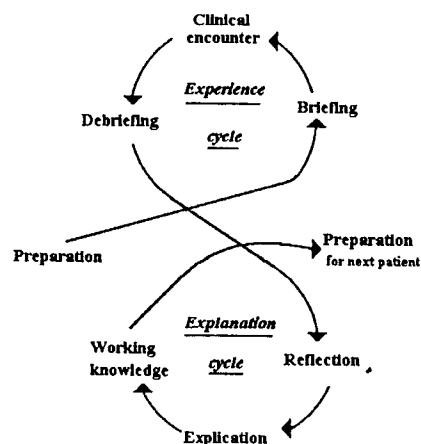


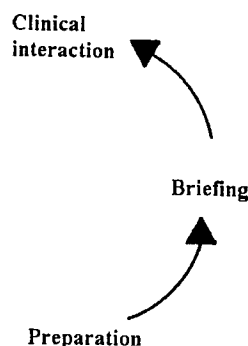
THE MEDICAL TEACHER

Planning bedside teaching — 4. Teaching around the patient

Ken Cox



So much can be covered within the brief interaction with a patient that, for effectiveness and efficiency, clinical teachers need to plan what they intend to do, and how they will do it. As well, unpredictable events (emergencies, complications, consultations) may provide "opportunistic" teaching. Clinical teachers need both to "think long" in considering the clinical curriculum and to "act short" in capitalising on vivid events which imprint themselves strongly on learners.



What can be learned from the patient is the history of illness and the examination of disease. For authenticity, the patient is essential. But this precious time of interacting with the patient and observing the evidence of disease is often, unfortunately, overtaken by discussion

about the niceties of investigation and treatment which could be better handled sitting in a side room.

This article deals only with the teaching of how to collect the physical evidence from the patient. Educationally, this learning from experience of sensory perception builds a clinical memory of images — prototypes² of disease patterns which clinicians call upon repeatedly with subsequent patients.

Planning

The evidence of what's wrong lies in the patient. The teacher's task is to help the student see and hear and feel the clinical features. Any clinical teaching time spent away from the patient wastes valuable opportunities for building the student's clinical memory based on those sensory experiences.

The students' task at the bedside is to cultivate skills of acute observation. From a co-professional:

... the most important practical session that can be given to nurses is to teach them what to observe, how to observe, what symptoms indicate improvement and which the reverse, which are the evidence of neglect and of what kind of neglect. ... If you cannot get the habit of observation one way or another, you had better give up being a nurse, for it is not your calling, however kind and anxious you may be.

Florence Nightingale³

The task of observation has two major components: *how to do it* and *what it feels like* (or sounds like or looks like). Each student must do both for himself or herself. Demonstration by the teacher cannot substitute for direct experience of what it feels like, but, obviously, only two or three students will be given the opportunity to examine a patient during a clinical teaching session.

In our observations of clinical teaching, teaching on clinical evidence focused more on interpretation than on what had been seen or felt or heard or smelled; but interpretation comes into play only after the features have been care-

fully observed. Clinical teachers ought not complain that students fail to learn physical examination techniques, when so little bedside teaching time is devoted to supervised practice.

Rules

What do you expect of your students in a teaching session at the bedside in which they are physically examining the patient? Your expectations determine your "rules", whether you have spelled them out explicitly or not.

Some aspects could be called socialisation into the rules of propriety with the patient, such as introducing oneself, requesting permission to examine, questioning whether any area is sensitive before touching it, checking the patient's comfort or discomfort during the examination, seeking feedback from the patient, and thanking the patient at the conclusion. Not only must the clinical teacher make these rules explicit, but he or she should personally model such politeness and caution with the patient.

Some expectations relate to recognition of the underlying anatomy, some to careful attention to the steps of examination, some to visualisation of possible pathological processes.

The allowable boundaries of discussion with this patient ought to have been clarified during briefing.

Roles

Clinical teachers have many roles — boss of the ward, expert clinician, demonstrator of technique and signs, carer for the patient and family, teacher about illness and disease, supervisor and assessor of performance — some of which may conflict. Concern for the patient's comfort, for example, may conflict with concern for ensuring that each student feels that nodule in the prostate.

The clinical teacher's role may vary with the patient, the malady and the setting, as well as with the stage of development of the trainees or students. However that role is seen, some of your most powerful teaching flows from your own modelling of politeness, concern, discretion, gentleness, honesty and persistence until you are certain.

Students enjoy close involvement with their teachers as approachable human beings, watching them as experts at work, being

supported as they try new tasks, building their confidence and knowledge of *what to do* and *how to do it*, but their learning from experience requires much more planning and supervision than solely "learning by doing". The evidence collected has to be examined, reflected upon, and linked to other learning. Clinical teaching helps students to use knowledge, not just possess it. Clinical teachers add interpretation and judgement to the physical examination evidence to ensure "meaningful learning",⁴ which links their observations to underlying explanations (but only after you are confident that they can make those observations accurately).

Steps

Learning physical examination entails explanation, demonstration, direct experience, and interpretation of what has been seen or felt or heard or smelled.

The steps in the clinical teacher's tasks, then, are as follows.

1. To ensure that the students clearly understand what they are searching for. Explanation of exactly what physical manifestations of the disease are being looked for, and what they are like, can be difficult because our clinical vocabulary of sensory perception is thin and ill-defined. Clinical education faces a major task in developing an accurate descriptive language for clinical phenomena.
2. To guide the practice of an effective and efficient examination technique for detecting the physical evidence. Demonstration shows how to examine, particularly with anatomical justification for the method and demonstration of how to create optimal conditions of lighting or relaxation.

The steps include sequences such as inspection, percussion, palpation and auscultation of the abdomen, the order of the steps of each drill, any priorities about which steps are critical, and a checklist on whether all were done. Demonstrations show each step, aiming to optimise the accuracy and efficiency of the examination.

3. To ensure that the students have detected the clinical evidence, particularly by listening to their detailed description of what they are sensing. None of us can know what others are actually sensing, but their description of what they're discovering can provide some indication.

4. To encourage comparison of the sensory evidence with similar sensory experiences. The students' perceptual image of the clinical feature is complemented by being "examined consciously" as well, in the sense of concentrating on what is being detected, trying to describe the sensation, comparing it with other sensory experiences, discriminating it from similar sensations, and deciding what pattern it fits. What is being experienced at a sensory level is being translated into disease meanings on one level and into description for others at a verbal level.

The clinical teacher may suggest that students

form a mental picture of the organs being examined, visualising the pathological changes they are sensing. The teacher is encouraging insights (looking in) by helping the students to connect their sensory observations of one patient to their knowledge about diseases and the clinical manifestations thereof.

5. To help students identify differences among similar instances of the same disease.
6. To help students identify differences from similar signs in different diseases.
7. To help them identify the extent or stage and severity of disease evident from the signs.
8. To help students discern faint or ill-defined features, especially those which discriminate apparently similar entities, helping them separate those who need investigation from

those who don't. Concentration or focused awareness of the sensation may be heightened by shutting off other sensory channels, especially by sitting down to examine the patient and shutting the eyes.

9. To require all students to persist until they are certain exactly what they have perceived, or, if the patient's tolerance has been neared, to return later to verify the evidence. Teachers need to model tenacity and honesty if they expect the same of their students.

Teachers can build their students' confidence by giving positive feedback on successful performance, by supervising further practice, and by conferring increasing responsibility, as in having students do the work-ups of clinic patients.

Clinical perception

Perceptual task	Learning task	Educational concepts
What am I to search for? What is it like?	Clear understanding of feature	Expectancy, anticipation, readiness, motivation, awareness
How do I search? Where do I search? What do I focus on? How do I separate it from background?	Clear understanding of process Demonstration of process, optimal conditions for task	Selective perception Signal to noise ratio field and ground wood from trees
What can I detect? (see, feel, hear, smell)	Sensing, finding direct experience of feature	Data entry, acquisition
What is it like? How can I describe it?	Description of sensory experience	Identifying, coding naming
How does it compare with ... ?	Comparison Practice	Classification
What distinguishes it from ... ? What is it not? What fine details must I seek?	Discrimination differentiation Fine tuning	Contrasting examples Practice
Am I certain?	Persistence	Motivation
Does it fit a pattern?	Pattern recognition	
Any mismatch?	Intuition Clinical memory	Experience
If-then, how extensive, how severe? Where else do I search? What else do I seek?	Application of knowledge to a case	Transfer, generalisation
What does it mean? What is its significance?	Interpretation Meaning	Classification Reflection
What is my diagnosis?	Judgement	Classification
What is my decision? What shall I do?	Choice, decision Action	

The task is summarised in the Box, which relates the perceptual task⁵ to what must be learned, and the educational principles which optimise such experiential learning.

Skills

The range of skills in teaching around patients is very wide, combining tasks as expert practitioner and teacher. The principal skills of clinical practice relate to communicating with the patient, perceiving and eliciting observational data, physically handling the patient, doing practical tasks and procedures, reasoning with the data and judging what to do, and managing the plan of action.

The teaching skills, therefore, lie principally in:

- guiding communication with the patient and explaining clearly to the students;
- demonstrating a variety of clinical observables and how to elicit them accurately;
- supervising student performance and providing gentle but firm feedback;
- questioning and challenging student interpretations of the sensory data; and
- modelling professional style with the patient and persistence in checking the evidence.

Evaluation

How will you know whether you taught well or not? That depends on what you want to evaluate as representing good teaching. Will you assess

your planning and organisation of the clinical interaction? Do you want to examine the rules and roles you have established for yourself and the students? Or your management of the steps and control of the session? Or your skills in handling communication, demonstration and questioning? Or the learning climate you created? Or what the students learned? Or how they feel about the sessions?

Each of the questions just posed calls for different evidence. Evaluation is worth undertaking only if you intend to act on the findings. Think hard before embarking on any evaluation of anything. Who are your sources of information? Your patients, your students, your colleagues, yourself? What can each tell you from their perspective? If you intend to act on your findings, you will need specific data which show exactly what is happening, from which you can choose which aspects you can attempt to improve.

Review of clinical interaction

The great strength of clinical learning is that students learn from the direct experience of interacting with real patients and the evidence which they can elicit, especially with the helpful guidance of a respected teacher.

The great weaknesses are the frequent failure by clinical teachers to ensure that students actually get those experiences, and the failure to supervise the practice of each until a sufficient

level of proficiency has been achieved. Once the clinical features have been sensed by the students, teachers can discuss the lessons of that experience to translate the sensory images into interpretations of the disease.

Experience teaches reality, but experience can be a slow teacher if what went on is not examined closely and fitted with other knowledge. And experience can be an inaccurate teacher if the clinical events are consistently misinterpreted because of lack of supervision and feedback on accuracy and understanding. Clinical teachers carry heavy responsibilities in their guiding roles.

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Students learn clinical knowledge from what they glean from the patient — the story of illness and perception of the signs of disease. Clinical teachers must ensure that each student gains direct experience with the patient.

The next article deals with debriefing the students after the session with the patient.

TODAY'S TECHNIQUES

Magnetic resonance imaging of lesions in the abdomen

J Patrick Shoenut and Richard C Semelka

The natural comparison of imaging modalities for lesions in the abdomen for the past 10 years has been among magnetic resonance imaging (MRI), computed tomography (CT) and to some extent ultrasound. The superior spatial resolution of CT, availability of instrumentation and experienced personnel has made CT an attractive choice. We believe however, that new MR sequences and contrast agents have, in some selected instances,

supplanted CT, and that in the future MRI will gain wide acceptability for abdominal imaging.

Magnetic resonance imaging is now realising increased use in the abdomen to detect and characterise lesions. In general terms we use three sequences operating at high magnetic field strength (1.5 Tesla), using a Siemens MR imager. The sequences are T1-weighted breath-hold gradient echo, fast low angle shot (FLASH), T1-weighted fat suppressed spin echo (T1FS)

and T2-weighted fat suppressed spin echo (T2FS).

The physics of MRI is quite complicated, but in general, it involves imaging mobile protons. These are protons found in water and fat. Most pathological changes increase tissue water content and are relatively dark on T1-weighted images and relatively bright on T2-weighted images.

T1-weighting refers to the longitudinal relaxation of protons in the magnetic field. The use of T1-weighting makes water appear dark. T2-weighting is proton relaxation in the transverse plane. The use of T2-weighting gives fluid a bright appearance on images. Both T1 and T2 weighted images give fat a bright appearance.

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