

Advancing Education in

**PRACTICE-BASED LEARNING &
IMPROVEMENT**

*An Educational Resource
from the*



ACGME

Outcome Project

*Enhancing residency education
through outcomes assessment*

ADVANCING EDUCATION IN PRACTICE-BASED LEARNING & IMPROVEMENT

OVERVIEW

PURPOSE: To provide educational resources for program directors and other medical educators to teach or foster and assess Practice-based Learning & Improvement, one of the six ACGME general competencies

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What is Practice-based Learning & Improvement?

PRACTICE-BASED LEARNING & IMPROVEMENT

Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- analyze practice experience and perform practice-based improvement activities using a systematic methodology
- locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems
- obtain and use information about their own population of patients and the larger population from which their patients are drawn
- apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness
- use information technology to manage information, access on-line medical information; and support their own education
- facilitate the learning of students and other health care professionals¹

Other Perspectives on Practice-based Learning & Improvement

Practice-based Learning & Improvement (PBLI) is similar to “holding a mirror up to ourselves to document, assess, and improve our practice.”²

PBLI is “how you get better” at medicine.³

PBLI Steps⁴

- Monitor practice
- Reflect on or analyze practice to identify learning or improvement needs
- Engage in learning or plan improvement
- Apply new learning or improvement
- Monitor impact of learning or improvement

References

1. Accreditation Council for Graduate Medical Education. ACGME Outcome Project. Retrieved July 15, 2004, from www.acgme.org/Outcome.
2. Ziegelstein RC, Fiebach NH. “The Mirror” and “The Village”: a new method for teaching practice-based learning and improvement and systems-based practice. *Acad Med* 2004;79:83-8.
3. Gordon P, Tomasa L, Kerwin J. ACGME Outcomes Project: selling our expertise. *Fam Med* 2004;36:164-7.
4. Lynch DC, Swing SR, Horowitz SD, Holt K, Messer JV. Assessing Practice-based Learning and Improvement. *Teach Learn Med* 2004;16:85-92.

Frequently Asked Questions about Practice-based Learning & Improvement

1. What is the rationale for Practice-based Learning & Improvement (PBLI)?

PBLI is important because physicians should monitor the quality of their own work, improve their work, and keep up with developments in medicine. The broader rationale for PBLI is based on the belief that physicians should be leaders in making change rather than reacting to changes made by others and the belief that positive changes in one's own practice behavior can have positive effects on larger systems.

2. How can PBLI affect health care?

Numerous studies show that deliberate attempts to analyze and improve practice result in improved processes and outcomes of care. Specific examples in residency education include increasing preventive care,^{1,2} improving chronic disease management,^{3,4} and enhancing patient safety.^{3,5}

3. What is the difference between PBLI and Systems-based Practice?

PBLI occurs when a physician analyzes and improves his or her own practice behaviors; therefore, it pertains to improvements that an individual physician can personally make. Self-improvement is central to PBLI. Systems-based Practice (SBP) occurs when a physician practices medicine that is mindful of the interdependency between the health care system and his or her own practice. If improvements are needed, the relevant system is examined and several providers may have to change their behaviors. All of the competencies overlap to some extent; this is especially true of PBLI and SBP. Overlap happens, for example, when reflection on one's own practice increases awareness of systems issues or when an individual improvement project is expanded to a group of health care professionals or has system-wide implications.

4. Regarding PBLI, what behaviors should I look for?

PBLI can be described in terms of three interrelated categories of behavior: practice tracking and analysis, ongoing learning, and improvement. Evidence of practice tracking and analysis includes the use of a log, critical incident journal, or a chart review summary to monitor the processes and outcomes of care. Ongoing learning can be inferred when a resident discusses and applies current literature and best practices, recognizes and tries to address mistakes, seeks feedback about performance, and learns new skills. Improvement is reflected in positive changes to practice behaviors and the application of new skills or knowledge to patient care. These categories of behaviors are interrelated; for instance, a physician is more likely to improve if he or she recognizes and admits aspects of his or her practice that could be better.⁶

References

1. Mohr JJ, Randolph GD, Laughon MM, Schaff E. Integrating improvement competencies into residency education: a pilot project from a pediatric continuity clinic. *Amb Peds* 2003;3:131-6.
2. Paukert JL, Chumley-Jones HS, Littlefield JH. Do peer chart audits improve residents' performance in providing preventive care. *Acad Med* 2003;78(suppl 10):S39-41.
3. Coleman MT, Nasraty S, Ostapchuk M, Wheeler S, Looney S, Rhodes S. Introducing practice-based learning and improvement ACGME core competencies into a family medicine residency curriculum. *Jt Comm J Qual Safety* 2003;29:238-47.
4. Sutherland JE, Hoehns JD, O'Donnell B, Wiblin RT. Diabetes management quality improvement in a family medicine residency program. *J Am Board Fam Pract* 2001;14:243-51.
5. Parenti CM, Lederle FA, Impola CL, Peterson LR. Reduction of unnecessary intravenous catheter use. Internal medicine housestaff participate in a successful quality improvement project. *Arch Intern Med* 1994;154:1829-32.
6. Wu AW, Folkman S, McPhee SJ, Lo B. Do house officers learn from their mistakes? *JAMA* 1991;265:2089-94.

There are a number of approaches to **teach or foster** Practice-based Learning & Improvement

<i>Example</i>	<i>Description</i>
Exit Rounds <i>Arseneau R. Exit rounds: a reflection exercise. Acad Med 1995;70:684-7.</i>	In a group session with the attending, each resident reviews a discharged patient for whom he/she was responsible and describes what was learned from caring for that patient.
Mortality & Morbidity Conference <i>Ziegelstein RC, Fiebach NH. "The Mirror" and "The Village": a new method for teaching practice-based learning and improvement and systems-based practice. Acad Med 2004;79:83-8.</i>	An M&M case is assigned to each resident who analyzes the case in terms of his or her own practice behaviors that could be improved. The resident presents these issues during M&M conference.*
Practice-based Small Group Learning Program <i>Foundation for Medical Practice Education (www.fmpe.org/en/programs/pb sg.html)</i>	Residents meet to review current information about a specific clinical problem and to reflect on their experiences and challenges with it. Group discussion is stimulated by prepared material and led by a trained peer facilitator.
Evidence-based Medicine Curriculum <i>Green ML, Ellis PJ. Impact of an evidence-based medicine curriculum based on adult learning theory. J Gen Intern Med 1997;12:742-50.</i>	Residents rotate as leaders of a group session to discuss the application of EBM to one of their own patients. As preparation, residents develop a focused clinical question, conduct a literature search, critically appraise the evidence, and then apply it to the care of their own patients.
Log and learning plan <i>Fung Kee Fung M, Walker M, Fung Kee Fung K, Temple L, Lajoie F, Bellamare G, Bryson SC. An internet-based learning portfolio in resident education: the KOALA™ multicentre programme. Med Educ 2000;34:474-9.</i>	Working with a mentor, residents keep a log of significant events or clinical surprises and develop a plan to address learning needs revealed by these events.
Improvement project <i>Lough JRM, Murray TS. Audit and summative assessment: a completed audit cycle. Med Educ 2001;35:357-63.</i>	Residents work with a mentor to identify an aspect of their own practice that needs to be improved, implement the improvement, and determine its effectiveness during senior year.*

*See pages 6 & 7 for more information about this approach

There are a number of approaches to **assess** Practice-based Learning & Improvement

<i>Example</i>	<i>Description</i>
Improvement project <i>Lough JRM, Murray TS. Audit and summative assessment: a completed audit cycle. Med Educ 2001;35:357-63.</i>	The resident completes a clinical improvement project within 12 months and a rater uses a checklist to assess it.*
Portfolio entry <i>O'Sullivan, PS, Cogbill KK, McClain T, Reckase MD, Clardy JA. Portfolios as a novel approach for residency evaluation. Acad Psych 2002;26:173-9.</i>	The resident completes a cover letter and compiles supporting evidence of self-directed learning applied to patient care. A scoring rubric is used to rate the entry.*
Learning plan <i>ACGME. Advancing education in Practice-based Learning & Improvement. ACGME, 2004.</i>	The resident's written analysis of a critical incident or pattern of practice behaviors, and related learning plan are rated against specific criteria*
Quality Improvement Knowledge Application Tool <i>Ogrinc G, Headrick LA, Morrison LJ, Foster T. Teaching and assessing resident competence in practice-based learning and improvement. J Gen Intern Med 2004;19:496-500.</i>	The resident describes in writing how he/she would investigate and improve clinical problems presented in 3 case-based scenarios. Assessors use a 6-point scale (from "no response" to "excellent, no modification needed, elements clearly related") to rate responses.
EBM Skills Test <i>Smith CA, Ganschow PS, Reilly BM. Teaching residents evidence-based medicine skills: a controlled trial of effectiveness and assessment of durability. J Gen Intern Med 2000;15:710-5.</i>	Using 8 different scenarios or abstracts, this written 28-item test assesses the resident's ability to compose relevant, concise, and searchable clinical questions; conduct an efficient literature search; choose relevant and methodologically sound evidence; and calculate statistics relevant to diagnosis and treatment.
Physician Achievement Review <i>Hall W, Violata C, Lewkonja R, Lockyer J, Fidler H, Toews J. et al. Assessment of physician performance in Alberta: the Physician Achievement Review. CMAJ 1999;161:52-7.</i>	A physician's peers, patients, co-workers and the physician him or herself rate performance in several areas including Patient Care, Professionalism, and Communication Skills. The 17 to 41-item rating forms (depending on type of rater) are re-administered to determine if improvements have occurred.

* See pages 8-13 for more information about this instrument, permission has been granted for its use

Using Mortality and Morbidity Conference Cases to Foster and Assess Practice-based Learning & Improvement

Goal: To foster learners' abilities to self-monitor and reflect on their own work and initiate their own learning.

Learning Objectives:

1. Residents will be able to self-assess their work with a challenging case.
2. Residents will be able to check the accuracy of their self-assessments by consulting relevant literature and data and by obtaining feedback from knowledgeable teachers and peers.
3. Residents will be able to articulate personal learning points and a learning plan from their work with a challenging case.

Learning Activity

1. Once a week the program director or chief resident compiles a list of patient discharges or operations and deaths from the previous week for each teaching service.
2. The chief resident or program director selects cases for which there were significant patient complications and all deaths.
3. Residents with primary responsibility for the selected cases prepare a presentation on their case. The resident must describe the case, reflect on and identify what went wrong, list resources used to gain a better understanding of the case, ask themselves what he or she would do differently and what he or she would have to learn (knowledge, skill, attitude/perspective) in order to improve.
4. Cases are presented during the M&M conference first by the resident and then by reviewing faculty, if needed. There is open discussion of the case.

Assessment

1. The resident completes a brief learning plan that describes what he or she would need to learn to do things differently.
2. Following the M&M conference the resident and program director or mentor review the resident's presentation and learning plan.
3. Based on the M&M presentation, the learning plan, and discussion with the resident, the PD or mentor rates the following areas: practice analysis, improvement opportunity, resources to support analysis, and action plan.

How does this address PBLI?

- Requires the resident to reflect on and analyze a sample of own practice.
- Requires the resident to seek and use objective information such as national data or the literature, to evaluate own work.
- Guides the resident toward identifying learning needs related to a specific case.

Note: Adapted from,

1. Rosenfeld JC. Utilizing the morbidity and mortality conference to teach and assess ACGME competencies. Presented at the 2004 Annual ACGME Educational conference, March 3-5, Chicago
2. Ziegelstein RC, Fiebach NH. "The Mirror" and "The Village": a new method for teaching practice-based learning and improvement and systems-based practice. Acad Med 2004;79:83-8.

Using an Improvement Project to Foster and Assess Practice-based Learning & Improvement

Goal: To foster learners' abilities to improve their own practice of medicine

Objectives:

1. Residents will be able to conduct a chart review of their patients to obtain information about their own practice.
2. Residents will be able to compare their own practice with best evidence.
3. Residents will be able to identify an intervention to improve their own practice.
4. Residents will be able to implement an intervention designed to improve their own practice.
5. Residents will be able to check the effect of improvement interventions.

Learning Activity

1. A group facilitator (faculty) prepares information about practice improvement tools and discusses it during group discussions with residents. Sample topics include: rapid cycle testing, plan-do-study-act cycles, the use of flow and Pareto charts to monitor processes, and the use of control and specification charts to monitor outcomes.
2. The group facilitator guides discussion so that each resident designs an aim for his or her own improvement project.
3. During the planning phase of projects, each resident presents an evidence-based rationale for planned improvements and receives feedback from the group.
4. During the implementation phase of projects, each resident updates the group facilitator or a mentor on progress during one-on-one meetings.
5. The discussion group reconvenes after the improvement projects have been implemented and results collected. Residents present the results of their interventions.

Assessment

1. The resident documents each step of the improvement project.
2. During a group seminar, the resident presents his or her improvement project to other residents and the group facilitator or mentor.
3. The group facilitator or mentor rates the written project using the PBLI improvement project checklist.

How does this address PBLI?

- Requires the resident to analyze a sample of his or her own practice.
- Requires the resident to seek current information about the area targeted for improvement.
- Requires the resident to implement an improvement intervention.
- Requires the resident to examine the effects of the intervention on his or her own practice.

Note: Adapted from,
Lough JRM, Murray TS. Audit and summative assessment: a completed audit cycle. Med Educ 2001;35:357-63.

Practice-based Learning & Improvement Project and Checklist

What is it?

The checklist is used to rate Practice-based Learning and Improvement (PBLI) projects completed by residents. The topic for a PBLI project is stimulated by resident awareness of a practice behavior that needs improvement. A complete project includes information about a practice behavior that was changed and data regarding the impact of the change.

How may it be used?

Raters review a PBLI project and use the checklist to document the extent to which a project meets the requirements specified in each item of the checklist. A check mark is placed in the "YES" column if the project meets the item specification. A check mark is placed in the "NO" column if the project does not meet the item specification.

Benefits of this method

An improvement project can provide valid evidence of the ability to plan, implement, and check the impact of practice changes. The checklist has yielded reliable data especially if a second set of raters are used to rate projects that are not passed by initial raters.

Disadvantages of this method

To complete the checklist, raters have to read the entire PBLI project. This may become time-consuming depending on the number of residents in the program.

Practice-based Learning & Improvement Project Checklist

Resident Name: _____
 Specialty: _____
 Level (circle one): PGY1 PGY2 PGY3 PGY4 PGY5 PGY6 Other
 Title of Project: _____
 Date Project Submitted: _____
 Assessor: _____

For each item below, place a check mark in the "YES" column if the project meets the item specification. Place a check mark in the "NO" column if the project does not meet the item specification.

	<u>YES</u>	<u>NO</u>
1. The project topic is related to a needed change in medical care processes and/or outcomes.	_____	_____
2. The practice behavior is feasible to change.	_____	_____
3. The approach used to change the practice behavior is justifiable.	_____	_____
4. The standards for determining success are articulated.	_____	_____
5. Data have been collected.	_____	_____
6. Data have been compared to standards (set by learner).	_____	_____
7. Changes needed to move results closer to standards are implemented.	_____	_____
8. Post change data are presented.	_____	_____
9. Post change data are compared to standards (set by learner).	_____	_____
10. A summary of the improvement process is presented.	_____	_____
11. Conclusions are presented.	_____	_____
TOTAL	<input style="width: 50px; height: 20px;" type="text"/>	<input style="width: 50px; height: 20px;" type="text"/>

Comments:

Note: Adapted from: Lough JRM, Murray TS. Audit and summative assessment: a completed audit cycle. Med Educ 2001;35:357-63.

Self-directed Learning Portfolio Entry and Scoring Rubric

What is it?

The portfolio entry consists of a cover letter and supporting documents such as case notes or journal material. In the cover letter, the resident describes a challenging case that prompted him or her to seek new information or learn new skills, the educational resources used, and how the documentation fits together to illustrate self-directed learning. If the new information or skills were applied to the case, the resident must describe the effect of this on the process or outcomes of patient care.

How may it be rated?

Scoring rubrics are used to rate the quality of portfolio entries or contents. Rubrics are descriptions of criteria for specific levels of performance. The self-directed learning rubric describes six levels of evidence that demonstrate weak to strong self-directed learning abilities. The rater assesses the quality of the portfolio entry by selecting one of the six criteria best met by the entry.

Benefits of this method

Portfolio entries are based on residents' practice experiences and require residents to reflect on and critically review their practice. This kind of portfolio entry can thus provide valid evidence of the ability to analyze practice. Reliable rating is enhanced by increasing the number of entries required per resident. Since portfolio contents are permanent products, they can be rated at times convenient to the rater. This also enhances the feasibility of checking inter-rater reliability.

Disadvantages of this method

This approach is relatively unconventional and may be challenging to implement especially if residents perceive portfolio entries as busy work. Further, this approach may generate a large volume of information per resident, thus making it time-consuming to rate.

Self-Directed Learning Portfolio Scoring Rubric

The following criteria can be used to rate portfolio entries for self-directed learning. The rater selects one of the six criteria below best met by the portfolio entry.

Important skills and/or knowledge missing to adequately deal with the case. Resources reviewed do not match case and self-direct learning. Failed to relate resources to clinical case.

Appropriate approach to case, but demonstrated weaknesses that would likely lead to potential problems. Used weak resources for solving problem.

Competent to successfully pursue basic medical questions using self directed learning.

Able to use conventional approach for more complex case. Pursues clarification when there is weak or no evidence for clinical care.

Well-integrated knowledge and skills that facilitates resolution. Develops conclusions and plans from various sources. Goes beyond the conventional approach.

Wide breadth of knowledge and skills integrated from numerous and varied sources to resolve case. Considers alternatives in plans. Considers strengths and weaknesses of the literature.

Note: Used with permission from Dr. James Clardy and Dr. Patricia O' Sullivan, University of Arkansas for Medical Sciences (www.psychres.uams.edu).

From: "O'Sullivan, PS, Cogbill KK, McClain T, Reckase MD, Clardy JA. Portfolios as a novel approach for residency evaluation. *Academic Psychiatry* 2002;26(3):173-179."

Learning Plan and Rating Form

What is it?

A learning plan is a blueprint for professional development that is created by the learner. The main purposes of a learning plan are to stimulate learner reflection about areas in which they could improve and to encourage learner commitment to address these areas. The content of a learning plan may be triggered by an M&M case, a critical incident, or a pattern of practice behaviors or outcomes discerned from chart or log review. Plans are typically structured to include questions such as, "What do you want to learn?" "How are you going to learn it?" "How will you know when you have learned it?" Learning plans may be paper-based or electronic and may comprise part of a portfolio or used in conjunction with logs.

How may it be rated?

Mentors or attendings should discuss and review the learning plan with the resident. Based on this information, the rating form can be used to indicate the extent to which the learning plan meets the criteria specified for each rating form item.

Benefits of this method

Although generally regarded as an instructional technique to aid lifelong learning, learning plans can provide evidence of self-reflection if the resident accurately identifies areas where they need to improve. In addition, plans can provide evidence of actual learning or improvement if they are structured to elicit this type of information. This may be achieved, for example, by adding a question such as "what is the evidence that you have made the improvements stated in your plan?" Learning plans may thus yield valid information about some components of lifelong learning.

Disadvantages of this method

Learning plans require learners to engage in self-assessment, however, some learners can not accurately identify areas in which they need to improve. Self-assessment accuracy may be enhanced by obtaining feedback from others; thus, mentor involvement in learning plan development is crucial. In addition, using critical incidents or a chart review as triggers for learning plan material may aid accuracy. Another disadvantage of learning plans is that some learners may perceive them as busy work.

Learning Plan Rating Form

Resident: _____

Rotation: _____

Faculty: _____

Date: _____

Developing= Several behaviors performed inadequately or missed (ratings 1, 2, or 3)

Acceptable= Most behaviors performed acceptably (ratings 4, 5, or 6); acceptable performance as described below

Exemplary= All behaviors performed very well (ratings 7, 8, or 9)

	Developing			Acceptable			Exemplary				
	1	2	3	4	5	6	7	8	9		
1. Practice analysis				Provides brief description of significant event & response to it or describes pattern of practice behaviors/outcomes; explains reasons for response or pattern of responses; considers several variables in analysis including personal, team, environment equipment, & disease process; for personal variable explores cognitive issues such as confirmation bias							
2. Improvement opportunity	1	2	3	4	5	6	7	8	9		
				States what could be done differently; suggested improvement is related to significant event or pattern of practice behaviors/outcomes, is grounded in best evidence or current, accepted practice, & feasible							
3. Action plan				4	5	6	7	8	9		
				Articulates learning needs that are logically related to event or pattern of pattern of practice behaviors/outcomes; describes how & when learning needs will be met, what will comprise evidence of learning, what would aid learning, & likelihood of applying to practice							
4. Resources to support analysis & plan				4	5	6	7	8	9		
				Cites relevant, current literature, guidelines, best practices or data; referenced evidence demonstrates understanding of key issues & ability to use information technology							

Comments:

PRACTICE-BASED LEARNING & IMPROVEMENT ACGME Web-based Resource Guide

<i>WHAT?</i>	<i>WHERE?</i>
<p>Assessment Toolbox Find out about the characteristics of various methods of assessment.</p> <p>Example Assessments Identify specific tools that may be used to assess PBLI, including some practical and technical features of each.</p> <p>RSVP Learn about initiatives underway at programs and institutions to integrate the teaching and assessment of PBLI into GME curricula.</p> <p>References (i) Scan references related to the theory/concepts/rationale and the teaching and learning of PBLI (ii) Scan references related to assessing PBLI</p> <p>Think Tank Recommendations for Assessing PBLI Read about approaches to assess PBLI recommended by the RRC Outcome Project Think Tank, which is an ad hoc advisory group whose purpose is to facilitate implementation of outcomes assessment according to ACGME program requirements.</p>	<p>www.acgme.org/outcome/assess/toolbox.asp</p> <p>www.acgme.org/outcome/assess/PBLI_Index.asp</p> <p>www.acgme.org/outcome/implement/rsvp.asp</p> <p>www.acgme.org/outcome/refs_PBLI.pdf</p> <p>www.acgme.org/outcome/PBLI/PBLI_refsass.pdf</p> <p>www.acgme.org/outcome/project/thinktank.asp</p>

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<i>ORGANIZATION</i>	<i>WHERE?</i>
Agency for Healthcare Research and Quality	www.ahrq.gov
American Academy of Family Practice	www.aafp.org/x16578.xml
American Academy of Pediatrics	www.eqipp.org
American Board of Internal Medicine Foundation	www.abimfoundation.org/cpd/cpdhome/components.htm
Centre for Health Evidence	www.cche.net/usersguides/main.asp
Evidence-based Medicine Resource Center	www.ebmny.org
Foundation for Medical Practice Education	www.fmpe.org/en/programs/pbsg.html
Institute for Healthcare Improvement	www.ihl.org
Managed Care Education Connection	www.mceconnection.org/mce/documents/179.pdf
National Association for Healthcare Quality	www.nahq.gov
National Guideline Clearinghouse	www.guidelines.org