

A GUIDE TO PBL CASE CONSTRUCTION AT THE UNIVERSITY OF ROCHESTER

Laurence B. Guttmacher, M.D.

Director of Faculty Development, Curricular Affairs Office

laurence_guttmacher@urmc.rochester.edu or 5-6580

Overview

Development of an effective PBL case is a challenging and rewarding process. This guide is designed to give you some ideas on how to approach case construction and also to alert you to local resources that may help you through the process. The Curricular Affairs Office is anxious to be as helpful as we can be. Please approach any of us with ideas, suggestions, or requests for assistance.

PBL works when you invoke the basic principles of adult learning. We learn best when learning is active. We learn best when there is personal meaning. We learn best when we build on our previous knowledge base. We learn best from real (hence messy) cases and not from classic stereotypes of illness.

Effective PBL case construction also demands that you put yourself in the shoes of someone who does not have expertise in the area. This is a difficult transition for many of us to make. You need to revisit the case from the perspective of a beginning student naive to the field.

Students will do best when they become involved in the case. An effective case will either get them involved in a Sherlock Holmesian search for the answer or will demand a product from them that they care about. Work to get students involved in the case.

I. Identify your learning objectives

Case construction cannot proceed unless you are able to articulate what is that you are trying to teach. You have already developed the learning objectives for your course. Next, figure out as specifically as possible the learning objectives for the case that you are to write. Try to integrate two to three of the cross-cutting themes into each case. Recall that we have purchased the library of Harvard Medical School PBL's.* Our understanding with Harvard is that we will sometimes use them more or less intact and will at other times use them as a springboard for revision. See if any fill your needs. If not, you will need to start from scratch yourself. Once you have specified the learning objectives and thought about the thematic issues, you need to:

II. Determine which type of patient will best illustrate your learning objectives.

If you are trying to teach about complement, decide what sort of patient will best illustrate the learning objectives that you have developed. You may well decide that you would do best with a patient suffering from rheumatoid arthritis. PBL cases work most effectively if they are based on a real patient. Cases based on real patients require less imagination and are therefore easier to write. They are also, like humans, not perfect. Students need to learn that all patients are not textbook patients; drawing on real-life examples will help with that.

* If you do use a Harvard case, you must notify Laura Connard in Curricular Affairs since we will need to pay HMS a royalty. Also, Harvard requests that we send them copies of any modified cases.

PBL Case Construction Guide

If you can readily lay your hands on the file of an appropriate patient with rheumatoid arthritis who meets your needs, wonderful. If not, we have developed a cohort of clinical faculty who will be glad to assist you in finding appropriate clinical material. They will often be able to offer you a sanitized (names and identifying data removed) version of a patient's file as well as supporting films, lab work, etc. A list of resource faculty is attached below:

AREA	NAME	EMAIL
Cardiology	Frank Richeson, M.D.	frank_richeson@urmc.rochester.edu
Developmental Pediatrics	Steve Sulkes, M.D.	steve_sulkes@urmc.rochester.edu
Emergency Medicine	Sandy Schneider, M.D.	sschneid@cc.urmc.rochester.edu
Endocrinology	Larry Jacobs, M.D.	larry_jacobs@urmc.rochester.edu
Gastroenterology	Gregory Potter, M.D.	gregory_potter@urmc.rochester.edu
Gastroenterology	William Chey, M.D.	williamY_chey@urmc.rochester.edu
General Surgery	Robert Caldwell, M.D.	rcaldwell@highland.rochester.edu
Geriatrics	T. Franklin Williams, M.D.	
Hematology	Jane Liesveld, M.D.	jane_liesveld@urmc.rochester.edu
Nephrology	Martin Zand, M.D.	martin_zand@urmc.rochester.edu
Neurology	Ralph Jozefowicz, M.D.	rjozef@mail.neurology.rochester.edu
Neurosurgery	Webster Pilcher, M.D.	wpilcher@macmail.cc.rochester.edu
Ob-Gyn	Diane Hartman, M.D.	dhartmann@obgyn.rochester.edu
Ob-Gyn Repro/Endo	Wm. Phipps	William_phipps@urmc.rochester.edu
Ob-Gyn Maternal/Fetal Med	Chris Glantz	Chris_glantz@urmc.rochester.edu
Ophthalmology	Barrett Katz, M.D.	barrett_katz@urmc.rochester.edu
Orthopaedics	Richard Lewis, M.D.	richard_lewis@urmc.rochester.edu
Otolaryngology	John Coniglio, M.D.	john_coniglio@urmc.rochester.edu
Pathology	Leon Metlay, M.D.	lmetlay@acu.pathology.rochester.edu
Pathology	Patrice Spitalnik, M.D.	patrice_spitalnik@urmc.rochester.edu
PC/Family Medicine	Ronald Epstein, M.D.	ronald_epstein@urmc.rochester.edu
PC/Internal Medicine	Geoffrey Williams, M.D., Ph.D.	williams@scp.rochester.edu
PC/Internal Medicine	Kathryn Markakis, M.D.	kathryn_markakis@urmc.rochester.edu
PC/Internal Medicine	Nancy Shafer, M.D.	nancy_shafer@urmc.rochester.edu
PC/Internal Medicine	Timothy Quill, M.D.	timothy.quill@viahealth.org
Pediatric Hematology	Norma Lerner, M.D.	norma_lerner@urmc.rochester.edu
Pediatrics	Cynthia Christy, M.D.	cynthia.christy@viahealth.org
Pediatrics	Nicholas Jospe, M.D.	njospe@cc.urmc.rochester.edu
Primary Care/Family Medicine	Elizabeth Naumburg, M.D.	elizabeth_naumburg@urmc.rochester.edu
Psychiatry	Laurence Guttmacher, M.D.	laurence_guttmacher@urmc.rochester.edu
Pulmonology	Andrew Swinburne, M.D.	aswinburne@rghnet.edu
Surgical Oncology	James Peacock, M.D.	james_peacock@urmc.rochester.edu
Urology	William Hulbert, M.D.	william.hulbert@viahealth.org

The theme directors will also make themselves available:

THEME	THEME DIRECTOR	EMAIL
Diversity	Nancy Chin, Ph.D.	nancy_chin@urmc.rochester.edu
Ethics and Law	Jane Greenlaw, LL.D.	jane_greenlaw@urmc.rochester.edu
Health Economics	Alvin Mushlin, M.D.	mushlin@prevmed.rochester.edu

PBL Case Construction Guide

Nutrition	Thomas Pearson, M.D., Ph.D.	tpearson@prevmed.rochester.edu
Prevention	William Barker, M.D.	mbarker@prevmed.rochester.edu

My personal morality and world-view find nothing wrong with improving reality. If your case will be helped by minor twists in the history, do so. Students do, however, like to think that they are dealing with a real case. They invest more heavily in real cases than in what they perceive to be figments of our imagination.

Once you have the clinical material in hand:

III. *Write the first draft of the case*

We will have a template available for you since, for the student's sake, we are trying for some uniformity in format from course to course. As you write the case, think about the following principles:

- A. A really good case will grab the student. This may be because it is a wonderful detective story or because the students identify strongly with the patient or the physician. The detective story aspect may revolve around issues of diagnosis or of pathophysiology, but it should surely involve both. Students will miss out on a great deal if the case only takes them as far as diagnosing the patient. Some cases will, as in real life, start out with a diagnosis supplied and then, instead, focus on other issues.
- B. A good case unfolds, much as patient's stories unfold. Don't lay all the information out in the beginning, but schedule in stops for students to think and reflect. As they go through the process, tutors will ask the students to think about what they know, what they don't know, and how they plan on filling in the holes in their knowledge base. If everything is laid out for them, they will be discouraged from developing these sorts of inquiry skills. The usual error here is to lay out too much information up front. Recall that in real life we only learn if we ask.
- C. The ideal case will demand a product of the student. This affords them (and us) a way to measure if they have completed the task.
- D. You will find attached an example of a well constructed case. You can use it as a guide in terms of format.
 - 1. Your CDT will need to decide on how many sessions to devote to any given case. A PBL can never be run in one session, since they are built around the premise that students will go off and explore issues on their own. Most will be set up over two to three days, but there are no rules that prohibit going longer. Your tutor guide should offer some guidelines of what you expect to see covered each day.
 - 2. Each case will be divided into parts. The divisions should occur at the point where you expect that the students will have enough information to develop a reasonable list of hypotheses. Breaks are classically built in at branch points in

PBL Case Construction Guide

the clinical reasoning process. Creation of a break will demand that they talk about the data in hand, begin to develop hypotheses, ascertain what they do not know, and determine how they will resolve these learning issues.

3. You should be able to anticipate what learning issues will evolve for the students. For your own purposes, try to place yourself in the students' shoes and write down what learning issues you anticipate developing. We will talk later about the importance of field-testing. Adequate field testing is a critical step in the development of an effective case. You will learn a great deal about the case by comparing your anticipated learning issues with those that actually evolve in your test group.
 4. At the end of the last session the tutor will hand out the faculty determined learning objectives and a list of references. The references should be primary sources. This will allow students to fill in holes that were not adequately covered in their groups.
- F. *Be creative.* You don't need to limit yourselves to the printed page. Some examples of alternative approaches follow:
1. You might want to begin with a videoclip of an interview. This would test students' observational skills. A clip of a patient with a physical finding would be much more valuable than simply writing down that the patient had ptosis.
 2. You might want to use standardized patients (actors trained into specific patient roles). This would allow you to work with the ICM course around interviewing.
 3. You could present an audio tape of a cardiac examination instead of simply writing that the patient had a Grade III holosystolic murmur.
 4. You could present slides with the histology findings from the patient's biopsy, thereby requiring them to ascertain what was going on.
 5. Think about whether you want to provide them a list of outside experts. Some cases will list faculty members who have agreed to serve as consultants on a given case. The advantage is that this gets students talking to faculty who are expert in the area; the disadvantage is that this could afford them a way to resolve their questions without independent work.
 6. I will paste in a response from Tim Quill to an email asking if he would be willing to facilitate access to clinical material. It seems to me that it represents precisely the sort of creativity that we should encourage in this process.

"I received both the letter and the email, and have spoken to several faculty members about the PBL case needs. It is very clear to me that we have many cases that could be appropriate, and that many faculty members might be asked to contribute one or more, including the associated laboratory material. An additional opportunity should be considered that the clinician who is creating the case might be made available to the group of students at the end of the week, perhaps in the integration conference, and answer questions raised about the real case. It might be an opportunity to give the students contact with a broader range of clinicians, and keep the

PBL Case Construction Guide

PBLs grounded in clinical reality. Many times, the actual patient (if still alive and kicking) could come to a conference at some time in the week. For example, at a grand rounds today we heard about a case of a rare undifferentiated nasal carcinoma that had invaded the frontal lobe, and had dramatic physical exam findings and an unforgettable MRI. The patient responded dramatically to chemo and radiation, and could be there to tell the tale and to talk about the uncertainty of the future (depending on the future, she might or might not be available for the conference, and follow-up information could be presented.) The case material has already been put together, and a PBL could be created with little or no work. There are many such cases which have already been presented, and could be in the future. The enthusiasm for creating the cases would be increased if the actual clinicians would be used as a teaching resource to the curriculum, rather than creating a case for others to use with little or no acknowledgment or opportunity to share your experience and expertise with the students.”

G. Get lots of consultation.

1. Look to colleagues. Run the case by them. This is ideally done both with those who are subject experts and those who are not.
2. Run the case by those with experience tutoring. We have a core group of faculty with some training in case construction that will be glad to offer feedback.

NAME	EMAIL
Barbara Davis, Ph.D.	barbara_davis@urmc.rochester.edu
Laurence Guttmacher, M.D.	laurence_guttmacher@urmc.rochester.edu
John Hansen, Ph.D.	john_hansen@urmc.rochester.edu
Diane Piekut, Ph.D.	diane_piekut@urmc.rochester.edu

3. Revise your case based on the feedback.
4. Submit the case to the Curricular Affairs Office. They will review it, offer suggestions, and also look to see whether the case should be modified to better fit the cross-cutting themes.
5. Incorporate this feedback and revise again.

IV. Work on the tutor guide

- A. A good tutor guide is vital. Anticipate that some of your faculty will not be subject experts. The guide should help all faculty, both expert and otherwise, to understand what you hope the students will learn. It is certainly reasonable to expect your tutors to spend an hour or two reading and thinking prior to each new case. Your guide and relevant reprints that you will offer will help them immeasurably and will help level the playing field for the students.
- B. The tutor guide should emphasize the basic points that all students should know when they finish the case.

V. Field test the case.

- A. We will be hiring a group of first year students this summer to serve as PBL guinea pigs. We will be using them both for tutor training and for refining cases. There are inevitable surprises when you actually run a case. You can schedule the students by calling the Curricular Affairs Office at 5-7202.

PBL Case Construction Guide

- B. It will be far easier if you are able to run the cases with the students this summer. If you are unable to take advantage of the summer students, you may be able to find student volunteers during the school year, but it will clearly be more work to round them up on your own. My experience is that students have been remarkably generous in this respect, probably because they learn a great deal from these cases. We are also hopeful that the students this summer will become sophisticated PBL consumers, adept at offering feedback on PBL.

The Curricular Affairs Office really wants to help you with this. If in doubt about who to triage your call to, call 5-7202. If your issue relates to case-construction contact either John Hansen or Larry Guttmacher. If you need logistical support, contact the Curricular Affairs Office.