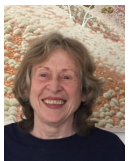


ORIGINAL RESEARCH

What are they thinking? Facilitating clinical reasoning through longitudinal patient exposure in rural practice

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PUBLISHED

18 December 2017 Volume 17 Issue 4

HISTORY

RECEIVED: 7 August 2016

REVISED: 13 May 2017

ACCEPTED: 16 May 2017

CITATION

Campbell D, Walters L, Couper I, Greacen J. What are they thinking? Facilitating clinical reasoning through longitudinal patient exposure in rural practice. *Rural and Remote Health* 2017; **17**: 4162. <https://doi.org/10.22605/RRH4162>

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Introduction: This article reports the findings from an international research workshop, held over 2 days in October 2014 in Bairnsdale, Australia, which brought together 19 clinician teachers and medical educators who work in rural primary care. The objectives of the workshop were to clarify and identify the key aspects of the development of clinical reasoning in students and junior doctors, particularly as a result of longitudinal immersion in rural community practice.

Methods: Delegates were asked to prepare a 55-word vignette related to their experience of teaching clinical reasoning, and these case studies formed the basis of identification of key issues, further refined via a modified Delphi process.

Results: The workshop identified four key themes: the patient's story, the learner's reasoning, the context of learning, and the role of the supervisor. Exposure to undifferentiated patient presentations is increasingly common in medical education, particularly in longitudinal integrated placements.

Conclusions: This research explored clinicians' perspectives of how students develop their clinical reasoning: by learning from patients, from their supervisors and by understanding the context of their clinical interactions.

KEYWORDS:

Australia, clinical reasoning, community-based medical education, diagnostic reasoning, longitudinal integrated clerkships, medical student learning rural practice, undifferentiated clinical presentations.

FULL ARTICLE:

Introduction

Clinical reasoning describes the process of translating patient stories and physical findings into a differential diagnosis; this is further investigated and refined, before negotiating a management plan using best available evidence and taking full account of patient preference and the context of care. The concept of learning clinical reasoning and how students and junior doctors are enabled to make diagnostic and management decisions has been the subject of health education literature for more than four decades.¹ Repeated attempts have been made over this period to explain the cognitive process of diagnostic reasoning and provide guidance to clinicians to improve their teaching thereof.^{2,3}

Community-based medical education and longitudinal integrated clerkships have been described as transformative innovations in medical education.⁴ Continuity of supervision and continuity of patient care have been shown to enhance the student's learning experience and development of clinical competence,⁵ which includes the development of clinical reasoning skills. These innovations have also demonstrated that positive relationships between students and supervisors and between students and patients in primary care, particularly in rural settings, can have a profoundly positive impact on the learning experiences of students⁶. This is enhanced in longitudinal rural placements because of the students' immersion in and connection with the local community. In addition, there is emerging evidence that the primary care environment provides students with structured systems of supervision and authentic roles in the clinical teams.⁷

In this research we aimed to explore the lived experience of rural primary care clinicians engaged in community-based and/or longitudinal integrated programs, and in particular to capture how clinical reasoning develops in students and junior doctors exposed to repeated undifferentiated patient presentations in the community context. (For the purposes of this research, we use the term 'student' to encompass both undergraduate and immediate postgraduate/junior doctor learners.) There is good evidence that students engaged in rural longitudinal clinical placements are exposed to a greater number of undifferentiated clinical presentations than in traditional medical education programs.⁸

Methods

We used a constructivist approach in planning a workshop, recognising that each of us constructs our own understanding of clinical reasoning through experiencing clinical practice and reflecting on those experiences. A 2-day workshop was held in Bairnsdale in the Gippsland region of south-east Australia in October 2014. Nineteen academics, teachers and clinicians from Australia and other countries attended the workshop at the Bairnsdale campus of the Monash University School of Rural Health.

Prior to the workshop, delegates were invited to submit a 55-word story relating their experience of teaching clinical reasoning or related to a particular clinical case, accompanied by a more extensive written report providing the background to the 55-word story. The 55-word story format was developed in 1987 by Stephen Moss, editor of the San Luis Obispo *New Times*, for a short-story contest, which attracted a lot of interest,⁹ with many of these being published.¹⁰ More recently, the format has been used as a device in assisting healthcare practitioners and students to reflect on their experiences.⁰ Concepts arising from these stories were recorded on a

whiteboard and explored by the group. The concepts were clustered into groups by the delegates and further refined overnight by the facilitators (IC, LW, DC) to draw together three initial themes, namely the context of learning, the role of patients and education processes, and the role of supervisors in the clinical environment.

The following day these three themes were refined using a modified Delphi process. Workshop delegates were divided into three groups. Each group commenced by crafting descriptions around one of the three proposed themes and then moved on to consider and recraft the descriptions in the next group. Each group considered all three themes before returning to review the theme they started the session with, where they had an opportunity to review the refinements made by the other groups. This process led to consensus around two themes; the third theme required further deliberation by the delegates, and this was then separated into two themes by the facilitators. The resulting four themes are outlined in the results section.

The draft concepts arising from the workshop were then evaluated by a group of experienced supervisors from Southern GP Training, the general practice training provider in the Gippsland region. This led to a further refinement of the key concepts in the development of this article.

The final process performed by the facilitators was to return to the 55-word stories and background information to ensure that the original data provided was consistent with the consensus conceptual framework developed.

Results

Delegates to the Bairnsdale workshop represented a broad spectrum of experience in rural medical education, community-based education, longitudinal integrated curriculum programs and medical education at several levels from undergraduate to vocational training:

Four themes in the facilitation of clinical reasoning in medical students when working with undifferentiated patients were developed through this process. They are the:

- patient's story
- learner's reasoning
- role of the supervisor
- context of the clinical encounter.

For each theme, we have included an illustrative 55-word story written by a delegate to reflect on their experience of teaching clinical reasoning as part of the preparation for the workshop.

Patient's story

'Pratima'

Burdened by problems, she was surprised to be asked about wellness.

The sick role suited her, perceived disability greater in mind than body.

I discerned her powerlessness in the face of life's onslaughts, making hypertension only a symptom.

Differentiating and addressing core needs brought greater healing than any prescription renewals.

A humbling lesson for me.

Delegates spoke with conviction of the patients they cared for and who had shaped their clinical reasoning. It was taken for granted by the group that the aim of clinical reasoning in primary care is to meet the clinical and more holistic needs of our patients.

There was consensus that the ability to interpret the patient's story is essential to the diagnostic process. This includes observing the patient's demeanour, listening to their presenting story (sometimes for longer than a minute or two during a standard consultation) and beginning with open-ended questions. The primary care context was seen as important in shaping clinical reasoning for two reasons: first, there are no limits to diagnostic possibilities amongst patient presentations in primary care, and, second, the psychosocial aspects of the undifferentiated patient presentation contribute significantly to how and what conditions patients bring to their doctors.

There was an interesting tension between trusting that the patient could and would tell the clinician the details necessary for making a diagnosis, and the need to dig deeper. On the one hand the delegates described that 'The patient will tell you what is important if you give them space to speak ... Patients will have thought about what they want to say. Most of the key points in the history will come out.' In contrast, the delegates described the need to take notice of small subconscious discrepancies in a patient's presentation and to pursue those with further questions. It was acknowledged that clinical cues may not initially be accessible to conscious thought.

Learner's reasoning

'Perplexed'

A tearing inside becomes placental abruption. The language so perplexing.

Seeking to translate her story with its rich tapestry of meaning into the crisp white arguments of improbable certainties.

Drawing out the facts, weighing up the odds, shaping evidence to fit the patient and the context.

It was agreed that it is important for students to be exposed to a theoretical basis of clinical reasoning early in their training, enabling them to apply such a theoretical framework when exposed to the clinical environment, under guided supervision. Ideally this clinical (patient) exposure, and exposure to the healthcare team, would commence very early in training. The learning process was seen as the integration of communication, knowledge and experience. It was appreciated that the novice learner at the undergraduate level may have only basic medical knowledge and understanding of disease processes and symptomatology. Knowledge of human behaviour from both formal study and life experience can vary from learner to learner. The novice learner would, over time, develop an understanding of both clinical and patient language.

The group emphasised the importance of the learner developing an understanding of the process of verbal and non-verbal communication to elicit key symptoms and explore the details of these symptoms. There were several 'interview' techniques that were thought to contribute to this process. It was recommended that with each patient encounter, students ask themselves 'What is the central clinical issue here? What else could it be?' The group's consensus was that learners improved as they gained more experience, developing pattern recognition (what has this looked like before) and becoming alert to the process of including or excluding a range of possible diagnoses. Importantly, the diagnostic reasoning process must avoid the traps of jumping prematurely to a diagnostic endpoint.

There was also talk of the art of 'clinical intuition' or 'non-analytic reasoning'. This was described as an ability to be subconsciously alert to discrepancies in the patient's 'symptom complex'; it was also described as a 'sixth sense' that leads to the clinician feeling uneasy about the diagnostic process. Testing and re-testing a working hypothesis were also seen to be part of the process.

Students' repeated exposure to undifferentiated presentations was recognised as enabling refinement of targeted yet comprehensive history-taking aligned with the development of efficient yet comprehensive examination techniques, with a broader focus on the patient than just the presenting complaint.

Role of the supervisor

To teach reason ably.

Let ritual bind, hand, ear, eye,

To heart, mind.

Let thinking aloud be allowed,

Utterances uttered utterly ok.

Let arguments argued, persuade or pursue,

Judgments justified, decisions done or to do.

Let stories told of stories told be wealth,

Stored, retold, restored on hippocampal shelf.

Let docere diagnose patient, student, self.

The group spent considerable time considering how they felt supervisors could help improve students' development of clinical reasoning. There was general consensus that supervisors should provide a culturally safe environment for both learning and healing. This included creating an atmosphere that allowed free exchange of ideas: between patients and learners, learners and supervisors, patients and supervisors, and learners and learners. Supervisors should seek to demonstrate trust in the learner, including encouraging the learner to take responsibility for their patients.

The value of asking students to present their findings in front of the patient was seen as allowing the patient to comment on the accuracy of the information ('the patient as teacher'), and it also helps students to involve the patient in the decision-making process. Patient feedback could enable students to better understand what was important to the patient in the interaction. It was suggested that

we need to discuss the issue of 'intuition' on a daily basis with students, and ask the students to recognise the feeling of unease that will lead them to question their decisions. For example, 'Does the patient's story depart from a classical presentation? Do you need to dig deeper? Do you need help?' The group felt that supervisors should assist the student to understand the lens they are using to look at their patient: 'What did you hear? Why did you hear that?'

When supervisors invite students to critique their initial differential diagnosis, there are opportunities to acknowledge that first impressions are important but might not be correct. Students could be asked why they gave importance to some pieces of information over others, to consider alternative explanations, and to understand what information should not be missed (red flags). This process allows supervisors to affirm the rudimentary reasoning of early learners and helps them to see that their contributions to the clinical discourse are no less respected – just less experienced clinically.

Another point considered to be important is the value of time as a diagnostic tool in undifferentiated illnesses. For example, statements made by supervisors, such as 'we need to keep an eye on this' **and** 'I know enough to let the diagnosis unfold', are useful strategies for students to observe and feel comfortable with.

Context of the clinical encounter

'Lifting the lid on the diagnostic process'

Winter winds stirred the coastal sands.

Patient and Registrar had recently blown into town.

One eye was sore and watery. The history lacked onset and circumstance. Examination, despite corneal-staining, acuity measured and slit-lamp used, was incomplete.

Only with the lid inverted were the coastal sands revealed –

lifting the lid on the importance of the context.

It was agreed that the context of the clinical encounter contributes to clinical reasoning in many ways. Key foci include the context of the local region, the context of primary care and the context of the student placement style. Clinical supervisors seek to help students see the unique value of undifferentiated presentations and to be comfortable with a comparatively unstructured learning environment. Learners need to develop awareness of the geographical, epidemiological, cultural, environmental and social context in which their patient is situated. It was felt that the rural context of relative professional isolation and relative lack of resources such as sophisticated investigation technology (CT, MRI, rapid pathology results, etc.) can drive the development of clinical reasoning. The student learns to rely on their clinical acumen through true engagement with their patients, and testing and re-testing their 'pattern recognition' during observation of patients' progress.

Students are empowered by having their own appointment book, list of patients and/or consulting space, in the primary care setting, with a 'parallel consulting' model. The lack of a 'clinical hierarchy' in community-based education programs facilitates learning. The students' observation of the clinical reasoning process employed by experienced senior clinicians helps them to interpret the theoretic content of the formal curriculum.

In this way, longitudinal student placements allow for an evolving process of developing clinical reasoning skills, observed by the supervisor throughout the apprenticeship. Students are accepted as part of the multidisciplinary clinical team, learning to identify the roles of team members and how to utilise the resources of the health professionals with whom they are working.

Students in longitudinal rural community placements also have the opportunity to observe and experience how clinical decision-making is affected by the unique doctor–patient relationship, which will often extend beyond the consulting room or the bedside. Learners in this context develop an appreciation of issues related to professional boundaries, such as providing clinical care to friends and colleagues, lack of anonymity and how living in the 'fish bowl' impacts on the diagnostic and clinical process.

Under the apprenticeship model of longitudinal placements, students who are not progressing as expected are able to be identified early in the placement. This will particularly relate to their diagnostic and management decisions, enabling the supervisor to explore whether this is an issue of basic knowledge of pathological processes, or a more fundamental difficulty with eliciting information and making sense of it in the diagnostic process; that is, whether it is knowledge or reasoning that is lacking.

Discussion

The four themes – patient's story, learner's reasoning, role of the supervisor and context of learning – were the key outcomes from the workshop, thus being identified as the core components in learning clinical reasoning, particularly in the context of undifferentiated

patient encounters.

The apprenticeship model of clinical experience involves students participating in a set of structured social relationships.⁶ Lave and Wenger's situated learning theory suggests that learning is a by-product of engaging in problem solving 'situated' in a real-world environment, enhanced by social interaction and collaboration.⁰ Implicit in this apprenticeship model of learning is that the student is supported to feel safe to gather and interpret clinical information as well as being encouraged to develop therapeutic relationships with patients and understand the context of care delivery. The parallel consulting model of preceptorship, where students have an opportunity to commence the consultation, develop patient rapport, take responsibility to make an assessment and report their findings to the supervising clinician in the presence of the patient, supports the learner in the transition from novice to effective clinician. The triad of patient, learner and supervisor has been shown to have a powerful effect on student learning, reflection and development of clinical competence.⁰

In discussing the clinical presentation with the learner, there is value in supervisors arriving at a shared understanding about the problem, including asking the learner to make a decision. This provides space for learners to make mistakes and grow. The process is assisted by supervisors reflecting on their own critical incidents and events and how these have influenced their reasoning. Supervisors need to engage students in self-reflection, to assist students to match their clinical confidence with their clinical competence.

As part of this, the supervisor can take the opportunity to model how to manage and work with uncertainty. This includes providing support for the student to engage with the patient in planning the next steps. Encouraging learners to follow patients' progress through episodes of care reinforces the impact of their clinical decision-making on patients, their families and their lives.

Development of a professional relationship between the student and supervisor enables the student to observe the decision-making processes of an experienced clinician, or group of clinicians, over time, with the opportunity to discuss both analytical and non-analytical reasoning strategies.

Longitudinal clinical placements provide continuity of supervision and the opportunity for constructive global feedback to the learner. Over time, appropriate, constructive and well-directed feedback about clinical performance and clinical decision-making can assist the learner to develop an increasingly sophisticated approach to history-taking, interpretation of information and clinical management decisions. This is more easily achieved with longitudinal placements.

There was consensus amongst delegates that students build their clinical reasoning skills by learning from patients, by learning from their clinical teachers and by having an understanding of the context of the clinical encounter. The research did not include a perspective from students or junior doctors, which would have added a rich contribution to the findings, and this creates an opportunity for future work in this area.

Conclusions

This research project brought together the perspective of 19 experienced rural clinical teachers and academics, with several hundred years of cumulative teaching experience, to consider how medical students and junior doctors assimilate clinical reasoning skills. The principal context involved students undertaking longitudinal clinical placements in rural practice. Concepts were initially presented via the contribution of 55-word stories representing case studies from delegates, providing some concise and well-considered insights into the clinical reasoning process. Four themes were identified and subsequently refined via a modified Delphi process, with consolidation of the conceptual framework identifying the elements of the clinical reasoning process in early-career learners.

The outcomes of this research provide some useful contributions to our understanding of how students learn to be wise, careful and compassionate doctors, the importance of the context of the clinical encounter, the patient's contribution to the process, and the importance of learning under supervision in a longitudinal apprenticeship model of medical education, particularly as part of a rural community.

Acknowledgements

Professor Ian Couper's visit to Australia was supported by Southern GP Training, the regional training provider in the Gippsland region, under the auspices of the Australian Government Australian General Practice Training Program.

In early 2015, GP practice supervisors from the Gippsland region of Southern GP Training evaluated and commented on the draft concepts arising from the original workshop in October 2014.

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