Faculty Orientation to Teaching

Updated April, 2017

"It goes without saying that no man can teach successfully who is not at the same time a student."

Sir William Osler, The Student Life in Aequanimitas, 1906

"We must acknowledge again that the most important, indeed, the only, thing we have to offer our students is ourselves. Everything else they can read in a book or discover independently, usually with a better understanding than our efforts can convey."

Daniel Tosteson, Dean of Harvard Medical School, 1977 -1997

Introduction

As a faculty member at the University of Saskatchewan, you will be expected to teach a variety of learners including medical students, clerks and residents. "To teach is to learn twice" – teaching others improves our understanding of medicine because it forces us to rethink our knowledge and skills in a particular area. You are encouraged to attend Faculty Development courses on Medical Education as an introduction to teaching here. Information on courses offered can be found on our website. This orientation is meant to provide you with some very basic knowledge about teaching until you are able to take more in depth courses.

There are 6 objectives which correspond to the six sections in this orientation. Upon completing this online module, you will be able to:

1. Define the relationship between teaching and learning
2. Use learning objectives to plan a unit of instruction, e.g., a lecture, seminar, academic half-day, clinical block, or course
3. Plan learning activities that involve active participation of students
4. Describe how you would use formative assessment (feedback) to enhance your students' learning
5. Describe methods of summative assessment for deciding who is admitted, progresses or qualifies, e.g., who passes and who fails
6. Evaluate your present skills as a teacher using one or more methods to obtain feedback on your teaching.

Note: Links with ***** are considered "required reading" to get the most out of this introduction to teaching; other links are to expand your personal understanding of a topic. If a page has both classroom and clinical sections, you can read the section that applies to where you usually teach. This orientation should take between 2 to 5 hours depending on how many links you decide to read.

Becoming a Good Teacher:

Teachers often go through stages in their development. They start out motivated by fear – fear that they don't know enough about the content and will be found out. Brookfield describes how novice teachers sometimes feel like imposters:

> "Impostership means that many of us go through our teaching lives fearing that at some unspecified point in the future we will undergo a humiliating public unveiling. We wear an external mask of control, but beneath it we know that really we are frail figures, struggling not to appear totally incompetent to those around us" (Brookfield S: *The Skillful Teacher – On Technique, Trust, and Responsiveness in the Classroom*. 2nd Edition. San Francisco: Jossey-Bass, 2006.)

With experience, teachers move to the next stage – they are more confident now and want to show how much they know. Tompkins describes this stage:

> "I had finally realized that what I was actually concerned with and focused on most of the time were three things: a) to show the students how smart I was, b) to show them how knowledgeable I was, and c) to show them how well-prepared I was ... I had been putting on a performance whose true goal was not to help the students learn but to perform before them in such a way that they would have a good opinion of me" (Tompkins J: Pedagogy of the distressed. *College English*. 1990;52(6):653-660.)

In the third stage, teachers are comfortable with their knowledge and skills and can focus on the learners and their needs instead of on themselves.

Key teaching point #1

The central purpose of your teaching is to <u>help people learn.</u>

How Do We Define Learning?

A commonly used definition of learning is: "*a relatively permanent change in behaviour due to experience that increases the potential for improved performance and future learning". (Adapted from Mayer RE: The promise of educational psychology, Volume 2. Teaching for Meaningful Learning. Upper Saddle River, NJ: Merrill Prentice Hall, 2002.)* This definition differentiates learning from other types of change that are transient or brought about by development. But there are many other definitions of learning based on the many different theories of learning, e.g., behaviourism, cognitivism, humanism and social learning theory. Learning is far too complex to be explained with one theory alone – some changes, such as learning a skill, are well-explained using behavioural learning theory; others, such as learning to relate compassionately with patients are better explained using humanistic learning theory. To learn more about how people learn and about learning theories, click **HERE**.

Learning in medical school has been compared to trying to take a drink from a firehose. In our enthusiasm for our subjects, we try to teach too much and overwhelm our students. One study of lecture density reported that the average medical school lecture presented about 24 new facts/concepts per hour compared to 6-10 concepts/facts per hour in fine arts and mathematics programs. In comparing three versions of the same 50-minute lecture – high, medium, and low density – students performed significantly better on a test of knowledge if they had the low density lecture which contained 40% less information. On the same test 15 days after the lecture, students in the high density lecture had a mean score of 70.59% and those in the low density lecture, 82.18%. (Russell IJ, Hendricson WD, Herbert RJ: Effects of lecture information density on medical student achievement. Journal of Medical Education. 1984;59:881-889.) The article is available **HERE.**

Since this study was done there has been a lot of research on learning in lectures leading to valuable advice about how to make lectures more effective by making them more interactive and introducing variety every 15-20 minutes. Most tips about lectures advise us that "less is more" – our students will learn more if we limit how much we try to teach in each 50-minute lecture. Faculty Development courses offered can provide a valuable opportunity to learn more about lecturing and making presentations.

Please continue to the next section: How to Use Learning Objectives.

How to Use Learning Objectives:

"If you're not sure where you're going, you're likely to end up somewhere else."

(Mager RF: How to Turn Learners On…without turning them off. 3rd edition. Atlanta: The Center for Effective Performance, 1997.)

Mager writes passionately about the importance of having clear learning objectives for each unit of instruction. Objectives can help our teaching and student learning in many ways:

- They communicate expectations to learners, helping them to monitor their progress and direct their own study.
- For teachers, they provide a framework to organize content and focus on what is most important.
- Objectives also guide the choice of learning activities and assessment.

In order to maintain accreditation, the College of Medicine, and its teachers, are required to use objectives, usually framed as competencies, in its teaching programs.

"The Committee on the Accreditation of Canadian Medical Schools (CACMS) *Standards and Elements* provide the basis by which the quality of Canadian medical education programs leading to the M.D. degree will be judged in the peer-review process of accreditation…These CACMS *Standards and Elements* resulted from a Canada-wide consultative process and a collaboration between the CACMS and the Liaison Committee for Medical Education (LCME). This document replaces the LCME *Functions and Structure of a Medical School* document with respect to accreditation of Canadian medical education programs beginning with accreditation activities conducted in 2015-2016."

6.1 Program and Learning Objectives:
"The faculty of a medical school define its medical education program objectives in competency-based terms that reflect and support the continuum of medical education in Canada and allow the assessment of medical students' progress in developing the competencies for entry into residency and expected by the profession and the public of a physician. The medical school makes these medical education program objectives known to all medical students and faculty members with leadership roles in the medical education program, and others with substantial responsibility for medical student education and assessment. In addition, the medical school ensures that the learning objectives for each required learning experience are made known to all medical students and those faculty, residents, and others with teaching and assessment responsibilities in those required experiences." (CACMS: Standards and Elements Effective July 1 2017)

See the full set of standards of the Committee on Accreditation of Canadian Medical Schools **HERE.**

Objectives, Competencies, Milestones and EPAs:

Medical education has gone through remarkable change in recent years by adopting a competency-based approach to medical education. This is an outcomes-based approach in which the curriculum focuses on the learning outcomes we expect of our students and residents in terms of their abilities to perform the seven roles of a physician – expert, communicator, collaborator, advocate, leader, professional, and scholar. Under each role, the expected outcomes are defined in terms of key and enabling competencies. Previously, the curriculum was organized around long lists of objectives framed in terms of knowledge, skills and attitudes/values that we expected our students and residents to learn.

For postgraduate education, both the Royal College of Physicians & Surgeons of Canada (RCPSC) & the College of Family Physicians of Canada (CFPC) have adopted competency based medical education. The RCPSC last updated the competencies in 2015 and the CFPC is completing a new version for 2017. For undergraduate medical education, the CFPC developed **CanMEDS-FMU** – a description of competencies appropriate for undergraduate education from a family medicine perspective. It is currently being updated and should be available in 2017.

Enabling competencies are the knowledge, skills & values which serve as building blocks toward more general competencies & milestones. For example, the following would serve as enabling competencies for the key competency for the Advocacy Role: "Respond to an individual patient's health needs by advocating with the patient within and beyond the clinical environment"

- Work with patients to address determinants of health that affect them and their access to needed health services or resources.
- Work with patients and their families to increase opportunities to adopt healthy behaviours.
- Incorporate disease prevention, health promotion, and health surveillance into interactions with individuals.

Milestones are markers of a learner's abilities at various stages of training. There will be a series of ascending milestones along a developmental continuum from novice to mastery – they describe steps on the way to a competency. As an example, given the competency, "Prioritize issues to be addressed in a patient encounter", the following would be an early or beginning milestone, expected of a graduating medical student:

- *Identify the concerns & goals of the patient & family for the encounter.*

The following would be a later milestone, expected of a senior resident (with possibly a series of intermediate milestones in between):

- Prioritize which issues need to be addressed during future visits or with other health care practitioners.

Course Objectives are smaller, more discrete goals used to guide learning and teaching in lectures, small group sessions and courses. They are often framed in terms of knowledge, skills and attitudes/values rather than competencies. For example, here are a few objectives from the 1st year Cardiovascular course:

- Define key terms of dysrhythmia.
- Describe the microscopic structure, the components and the functions of the 3 layers (coats) of blood vessels.
- Discuss the current state of research on psychosocial variable factors such as connection, attitude, meaning, purpose, emotional expression, and relaxation.

In writing learning objectives, it is important to select the correct verbs that indicate the level of knowledge expected and that are measurable on a test, e.g.,

- "List the causes of chest pain" implies that the learner only needs to memorize a list (although they would understand and remember the causes better if they concentrated on comprehension of the different causes).
- "Given a patient with chest pain, describe how you would determine the cause" indicates a deeper understanding is required. It could be tested with short answer questions.
- "Given a standardized patient with chest pain, take a history and, when provided with the results of the physical examination, determine the most likely causes of their chest pain." This objective implies that the learner will be in a clinical situation where they can practice taking a history on patients, some of whom will have chest pain, and they will be required to make a differential diagnosis. It will likely be tested on an Objective Structured Clinical Examination (OSCE).

Avoid using words such as "appreciate", "understand", "know", and "learn". They are too vague and very difficult to measure in a test. Also, it leaves both the teacher and learner guessing about what exactly is expected. For more on learning objectives, click **HERE.**

Another excellent resource on writing objectives is Chapter 4 – Goals and Objectives in Thomas PA, Kern DE, Hughes MT, Chen BY: Curriculum Development for Medical Education: A Six-Step Approach – click **HERE.**

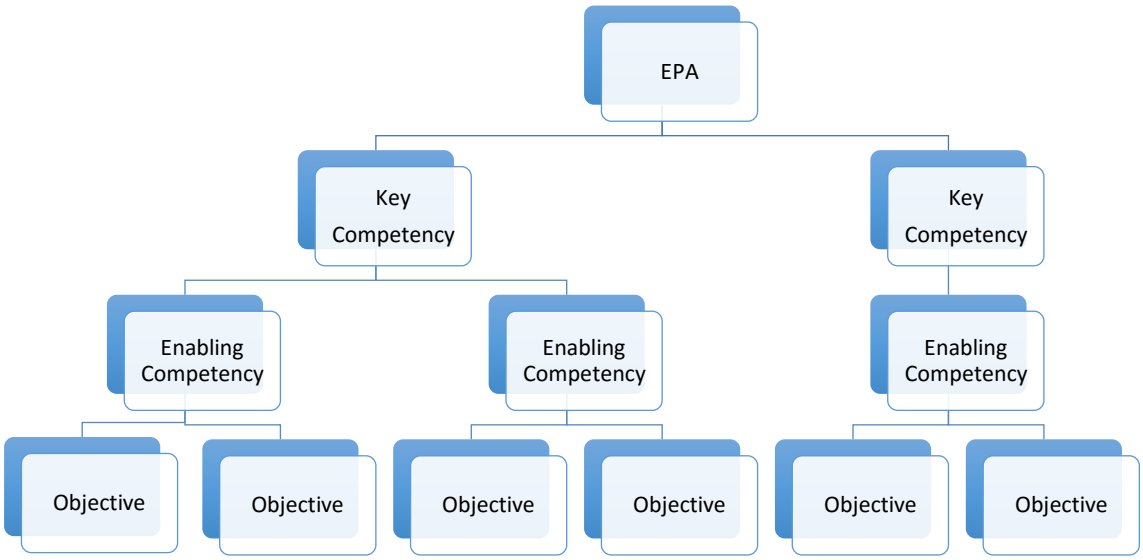
Entrustable Professional Activities (EPAs) are tasks or responsibilities that are part of essential professional work in a given clinical context. Each EPA reflects several competencies and, taken together, the EPAs constitute the core of the profession. These are activities learners are expected to be able to perform with little or no supervision at the end of a period of education. EPAs have become popular recently because they organize the long lists of key and enabling competencies into a much shorter list of activities and provide valuable guidance to supervisors as they decide how much responsibility for patient care to grant to a learner.

Recently the Association of Faculties of Medicine of Canada has described 12 EPAs for the transition from medical school to residency. This list represents the activities that all learners entering a residency program in Canada are expected to perform under indirect supervision.

EPA 1-Obtain a history and perform a physical examination adapted to the patient's clinical situation
EPA 2-Formulate and justify a prioritized differential diagnosis
EPA 3-Formulate an initial plan of investigation based on the diagnostic hypotheses
EPA 4-Interpret and communicate results of common diagnostic and screening tests
EPA 5-Formulate, communicate and implement management plans
EPA 6-Present oral and written reports that document a clinical encounter
EPA 7-Provide and receive the handover in transitions of care
EPA 8-Recognize a patient requiring urgent or emergent care, provide initial management and seek help
EPA 9-Communicate in difficult situations
EPA 10-Participate in health quality improvement initiatives
EPA 11-Perform general procedures of a physician
EPA 12-Educate patients on disease management, health promotion and preventive medicine

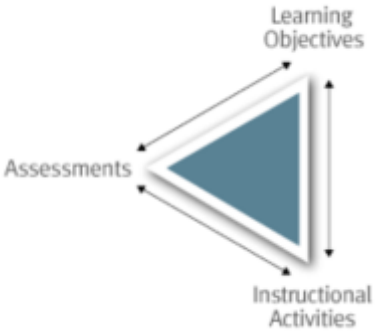
For more information about these EPAs, click **HERE.**

The following chart shows the relationship between EPAs, key and enabling competencies and objectives. Each EPA consists of several key competencies which, in turn consist of several enabling competencies. The learning objectives of courses in the preclerkship curriculum and formal academic activities during clerkship and residency should help students and residents develop their abilities to achieve the enabling competencies. By linking formal coursework to the clinical abilities needed, learners are more likely to see the link between what they are asked to learn and the eventual clinical application of that knowledge.



Relationship between Objectives, Learning Activities and Assessment

It is important for the objectives, learning activities and assessments to be closely aligned. When the assessment is not aligned with the instruction or objectives, students tend to concentrate on the assessment because doing well on the exam is a priority and may be important in terms of awards or being selected into their preferred residency program
- even if it means spending less time on what will be far more important later for patient care.



In planning a unit of instruction, ask yourself:

- What do I want my students to be able to do after the instruction?
- What activities, in and out of class, will help them learn and prepare them for the assessment?
- How can I assess my students to reveal whether or not they have achieved the objectives?

A preclerkship example:

- The objective is "Students will explain peripheral edema in venous insufficiency using Starling's equation".
- Learning methods could include a lecture, a video explanation of Starling forces and how they interact in forming edema, a PBL case, reading a relevant section of a physiology or

pathology textbook perhaps followed by classroom discussion of cases of edema or by a combination of these methods.
- Assessment could be done with well-constructed MCQs or with short answer questions.

A clinical example:
- The objective is "Perform a focused history on a patient with shortness of breath".
- Learning methods could include a short didactic session on the causes of dyspnea and a review of the types of questions to ask, practice on taking a history on a simulated patient with dyspnea followed by preceptor feedback, or video-review of the student's interview of a simulated patient with dyspnea.
- The assessment could be part of an Objective Structured Clinical Examination (OSCE) or by peer or preceptor assessment of a video-recording of the student's interview at the end of the instruction.

Key teaching point #2

Clear objectives are important for both teachers and learners. They guide teachers as they plan appropriate learning activities and assessments; knowing the goals motivates students to concentrate their studies to meet them.

The following 4-minute video explains how to use Bloom's taxonomy in writing objectives. Click **HERE.**

For more information about writing objectives, check out this **10 minute video.**

Where Do I Find My Course Objectives?

It is your professional responsibility to be familiar with, and teach, the objectives created by the College of Medicine. Objectives for all UGME and PGME courses are available on **ONE45** under the courses tag * or **HERE** to see a larger overview.

Please continue to the next section: Plan Interactive Learning Activities.

Plan Interactive Learning Activities

Learn to expand your use of PowerPoint, Whiteboards and Clickers as learning aids. Lynda.com has basic tutorials on how to use PowerPoint and other tech tools that the University pays for. Improve how you maintain student attention. Use Graphic Organizers and Illness Patterns to create interactive learning activities.

"It is nowhere denied that we ask impossible tasks of students, who are bewildered by hours of listening, and that we stamp out the habit of reflection by a ceaseless drill."

Charles Wilson: 'The student in irons': the curriculum. BMJ. 1932;1(3714:485-487.

"I never teach my pupils, I only attempt to provide the conditions in which they can learn."

Albert Einstein

So far you have learned that learning activities:

1. Are informed by the learning objectives.
2. Should be chosen based on their ability to help students achieve the learning objectives and succeed in the assessment.

What other criteria do you think you need to meet?

For Classroom Teachers

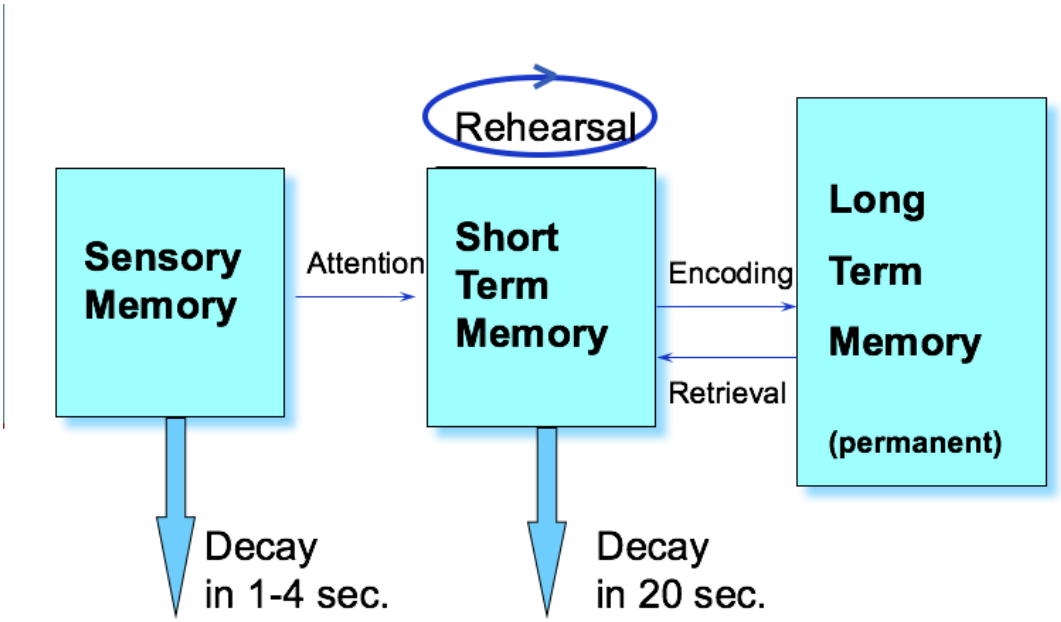
Begin by watching this excerpt from **This Will Revolutionize Education.*** Scientist Dr. Derek Muller has an important message about a teacher's role.

Is a teacher's primary role to guide, inspire, & excite or to transmit facts? Your answer to this question is very important in considering how you approach teaching & learning.

Learning is not a spectator sport – students learn better by being actively involved. Teachers need to engage learners in order to catch and keep their attention.

- Take a quick look **HERE** * for ideas about active learning.
- Consider using an alternative to lecturing such as **FLIPPING***

The Information Processing Model of Learning and Memory



This is a simplified model of how the brain handles sensory input and turns it into learning. The sensory memory gathers information from our five senses. These inputs decay rapidly unless we pay attention to them. By paying attention they enter short term memory, also referred to as working memory. Working memory can only handle approximately five +/- 2 chunks of information simultaneously and information decays in about 20 seconds unless we keep

repeating the information or encode it into long-term memory. A common example of rehearsal is looking up a telephone number and repeating it over and over until we dial it. Because of the limited capacity of short term memory, it is easily exceeded by overloading it with information. Cognitive load theory addresses this limitation and explains why "less is more" – trying to absorb too much information (or teach too much) at one time results in learning less. Forgetting is primarily a retrieval problem. In order to retrieve information from long term memory, we use retrieval cues. For example, we usually remember details of a particular patient's disease better than we remember details of a disease from a textbook because the patient is a much more memorable retrieval cue than the pages of a book.

Teachers can use this framework to design their teaching so that it is in tune with how the brain learns:

- Maintain student **attention** using eye contact, enthusiasm, active involvement, and using a variety of teaching methods. Consider including a "jaw dropping moment" – a hook that creates a heightened state of emotion. Bill Gates jaw dropping moment in his TED talk is a famous example – click **HERE.**
- Avoid overloading **working memory** by integrating various sources of information rather than giving students several individual sources, lecturing at a slower pace, summarizing periodically, avoiding distractions, and reducing the content on PowerPoint slides. New classroom teachers are often surprised by how slowly master teachers lecture.
- Improve **encoding** by using overviews, examples, stories, and practical applications.
- Enhance **retrieval** by providing opportunities to practice retrieval, e.g., asking questions, student presentations, and frequent low stakes tests.
- To learn more about the Information Processing Model of Learning, click **HERE.**

If you decide to lecture, consider doing the following:

- Use more images and less text. Some excellent lecturers use slides with only images and no words or only 1 – 2 words per slide.
- Text should be a minimum font size of 24 – if you need it smaller than this, you are likely using too much text.
- Make only ONE point per slide.
- Avoid bullet points – they encourage you to put too much on the slides.
- Leave out everything that does not contribute to the message on the slide. Additional information increases cognitive load and reduces learning.
- A general rule of thumb is one slide per minute of presentation.
- Use a big picture slide as an overview that ties content together and informs the student about the overall content of the lecture.
- Consider adding a slide every 15 minutes that asks the audience a question.
- **Do not read your slides to the students!** Cognitive Science has shown people can't listen and read at the same time & they will read at a different pace than you will be talking.

- Tell stories or ask for audience experiences. We all love stories. They usually increase attention and, when relevant to the topic of the lecture, will improve students' recall. Click **HERE** for an article on the use of narrative in medicine.
- Incorporate micro mind breaks (slides with landscapes, cartoons etc.) as transitions between activities to refocus attention.
- Use Write, Pair, Share, a technique where students write their answer, give the answer to the person beside them, then discuss the results.
- Include a summary slide at the end or ask your audience what the key points were.
- Consider not using PowerPoint at all – many excellent TED talks don't use any slides. Watching TED talks is a great way to pick up tips on good lecturing. And you will probably learn something interesting! Click **HERE** for a collection of the most popular TED Talks.

Bookmark any of the following links for later reading; pick **one** of them to concentrate on improving your teaching now:

- Learn to expand your use of **PowerPoint,** Whiteboards and **Audience Response Systems** (University of Saskatchewan uses **Top Hat**) as learning aids. **Lynda.com** has basic tutorials on how to use PowerPoint and other tech tools that the University pays for.
- Improve how you seek **student attention.**
- Use **Graphic Organizers** and **Illness Patterns** to illustrate how you think through problems (scaffolding). Pattern making (schema development) is an important aspect of medical education and is explained in this **2:21 minute video**.
- Learn to use **Videoconferencing** as a teaching aid. Teaching at a distance has additional challenges compared with single classroom teaching.
- Become familiar with **copyright laws** and the **Creative Commons** search engine.
- Become familiar with the **Teaching and Technology Centre** services.

You can learn more about preparing learning activities in future Faculty Development courses. You can also make an appointment through the Faculty Development Office to talk about teaching.

Key Teaching Point #3

An important aspect of teaching is to provide learners with the best possible opportunities to be successful.

For Clinical Teachers

The themes below will be explored further in other FD courses. If you are teaching in a clinical setting, take a look at the resource on the Faculty Development website Dr. Wayne Weston's *Clinical Teaching Tips*, or download the free **Clinical Teaching Guidebook** to your iPad.

Learning Environment

Teaching is a highly interpersonal activity. Relationships in teaching are not a frill – they have an enormous influence on the quality of teaching and learning. "By some estimates the teacher-learner relationship explains roughly half of the variance in the effectiveness of teaching." (Tiberius RG, Sinai J, Flak E: The role of teacher-learner relationships in medical education. In: Norman GR, van der Vleuten CPM, Newble DI: International Handbook of Research in Medical Education. Boston: Kluwer Academic Publishers, 2002: 463-497.) Learners will benefit if their teacher is:

- Positive
- Supportive
- Encouraging
- Approachable

Motivation

While learners in the clinical setting will typically be highly motivated, there are a few principles to keep in mind to increase motivation:

- Relevancy – sometimes teachers need to make relevancy of knowledge or skills explicit, e.g., by providing an example of how the topic will be used in the care of patients.
- Expectations of success - teachers augment this by showing support & encouragement.
- Self-Determination Theory (SDT) - teachers can increase motivation by addressing the three intrinsic psychological needs involved in self-determination theory:
  - Relatedness – a sense of belonging to the profession and attachment to other people.
  - Autonomy – feeling in control of their behaviour and having choice, opportunity, & meaningful responsibility.
  - Mastery – competence or doing well within your profession

Click **HERE** to watch a 14-minute presentation on SDT by the originators of this theory of motivation – Richard Ryan and Edward Deci.

Questions

- Ask questions that challenge your learner to think critically & problem solve
- Ask questions with clinical relevance
- Allow learners to ask questions to clarify their thinking
- Use mistakes as opportunities to learn
- Always encourage reflection - what did they think went well & what do they think they need to work on?
- Click **HERE** for a one page outline of the effective use of questioning in clinical teaching.

Clinical Reasoning

- Encourage students to think in terms of probabilities & likelihoods as opposed to THE one right answer. When developing a differential diagnosis help students to consider both probability and payoff, i.e., consider what is most likely ("When you hear hoof beats, think of horses, not zebras") and what may be rare but serious and treatable (things that must not be missed even if less likely).
- Explain the importance & rationale of a differential – have them practice clinical thinking.
- Help students transition from using primarily biomedical knowledge for diagnosis to using illness scripts. Click **HERE** for a video on illness scripts.
- Provide meaningful experiences: cases, examples, appropriate responsibility for patient care.
- Diagnose your learner's strengths & weaknesses & help in their areas of need.
- Help students organize their thoughts around patterns: illness scripts, meaningful comparisons, conceptual structures & frameworks. This 6-minute video provides a good overview of making a differential diagnosis for medical students using the mnemonic VINDICATE, anatomic and physiologic frameworks, and pattern recognition. Click **HERE.**

Role Modeling

Since role modeling is not something one gets to choose, clinical teachers must:

- Demonstrate characteristics & behaviours expected of professionals.
- Make behaviours explicit to learners.
- Have learners observe you caring for patients & take time to debrief. Often it is helpful to brief the student in advance so that they are primed to see what you hope they will notice.

Feedback

Students and residents tell us that they don't get enough feedback about their abilities. And they are right! Research by David Irby (1995) demonstrated that feedback is provided in only 0 - 16% of teaching encounters. As a result, learners may be unaware of their strengths and weak areas. Because feedback is one of the most potent influences on learning, it is important to set aside some time daily to provide feedback to your learners. Some fundamental aspects of good feedback are:

- Timely – feedback is more effective if it is given soon after an activity by the learner while you can both remember the details clearly.
- Specific – it is more helpful if it is specific, e.g., "Your chest exam was inadequate" does not help the student understand what they need to work on. Instead, say, "You did well in auscultating each lobe of the lung but you seemed to be having trouble percussing the chest. Can I help you with that?"
- Focused on 1-2 issues – giving feedback on too many issues at one time can overwhelm a learner.
- Appropriate – feedback should be based on what you observed not on your inferences about why they behaved that way, e.g., "I noticed that you rarely make empathic comments to patients" is more helpful than "You come across as uncaring." There can be many reasons for not making empathic comments. Calling a student uncaring will likely upset them and make it harder for you to help them.

Please continue to the next section: Formative Assessment Techniques

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Formative Assessment Techniques

"Follow effective action with quiet reflection. From the quiet reflection will come even more effective action."

Peter Drucker

"Just as many learning opportunities are wasted if they are not accompanied by feedback from an observer, so too are they wasted if the learner cannot reflect honestly on his or her performance."

Jill Gordon. BMJ. 2003;326(7388):543-545.

Why Formative Assessment is Crucial to Learning?

Formative assessment answers three questions:

- Where am I going (what are the goals?)
- How am I doing (what progress is being made toward the goal?)
- Where to next (what activities need to be undertaken to make better progress?)

Ideally, both teachers and learners collaborate on answering these questions together.

Teachers provide focused formative assessments that include what the student is doing well and where they need to spend more time or change their approach. Feedback is one type of formative assessment, and another is anonymous clicker quizzes. As a faculty member, you may or may not be involved in summative assessment (the final decisions about whether or not a person has achieved an objective or competency). But you will be involved to one degree or another in formative assessment.

Key teaching point # 4

Formative assessment from you is essential for students to understand what they need to do next.

Classroom Formative Assessment

In your role as someone who helps all students improve their learning, formative assessment is a powerful asset in your toolbox.

Here are some examples, you might think about:

- Student response systems (such as polling) – when used anonymously, these short quizzes identify for individual students where their knowledge gaps lie and how they are doing compared to their peers without the embarrassment of marks or raised hands. It also lets the teacher know how well the lecture was understood and gives the teacher an opportunity to explain topics that were poorly understood.
- Asking students to summarize what they learned at the end of a session helps them to clarify key points.
- Providing descriptions of the performance expected during classroom discussions lets students know in advance what they will be marked on so that they can assess their skills and prepare more effectively. Click **HERE** for an example of criteria used at one school. Similar handouts can be provided to students so they can self-assess before handing in projects or papers or case reports. Helping students review and understand the descriptors guides their self-assessment as a type of formative assessment.
- Descriptors for performance of clinical skills are also valuable for guiding student's self-assessment – click **HERE.**
- Use formative questions
    - How much time and effort did you put into this?
    - What do you think your strengths and weaknesses were in this assignment?
    - How could you improve your assignment?
    - What are the most valuable things you learned from this assignment?
- Hardest Question - ask students what was the most difficult question on a recent exam and walk them through how they understood the question and how they might approach it differently next time. This can be a great tension reliever both soon after and just before exams.
- Midterm Exam Review is an ideal opportunity to help students identify gaps in their learning before high stake licensing exams. As a competency-based college we have a responsibility to offer this.
- Read **Retrieval-Based Learning *** for some theoretical underpinnings of why students need practice remembering. Students are often unaware of the importance of practicing retrieval to enhance their learning. Many textbooks include questions at the end of each chapter. Students who spend time answering them do much better on tests related to the chapter. It is a much more effective strategy for learning than re-reading the chapter. You might want to have another look at the Information Processing Model of Learning and Memory in Section 2 of this Faculty Orientation.

Clinical Formative Assessment

Most of your time will probably be spent teaching clerks and residents who are trying to develop and improve skills, so it's important to be familiar with how people learn new skills. Because **rewards and punishment *** are poor motivators, it's important to know what to do when people make mistakes. Here are some ideas for giving feedback:

- Ask the clerk/resident to tell you what they think they did well, because you want to encourage them to connect with how they are learning and improving.
- Ask the clerk/resident what they think they would do differently next time, because you want to tap into their thinking brain and not their emotional (defensive or self-punishing) brain.
- If the clerk/resident is too emotionally overwrought, take a break and schedule a later time.
- If they are able to articulate errors, think about where they are on the **learning cycle*** (also known as the Conscious Competence Ladder) based on their answer and whether they need teaching or more practice
- it can be very difficult to provide feedback to someone at the unconscious incompetent (blissfully ignorant) stage, so you might want to call in someone with more teaching experience for advice.
  You will discuss the feedback process in more depth in our Teaching programs such as TIPS etc.

Please continue to the next section: Summative Assessment Techniques.

Describe Summative Assessment Techniques

Effective and ongoing evaluation can enhance the quality of the learning experience and set the stage for future professional growth. When integrated into the entire learning experience, the evaluation process can enhance the educational value of the rotation for the learner.

EVALUATION: Making It Work

Pass/Fail and Competency Based Education

The University of Saskatchewan College of Medicine is a pass/fail college. Pass/fail reduces competition as part of the movement towards teaching students to be more team conscious. Does that mean that 50% = a pass? No! Check with your department for pass criteria (usually 60% or higher). In most competency based colleges, a pass is 80+ % and we are moving in that direction.

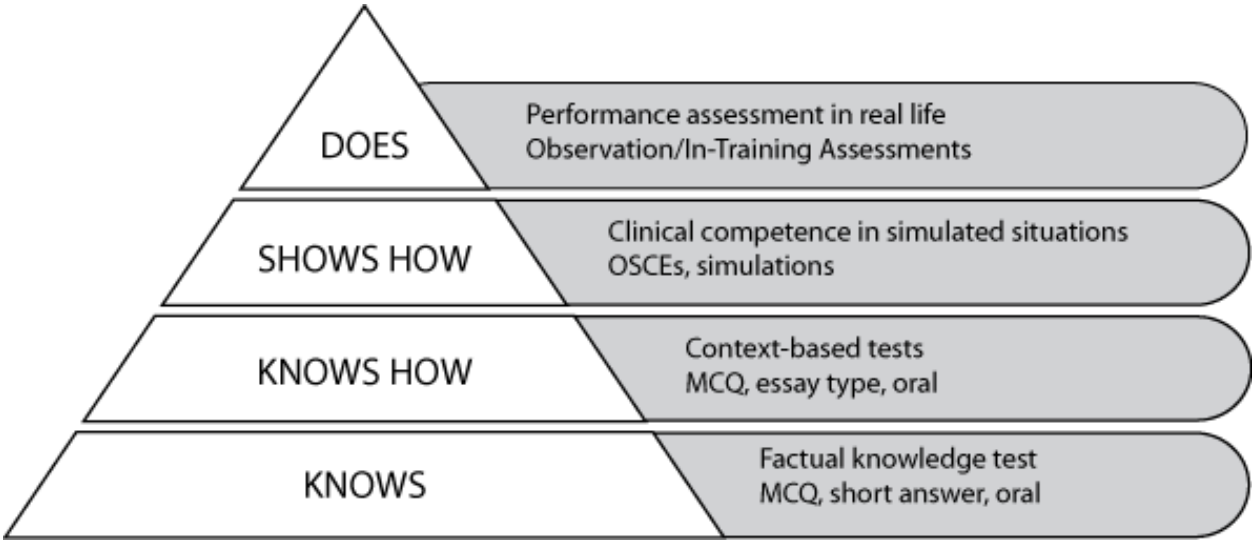
Assessment drives learning. In fact, it has more impact on learning than anything else teachers do. Therefore, it is essential that we get it right**.** Assessment has a powerful "steering effect" by directing students to focus their learning on what they anticipate might be on an exam. Because of this strong effect on student learning, assessment has often been called "the tail that wags the curriculum dog". Poorly designed examinations may encourage cramming and superficial learning rather than deeper understanding.

Summative assessment is used to decide a final evaluation of a student, determining a competency level appropriate for moving on to the next stage, phase, course, etc. It measures student achievement at the end of a course, unit, module, section, rotation, etc. When selecting a method for assessing students, consider first its effect on student learning. For high stakes exams, validity and reliability are especially important because a test that is not reliable or valid is of no value.

1. **Validity** – your assessment measures *what it is intended to measure*. One way to do this is by ensuring that your assessment aligns with the learning objectives and is capable of measuring the relevant behaviour. For example, an OSCE provides a more valid measure of communication skills than a MCQ test.
2. **Reliability** – your assessment *accurately measures student competency*. It is a measure of the reproducibility and consistency of test scores. A student should obtain the same assessment if they repeated the test or had a different examiner. Using a variety of assessment tools will enhance reliability.

The separation of validity and reliability is somewhat artificial; in practice they are intertwined. Tests with high reliability often have lower validity and vice versa. For example, MCQs have higher reliability scores than most other test formats but they are less valid than OSCEs in assessing clinical skills.

In the **classroom**, summative assessment will usually focus on the bottom half of Miller's Pyramid below) – assessing a student's knowledge of facts and concepts as well as their ability to apply those facts and concepts (i.e. assessing a student's cognitive ability). Typical instruments/methods used at this level are various types of exams – MCQs (Multiple Choice Questions), short answer, true/false, matching, essay, and oral. Scoring rubrics and portfolios are used to assess a variety of reports, projects, papers, and articles which may also be used in this setting.



From http://wbaonline.amc.org.au/about/

The **clinical** setting allows for assessing students
at the top of Miller's Pyramid – assessing a student's ability to perform professional activities in work-related, or simulated work-related, environments (i.e., assessing a student's behaviour). Some typical instruments/methods for assessing at this level are OSCEs (Objective Structured Clinical Examinations), standardized patients, video, direct observation checklists, and simulations. While these assessment tools assess at the performance level, knowledge and application can also be assessed at the same time.
Please keep in mind that many of these may be used for formative assessment as well. Whether an assessment is summative, formative, or a combination of both depends on how that particular tool's results are *used*.

Descriptions of a variety of commonly used assessment instruments/methods

OSCE – Usually a series of stations in which the student is examined one-to-one with one or two examiners and either real or simulated patients. They are used to assess clinical skills and professional performance.

ITER – An In-Training Evaluation Report using rating scales to assess clinical behaviours. They are used to measure actual performance in a wide range of skills and behaviours, but subjectivity of the instructor may reduce reliability.

Portfolio – A collection of materials and documentation which provides evidence of learned skills and knowledge. Portfolios offer proof that competencies have been attained. A wide variety of items may be included in a portfolio – papers, reports, projects, reference letters, logs, video recorded consultations or procedures, case presentations, preceptor feedback, 360 degree assessments (from a variety of other sources including patients, peers, and colleagues), committee activities, and any other type of material that demonstrates competency and satisfy the learning objectives.

Direct Observation Field Notes – A small but detailed sheet or card which can be used to assess any range of student knowledge and skills. Typically, this would be used by the instructor while the student is performing "on-the-job". **Field Notes** are used in Family Medicine rotations at USASK. Field notes have the advantage that they are quick and easy to complete and many samples of learner behaviour can be captured by different teachers in different settings to provide a comprehensive picture of the learner's competence.

Rubric – A description of the criteria used for judging student performance. Basically, rubrics serve as the "scoring rules" which instructors use for assessment and learners use for direction and guidance. A good scoring rubric will communicate, to both the assessor and the student, expectations of performance standards, often including descriptions of what is considered adequate and what is considered unacceptable. **HERE** you will find numerous rubric examples as well as tips for creating your own. **Authentic Assessment Toolbox** has some very basic information on assessment as well as creating rubrics and portfolios.

At the University of Saskatchewan, **One45** is the software instructors use to complete and monitor student assessments. We are currently evaluating the use of **ExamSoft** for creation and administration of tests. Workshops on assessment can be offered by Faculty Development.

Resources

This terrific article by Ron Epstein provides a review of the different methods of assessment in medical education, how each is used and the strengths and limitations of each tool.

The National Board of Medical Examiners (U.S.) provides an excellent 45 minute tutorial on writing multiple choice questions. Click **HERE.**

Please continue to the next section: Evaluate Your Skills as a Teacher

Evaluate Your Skills as a Teacher

"A poor surgeon hurts 1 person at a time. A poor teacher hurts 130."
Ernest Leroy Boyer

"Some teachers are born great, some achieve greatness, and some just grate upon you." Anonymous

Strategies for Becoming a Great Teacher:

Most teachers spend time at the start of their teaching career learning enough about teaching to get by. Once they get good enough to receive reasonable student evaluations of their teaching they may plateau – teaching is not rewarded well in many medical schools and they are busy enough with clinical or laboratory work, seeking research grants, doing research and publishing. Fortunately, many medical schools have finally recognized the value of good teaching and provide opportunities for faculty to focus their careers on education and teaching. For these faculty, it is important that they continue to develop their knowledge of education and skills in teaching. There are many ways to do this:

1. Assess the impact of your teaching on student learning:

How do you know if students are learning because of you or in spite of you? Here are some ideas:

- Watch the audience, are they paying attention? Are they nodding, making eye contact with you, and taking notes? All of these are examples of attention.
- Use clickers or polling and you will quickly learn how many in the class "get it".
- Ask students to list the key ideas from today's session at the end of class.
- Ask students to write down something they aren't clear about and drop it in a bowl at the end of class.
- Use the **class evaluation reports** for feedback on your teaching. (The evaluation forms start on page 8.) Ignore rude comments or criticisms from a very small minority. But pay attention to scores that are low.
- Review student grades to identify topics in your course where they are not performing well. Seek out other ways to teach this content.

2. Reflect on Your Experiences as a Teacher:

Keep a private journal for your teaching and write down how you felt at the end of each session. Focus particularly on courses where you had poor evaluations or courses that you are teaching for the first time. **Reflect** on what you think is going well and what you want to change. If a serious incident occurs, consider doing a **Significant Event Audit.**

3. Ask for Assistance from Others:

Take **Faculty Development** sessions based on the areas you want to change. If what you need isn't on the list or offered in the near future, request it. Find a mentor or coach.

4. Talk to the expert teachers in the College of Medicine:

- Find out who the Master Teachers are in your department and ask to observe them. Also, TED Talks are usually very good – watch how these teachers make their presentations excellent. A good reference is Gallo C: Talk Like Ted. New York: St. Martin's Press, 2014. See **The Most Popular TED Talks of All Time**.
- Find out if your department has a formal or informal mentoring program.
- Talk to **Faculty Development** about pressing questions.
- Thinking about doing research, check out the **Research Mentorship Program.**
- Ask for a peer review where you get feedback from a faculty member who observes your teaching live or on a video recording. Reviewing a video recording of your teaching with a colleague is a powerful strategy for improvement but it takes courage. Even reviewing video recordings of your own teaching on your own can be helpful.

5. Draw on Relevant Research:

Here are some examples of medical teaching research available to you:

- Journals: **Medical Teacher, Clinical Teacher, Medical Science Educator, Academic Medicine, Canadian Medical Education Journal, Teaching and Learning in Medicine, Advances in Health Science Education.** (These are available online through the medical library.)
- Online resources: **KeyLIME Podcasts** from RCPSC, **Twitter, International Clinician Educators Network**, QxMD
- Explore the use of technology such as archiving tools (**Diigo, Endnote, ScoopIt**)
- Books: the Library and the Faculty Development office have a large number of books on teaching that may be borrowed.

6. Adjust Teaching Accordingly:

Teaching, like any other skill, requires ongoing practice and fine tuning. Teaching expectations change over time particularly as new technologies are introduced, so expect learning new things to be a lifelong process.

Notes on Deliberate Practice:

Most people, when they practice, simply repeat their behaviour over and over again until they feel reasonably comfortable with their ability. This approach certainly results in improvements but it leads to a performance plateau. If we want to continue improving, we need to push past this plateau but it takes effortful practice. The **research by K Anders Ericsson** and others indicates that it usually takes about 10,000 hours of effortful practice to become an expert in almost any field. Innate ability plays only a small part in becoming an expert. That's good news – it means we don't have to be born with the right genes but the bad news is that it means we have to work hard at it. Deliberate practice involves several components:

1. *Select* a clear goal for practice – not too big and not too small.
2. *Practice.* Deliberate practice involves pushing yourself, not simply doing well enough to get by. It might be hard to practice some skills in a real classroom. Courses, such as TIPS, provide a good opportunity to practice in front of an audience who will provide immediate feedback about your performance. Even better is to practice with an expert coach who will help you define appropriate goals that are hard but not too hard and provide honest and specific feedback. They might provide you with drills to practice between coaching sessions. Coaches can often see what we are unable to see about our own performance.
3. *Feedback* needs to be very specific so that you will know exactly how to change your performance to make it better.
4. *Practice again*, modifying your performance based on the feedback.
5. *Repeat each step.* Once you have mastered your initial goal, select another goal. Ideally, deliberate practice involves very focused practice on a small component of the overall skill before eventually practicing putting all the component skills together.

Additional Resources:

1. University of Saskatchewan College of Medicine Teaching Resources

- **One45 Support**
- **Instructor Evaluation Framework**
- **Medical Education Wiki**
- **Learning Management Guidelines**
- **Faculty Development website**

2. Teaching and Learning Resources at the University:

- **Gwenna Moss Teaching and Learning Centre** has regular workshops on university teaching.
- **Information Communication Technology (ICT)** provides training in various types of technology used at the university

3. **National and International Resources:**

   - **CHEC - Canadian Healthcare Education Commons**

4. **Teaching Perspectives Inventory** can help you collect your thoughts and summarize your ideas about teaching.

5. **Becoming a Critically Reflective Teacher** by Stephen Brookfield

6. The **Future of Medical Education in Canada (FMEC).** This website includes several valuable reports:
   - EPAs for all Canadian Medical Schools and Students
   - Faculty Development
   - FMEC – A Collective Vision for MD Education
   - FMEC – A Collective Vision for Postgraduate Medical Education in Canada
   - FMEC MD 2015

7. **CanMEDS and Faculty Development Resources** has links to publications, presentations and media and pocket resources.

8. **Aboriginal Health Needs** has links to the Indigenous Physicians Association of Canada-AFMC First Nations, Métis Health Core Competencies Framework for UGME and the Curriculum Implementation Toolkit as well as several other valuable reports. Sign up for the U of S online course: "The Role of the Practitioner in Indigenous Wellness". Excellent education on this topic!

This brings us to the end of this orientation. Go forth and teach!

If you would like a Certificate of Completion, you can complete a reflective exercise describing three strategies you have adopted to enhance your teaching, please contact the Faculty Development office. Our email is medicine.facultydevelopment@usask.ca