# MEDEDU 2100

**ENHANCING TEACHING SKILLS FOR CLINICIAN EDUCATORS**

2010

**COURSE DIRECTOR:** Rosanne Granieri, M.D.  ([granierir@upmc.edu](mailto:granierir@upmc.edu))

**GUEST LECTURERS:** Hollis Day, M.D.  
Peggy Hasley, M.D.  
John Mahoney, M.D.  
Sam Lewis

**LOCATION:** 220 Parkvale Building (except Session XII)

**TIME:** 1:00-3:00 PM

**CREDITS:** 2

<table>
<thead>
<tr>
<th>SESSION DATE</th>
<th>SESSION CONTENT</th>
<th>SESSION LEADER</th>
</tr>
</thead>
</table>
| **SESSION I** Monday, August 30 | Overview of Course  
Characteristics of Good Teaching  
And Learning Environments | Rosanne Granieri, M.D. |
| **SESSION II** Wednesday, September 1 | Adult Learning  
Learning Domains; Motivation | Rosanne Granieri, M.D. |
| **SESSION III** Wednesday, September 8 | Challenges in Learning Environments  
Styles of Teaching  
Stages of Clinical Teaching  
Setting Goals and Expectations | Rosanne Granieri, M.D. |
| **SESSION IV** Monday, September 13 | Feedback and Evaluation | Peggy Hasley, MD |
| **SESSION V** Wednesday, September 15 | Case Based Teaching | Rosanne Granieri, MD |
| **SESSION VI** Monday, September 20 | Bedside Teaching | Hollis Day, MD |
| **SESSION VII** Wednesday, September 22 | Inpatient Teaching | Rosanne Granieri, MD |
| **SESSION VIII** Monday, September 27 | Teaching in the Ambulatory Setting | Rosanne Granieri, MD |
| **SESSION IX** Wednesday, September 29 | Teaching in Small Groups | Rosanne Granieri, MD |
| **SESSION X** Monday, October 4 | Problem Based Learning | John Mahoney, MD |
| **SESSION XI** Wednesday, October 6 | Teaching in Large Groups: The Art of The Lecture | Rosanne Granieri, MD |
| **SESSION XII** Monday, October 11 | PowerPoint Instructions for Educators: Enhancing Your Presentations | Sam Lewis |
| **SESSION XIII** Wednesday, October 13 | Diagnosing and Dealing with the Problem Learner | Rosanne Granieri, MD |
| **SESSION XIV** Monday, October 18 | Interactive Discussion: Education Afternoon  
Report: Challenging Teaching Cases | Students  
Rosanne Granieri, MD |
| **SESSION XV** Wednesday, October 20 | COURSE EVALUATION  
An Educational Framework for Analyzing Teaching / Outcomes Based Education  
Future Challenges in Medical Education | Program Office  
Rosanne Granieri, M.D. |
| **SESSION XVI** Monday, October 25 | Student Presentations  
Wrap-up | Students  
Rosanne Granieri, M.D. |
LEARNING OBJECTIVES

- To identify characteristics of excellent teachers and optimal learning environments
- To identify how the learning process is affected by the student’s learning style, teacher’s approach to teaching and learning and the context in which the learning takes place
- To identify role modeling as a powerful teaching method
- To explain the relative value of surface learning, deep learning and strategic learning
- To compare and contrast the “ideal” clinical teacher with self reflection and one’s own teaching skills

ASSIGNMENT

- Recommended: CLINICAL TEACHING PRECEPTING INVENTORY
  (www.ucimc.netouch.com/intro.htm)


- FOR EMAIL IN PRIOR TO SESSION II: Considering our class discussion about what students identify as characteristics of outstanding clinical teachers and the article above, reflect on your teaching style and “teaching personality.” Then, in working for continued improvement in your teaching, list 3 general goals for your teaching this year and specifically how you plan to meet these goals.

  - Tack these 3 goals up in your cubicle/office to remind yourself of them during the year. We will discuss next class session. Each person will discuss his or her priority goal.

### LEARNING OBJECTIVES

- To identify principles of adult learning and how these principles impact medical education
- To identify at least 6 factors that affect motivation
- To list the 3 learning domains and to recognize arenas where each domain may be most appropriate
- To recognize ways of assessing and instructing in each learning domain

### ASSIGNMENT

- **REQUIRED READING**

- **EMAIL IN PRIOR TO SESSION III BE PREPARED to discuss in Session III**

  **Re-read point #9 in the Mann article:**
  
  *Using teaching and learning strategies that are inherently motivating. We must employ strategies that engage learners actively in their learning. Increasingly, such educational methods as problem-based learning, practice-based learning, experiential learning and cooperative learning are being implemented and are having desired effects on motivation.*

  Now, give a concrete example of implementing Point #9 in the following scenario:

  - You are asked to plan a 2 hour session in the patient safety curriculum for your program

- **EMAIL IN PRIOR TO SESSION III BE PREPARED to discuss in Session III**

   You are asked to develop a 2 hour seminar in chronic pain management OR liver transplants in the patient with alcoholic liver disease OR adverse medication reactions for third year residents. 
   Briefly describe how you would you incorporate the 3 learning domains (knowledge, attitudes and skills) in the planning of and evaluation of the effectiveness of your program?

- **THOUGHTFUL QUOTE FOR REFLECTION**
  
  “If the learner didn’t learn, the teacher didn’t teach.”

- **SELF REFLECT DURING THE YEAR:**

  Am I using teaching principles that are motivating my learners? What in particular am I doing that is motivating? How can I tell it’s working?
LEARNING OBJECTIVES

- To identify challenges in teaching today’s academic environment
- To describe and demonstrate 6 styles of teaching
- To identify and utilize the 3 stages of clinical teaching
- To list factors to consider in the preparation for a teaching encounter
- To differentiate between goals and objectives
- To write appropriate goals and learning objectives for a teaching assignment.
- To identify 3 reasons for setting goals, learning objectives and expectations and to compose a set of goals, learning objectives and expectations for different clinical teaching encounters

ASSIGNMENT

READ: Handouts: Developing goals and objectives and Bloom’s taxonomy (again)

FOR EMAIL TO THE CLASS GROUP EMAIL LIST BY MONDAY, SEPTEMBER 13.
THIS IS AN “EMAIL ONLY” ASSIGNMENT TO THE WHOLE GROUP

- You have been asked to give a talk on the current work hour restrictions in medical education to a group of program directors.
  List up to 3 goals and up to 3 learning objectives for this talk.
  Email these to the class and me (via our group email) by Monday, September 13. Everyone should review the work of the class and feel free to make comments via email via “respond to all”.

FOR EMAIL TO OR HAND IN PRIOR TO SESSION V, Wednesday, September 15.
BE PREPARED TO DISCUSS IN CLASS ON WEDNESDAY, SEPTEMBER 15

- Choose an educational activity (small or large) that you would like to do or have been asked to do (develop a Master’s Degree in Medical Education, deliver a talk on human papilloma virus, acute renal failure, acute coronary syndrome, become director of an outpatient clinic for residents etc.) Write the goals and learning objectives for this educational activity.

FOR EMAIL to me by Wednesday, September 15 (SESSION V)

You are about to begin ward attending or consult attending OR have a student/intern assigned to your clinic/emergency department or be with you on rounds.

- Write up to 10 expectations for yourself and up to 10 expectations for the learner.

- In the next week, observe and reflect upon as many teaching styles as you can (either demonstrated by someone else or personally used by yourself in any teaching setting).

FOR LONG TERM ASSIGNMENT

Start thinking on one of your teaching assignments or teaching interactions that went poorly.
Write this down for discussion in the MONDAY, OCTOBER 18 (Session XIV) class
- What was the problem?
- How could it be rectified?
### SESSION IV
Monday, September 13

**Feedback and Evaluation**

**Peggy Hasley, MD**

**LEARNING OBJECTIVES**

- To differentiate feedback from evaluation
- To list components of effective feedback
- To formulate a template for giving a summative evaluation
- To identify barriers to effective feedback and evaluation

**ASSIGNMENT**

**READ:**
- **LISTEN** TO DR. ENDE’s UPSOM MEDICAL EDUCATION GRAND ROUNDS 10/8/08
  - [http://mediasite.cidde.pitt.edu/mediasite/Viewer/?peid=384549d5-0433-4170-a9c1-bd0cf2281820](http://mediasite.cidde.pitt.edu/mediasite/Viewer/?peid=384549d5-0433-4170-a9c1-bd0cf2281820)

### SESSION V
Wednesday, September 15

**Case Based Teaching**

**Rosanne Granieri, M.D.**

**LEARNING OBJECTIVES**

- To define case based teaching
- To describe and ultimately use effectively 6 methods of case based teaching
- To effectively demonstrate the 5 Microskills of Teaching and the Aunt Minnie method
- To list a compendium of 15 communication skills to assist case based learning

**ASSIGNMENT**

**READ**

**PICK ONE AND HAND IN WHEN COMPLETED**

- Identify one method discussed in today’s session. Practice this method in any of your teaching assignments this week at least once and **FOR HAND-IN WHEN COMPLETED**, describe what you did and how it went.
  - If you do not have a specific teaching scenario to use or if you are not currently teaching, comment upon whether one of these teaching methods, in particular, may be beneficial for inclusion in your teaching “tool box” and why.

**RE-READ** the last slide from today’s lecture (Precepting Errors) and critically reflect upon your precepting style. Pick one area in which you need to improve your precepting skills, write it down on an index card and concentrate on making it better over the next few weeks.
SESSION VI
Monday, September 20

<table>
<thead>
<tr>
<th>Bedside Teaching</th>
<th>Hollis Day, MD</th>
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LEARNING OBJECTIVES

- To define bedside teaching
- To construct a personal portfolio of techniques used in bedside teaching
- To identify resources to improve self-directed learning in this method of teaching

ASSIGNMENT

- **READ:**
  - As directed by Dr. Day
- **REPORT BACK** in SESSION VII one tip from Dr. Day’s discussion

SESSION VII
Wednesday, September 22

<table>
<thead>
<tr>
<th>Inpatient Teaching</th>
<th>Rosanne Granieri, M.D.</th>
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LEARNING OBJECTIVES

- To identify the roles and responsibilities of an inpatient attending
- To recognize the challenges of inpatient teaching: teaching vs patient care and oversight vs control
- To construct a personal portfolio of teaching techniques to enhance attending rounds
- To list and evaluate effective oral and written skills

ASSIGNMENT

- **READ**

- **CASE SCENARIO BAG: YOU PICK ONE**
  Pick at random 1 clinical scenario from the Case Scenario bag.
  Write, for **EMAIL OR HAND-IN by Session VIII, Monday, September 27**, the way you would handle the issue presented.
  **BE PREPARED TO DISCUSS IN CLASS ON MONDAY.**

- **READ** Figure 8.2 QUESTIONS TO STIMULATE PROBLEM SOLVING AND CRITICAL THINKING

- **SUGGESTED READING** AT SOME POINT IN YOUR LIFE, FOR YOUR EDUCATION
SESSION VIII
Monday, September 27

Teaching in the Ambulatory Setting
Rosanne Granieri, M.D.

LEARNING OBJECTIVES

• To identify the challenges of teaching in the outpatient setting
• To list a four step process that can be used to enhance learning (in the outpatient setting)
• To list and ultimately utilize 12 efficiency tips in the (outpatient) setting
• To identify potential errors that may occur when teaching in the outpatient setting

ASSIGNMENT

• CASE SCENARIO BAG: YOU PICK ONE

Pick at random 1 clinical scenario from the Case Scenario bag. Write, for EMAIL OR HAND-IN by Session IX, Wednesday, Sept 29, the way you would handle the issue presented. BE PREPARED TO DISCUSS IN CLASS ON Wednesday.

READ:


SESSION IX
Wednesday, September 29

Teaching in Small Groups
Rosanne Granieri, M.D.

LEARNING OBJECTIVES

• To create learning objectives for different small group teaching situations
• To identify successful and unsuccessful strategies for small group teaching
• To identify and use effective questioning
• To identify and solve problems in dealing with difficult groups

ASSIGNMENT

• REVIEW and complete for self assessment: Effective Questioning: Self-Evaluation (HANDOUT)

• RECOMMENDED READING MATERIAL IN THE SYLLABUS
  o Soliman I. Teaching Small Groups.
  o Forms and Checklist: Small Group Teaching
  o Small Group Options
• **READ:**


• **FOR HAND IN OR EMAIL BY SESSION XI, Wednesday, October 6**

Using the challenge of teaching to a group comprised of *varied level of learners* (EG: third year medical students, fourth year medical students, PGY-I and PGY-IIIIs), create an **outline or approach** to a small group session discussing a topic of choice. (example-preventing complications in diabetics, osteoporosis, chronic pain management, taking a history from an adolescent, acute renal failure, evaluation of the patient with suspected appendicitis, post-op management of the renal transplant patient, management of ACS).

Be sure to include ways that you would develop your session to include all levels of learners and ways that would assess knowledge, attitudes and skills, if appropriate.

**BE PREPARED TO DISCUSS IN SESSION XI CLASS ON Wednesday, October 6.**

• **PRACTICE** using different types of questions in your teaching responsibilities over the next week

• **READ IN PREPARATION FOR SESSION X**


<table>
<thead>
<tr>
<th>SESSION X</th>
<th>Problem Based Learning PAR I</th>
<th>John Mahoney, M.D.</th>
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<td>Monday, October 4</td>
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**LEARNING OBJECTIVE**

- To demonstrate skills necessary to create and facilitate PBL sessions in medical education

**ASSIGNMENT**

- Per Dr. Mahoney
SESSION XI
Wednesday, October 6

Teaching in Large Groups; The Art of the Lecture
Rosanne Granieri, M.D.

LEARNING OBJECTIVES

• To list 2 reasons to give a lecture
• To list the 3 stages in giving a lecture and goals for each stage
• To list and demonstrate effective oral presentation skills
• To demonstrate effective use of audiovisual aides
• To prepare and deliver a 15 minute lecture to the class (Session XVI)

ASSIGNMENT

• FOR FUN: ATTEND any lecture in your department. This time, don’t concentrate on the content of the lecture but mainly the lecture technique/style and delivery.
• COMPLETE the evaluation checklist modified from Whitman NA. There is No Good Gene for Teaching: A Handbook on Lecturing for Medical Teachers. 2nd edition as you are listening to the lecture.
• THINK How could this lecture be better? What was done well?

• FOR EMAIL HAND IN by Monday, October 11: CREATE an approach to a “lecture” to be given to a group of residents post call on a notoriously boring topic (examples below). How would you structure this lecture? How would you enhance attaining and maintaining the attention of your audience?

BE PREPARED TO DISCUSS IN CLASS, SESSION XIII, WEDNESDAY, OCTOBER 13.

• PA Rules and Regulations
• Immunization schedules in children <12 years of age
• Asbestosis in the workplace
• The interpretation of PFTs
• Integrating systems based practice into our clinic

• READ

SESSION XII
Monday, October 11

PowerPoint Instruction for Educators: Enhancing Your Presentations
Falk Library, 2nd floor Scaife Windows Classroom I Samuel Lewis

LEARNING OBJECTIVES

• To demonstrate effective use of PowerPoint in preparing and presenting a lecture and to augment a lecture with visual aides.

ASSIGNMENT

• BRING BACK to Session XII, Wednesday, October 13, 1 specific thing you learned and be prepared to demonstrate to the class.

• SEE NEXT PAGE
• **RECOMMENDED READING** FOR SESSION XIII (can do before or after)

  - Clever L.H. Who is sicker: patients- or residents? Residents’ distress and the care of patients. Ann Intern Med 2002;136:391-93,

• **RECALL FROM SESSION III** (and due for Wednesday, October 13)

  • **LONG TERM ASSIGNMENT** Start thinking on one of your teaching assignments or teaching interactions that went poorly. Write this down for discussion in the Mon Oct 18 (Session XIV) class
    • What was the problem?
    • How could it be rectified?

<table>
<thead>
<tr>
<th>SESSION XIII</th>
<th>Diagnosing and Dealing with the Problem Learner</th>
<th>Rosanne Granieri, M.D.</th>
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</thead>
<tbody>
<tr>
<td>Wednesday, October 13</td>
<td>Diagnosing and Dealing with the Problem Learner</td>
<td>Rosanne Granieri, M.D.</td>
</tr>
</tbody>
</table>

**LEARNING OBJECTIVES**

- To recognize multiple factors that contribute to a difficult learning situation
- To define “difficult learner” (“problem learner”) and identify 3 types of difficult learners
- To identify teaching strategies to use when dealing with a difficult learner
- To identify strategies to deal with burnout
- To identify interventional strategies to address other problems not amenable to instructional techniques

**ASSIGNMENT**

• **CASE SCENARIO BAG: YOU PICK ONE**

  Pick at random one clinical scenario from the Case Scenario bag. , FOR EMAIL PRIOR TO SESSION XIV, Mon, Oct 18., the way you would handle the issue
  BE PREPARED TO DISCUSS IN CLASS MONDAY, OCTOBER 18

• **FOR EMAIL PRIOR TO SESSION XIV**

  You are a Program Director. Think about what you know about burnout.
  LIST at least three specific, yet realistic, things you would do.
  Be prepared to discuss in Session XIV

• **RECOMMENDED READING**

  - Sayer M. Support for students with academic difficulties. Medical Education 2002;36:643.
### SESSION XIV
**Wednesday, October 21**

**Challenging Teaching Cases:** Identification, Management and Potential Prevention  
*(Education Afternoon Report)*

| Students | Rosanne Granieri, MD | Students |

#### LEARNING OBJECTIVES
- To identify, diagnose, and manage challenging teaching scenarios

#### ASSIGNMENT

**READ IN PREPARATION FOR SESSION XV**

### SESSION XV
**Wednesday, October 20**

**COURSE EVALUATION**
An Educational Framework for Analyzing Teaching Outcomes Based Education Challenges in Medical Education

| Rosanne Granieri, M.D. |

#### LEARNING OBJECTIVES
- To define the concept of “outcome-based education”
- To develop a personal assessment of teaching effectiveness, drawing upon the 7 criteria from the Stanford Faculty Development Program

#### FINAL ASSIGNMENT

**WRITE**
- ONE TO TWO PAGE ESSAY. Include the following:
  - Overall, philosophy of teaching
  - Teaching goals for the next year
  - What will be your biggest challenge and how do you plan to meet it?
  - What if anything did the course identify for you things you are doing well already?
  - What if anything did the course identify for you to do differently and better?

- EMAIL ESSAY BY MONDAY, NOVEMBER 1 to granierir@upmc.edu
SESSION XVI  
Monday, October 25  
Student Presentations  
WRAP-UP  
Students

LEARNING OBJECTIVES

- To utilize skills and techniques learned in the course on teaching in small groups/lecturing
- To identify the importance of a course evaluation

ASSIGNMENT

- YOUR PRESENTATION
- PEER EVALUATION OF PRESENTATION
ADDITIONAL READING
MEDICAL EDUCATION

JOURNALS

List compiled from
http://www.library.vcu.edu/tml/bibs/medicaleducationjournals.html
which also lists specialty related journals that publish articles on medical education..

*Academic Medicine
*Advances in Health Sciences Education: theory and practice
*BMC Medical Education
Journal of Audiovisual Media in Medicine
Journal of Continuing Education in the Health Professions
Journal of Medical Internet Research
Journal of the International Association of Medical Science Educators
*Medical Education
Medical Education Online (MEO) (http://www.med-ed-online.org/)
Medical Teacher
Teaching and Learning in Medicine
*Journal of General Internal Medicine

*available as E-journal online vis hsls
(http://www.hsls.pitt.edu/resources/title_search?bibtype=Journal&search_string=teaching+and+learning&match=all)

AVAILABLE TEXTS and EXTERNAL SOURCES
most texts available on www.amazon.com

EXTERNAL SOURCES (a brief list)


2. ABC of Learning and Teaching- the BMJ series (available via hsls)

   Curriculum design  BMJ, Feb 2003; 326: 266 - 270.
   Teaching large groups  BMJ, Feb 2003; 326: 437.
   Teaching small groups  BMJ, Mar 2003; 326: 492 - 494.
   One to one teaching and feedback  BMJ, Mar 2003; 326: 543 - 545.
   Web based learning  BMJ, Apr 2003; 326: 870 - 873.

3. The Clinician Educator Handbook (free download)
   Teri Turner, Debra Palazzi, and Mark Ward
   www.bcm.edu/pediatrics/clinician_educator_handbook
4. Guidebook for Clerkship Directors 3rd Edition (free download)  
http://familymed.uthscsa.edu/ACE/guidebook.htm


6. http://www.ttuhsc.edu/SOM/success (has chapter about creating TBL sessions)  
Success Types in Medical Education: A Program for Improving Academic Performance  
Version 1.1 (free)  
John W. Pelley, PhD with Bernell K Dalley, PhD

TEXTS

Medical Teaching  
http://www.acponline.org/atpro/timssnet/products/tnt_products.cfm?action=long&primary_id=331291000  
(Editor- Jack Ende), published by American College of Physicians in 2010  
$139.95 via amazon.com or ACP website  
https://www.acponline.org/atpro/timssnet/products/tnt_products.cfm?action=long&primary_id=331291000
- Theory and Practice of Teaching Medicine (Jack Ende, ed.)  
- Methods for Teaching Medicine (Kelley Skeff and Georgette Stratos, eds.)  
- Teaching in Your Office, 2nd ed. (Patrick Alguire et al., eds.)  
- Teaching in the Hospital (Jeff Wiese, ed.)  
- Mentoring in Academic Medicine (Holly Humphrey, ed.)  
- Leadership Careers in Medical Education (Lou Pangaro, ed.)

Understanding and Facilitating Adult Learning: A Comprehensive Analysis of Principles and Effective Practices  
Stephen D. Brookfield

Achieving Excellence in Medical Education (Paperback)  
Richard B. Gunderman

Peer Teaching: To Teach Is to Learn Twice  
Neal A. Whitman

A Handbook for Medical Teachers (4th Revised Edition)  
D.I. Newble, R.A. Cannon

Learner-Centered Teaching: Five Key Changes to Practice  
Maryellen Weimer

ABC of Learning and Teaching (ABC)  
Peter Cantillon, Diana Wood

Workshops: Designing and Facilitating Experiential Learning (Paperback)  
Jeff E. Brooks-Harris, Susan R. Stock (a.k.a. Stock-Ward) *

Teaching during Rounds: A Handbook for Attending Physicians and Residents  
Donn Weinholtz, Janine C. Edwards

Curriculum Development for Medical Education: A Six-Step Approach  
David E. Kern, Patricia A. Thomas, Donna M. Howard, Eric B. Bass

Educating for Professionalism: Creating a Culture of Humanism in Medical  
Jordan J. Cohen

A Practical Guide for Medical Teachers  
John A. Dent, Ronald M., M.D. Harden

Basics in Medical Education  
Zubair Amin, Khoo Hoon Eng
Teaching Ambulatory Medicine: Moving Medical Education Into the Office
Samuel C. Durso

Community-Based Teaching: A Guide to Developing Education Programs for Medical Students and Residents in the Practitioner's Office (Office-Based Medical Education)
Susan L. Deutsch (Editor), John Noble (Editor)

Medical Teaching in Ambulatory Care (Springer Series on Medical Education)
Warren Rubenstein, Yves Talbot

Teaching in Your Office: A Guide to Instructing Medical Students and Residents (Office-Based Medical Education)
Dawn E. Dewitt, et al

The Johns Hopkins University School of Medicine Curriculum for the Twenty-first Century
Catherine D. De Angelis (Editor), Michael M. E. Johns

Teaching and Learning in Medical and Surgical Education: Lessons Learned for the 21st Century
Gary L. Dunnington (Editor), et al

Residents' Teaching Skills
Janine C. Edwards (Editor), et al

International Handbook of Research in Medical Education (2 Vol. Set) (Springer International Handbooks of Education)
Geoffrey R. Norman (Editor), et al

Portfolio Use and Assessment
Ven Klenowski, Val Klenowski

Time to Heal: American Medical Education from the Turn of the Century to the Era of Managed Care
Kenneth M. Ludmerer

Mastering the Objective Structured Clinical Examination and the Clinical Skills Assessment
Jo-Ann Reteguiz, Beverly Cornel-Avendano

Creative Medical Teaching
Neal Whitman

The Physician as Teacher. 2nd Ed. Baltimore
Neal Whitman, Thomas Schwenk

Teaching and Learning in Primary Care
Richard Hayes

Ward Attending: The Forty Day Month
Luc M. Osborn, Neal Whitman

A Handbook for Group Discussion Leaders: Alternatives to Lecturing Medical Students to Death
Neal A. Whitman, Thomas L. Schwenk

There is No Gene for Good Teaching: A Handbook on Lecturing for Medical Students
Neal Whitman
Preceptors as Teachers. A Guide to Clinical Teaching.
Neal Whitman, Thomas Schwenk

Problem-based learning: an approach to medical education
Howard S. Barrows, Robyn M. Tamblyn

Medical education in the United States and Canada; a report to the Carnegie Foundation for the Advancement of Teaching
Abraham Flexner; Henry S Pritchett; Carnegie Foundation for the Advancement of Teaching

Practice-Based Learning: Problem-Based Learning Applied to Medical Education.
Howard S. Barrows