Experience plus explanation

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Abstract

The more clearly the clinician comprehends the processes of clinical perception and of linking the experience with explanation, the more thoughtfully clinical students can be guided to construct an accurate 'clinical memory' of cases, and to construct a sound 'working knowledge' structure from their personal 'examined experience'. The structuring of the steps of clinical learning is intended as a check list to optimise their coverage, and as a framework for examining and codifying clinical working knowledge within which continuing education can be conducted.

Bedside teaching provides the most powerful inputs into undergraduate clinical learning. The patient is a person, a human being distressed by their illness and apprehensive about its implications. The patient is also a case, an example of a clinical presentation to be translated into a diagnosis of disease. Medical students deal interpersonally with the sick person, and intellectually with the case to be solved.
Like other human beings, the students interact with the patient conversationally around the story, perceptually in what they can see, feel, hear and smell, intellectually as they interpret the data in the case, and affectively as they register the patient's reactions and relate them to their own feelings.

What they learn from each experience varies with how well their clinical teacher can help them

- collate the evidence,
- link the clinical picture with a case prototype,
- unravel the mechanisms by which the disease process produces the clinical manifestations, and
- gain insights in to how the illness is affecting the patient and family.

Integration of experience and explanation creates clinical working knowledge of what to do next time with a patient like this.
This note sets out eight steps of clinical teaching to link these many 'ways of knowing' – communicative, perceptual, intellectual and affective. The steps are arranged in an experience cycle with the patient, and a subsequent explanation cycle in which teachers can glean the most from the experience.[1]

Experience cycle

Four steps are set out for bedside teaching – preparation for clinical learning, briefing before seeing the patient, interaction with the patient, and debriefing of the clinical interaction.

۱. Preparation for clinical learning

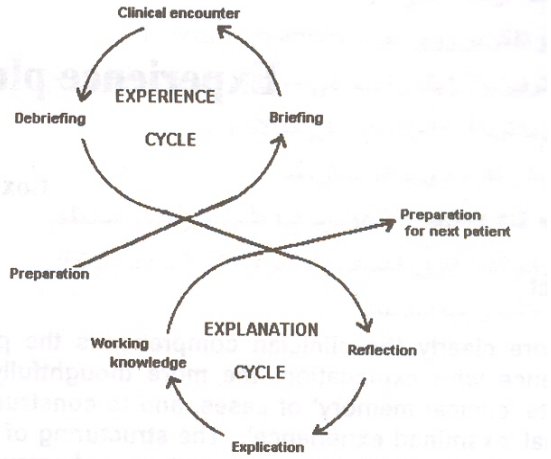
The clinical abilities to be learned eventually cover five main skill areas, **communication** with the patient (and their family and professional colleagues), **perception** of the clinical evidence, manual, **technical skills** in examination and procedures, **interpretation** and **inference** from the evidence, and management of the patient's care. Of these, the routines of history taking, physical examination, and the use of clinical instruments can be taught before the students enter the clinical area. Teaching may be as applied anatomy and physiology on one another (or recruited 'patients'), or in a 'clinical laboratory' set up for the purpose.

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Some teachers develop the applied anatomy seriously, say, as skills in examination of heart and lungs, of cranial and peripheral nerves, and of the fundus and middle ear. In most medical schools, however, such learning begins only when the students enter the wards for Educationally, novices need to rehearse such drills or routines in using the 'clinical tool kit'. If they can't rom not knowing what to say or do with the patient.



۲.Briefing before seeing the patient

Both patient and students should be briefed to prepare them for the teaching session.

Briefing the patient.

In our studies of clinical teaching, we found that the contribution of the patient was usually seriously underestimated. As a human being with illness and disease, the patient is both the purpose of the procedure or consultation, and the source of information. The patient is also an expert on their own malady and its impact on their life. No one has as much 'inside information' to offer on the causes, precursors, precipitation, implications and meanings of the illness. No one knows more about the desired goals for management.

All doctors know more about diseases than all patients.
All patients know more about their illness than all doctors.

Many patients are experts on the details of their own management in all its details, for example, diabetics, those managing their own dialysis, or transplantation patients on an immunosuppressive regimen. And most nurses know more about the contributions of both than is usually acknowledged!

Patients will agree
- ➢ to questioning about their illness,
- ➢ to demonstration of their clinical evidence,
- ➢ to supervision of their care by students,
- ➢ to giving feedback on the student's performance, and een
- ➢ to contributing in assessment of the student's performance.

But patients also want teachers
- ✓ to introduce themselves,
- ✓ to inform them what the bedside session is about,
- ✓ to translate medical terms so that the patient can follow the discussion,
- ✓ to know the schedule of ward rounds and other planned activities in advance, and
- ✓ not to be too tired by a long round and the teaching sequence.[۲]

Briefing the students

Briefing orients the students
- ✓ to a particular patient,
- ✓ to what is likely to be experienced,
- ✓ to what is important to look for, and
- ✓ to what the student is expected to learn (the goals of the experience).

Many (conflicting) educational principles come into play during briefing. Discussing 'what is likely to be experienced' provides an 'advance organiser' or framework for the student that can act as a 'cognitive bridge' form the known to the unknown. Too detailed a briefing, however, pre-empts learning by discovery.

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Too cursory a briefing misses out on preparing the student for opportunities or phenomena that may not be recognized unaided. Too strict a set of instructions turns the experience into a 'drill'. No briefing at all may well be dangerous to the patient and a negative experience for the student as well.

Identifying 'what is important' creates 'anticipation' of the learning, heightens perceptual alertness, and avoids 'failure to notice'. Preparing students to perceive some aspects of the story or the physical sings may, however, focus them too closely on a limited set of observations.
Demonstration displays the skills of 'teacher as expert', but sometimes students just become passive observes. Active solving of the clinical problem can be made the task of the students, guided by 'teacher as coach'.

۳. Interacting with the patient

The evidence of what's wrong lies in the patient, not in 'the books'. Teaching guides the students in eliciting the story, and seeing, feeling, hearing and even smelling all the signs. This 'prime time' with the patient is too precious to waste on didactic textbook lists for which the patient is not essential.
The students' task is to cultivate skills of acute and exact observation. Which requires guidance on the steps of both 'how to do it' and 'what it feels like'. The clinical teacher must guide the student to sense the features, and then 'make sense' of what they find.
That teaching task must ensure that students clearly **understand the clinical feature** *(What am I to search for? What is it like?)* plus clear understanding of the **processes** of physical examination *(Where do I search? How do I search?)* Their **description** of what they have found in the patient must be followed by **interpretation** *(How does it compare with …?)* and **discrimination** *(What differentiates it from ..?)*. Clinical exactness in physical examination requires conscious awareness and **sensitivity** to the sensory characteristics *(What fine details must I seek?)*, **practice** and **persistence** *(Am I certain?)*. Building the students' **'clinical memory**' of sensory detail and of patterns leads to both **pattern recognition** of **case prototypes** and intuitive awareness of mismatches from the pattern.
Experience teaches reality, but experience can be a slow teacher if the sensory data are not 'brought to mind' and translated into information.[†] The data must not only be collected carefully and thoroughly, but must then be fitted with the pathophysiology to the underlying disease to provide a coherent understanding. This collation of perceptual experience with scientific explanation constructs the links between our two major ways of knowing', our parallel processing of whole images and personally sensed details (processed largely in our 'right' brain) and our sequential processing of verbal description and logical argument (processed in our left cortex).
Our neuropsychological 'hard wiring' provides only weak connections between our experiencing brain and our explaining brain. We have few explicit words for describing that perceptual experience of physical signs, and only a clumsy, inexact clinical vocabulary. That dose not make that personal, sensory experience of reality less valid, but the logical left cortex is dismissive of data that cannot be observed and confirmed 'objectively' by more than one observer. The observations stored in our personal 'clinical memory' are often denigrated as unreliable because they are 'subjective' and 'anecdotal', as if they somehow lose their validity because other observers weren't there at the time to verify them. The risk is that clinical experience may be treated as less sound than investigational data (which are usually trusted because the data are visible and often numerical).
Since alert detection of faint evidence of early disease can save lives, clinical teachers must ensure the accuracy of the clinical signs the student detect. When examination has been carefully performed, students should trust that perceptual recognition, which may be more accurate than investigations.

٤. Debriefing after the clinical interaction

Clinical teachers often hurry on to the excitement of demonstrating the features of the next patient without extracting the most from the last patient. Deliberate debriefing, however, enables both teacher and student to review exactly what went on during the experience with the patient.

[†] Data are observations and measurements on clinical phenomena. Information is 'reducation of uncertainty' by using various data to 'inform' a question or decision. Knowledge synthesizes information into concepts linked into principles which are linked into theory. Understanding (or gnosis) integrates knowledge, skill and values into judgment and action.

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The role the teacher takes on during debriefing powerfully affects student learning. Educationally, the clinician must choose whether to teach what s/he knows, or to listen to what the student knows. Teaching may be as 'clinical expert' emphasizing what were the salient features, and constructing practical 'working knowledge' around the case prototype. Or as 'critic' challenging the students' assumptions and reasoning, and requiring their rigorous justification. Or as 'assessor' judging flaws in performance, using observations on their approach to the patient, the timing and phrasing of questions, the response to issues raised by the patient, the logical sequence of the consulation, and the skills of physical examination. Or as 'planner' guiding students to further learning from other patients and resources.

If teachers talk all the time, they can't hear the students' thinking. And students won't confess their ignorance if it could lead to an embarrassing put-down.

Listening to students debriefing their experience, however, reveals what clinical features the students recognized and what they missed, what they understood accurately and what they misinterpreted. The clinician as 'supportive facilitator' can share ideas about the possible explanations as disease, and about the patient and how the illness affects their life. If the clinician encourages students to express their uncertainties and confusions as a good starting point for teaching, students cease to conceal their ignorance. Clinical presentations are never as tidy as textbook descriptions; the patient displays the complexity of the real world, which can be learned only from the patient.

Debriefing must usually be brief. The teaching skills needed are in

- ✓ balancing open-ended discussion with control of its direction,
- ✓ listening carefully to clarify ambiguous or uncertain aspects,
- ✓ setting standards of critical thinking,
- ✓encouraging expression of feelings and attitudes perhaps with some self-disclosure, and
- ✓ synthesising the lessons from the experience.

Explanation cycle

After optimizing the 'prime time' with the patient, the experience of the clinical manifestations of illness and disease must be fitted with their pathophysiological and socio-behavioural explanations. The teaching task is to link the perceptual ('right brain') images of sensory experience with logical ('left brain') reasoning, expressed verbally.

Four steps are covered – reflection on the experience, explication of the underlying phenomena, extraction of practical working knowledge, and preparation for the next similar patient.

٥. Reflection on the experience

Debriefing usually comprises a quick review of the objective clinical data in the case before moving on to the next case. Reflection provides a framework for more thorough appraisal from many directions of learning.

One direction looks **within** 'what was going through your mind' to explore the thinking of the clinician and the students at the bedside (during the consultation in Step ٣).

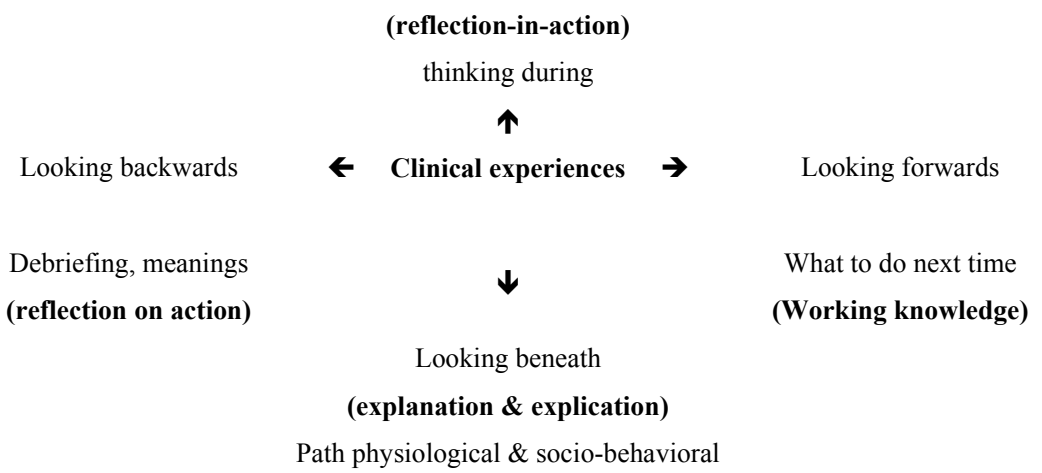
One looks **backwards** at the immediate experience to think again about the clinical evidence within that case, to test the interpretations of the evidence and the diagnostic inferences. (as covered in debriefing in Step ٤).

One looks **inwards** to find 'insights' into this case and to compare them with similar presentations and personal experiences. Here the shift is from debriefing and reviewing the visible, external events to reflecting more on their connections to other experiences. The shift is also from *"what went on?"* to *"What did that mean?"* to extract their invisible, internal meanings to those involved in the interaction. The shift is from what the objective data denote as indicating a case prototype to what they connote cognitively from previous clinical experiences, and affectively from personal meanings and 'subjective' explanations of the patient's responses (Step ٥).

One looks **beneath** the surface phenomena to find explanations for the 'objective' events from book knowledge and journals, and from research and theory, which set out the pathophysiology (Step ٦).

One looks **forward** to link the lessons into integrated 'working knowledge' which derives guidelines or decision rules on what to do next time, and to remedying any defects in performance (Step ٧). Lastly, teachers plan whatever further student learning will complement these steps in preparation for the next similar patient (Step ٨).

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These steps overlap considerably in our observations on clinical teaching. More obvious, however, is how many opportunities to learn more deeply from a case are neglected, especially those which give students insights into an expert clinician's judgment and decision making.

Clinicians have to 'think on their feet' during a consultation as they consider what to do next. Some clinicians can 'think aloud' as they work, offering students a running account of what they are looking at, and what they are looking for. Surgeons may explain the steps as they work through an operation. But most clinicians do not.

The process can be called 'reflection-in-action'[۳] and is the most explicit guide to students of how the expert is thinking as he or she works through a clinical problem. It is easier to think aloud during the performance of a 'one-way' practical task, such as manipulation, than it is during a complex or interactive task, such as sensitive discussion exploring a patient's reaction to their disease. But even in the process of demonstrating a practical skill, some teachers may not think aloud.

Reflection is the first step in 'knowledge creation' in practice. The expertise of practitioners grows from the cumulation of a large series of individual examples. The series creates the experience; reflection on the experience creates the expertise.
"*When someone reflects-in-action, he becomes a researcher in the practice context. He is not dependent on the categories of established theory and technique, but constructs a new theory of the unique case. His inquiry is not limited to a deliberation about means which depends on a prior argument about ends. He does not keep means and ends separate, but defines them interactively as he frames a problematic situation. He does not separate knowing from doing …*"[٤]

Looking back over the details of the case and its management to examine them more closely introduces rigor into the clinical performance by questioning, for example,
- ✓ the exact definition of the problem to be dealt with,
- ✓ the accuracy of the data collected,
- ✓ the logical tracking in the search,
- ✓ the alternative diagnoses considered, and
- ✓ the sufficiency of data for the diagnosis.

Those issues are judged against the background of experience of parallel cases seen by the clinical teacher and by the students, and of journal reports and other descriptions of specific cases or of series of cases. Three activities (at least) are taking place here.

One is the comparison of the assembled set of evidence identifying this case to be compared with the set expected in the case prototype. The similarities and differences introduce critical review questions about the 'necessary and sufficient' set agreed upon normatively in the profession. Expertise and efficiency grow from identifying an 'optimal sub-set' of salient features to be looked for. The search for explanation of differences of one case from another begins a process of clinical research.

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A second is the review of performance
✓ in handling this case,
✓ in the strategy of search for evidence,
✓ in the thoroughness appropriate in such a case with criticism of the collection of any redundant data,
✓ in the choice of treatment, and
✓ in coverage of other needs, such as patient education in prevention of future disease.

A third justifies the choices made, particularly in management, in terms of likely outcomes and patient satisfaction. Here the assumptions underlying management can often be challenged. 'Accepted practice' may suffer from not having been questioned for decades. Suggested changes often induce horrified rejection; but the habit of critical appraisal within reflection can 'permit' the unthinkable to compete with established 'routines'. The growing volume of reported analyses of the diagnostic power of clinical features and tests, and the meta-analyses of clinical trials, now require clinicians to be able to assess their quality and validity.[٥]

6. Explication or "*How can I unravel and explain what went on*?"

The explanation of the clinical events now shifts from case review, and from the personal in reflection, to the underlying biopsychosocial science in explication. This phase is a critical opportunity for clinical teachers to get beyond empirical assumptions to check the interpretations against collated research data and underpinning theory.

The sources of information are reviews of experience in journal articles, monographs and text books, current research testing new hypotheses, and basic bioscience and behavioural science theory expressing coherent generalized principles.

Literally, the clinician turns away from the patient (and the perceptual inputs of what has been heard and seen and felt in the patient) to thinking (logically and verbally) about intangible human and biological processes. Here the clinician is helping to find the cause → effect sequences within basic biopsychosocial sciences that could explain the linkages among the pieces of clinical evidence. This 'examined experience' links the patient with collated clinical and scientific knowledge.

7. Working Knowledge or "*What would I do next time*"

The experience with one patient, examined at clinical level and explained by reflection and theory, provide the 'lessons of the case' which can lead to "*What could I have done differently?*" which constructs working rules for "*What shall I do next time*?"

The term 'working knowledge'[٦] embraces the way biomedical knowledge becomes re-organized for use in the tasks of clinical practice, for example, to:
Know what to look for – such as the salient features in a case like this, or an optimal sub-set of clinical findings, or the sign that decides whether you operate or not
Know when to investigate – when the findings are not strong enough, or not explicit, or the lesion needs, exactly defined
Know what is enough – when sufficient information has been gathered to allow action to begin
Know that if – in predicting the variations in prognosis likely with different contingencies or treatments
Know when to refer – in time, and in what you can't handle.

Common clinical tasks are, for example, to:
Know what are the critical questions – in what is serious or urgent, given the clinical presentation

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Know what must be done first – in setting priorities within a case, or *triage* among a number of patients or problems competing for attention
Know how to look – particularly the strategies of searching for the clinical evidence, inductively, deductively or intuitively, to answer the critical questions
Know how to go about it – in planning any set of activities (such as a therapeutic regimen), or what must be done (such as organizing an operating list and the staff involved)
Know how to organize – in controlling the people and facilities to be used.

Student need to develop their 'planning talk' in which they anticipate what could happen, and develop a mental scheme or program for what they'll do. That 'anticipatory acting' then passes through a step of mental 'rehearsal' before their becoming a 'participatory actor' in carrying it out.

The decision making knowledge they need in management, for instance, requires them to:
Know what can be achieved – in this patient with this disease
Know what is important – to the patient, family and others
Know which outcomes are most likely – in this patient with this disease
Know which alternatives – among the range of treatment options available in the setting
Know what to do if – using many decision rules, indications and contraindications according to what's found
Know whether – to choose a particular course of action – watching, reassuring, intervening now
Know when – to act and when to wait and watch.

Those suggested components of working knowledge are quite incomplete,[۷] but illustrate the reasoning tasks which still await development and careful codification of practical 'knowledge for action' for student guidance. Remember that clinical performance is not some simple application of bioscience to patients, but entails a rich range of skills in handling ill-defined, interactive, complex, multifaceted, value-laden situations requiring case management, people management and self management.[۸] Clinical teachers are critical in introducing students to such complex tasks in human interaction, and fostering their maturation.

۸. Preparation for the next case

Clinical teaching sessions ought to end with both a synthesis of the clinical experience with the patient and with the guidelines and decision rules for managing the next similar case presentation. The teacher can reinforce those lessons with references to readings on variations of the case prototype, specificity of particular clinical features and of investigations, and of sources of parallel patients to visit.
I find that the most powerful learning experience for students at this point is for them to go off and devise the most effective and efficient case management plan for 'a case like this'. That exercise requires them to explore the literature, to consider search strategies, to identify the most powerful evidence to confirm the diagnosis, and the most powerful evidence to exclude competing diagnoses, and to select how extensive the diagnosis must be for such a case. The exercise shifts them from remembering textbook lists to deciding on case management, from 'what to know' to 'what to do'.

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۱-Cox K. Planning bedside teaching. Med J Aust ۱۹۹۳, ۱٦۸, ۲۸۰-۲۸۲.

۲-Linfors EW, Neelon TA. The case for bedside rounds, New Engl. J Med ۱۹۸۰, ۳۰۳: ۱۲۳۰-۱۲۳۳.

۳-Schön DA. The reflective practitioner, San Francisco, Jossey Bass, ۱۹۸۵.

٤-Schön DA. Educating the reflective practitioner, San Francisco, Jossey Bass, ۱۹۸۹.

۵-Sackett DL. Applying overviews and meta-analyses at the beside J. Clin. Epidemiol. ۱۹۹۵, ٤۸, ٦۱-٦٦.

٦-Cox K. What surgeons know: A note on clinical working knowledge Aust. NZ J Surg. ١٩٩٢, ٦٢, ٨٣٦-٨٤٠.
٧-Cox K. What doctors need to know A note on professional performance MJA ١٥٧, ١٩٩٢, ٧٦٤-٧٦٨.
٨-Cox K. Clinical practice is not applied scientific method Aust NZ J Surg ١٩٩٥, ٦٥, ٥٥٣-٥٥٧.

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