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How Effectively are We Training Our Teachers to Teach Clinical Reasoning?

Khin-Htun S[1], Hickman J[2] and Glover I[2]
[1]*School of Medicine, University of Nottingham, Nottingham, United Kingdom*
[2]*Cambridge University Hospitals NHS Trust, United Kingdom*

Abstract

Background: Clinical reasoning (CR) is an ability to think, reason and make decisions in a context dependent clinical scenario but its intuitive component is a challenge to teach in formal settings. **Aim:** This research aims to develop an effective faculty training programme to train clinical teachers how to teach CR; specifically, to assess the learning needs of the clinical educators and develop a training programme based on this. In the initial phase, clinical teachers were interviewed to explore their understanding of CR and their current application of it within their teaching. The interviews were analysed and used to develop three workshops. **Workshop:** One focussed on an introduction to the principles of CR. Workshop Two explored literature recommendations and constraints on teaching. Workshop Three covered different learning theories and applications. Questionnaires were collected in order to evaluate the effectiveness of these interventions in helping to teach clinical reasoning. **Results:** Results from the initial learning needs analysis revealed that more than half reported that CR is currently not explicitly taught. The general consensus was it should be taught, but teachers were unsure how or when to deliver this teaching. In the post course evaluation 100% ranked the workshops four and above on the Likert scale. The workshops were described as a great learning experience, with fantastic resources and credible tutors. **Conclusion:** This research highlights the necessity for specific training programmes on teaching CR. There was large variation between sites; therefore we suggest the development of a shared syllabus with key vocabulary enabling consistency across centres. The learning needs analysis demonstrated lack of knowledge in how to deliver CR teaching due to its intangible nature. Therefore this faculty development programme will enable us to train our clinical teachers to effectively and explicitly teach CR; allowing us to develop the next generation of fully competent health care professionals.

Abbreviations:

CR: Clinical Reasoning; TF: Teaching Fellow; NUH: Nottingham University Hospitals; NE: Nurse Educator; UMED: Undergraduate Medical Education Department; UoN: University of Nottingham; PBL: Problem Based Learning

Background

Clinical reasoning (CR) at its most basic is an ability to think, reason and make decisions in a context dependent clinical scenario. CR comprises of both formal and casual intuition procedures [1]. Most clinicians learn CR during field experience, as this intuitive component is difficult to teach in a formal education setting. However it is essential to teach explicitly as studies suggest that diagnostic error due to CR is common and results in significant harm to patients.

The lack of formal training in CR for these current clinical teachers is a significant barrier in teaching their own students [2,3] and the ability to teach CR is somewhat independent of clinical expertise.

There has been increasing focus within literature on the importance of appropriate teaching methods in order to develop CR in future clinicians and therefore deliver enhanced, quality health care [4,5]. The nursing curriculum development authorities are also concentrating on providing training to their clinical teachers, but note that conventional teaching methods for CR are becoming obsolete [6] with the advancement of new teaching strategies.

Supervised clinical sessions are key in developing CR; the exercise enhances the clinicians own skills whilst practice with an expert role model facilitates development of the students' CR [7-9]. Faculty are responsible for developing CR skills by facilitating the connection of clinical context with basic knowledge [10-13]. Therefore they need to acquire skills that enable them to emphasise components of the reasoning process [14]. It is incumbent to have an effective faculty programme for this purpose.

The aim of this research is to develop an effective faculty training programme to train clinical teachers to teach CR. Specifically, the objectives are to i) assess the learning needs of the clinical educators, ii) develop a training programme based on this assessment, iii) analyse the effectiveness of this programme.

Methods

Initial learning needs analysis

To develop this programme we explored the current beliefs, opinions and practices of teaching fellows (TF) on CR by interviewing them at Nottingham University Hospitals

(NUH) NHS trust. A qualitative interview with semi-structured questions was carried out, during which clinical teachers were asked to describe their own understanding of CR, how they have acquired it, teach it, and how they could incorporate CR teaching better in their own teaching. Eight TFs and one Nurse Educator (NE) mainly involved in the teaching of clinical years, participated in the learning needs assessment. Their specialty backgrounds were; radiology, ophthalmology, general surgery, acute medicine, high dependent unit, general medicine, healthcare of the elderly, clinical skills and emergency medicine. Teaching experience ranged from four months to 26 years. Interviews were recorded, transcribed and emerging themes analysed recursively. The 'human-as-instrument' concept was utilised whereby the researcher acted as data collector, selector of relevant data and caller of meaning. Data interpretation may reflect the stance and thoughts of the researcher. However, member checking was applied to improve data credibility; where participants were given a password-protected transcription copy of their interview. The 'immersion and crystallization' pattern of data analysis [15] was applied: data was examined in detail, followed by reflection of the analysis process to identify articulate patterns or themes during immersion.

Intervention

We developed three half day workshops on 'Teaching and Learning CR' based on key themes identified within the learning needs assessment. The researcher acted as a faculty member, organised the event and developed the course materials with other faculty members. Undergraduate Medical Education Department (UMED) team arranged the venue, date and time for the course delivery. The course information and flyer were sent to all the TFs and NEs who teach University of Nottingham (UoN) medical students at different trusts.

Workshop 1

Workshop One was split into two parts. The first focussed on an introduction to all elements of CR to ensure all participants had a common language and understanding of basic principles. The second part used literature reviews to explore what works best in teaching and learning CR. Dual process theory, factors affecting judgement and decision making and best teaching practice were discussed. Fourteen clinical teachers attended this workshop.

Workshop 2

Workshop Two builds on 'A Teaching and Learning Clinical Reasoning' Workshop held at UMED Teaching Fellow Learning Event. The session is planned in order to ensure those new to these concepts and those who have already attended the workshop one could also benefit. The workshop explored literature recommendations on CR teaching and student requirements during clinical attachments. It then identified constraints on teaching during real-time clinical practice and how best to overcome these challenges. 30 clinical teachers attended this workshop.

Workshop 3

Workshop three was divided into three parts. Part one explored different learning theories; how to apply them and how this can improve the student's CR. Part two and three then used small group activities. Part two covered the use of the SNAPPS and One Minute Preceptor tool to discuss cases effectively in busy clinical environments. Part three used practical examples of students facing CR difficulties and covered remediation strategies to overcome these. 20 attended this workshop.

Post learning event evaluation

In every workshop, feedback forms were collected at the end in order to gather post learning event information. Learning event effectiveness was measured by the response from participants regarding the value of the training and the information they have learnt. Main categories of feedback included most and least useful from the training and any suggestions for improvement. Questionnaires began with closed questions and ranking scales and progressed to open questions for more detailed feedback.

Results

Initial learning needs analysis

The pre-course questions were used to establish the learning needs of clinical teachers; exploring the understanding of clinical reasoning and methods employed to teach it. The understanding of key elements of CR was firstly ascertained. One fellow described CR as a cognitive process of taking a problem, gathering the information and then formulating a differential. One expanded to the outcome of CR to all aspects of the clinical cycle; from differential diagnosis to investigations and treatment. Some added that to reason required applying and combined the situational information to background knowledge and experience. It was emphasised by others that CR is context dependent and multifactorial. It was felt that metacognition was itself an important element of clinical reasoning. Almost all fellows supposed that CR needed to be taught but were not sure how or when to teach, or if in fact it can be taught at all.

"I don't think you can teach it so that people are expert in their CR at the end of medical school. I think it's more about giving them some insight into what they're doing, how they're doing it" (TF 4)
"I think it's a theme that needs to be- it's not going to be a totally natural process for anybody. So something needs to happen to support it. So it's not a thing I've put a great deal of thought to which is terrible really." (TF8)

What are the barriers to teaching CR? As a vast, complex and context dependent topic, can it even be explicitly taught?

"Well I think CR has to be specific to a patient. I think it's very difficult to do generic CR. I think it's got to be, 'this is the situation. How do you reach that decision on this patient in front of you?' which I guess would bring challenges to the teaching side" (TF 4)

When should we teach clinical reasoning? It was felt that timing was important as CR requires domain specific knowledge.

"The students are exposed to a lot of things very, very early- they have no idea of the significance… They should have a degree of knowledge that would be appropriate." (TF 9)
"I think it is an aspect of continuing professional development which should continue to develop even when you're a consultant. So I don't think you can teach it so that people are expert in their CR." (TF 4)

How can we teach CR? It is reliant on experiential learning, deliberate practice and expert performance, but are there any structured methods in place to teach this?

"How we teach it. I'm not quite sure if there are specific models that are taught to them. I don't know." (TF1)

Without clear framework the fellows reported use of multiple educational interventions to teach CR alongside building a solid base of medical knowledge; a key element of CR. Nearly 90% incorporated CR using case-based discussions, pictures, role-play, simulations, real patients and debriefing. Some facilitate reflection using a wide range of cases for their students to experience. A few fellows deliberately design scenarios in order to discuss key models of CR, cognitive forcing and de-biasing strategies. Some simply attempt to be a role model for their students. Factors influencing development of CR including where they are based and learning opportunities provided. It is further dependent on the clinical phase and the curriculum model.

"There's very little consistency or methods for consistency that I can see between all the different sites" (TF 5)

In order to gain consistency between the different sites training the teachers 'How to teach CR in clinical settings' is recommended. It is necessary to ensure that all the clinical teachers from different sites have the competencies to teach these skills. More than half of the clinical teachers supposed that CR is not specifically taught at UoN.

"I've not personally observed any teaching on this concept". (TF2)

Post course evaluation

100% of participants rated 4 or 5 on Likert scale for the day (1=poor, 5=excellent). It was described as thought provoking, interactive and multidisciplinary.

Overall participants fed back that the discussions and practical sessions were the most beneficial aspects of the course. They added that learning the educational theories and tools for clinical education were particularly valuable.

"Great takeaway messages: how to implement integrated SNAPPS/1-min preceptor model and practice."
"Good structure to the event. A good mix of interactivity and theoretical background. I like the SNAPPS model."
"Practical session on different patient histories taken by students was really helpful. Also useful was the session on type 1 and 2 reasoning and linking knowledge to clinical practice."

It also helped participants to consider their own cognitive patterns, cementing knowledge as well inspiring new ideas for teaching CR.

"It made me think about how I think and de-biasing strategies and cognitive forcing strategies to promote safety"
"Gave me new ideas to discuss CR process with learners in every educational intervention"
"Fundamentals of CR how I can put into practice and will change my practice"

A common theme throughout the post course feedback was the discussions regarding biases. They developed a better understanding of different types of biases using case based discussions.

They added that in further courses they could benefit from "more ideas on how it [CR teaching] can be implemented in busy clinical areas", and "specific questions [following] each scenario" to ensure "that after one case is discussed the associated theory can be explored".

In general the course was described by multiple teachers as a great learning experience, with fantastic resources, credible tutors and excellent sessions.

Discussion

Training the teachers how to teach a subject in which they themselves did not receive formal education is a recognised challenge [3]. Burn and Mutton (2015) stated that the conventional teaching methods of the CR are getting obsolete with the introduction of new ideas, strategies, methods, and doctrines of CR teaching. This, coupled with changes in new student population demographics, requires an up to date faculty development programme.

Results from the initial qualitative interview can be used in two ways; an exploration of clinical teachers' understanding of CR aspects, and as a starting point for developing a faculty training programme. All the TFs/NEs had varying degrees of knowledge on theory and practical applications of CR. No encompassing definition of CR was offered by any of our clinical teachers in their pre course interviews. Understandably, teaching an apparently intangible topic therefore becomes much more challenging. A key theme of our learning needs analysis was therefore the understanding of CR; building on 'what' CR is we can then explore 'how' CR is taught. The objectives of the first workshop included an introduction to CR and its basic principles. Participants felt these workshops offered a good background to the "fundamentals of CR" and its evidence base.

The most significant barrier for teaching CR was the doubt raised that it could be taught in a formal learning

environment due to the lack of knowledge of specific learning models amongst participants. Therefore learning theories and tools were covered in the faculty development programme particularly in workshop three. It was commented in post course evaluation that this was a valuable aspect of the course.However, if this is then improved upon, the next challenge is when is the right time to teach CR?

In clinical years, the students' clinical attachments will be varied. In order to teach CR the targeted students must also have an appropriate level of medical knowledge. Therefore the learning opportunities afforded in different attachments will directly impact on development of a student's CR.

This study reinforces the benefits of developing a shared vocabulary and key components of a CR syllabus. It highlights the importance of providing practical advice for clinical teachers on how to break the barriers of CR teaching. Workshop two identified constraints on CR teaching during real-time clinical practice and discussed methods to overcome these. Participants felt this furthered their ability to discuss CR processes with learners in every educational intervention. Previous research on faculty development has highlighted a dual benefit – improvements in teaching skills and their own CR skills [3]. This was reflected in feedback from our own research; TFs and NEs felt having learnt how to teach CR would change their practice as both clinicians and educators.

Conclusion

All clinicians teach CR whether intentionally or not but to ensure the effective teaching, teachers require new knowledge and skills to meet the evolving needs [16-18]. The CR faculty development programme is effective in developing the teaching of CR for clinical teachers as well as their own CR skills. We have shown the importance and benefits of this programme and therefore it should continue to run annually. Furthermore this programme should be offered to a wider audience. We suggest the inclusion of clinical teachers from other trusts, and pre-clinical educators, for example Problem Based Learning (PBL) teachers. Careful planning is required to ensure the course evolves alongside the improving skills of the clinical teachers.

The educational techniques proven to aid CR are well developed but the lack of faculty expertise in teaching CR remains a significant barrier [2]. Even if there is an outstanding educational program about CR, efforts will be compromised if faculty is not prepared for teaching it (19). Therefore this faculty development programme will train our clinical teachers to effectively and explicitly teach CR; allowing us to develop the next generation of fully competent health care professionals.

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***Corresponding author:** Dr Swe Khin-Htun, M.B.,B.S, MRCS (Edin), MMedSci (Medical Education), MFST (Edin), FHEA (UK), MAcadMEd, FICS, Honorary Assistant Professor, School of Medicine, University of Nottingham (UoN), UK, Tel: 07800669015; Email: swe.khin-htun@nottingham.ac.uk

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