
Professional Biases		Beat biases by reflection.	'I can't go back to not thinking about that [ovarian cancer] in every young woman that I see, and it's actually quite a troubling threshold concept, because it changes your alarm levels.' (Anya S.)
Uncertainty	Sources of Uncertainty	Chew the Complexity, Unpredictability, Diversity.	'95% of the time when someone comes in with tiredness, that you're not going to find the cause.' (Eloise) 'People are very complicated to understand...[you] can't actually predict what they will say and how they will communicate.' (Tom) 'The breadth of knowledge that we need to have, it was just super overwhelming.' (Katie)
	Reactions to Uncertainty	Embrace the uncertainty.	'When I first started off, there was always this concern about patients...But learning to deal with it, I think, it's one of those things that over the years one becomes better at it.' (Augustine)
	Management of Uncertainty	Not knowing is knowing. Waiting and seeing, waiting and being. Seek and you shall find.	'I can't solve this. Oh, wait, actually I don't need to solve this because that's not what they want from me!' (Laura) 'You don't have to send the patient home with a diagnosis. You can just live with what's going on at the moment, as long as you've got a plan and a safety net... Learning to live with uncertainty... which I think is very different in general practice vs hospital medicine.' (Jenny) 'The good thing about general practice is, there's a journey with people over time as long as you are there with them and working things out as much as you can...is as good as being perfectly right all the time.' (Claire)
Patient needs		Look, listen, think between the lines.	'It was a breakthrough moment for me when I began to understand what the patient wants, as opposed to what I wanted...if we don't know [this], we're always going to be out of sync, and they'll be dissatisfied.' (Pete)
Patient adherence		Treat the patient beyond the disease.	'I didn't understand how important this (being non-judgemental) is to them until I saw it on their face, the relief that they get, and how more compliant they are with their treatment and how much [more] trusting they are of you, when they see that you are not actually judging them...I have to make sure I say to them it's not your fault and it always makes a big difference.' (Amy)
Patient context		No patient is an island.	'Patients aren't a vacuum...They have a context. They have a family...work situation...mental stuff... social structures...a whole load of stuff, and the beauty about general practices is that...you get to uncover all those things around them, and it's just beautiful when you grow up with them, and you can see where they all fit.' (Anne). 'It wasn't just your own health or your family's health, it was your village's health and your town's health and your district's health, and the politics and the financial and the economic situation ...war and poverty and food poverty. And that was a real 'Aha!' moment to me.' (Dr. T.)
Consult as Therapy	Explanation	Words work wonders.	'As a GP, you have to be able to reassure the patient on that or know something about it.' (Ruby)
	Listening	Hearing is healing.	'The concept of that sometimes listening is a treatment.' (Jason) 'Patients don't always want to know. They don't want to be told what's wrong. They just want to work through it with [someone]' (Dr. J.) 'You see silence used...and then you see how effective it is, because so much gold comes out from patient or family.' (Andrew)
	Presence	Being you and being there.	'Sometimes all you have to do is sit there and listen and do absolutely nothing. And that can be a worthwhile consultation to the patient in itself.' (Lucy)
Relationship		The relationship is worth a thousand consults.	'The relationship between the GP and the patient is probably more important than anything else that you can do.' (Maria) 'We just about [always] have to go with the patient on what they believe so that we can maintain that relationship. Then at times you can actually say, speak into it and then you can actually help them change that.' (Kathy) 'Giving the patient something of yourself. So, you actually connect on a human level, human to human.' (Eloise)

GPs, general practitioners.

of the physician's role, the patient's role (as perceived by the doctor), and the interaction between these two people. This reflects an irreducible aspect of relationality

in general practice. These results support approaches to PGME which include teaching and learning of the culture and context of general practice as equally legitimate parts

Table 4 Curriculum domains and threshold concepts

Curriculum domains	Threshold concepts
Communication	Right tool, right word, right place. Look, listen, think between the lines. Words work wonders. Hearing is healing. Being you and being there. The relationship is worth a thousand consults.
Clinical expertise	Guidelines, GPs' little helper. Seek and you shall find. Waiting and seeing, waiting and being. Not knowing is knowing. Chew the Complexity, Unpredictability, Diversity. Embrace the uncertainty. Beat biases by reflection.
Professionalism	The personal enhances the professional. Money makes the practice go round. Be a legal eagle.
Scholarship	Guidelines, GPs' little helper. Beat biases by reflection. The whole of the practice is greater than the sum of the parts.
Context of general practice	No patient is an island. Treat the patient beyond the disease. The whole of the practice is greater than the sum of the parts. Money makes the practice go round. The relationship is worth a thousand consults.
Management	The whole of the practice is greater than the sum of the parts. Money makes the practice go round. Manage time or it will manage you.
GP, general practitioner.	

of specialist training, in addition to the more specifically clinical skills such as history-taking and examination. As such, these TCs can act as pedagogical tools in curricula development.

Identifying TCs in this study

Few participants articulated immediately and in toto a TC, but more often described a situation where they felt transformed and/or had experienced an 'Aha!' moment. Previous research has shown context is essential,³ and that TCs are found in cognitive, affective, psychomotor, social and ethical domains.^{51 52} The incorporation of A/NZ's mainstream Te Whare Tapa Whā model of health as a tool to understand context, and aid the identification of TCs by our participants, proved useful as evidenced in our experience of the focus groups, and by the relative ease with which many TCs were identified. Notably, our TCs are not specifically related to any specific medical diagnosis or condition as only very few quotations included these. Their generalisability is such that there are many potential clinical circumstances in which these TCs can be experienced.

Our construction of TCs was an interpretative act looking beyond the initial thematic analysis, identifying overarching elements and characteristics which were contained within the quotations of that individual theme/sub-theme. We constructed our TCs as heuristical decision-making rules. Heuristics are '...a rule or guideline that is easily applied to make complex tasks more

simple'.^{53 54} An everyday example of heuristical thinking are proverbs/whakatauki: for example, 'a stitch in time saves nine'. Proverbs encapsulate wisdom based on analogous experiences in many, various situations, which can be applied in future situations when similar, but not identical, circumstances arise. Heuristical decision making is quick and efficient, particularly when making decisions under great uncertainty.⁵⁵ The need for speed and efficiency while tolerating some uncertainty characterises general practice decision-making. Medical proverbs are not new, appearing in the Hippocratic Corpus as aphorisms,⁵⁶ 'pithily expressed precept[s] or observation[s]; a maxim'.⁵⁷ More modern examples also exist.⁵⁸ Not all medical proverbs are TCs as they can lack the essential transformative element. A TC in proverbial form is a heuristical rule which is easy to learn and remember, and which captures the essential transformative element that leads to a 'paradigmatic shift'.⁵⁹ Alliteration was used to aid recollection and memorisation.

What this study adds to the understanding of TCs

Neve discussed several TCs (primarily uncertainty) identified in other medical disciplines as having the theoretical potential to be relevant to PGME in general practice.²⁰ Gupta and Howden identified three major TCs in undergraduate primary care learning: 'professional identity formation', being an 'agentic learner' and 'comfort with uncertainty'.²³ Vaughan *et al* identified 'being the good doctor', 'healthcare without a prescription', 'an ethic of care through relationship', 'negotiating the boundaries of care' and 'uncertainty and anxiety' as TCs in PGME in general practice.³⁵ A further paper by Vaughan,³⁶ identified 'dispositional attributes' relating to self-identity, breaking bad news, collecting clinical evidence, learning from colleagues, self-reflection, being present and listening; and relational aspects as also possible TCs. Our study provides confirmatory evidence of all these areas as sources for TCs, and in much more detail and depth. Additionally, our study identifies other possible TCs in new domains such as practice administration, taught guidelines, communication tools, personal experiences and professional biases. Furthermore, our construction of TCs as heuristic rules, rather than as simply descriptive labels, is new and (we argue) of more practical use.

Our depth of data collection and analysis also allows for a more nuanced understanding of previously identified TCs. For example, uncertainty is a concept which has been repeatedly identified as an important TC across multiple medical specialties^{20 22 23 27 34 60} for both undergraduate and postgraduate medicine. We found the sources of uncertainty for GPs compromise three factors: the complexity of patient presentations, the unpredictability of any working day, and the sheer diversity of what could occur (hence 'Chew the Complexity, Unpredictability, Diversity, CUD'). Reflection on these sources is required, even if they cannot be resolved. Building resilience and a degree of acceptance of uncertainty is beneficial; hence 'Embrace the uncertainty'. Uncertainty can be managed

by seeking out occult cases ('Seek and you shall find'), allowing time to reveal what is going on ('Waiting and seeing, waiting and being'), or simply supporting patients who do not seek resolution but empathy ('Not knowing is knowing').

What is helpful for patients, from the GPs' perspectives, is understanding patients' needs well and applying careful attention to what is said and not said that is, silence. Attention to these aspects can allow the consultation to flourish. Patient adherence to treatment plans also calls for nuanced approaches prioritising the patient before the illness. Learning how essential the understanding of the patient's context is in providing quality care, and realising the therapeutic potential of the consultation of itself, are also important TCs. Paying careful attention to how one explains situations to patients, knowing when to listen, and always being present in the consultation are crucial in providing good care. These TCs reflect defining, seminal moments of learning for participants, profoundly altering the nature and type of care they provide for patients.

The preservation and maintenance of physician–patient relationship is a key TC in understanding how general practice operates as little can be achieved without it. Due prioritisation of this means more can be achieved in the long run, even if in the short-term a GP may wait longer than they, themselves, would have preferred. For participants, these features clearly delineate general practice from hospital-based care.

Connecting with the patient as a person is a crucial part of medicine, giving rise to TCs in various disciplines.^{16 20 31} General practice is no exception. Relational aspects are seen in the physician–patient interaction meta-theme, and in other themes/subthemes; for example, communication techniques (eg, using formal Māori-based introductions such as pepeha to enhance the relationship with Māori patients, described as the process of whakawhanaungatanga,⁶¹ and intraprofessional and interprofessional relationships. It emphasises that when physicians and patients meet in a general practice, it is two people being together in a specifically bounded yet intimate way.

Implications and recommendations for teaching and learning

Although our TCs map onto the six domains of competencies in GPEP,³⁸ linking them to core competencies, currently, however, TC teaching is unstructured and learning serendipitous: participants learnt these TCs ad hoc during clinical experiences. We recommend formally teaching TCs in the large-group sessions in GPEP year 1, followed in years 2 and 3 by solidifying trainees' own experiences of them via the current format of learning in small group discussions. We believe this will help the trainee to understand these significant learning points earlier in their PGME. Currently taught techniques identified in this study as a basis for a TC (eg, specific communication tools), are known to require experience to be fully appreciated and finally transform practice, and hence are

revisited at multiple points in a spiral curriculum. This would suggest that a similar spiral approach should also occur when considering teaching based on TCs.

Strategies for applying TCs into PGME in general practice have yet to become widely accepted and thus there is a need for research in this area.⁶² Nevertheless, TC-based clinical teaching has been shown to be feasible,⁶³ and by using contextualised scenarios with discussions of lived experiences, TCs have been shown to benefit student learning and understanding.⁶⁴ Incorporating TCs into the curriculum requires a design which encourages students to self-reflect and to pay attention to the 'how' and 'why' rather than only 'what'.⁶⁵ Understanding TCs for a specialty identifies the unique aspects of such and enables the transition and acquisition of the new identity.²⁴ The trainee does not learn general practice; they become a GP.

Strengths and limitations

Strengths of this study are its sample size and the inclusion of a mixed group of trainees, Fellows and MEs allowed a greater range of TCs to be identified: there was a tendency for trainees' TCs to come from recently taught techniques and more experiential TCs to be reported by Fellows and MEs. Another strength is that both authors brought different lenses to the analysis through our personal and professional experiences; these and our work in PGME in general practice may have assisted in discovering a greater range and breadth of TCs than Vaughan *et al.*^{35 36} who were non-medical.

Our study's weaknesses included that our results largely reflected large-urban PGME in general practice and NZ European/Pākehā experiences. Specifically researching rural and ethnic groups—especially Māori and Pasifika—contexts for PGME in general practice is needed. The focus group format also had limitations as later speakers could be influenced by previous speakers, leading to potential bias. Our hope was that the brainstorming 5 min, performed individually, might mitigate this effect. Our experience suggests this probably was helpful although the framing bias from previous speakers was still evident on occasions. Another limitation is that this research only looked at the perspectives of physicians, and patients themselves almost certainly have important TCs to contribute to this area. Additionally, although not specifically sought, GPs' own personal experiences did inform some professional TCs. This may be an area for future research as personal experiences are known to valuably contribute towards professional identity formation.²⁷

Another limitation is that our method of wording TCs is highly culturally-dependent. It reflects our backgrounds and familiarity with Western European and NZ European/Pākehā cultural motifs, advertising slogans, Christian bible references etc; for example, 'No patient is an island' referenced John Donne's 17th Meditation.⁶⁶ 'Guidelines, GPs' little helpers' came from the phrase 'Santa's little helpers'. Even the TC 'CUD' required background knowledge: not knowing the gastric processes of

bovines would greatly diminish its utility. Therefore, our heuristical construction of TCs exposes itself to the limitations of all metaphorical constructs,⁶⁷ requiring certain background knowledge and experience to make sense.

In A/NZ, to extend these TCs by providing suitable whakataukī (proverbs) from Te Reo Māori would be desirable, but requires careful Māori-led scholarship. Cultural overlap may exist, for example, ‘No patient is an island’ might be appropriately replaced with ‘Nā koutou i tangi, nā tātau katoa’—‘When you cry, your tears are shed by us all’.^{68p.68} Or ‘E hara taku toa, I te toa takitahi, he toa takitini’—‘My strength is not as an individual, but as a collective’—might replace ‘The whole of the practice is greater than the sum of the parts’.^{68 p.117} Although discussed here in terms of A/NZ, these considerations also pertain to studies in other countries.

Although culturally specific, and requiring a certain knowledge base, the heuristical format of TCs proposed by this study, and the associated thematic material may well be useful to inform the PGME in general practice curriculum internationally. Further research is needed in several areas, not least of all understanding the TCs patients may experience when consulting GPs, an area yet to be explored by any specialty but of potential benefit to both patients and doctors. Another important area for future research is the role of TCs in vocational choice and whether the successful negotiation (or not) is determinative of the likelihood in completing PGME in general practice and/or remaining in that specialty.

CONCLUSION

This study has identified twenty TCs for PGME in general practice relating to many different aspects of the clinical work, context and cultural milieu of this specialty. Underpinning all of these TCs was the irreducible relationality existing within general practice, that at its fundamental core there is a meeting of two people; the doctor and the patient. We would advise consideration of these TCs when constructing or reviewing PGME programmes in general practice. While future pedagogical research is needed into the effectiveness of teaching centred on these TCs, our results suggest explicit teaching of these TCs may well strengthen and inform the curricula of PGME in general practice, and be of benefit to trainees in terms of not only clinical skills, but also role and identity formation.

Acknowledgements We would like to thank the RNZCGP for their funding of this project; Louise Abolins, Research and Education Committee, RNZCGP for her help with recruitment; the Medical Educators, GPEP trainees, Fellows and non-Fellow GPs who participated in this study and those who assisted in recruitment; Dr Anne O’Callaghan, Senior Lecturer, University of Auckland; Christy Ballard, Health Sciences Librarian; Dr Julie Timmermans, Senior Lecturer; Zoe Bristowe, Professional Practice Fellow, Ngāpuhi and Ngāti Pōrou; Dr Sharon Leitch, Senior Lecturer; Dr Emma Boddington, Professional Practice Fellow, and the Qualitative Research Group, all of the University of Otago, for their expertise and support on various aspects of this study.

Contributors KH performed the initial literature search, devised the project, the main conceptual ideas and grant application. AC updated the literature search, developed the focus group material (with oversight from KH), performed the

recruitment, and organised and ran all the focus groups. Both KH and AC performed the qualitative analysis and construction of threshold concepts. Both KH and AC constructed and reviewed earlier drafts of this paper and both were responsible for its final format. KH is the guarantor for this paper.

Funding This research was funded by a grant from the Royal New Zealand College of General Practitioners’ Research and Education Committee, reference number GJ20-129. This funding paid for Dr Chae’s salary, travel and consumable expenses.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants and was approved by This research was approved by the University of Otago’s Human Ethics Committee (Approval Number D20/445). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available. Consent was not sought from the participants for publication.

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