

Clinical Reasoning Learning Sessions

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Abstract

Problem-based learning (PBL) is used all over the world and is recognised as a modern and efficient way of teaching medicine. In most medical schools, these techniques are applied during the pre-clinical phase of the curriculum. We report here our experience with PBL during clerkship rotations. These sessions, called Clinical Reasoning Learning (CRL), have, as a main objective, the organisation of knowledge already stored by our students in mental networks, using a well-defined strategy. The principle of these sessions is to recreate a clinical consultation setting focussed on a specific problem identified among the mandatory objectives of rotation. Based on examples taken from the urological content of teaching during the rotation in surgery, we demonstrate the method and discuss the basis of this technique.

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Introduction

Many medical schools worldwide have made the shift toward problem-based learning (PBL) medical education. Some of them employ these new techniques in only part of their teaching, and usually in the pre-clinical phases, to make basic sciences easier and more attractive.

Based on a new type of teaching technique called "Clinical Reasoning Learning (CRL) Sessions" developed in the early 1990s at the Sherbrooke Medical School, we modified our teaching of urology during student surgery rotations.

The present article reproduces the contents of a lecture given by the author at the First ASEAN Conference on PBL in Health Sciences in Singapore in November 2000.

The Present Problem of Clinical Teaching

In the majority of medical schools, most clinical teaching is done at the bedside or in the clinic. While this direct contact with real patients is a very valuable teaching support, it is dependent on patient availability and opportunities, which are always unforeseen. There is usually a discrepancy between these opportunities and the specific objective of a rotation, leading to an incomplete coverage of content. Another limiting factor is that most of the time during their clerkship students will mainly see admitted patients in a tertiary care facility. These complex cases sometimes discourage students from being part of the management process. Finally, very often in a medical

teaching centre, surrounded by other students, interns, residents and staff, the students become simple, passive observers with little or no place for participation in management planning and decision-making.

Without excluding valuable bedside exposure, CRL is considered a good adjunct to clinical teaching. It is an elegant way of bypassing the afore-mentioned difficulties of clinical rotations.

The Set-up of CRL Sessions

During their clerkship, our students rotate in different services and different hospitals. Besides their work on the wards, including rounds with residents and staff which are used for bedside teaching, they have a busy schedule of mandatory lectures. These lectures are given by an expert to a small group of 6 to 8 students. Presently, the choice of teaching technique is left to each teacher, according to his or her preferences, but we are in the process of introducing CRL to all these small-group teaching sessions. In the Urology Department, this shift has already been completed.

Students meet around a table with the teacher as part of the group. Sometimes, specific equipment or data may be necessary, such as X-rays, laboratory results, small devices (e.g. a Foley catheter) or small instruments (needles, etc.). Usually, we avoid sophisticated equipment, such as computers, VCRs, and slide projectors, to try to stay as

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close as possible to our clinical practice.

Choice of the Topic for CRL

Any clinical content can be taught with this technique. As an example, we are going to use the session called “urological emergencies” which is given during a 4-week surgery rotation. Four small cases are discussed during that session and are presented in the way they used to be seen at the emergency room.

1. Acute scrotal pain in a 3-year-old boy;
2. Inability to void in a 68-year-old man;
3. Febrile right flank pain in a 35-year-old woman;
4. Haematuria in a 25-year-old man after a motorcycle accident.

Choosing case 3 as an example—“febrile right flank pain in a 35-year-old woman”—one of the students becomes “the doctor” and another “the patient”. The rest of the group becomes the doctor’s aides. For this role play, the “patient” receives an information script revealing her symptoms with positive findings on physical examination and tests. Everything that is not written is negative or normal.

The “patient” gives only the former information, which is what we get from the patient when she presents to us in the Emergency Room. In this case:

“I am a 35-year-old woman complaining of high fever, chills and right flank pain.”

Starting at this point, the “doctor” needs to follow a very specific path, which is the general strategy of CRL:

Initial information → generation of hypothesis
→ oriented information collection → hypothesis evaluation → selection and confirmation of the diagnosis → treatment.

Right away after having gotten this Initial Information, the “doctor” has to give his or her differential diagnoses (Generation of Hypotheses). These diagnoses obviously have to be given in a logical order. In this case:

acute pyelonephritis/acute cholecystitis/retro-caecal appendicitis/pneumonia/pelvic inflammatory disease/renal abscess/liver abscess.....

The group can complete this list if the tutor considers it incomplete. The group can be helped by the tutor’s questions.

Information Collection is the second task of the “doctor”. It is done through an oriented questionnaire, which is as brief as possible, with each question slanted to try to eliminate one or several of the hypotheses. These questions also have to follow a clinical logic, starting with the history and physical examination and ending with the tests.

Here again, priority is given to the “doctor” but the group

can be questioned to complete the task to the tutor’s satisfaction.

In our example, we learned that this patient had a cholecystectomy and an appendectomy, that she already passed urinary stones several times, that she had a completely normal gynaecological evaluation a few weeks ago, and that she had no cough. Her urine analysis showed blood, leukocytes and pus. After a group discussion on the best imaging technique for this patient, a spiral CT was requested, revealing a 12-mm stone impacted at the level of the uretero-pelvic junction.

These different information items obtained by the “doctor”, sometimes helped by the rest of the group, lead to the diagnosis of acute pyelonephritis secondary to an obstructive stone. The last step of this CRL is treatment. The focus is on acute management, to stay within the framework of the topic of the day: “urological emergency”. Fluid management, antibiotic treatment and indication of kidney drainage have to be discussed. The drainage technique and, eventually, management of the stone itself are more specialised and out of the focus of these sessions. It is important to stay focussed on the learning objectives due to the short time available for each case.

The Basis of CRL Sessions

CRL is based on 2 concepts:

- the use of a good, general strategy in problem-solving;
- good, specific knowledge on which strategies operate.

The clinician expert has adequate specific quantitative knowledge, which is qualitatively organised in mental networks. When facing a clinical situation, the expert does not formulate chancy hypotheses, but refers to his or her organised mental network to define possible diagnoses. This network allows him or her to progress through the hypotheses in a systematic and rational way, which directs his or her questions, physical examination and the request for specific tests. This progression leads to 1 diagnosis on which 1 set of treatment will be applied. This progressive strategy is the first concept that we aim to teach our students through CRL. The strategy usually does not change whatever the clinical situation. The content and even the sequence may be different according to the specific situation.

The second concept supporting CRL is good, specific knowledge on which strategies operate. Usually, our students are, at this stage of their progress, knowledgeable enough to handle most clinical situations. However, their knowledge is usually disorganised, and the second objective of CRL is to organise it in mental networks.^{1,2} This networking allows them to establish a logical sequence of “question-examination-test-treatment” in relation to the initial information. Sometimes, however, some basic

knowledge is missing and has to be brought up by the tutor or by preparatory reading.^{3,4}

The application of strategies to pre-existing knowledge through CRL enhances the learning process by putting together two catalysing learning situations:

- Action: it puts the student in the “middle of the battle”, in a real clinical situation, in a real doctor’s life.
- Participation: the student plays the first role in the process and solves the problem.

The Tutor’s Role

For CRL, the tutor has to be an expert. He or she has to set the stage by bringing the necessary equipment, documents, etc., as mentioned before. He or she is the time and process keeper. During all the phases of CRL, he has to question, request clarification, orient choices, and ask for examples of similar situations. This role is definitely more active than in a PBL session.

Conclusion

CRL sessions are an efficient and active way of developing the student’s clinical problem-solving skills. They allow the student to apply to real life, to fine-tune, and to organise, in mental networks, already stored knowledge. In terms of strategies, CRL permits the student to generate early differential diagnoses and their re-evaluation

according to findings of the data collection process. This new method solves the problem of unforeseen clinical exposure during a clinical rotation. Evaluation of this teaching is still challenging and in the process of improvement.⁵

As with most recent pedagogic innovations, this attractive technique needs important investment in teachers’ training and is time-consuming. These parameters have to be properly analysed according to each medical school before being adopted.

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