Can grounded theory provide a framework for clinical reasoning?

Ralph Pinnock, David Plummer, Paul Welch and Louise Young

Corresponding author: Ralph Pinnock ralph.pinnock@jcu.edu.au

Department: Associate Professor, JCU School of Medicine, Senior Staff Paediatrician, The Townsville Hospital, James Cook University Clinical School, School of Medicine and Dentistry Internal Mail Box 52, The Townsville Hospital, Douglas, Qld 4814.

Received: 12/07/2014
Accepted: 12/07/2014
Published: 22/07/2014

Abstract

Clinical reasoning is the ability to ‘sort through a cluster of features presented by a patient and accurately assign a diagnostic label, with the development of an appropriate treatment strategy as the end goal’ (Eva 2005). This paper proposes that grounded theory can be used as a model to explain the steps involved in clinical reasoning.

Keywords: Reflection/ critical thinking/ decision making/ clinical reasoning and theories of education.

Article

Clinical reasoning is the ability to ‘sort through a cluster of features presented by a patient and accurately assign a diagnostic label, with the development of an appropriate treatment strategy as the end goal’ (Eva 2005). It is central to our clinical practice, yet the process remains an enigma and continues to present a challenge to teachers and learners.

A recent review on an understanding of clinical reasoning has suggested that principles of qualitative methods and mixed methods could be used to add to a framework of clinical reasoning. (Durning et al. 2013) We propose that grounded theory can be used as a model to explain the steps involved in clinical reasoning.

The dual process theory has emerged as the dominant model of clinical reasoning. The intuitive approach or pattern recognition (type I) based on experience and the analytical or hypothetico-deductive (type II) approach are by no means mutually exclusive. (Croskerry 2009). The cognitive continuum theory proposes a continuum between the two with both approaches often interacting with each other during clinical reasoning. (Custers 2013)

Grounded theory methodology had its origins in the health social sciences. (Glaser& Strauss 1967) In this methodology theory is generated from the data collected as opposed to experimental research in which data is collected to prove or disprove hypotheses. The key notion is that the theory emerges from the empirical data and is thus ‘grounded’ in the data. In this method of qualitative research, knowledge is viewed as actively constructed by the product of human interactions. The researcher is actively engaged in the research process bringing his or her own background and assumptions to the analytical process. This contrasts with experimental research where truth is discovered by a detached and objective researcher. (Walling and Landward 2012)
This paper explains how grounded theory may more closely resemble clinical reasoning than the rigid seemingly objective hypothetico-deductive methodology of experimental research. Grounded theory research methodology provides a different paradigm for thinking about clinical reasoning. (Walling and Landward 2012)

Fundamental elements of grounded theory include a theoretical sampling, iterative data collection and analysis and the use of constant comparison to formulate explanatory models. Grounded theory research involves performing data collection and data analysis simultaneously, with each informing the other. The purposive sampling in grounded theory refers to the collection of data that is likely to be highly relevant in supporting or refuting the hypothesis under consideration. It is also termed theoretical sampling because it is guided by the theory being considered. Coding is a technique in which data are organised around key themes and concepts. It is an intrinsic and essential part of theory building. During coding use is made of constant comparison where data are compared to categorise findings into themes. In addition at this stage counter examples or ‘negative cases’ which will test the emerging theory under consideration are sought to avoid unwarranted generalization. In the memo-writing phase of grounded theory data are summarised to facilitate the emergence of new insights and possibilities. This is strengthened when memo writing occurs iteratively and memos are revised and revisited as data collection and analysis proceeds. This revision and revisiting of data collection is not only iterative but also non-linear. Finally ‘saturation’ occurs in grounded theory research when further enquiries reveal no new data and it is concluded that sufficient data have been collected to support an adequate understanding of the themes and advance a theory. Unlike experimental research it is not guided by a predetermined sample size. (Walling and Landward 2012)

The are many similarities between grounded theory and clinical reasoning.

**Table 1.**

<table>
<thead>
<tr>
<th>Clinical Reasoning</th>
<th>Grounded theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I reasoning - Intuition based on experience ↓ Seek confirmatory features to avoid premature closure Accept diagnosis or reject and proceed to Type II</td>
<td>Develop theory (diagnosis) grounded in data</td>
</tr>
<tr>
<td>Type II reasoning 3-4 possible diagnoses are considered based on knowledge ↓ History taking Iterative process - data collection and analysis occur simultaneously. The experienced clinician selects aspects of the history that will be most informative in supporting or refuting the diagnoses under consideration. ↓ Differential diagnoses based on history. ↓ Physical examination guided by data from history</td>
<td>Develop theory grounded in data rather than testing an hypothesis Iterative process - data collected informs analysis and guides further targeted data collection (Theoretical or purposive sampling)</td>
</tr>
</tbody>
</table>
When clinicians do not make a diagnosis based on first impressions, the hypothetico-deductive process comes into play. The iterative process of simultaneous data collection and analysis in grounded theory is similar to how clinicians collect and use data during hypothetico-deductive reasoning. The clinician is literally thinking on his or her feet. The clinician collects data not only to support the diagnosis but also to guide further targeted data collection (theoretical or purposive sampling) using both clinical assessment (history and clinical examination) and judiciously selected investigations. In fact this sampling or choice of which data to collect distinguishes expert from novice clinicians. Experienced clinicians often compare diagnostic possibilities to arrive at the correct diagnosis – this closely emulates the constant comparison of coding in grounded theory. Furthermore the constant review of data collected anywhere during the clinical reasoning process results in clinicians returning to earlier stages if data emerges which does not support the favoured diagnosis. In addition to collecting data that will support or refute a diagnosis the clinician seeks data that will support alternative diagnoses. This process is similar to seeking ‘counter examples’ or negative cases of grounded theory. It is common for clinicians to revisit the history if an unexpected or inconsistent sign is detected during physical examination. In the same way an unexpected finding from an investigation will prompt review of the clinical assessment. Clinical reasoning like grounded theory is not only iterative but also non-linear. Memo writing simulates ‘problem representation’ in clinical reasoning where data is intermittently thematically summarised in a generic way to facilitate access to illness scripts and exemplars. Saturation in clinical diagnosis occurs when sufficient data have been collected to confidently proceed to treatment. In emergencies this must occur quickly whereas in less urgent situations a slower more considered process is possible. Finally, like the qualitative researcher, the clinician accepts that clinical reasoning is subjective and open to bias. (Crosskerry 2009) One of the advantages of a proven research method such as grounded theory is that it includes procedural safeguards to ensure that these elements are transparent and minimise the risk of drawing unsustainable and unwarranted diagnosis.

We propose that the many similarities between clinical reasoning and grounded theory make grounded theory a suitable framework for clinical reasoning to (i) assist our understanding of clinical reasoning, (ii) provide an
An exploratory model for teaching and also (iii) be used as a framework for clinical reasoning research. This is the first attempt of which we are aware to use techniques from qualitative research to help further understand and describe clinical reasoning.
References

   http://dx.doi.org/10.1111/j.1365-2929.2004.01972.x

   http://dx.doi.org/10.1097/ACM.0b013e3182851b5b

   http://dx.doi.org/10.1097/ACM.0b013e3181ace703

   http://dx.doi.org/10.1097/ACM.0b013e31829a3b10


   http://dx.doi.org/10.3109/0142159X.2012.704439
Acknowledgements:

Prof Tim Wilkinson, Dean of Education, University of Otago, Christchurch, New Zealand and Dr Andrew White, Director of Paediatrics, Townsville Hospital, Townsville, Australia provided very helpful comments on an early draft.

Notes on contributors

Co-authors

Paul Welch, Development Manager, Northern Clinical Training Network
JCU School of Medicine and Dentistry
Townsville, QLD, 4811, AUSTRALIA
E: paul.welch@jcu.edu.au

David Plummer AM, Professorial Research Fellow
Health Practitioner Research Capacity Development
Townsville Hospital and Health Service
E: david.plummer@health.qld.gov.au

Louise Young, Associate Professor in Rural Medical Education,
Building 39, Room 212, College of Medicine and Dentistry,
James Cook University, Townsville, 4811, Queensland, Australia.
Email: louise.young1@jcu.edu.au

Ralph Pinnock practises as a Consultant General Paediatrician. He has researched medical education for seven years. His research interests include clinical reasoning, curriculum development, the learning environment and teaching clinical skills.

Paul Welch has over twenty years of experience in education across both the secondary and tertiary sectors. His particular interest is in the development of clinical reasoning skills amongst junior doctors. Paul works within the medical school at James Cook University, Townsville, Queensland.

Louise Young is Associate Professor in Rural Medical Education and Dentistry and Postgraduate Courses Coordinator at James Cook University. Research interests involve all aspects of medical education including innovations in teaching and learning, development of medical teacher skills, mentoring, and rural recruitment and retention.

David Plummer is Professor of Population Health at Griffith University, Australia. David holds a PhD in health sociology from the National Centre for Epidemiology and Population Health at the Australian National University. He is a medical specialist with expertise in public health and health sociology. David has worked in the Caribbean, Asia-Pacific, Europe and Africa.