A Multi-Faceted Approach to Evidence–Based Medicine Objective Structured Clinical Examination (OSCE) Instruction

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Goal: To help students become familiar with and committed to the principles of good searching that they will work toward more effective searching outcomes which identify evidence-based medical information to answer questions about patient care.

Learning EBM (from Centre for Evidence-Based Medicine, Oxford, UK)

1) Ask Answerable Questions

2) Find the Best Evidence

3) Critically Appraise the Evidence

4) Act on the Evidence

5) Evaluate Performance

Library Internal Medicine MSIII Objectives

Orientation Objectives

    The librarian introduces the medical students to the class assignment

    The librarian familiarizes the medical students with the teaching modules

Patient Objectives

    The medical student gathers patient information for their PICO (patient, intervention, comparison and outcome) question

    Discusses case with physician

One–on–one Training Objectives

    Outline the PICO question format

    Describe the search strategy process

    Identify the library's Point–of–Care tools

    Demonstrate a literature search using PubMed

    Student performs searches in Point–of–Care tools and PubMed on their own

OSCE (Objective structured clinical exam) Objectives

    Medical student works through an EBM (Evidence-based medicine) case study

    The medical student meets with the librarian to discuss search strategies and results

Debriefing Objectives

    Medical faculty meets with the medical student to discuss the previous library EBM training session

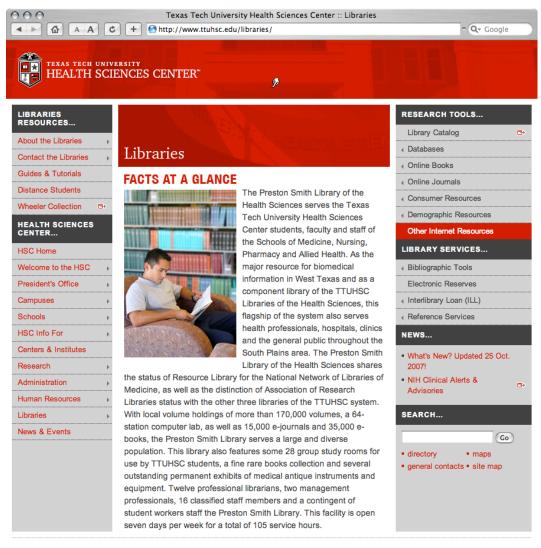   The medical student applies the search results to their patient's case

MEMO

TO: MSIII, Internal Medicine Clerkship, TTUHSC

FROM: Peggy Edwards, Carrie Gassett, Dawn Kruse, and Margaret Vugrin

Reference Librarians at TTUHSC Preston Smith Library

Welcome to the Evidence-Based Medical Literature component of the Internal Medicine clerkship. The learning activities will give you new and additional skills using many computer-based and mobile based Evidence-Based Medicine information resources.

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ACTIVITIES:

1) Identify a search question based on a patient you see during the Internal Medicine Rotation.

2) Review the handout *"Constructing a Focused, Well-Articulated Question."*

3) Complete the *PICO Worksheet.*

4) Bring your completed PICO worksheet to the library for your one-on-one teaching session. Contact from Internal Medicine will give you the schedule: time, date, place, & name of the librarian to whom you have been assigned.

OSCE:

There is an evidence-based medicine resources test station in the OSCE. There will be a total of 30 minutes spent at the EBM station. You will spend 20 minutes searching an assigned clinical question. The next 10 minutes will be spent with a librarian evaluating the information you have found on one or more of the following *foreground information* point-of-care databases:

> *ACP PIER*
>
> *Dynamed*
>
> *FirstConsult*
>
> *Essential Evidence Plus*
>
> *PubMed (using MeSH)*

You may also want to use the *National Guideline Clearinghouse* at www.guideline.gov.

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What makes a clinical question well built? First, the question should be directly relevant to the problems at hand. Next, the question should be phrased to facilitate searching for a precise answer. To achieve these aims, the question must be focused and well articulated for all 4 parts of its 'anatomy' (known as PICO):

> 1) the **P**atient, population or problem being addressed
>> What are the characteristics of the patient or population?
>> What is the condition or disease?
> 2) the **I**ntervention being considered which could include:
>> exposure, diagnostic test, prognostic factor, therapy, patient perception or
>> What do you want to do with this patient? Treat, diagnose, observe?
> 3) the **C**omparison intervention or exposure, when relevant
>> relevant most often when looking at therapy questions
>> What is the alternative to the intervention? Placebo, different drug, surgery?
> 4) the clinical **O**utcomes of interest
>> What are relevant clinical outcomes of interest to you and your patient?
>> Morbidity, death, complications?

Asking focused, four-component questions takes practice. Doing it well requires that you have insight into what you do not know, coupled with curiosity and a willingness to learn. Also, knowing how questions arise, where they come from, and how to recognize and articulate them can help you refine your skills.

How do clinical questions arise? During a patient encounter, the clinician may be uncomfortable making a decision until more is known. It is recommended that you quiet your emotions while turning your implicit knowledge gaps into explicit questions.

Most clinical questions arise from the following six aspects of clinical work:

> 1) Clinical evidence: how to gather clinical findings properly & interpret them soundly.
> 2) Diagnosis: how to select and interpret diagnostic tests.
> 3) Prognosis: how to anticipate the patient's likely course.
> 4) Therapy: how to select treatments that do more good than harm.
> 5) Prevention: how to screen and reduce the risk for disease.
> 6) Education: how to teach yourself, the patient, and the family what is needed.

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How can you recognize and formulate clinical questions as they occur? First, pay careful attention to the questions that spontaneously occur to you. Listen for the 'question behind the question.' Next, try saying your questions out loud or writing them down with all four components included. Then build your question in two steps, starting with the 'location,' such as 'my question is about therapy,' Ask yourself what type of clinical scenario would you like to consider: Therapy?   Prognosis?   Diagnosis?   Harm?

Then, articulate all four PICO components explicitly. See the example below.

What if too many questions arise? Select from the many questions the few that are most important to answer right away. Ask yourself, "What is the most important issue for this patient now? What issue should I address first? Which question, when answered, will help me most?

PICO Example:

Patient or Problem: 65-year-old man with a stroke & moderate carotid stenosis

Intervention: ASA (acetylsalicylic acid)

Comparison Intervention: Placebo

Outcome: Stroke

becomes a

Focused, Well-Built Question:

In a 65-year-old man with a stroke and moderate carotid stenosis, can ASA decrease the risk of another stroke compared with no treatment?

Additional Practice

If you would like additional practice formulating articulate questions using a web tutorial go to:

http://ktclearinghouse.ca/cebm/practise/formulate/

Answering Clinical Questions

After the patient care problem(s) has been articulated into a focused, well-built question, the next step is to search the literature. A variety of EBM resources will be explored in the library teaching sessions.

Taken from:
The well-built clinical question: a key to evidence-based decisions by W. Scott Richardson, MD, et al. in *ACP Journal Club*. 1995; 123 (Nov-Dec): A-12.

Centre for Evidence-Based Medicine, University Health Network, University of Toronto Libraries, (2004). *Practising EBM*. Retrieved May 8, 2007, from *Practising EBM: Formulating Answerable Clinical Questions* Web site: http://www.cebm.utoronto.ca/practise/formulate/

University of Washington Health Sciences Libraries, (1994-2007). Construct Well-Built Clinical Questions Using PICO. Retrieved May 9, 2007, from HealthLinks, Toolkits, Care Provider, Evidence Based Practice Web site: http://healthlinks.washington.edu/ebp/pico.html

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PICO Worksheet

Name: _____ **Date:** _____

Clinical Question:

Select Study category: therapy   diagnosis   harm   prognosis

PICO

Patient, population, or problem being addressed
        What are the characteristics of the patient or population?
        What is the condition or disease?

Intervention being considered which could include:
        exposure, diagnostic test, prognostic factor, therapy, patient perception
        What do you want to do with this patient? Treat, diagnose, observe?

Comparison intervention or exposure
        Relevant most often when looking at therapy questions.
        What is the alternative to the intervention? Placebo, different drug, surgery?

Outcomes of interest
        What are the relevant clinical outcomes of interest to you and your patient?
        Morbidity, death, complications?

Focused, Well-Built Question:

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Search Question:

Databases:

1 ⟷ AND	2 ⟷ AND	3 ⟷ AND	4
↑ OR ↓			

Do you need... ?

subheadings

dates

limiters such as:

language

human or animal

age groups

publication types

journal subsets

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Student: _____   **Date:** _____

Instructor: _____

____   **1) Identify patient question (Set up PICO question format)**
        P (patient)_____
        I (intervention)_____
        C (comparison)_____
        O (outcome)_____
        (patient seen during Internal Medicine rotation and pre-approved by IM)

____   **2) Search strategy worksheet** - how to strategize a search question with subject concepts and Boolean logic

____   **3)**   ____ a) DynaMed   ____ e) www.guideline.gov

                 ____ b) ACP PIER©   ____ f) www.medlineplus.gov

                 ____ c) Essential Evidence Plus   ____ g) Gold Rush

                 ____ d) First Consult

____   **4)   Foundations of searching PubMed (Hands-on):**

         ____   MeSH

         ____   Boolean Logic   (AND OR)

         ____   Subheadings

         ____   Explode feature

         ____   MeSH vs. Major topic

         ____   Limits and Advanced Search

         ____   Publication Types, MeSH Terms, Substances, Grant Support

         ____   Abstract format

         ____   Clipboard

         ____   E-mail

         ____   Full-text icons

         ____   Type of Article; Subsets: Systematic Reviews

         ____   My NCBI (set up Search Filters)

         ____   Export (Brief Intro to RefWorks)

____   **5) Mobile Devices:** PubMed links – (e.g. PICO, WISER)

____   **6) Print Hand-outs:**

         ____ a) EXAM MASTER™   ____ b) MICROMEDEX®   ____ c) MedlinePlus

         ____ d) Medical Resources for Mobile Devices   ____ e) RefWorks

         ____ f) SpringerImages

____   **7) Instructor Evaluation Form**

Student:_____   **Date:_____**

Internal Medicine OSCE

EBM Station Student pages

Scenario (Describe your patient/disease process here)

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Student:_____   **Date:_____**

1. ASK an answerable question

PICO

       Patient/Problem/Population

       Intervention

       Comparison

       Outcome

2. ACQUIRE   **(Remember to answer all parts of multipart question during the exam)**

Check which resources used (Please use at least 2 databases, NOTE where you did not find info)

    ACP Pier_____   Dynamed_____   Essential Evidence Plus (EE+)_____   First Consult_____

    Guideline.gov_____   PubMed_____   PubMed's Clinical Queries_____   MedlinePlus_____

1) Resource used:_____>term(s) used_____

Citation or specific info_____

2) Resource used:_____>term(s) used_____

Citation or specific info_____

3) Resource used:_____>term(s) used_____

Citation or specific info_____

4) Resource used:_____>term(s) used_____

Citation or specific info_____

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Student:_____   Date:_____

5) If you use PubMed   Your search strategy

Limits used

PMID, Source(s) or citation(s) Attach if you want

3) APPRAISE: Which database(s) was most beneficial in answering your question. Why?

Does/do the source(s) answer the question?

4) APPLY the evidence to the patient

Explain to the librarian in your own words how this info is pertinent to your case. (1-2 sentences ONLY)

Internal Medicine OSCE

EBM Station Student pages

(How to Use)

Scenario (Describe your patient/disease process here)

My 15 year old daughter is very interested in playing club soccer in the summer and also playing with the Varsity team in her high school during the school year. It seems that many adolescent female soccer players are tearing their knees with anterior cruciate ligament (ACL) tears as well as other knee injuries.

What preventive measures can be taken to prevent such injuries?

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1. ASK an answerable question   PICO

Patient/Problem/Population   Adolescent female soccer players

Intervention   preventive strength training

Comparison   no training

Outcome   less injuries

2. ACQUIRE (Remember to answer all parts of multipart questions during the exam)

Check resources used (Please use at least 2 databases, note where you did not find info)

ACP Pier___0____ Dynamed___+_____ Essential Evidence Plus (EE+)____+____ First Consult_____

Guideline.gov_____ PubMed_____ PubMed's Clinical Queries_____ MedlinePlus_____

1) Resource used:_____Dynamed_____>term(s) used_____ACL injuries ___

>information found__YES___Citation or specific info:

plyometric exercises may reduce rate of ACL injury in female athletes (level 2 [mid-level] evidence)

Knee Surg Sports Traumatol Arthrosc. 2010 Jun;18(6):824-30. Epub 2009 Sep 4.

A meta-analysis of the effect of neuromuscular training on the prevention of the anterior cruciate ligament injury in female athletes.

Yoo JH, Lim BO, Ha M, Lee SW, Oh SJ, Lee YS, Kim JG.

PMID: 19760399 [PubMed - in process]

physical exercise program plus education about injury risk may prevent soccer-related knee injuries in teenage girls (level 2 [mid-level] evidence)
Arch Intern Med 2010 Jan 11;170(1):43

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Arch Intern Med. 2010 Jan 11;170(1):43-9.

Prevention of soccer-related knee injuries in teenaged girls.

Kiani A, Hellquist E, Ahlqvist K, Gedeborg R, Michaëlsson K, Byberg L.

Case-Control, Intervention Studies

2) Resource used:_ _____EE+_____>term(s) used___Anterior Cruciate ligament injury

> **>information found____YES_____ Citation or specific info_____**

Kiani A, Hellquist E, Ahlqvist K, Gedeborg R, Michaëlsson K, Byberg L. Prevention of soccer-related knee injuries in teenaged girls. Arch Intern Med 2010;170(1):43-49.

Study design: Non-randomized controlled trial

3) If you use PubMed: Your search strategy (MeSH terms used)

Search History				▲
Search	**Most Recent Queries**		**Time**	**Result**
#39	Search "Anterior Cruciate Ligament/injuries"[Majr] AND "Soccer"[Mesh] Limits: Female, Meta-Analysis, Practice Guideline, Randomized Controlled Trial, Review, Adolescent: 13-18 years		16:03:46	3
#38	Search "Anterior Cruciate Ligament/injuries"[Majr] AND "Soccer"[Mesh] Limits: Female, Adolescent: 13-18 years		16:03:14	17
#37	Search "Anterior Cruciate Ligament/injuries"[Majr] AND "Soccer"[Mesh]		16:03:02	81
#36	Search "Anterior Cruciate Ligament/injuries"[Majr] AND "Soccer"[Mesh] Limits: Review, published in the last 5 years		16:03:02	6

Limits used: see above

PMID, Source(s) or citation(s) Attach if you want

Am J Sports Med. 2009 Mar;37(3):495-505.

Influence of age, sex, technique, and exercise program on movement patterns after an anterior cruciate ligament injury prevention program in youth soccer players.

DiStefano LJ, Padua DA, DiStefano MJ, Marshall SW.
University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA.
Randomized Controlled Trial

3) APPRAISE: Which database(s) was most beneficial in answering your question. Why?

I really like the organization of information in Dynamed. The prevention section had 3 articles that were directly related to preventing injuries in my patient. One of the articles listed specific kinds of exercises as well as those that do not help prevention of ACL injuries in the adolescent female population.

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4) APPLY the evidence to the patient

Explain to the librarian in your own words how this info is pertinent to your case.

(1-2 sentences ONLY)

Specific exercises were listed that were beneficial to my patient. I can now give the mom and her daughter appropriate exercises to prevent injury of this young female athlete.

Internal Medicine OSCE
EBM Station Grading Sheet

Student: _____

Date: _____

TOTAL POINTS EARNED: _____

1. **ASK** **an answerable question**
   Patient/Problem/Population **=**

   Intervention **=**

   Comparison **=**

   Outcome **=**

   (possible 10 pts.) _____

2. **ACQUIRE:** **Did the student use an appropriate resource to search for evidence?**
   a. Database(s) used:

   b. Search strategy used

   c. Extra points for correct use of MeSH, Limits, filters, complex Boolean

   (possible 40 pts.) _____

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Internal Medicine OSCE
EBM Station Grading Sheet

Student: _____

Date: _____

3. APPRAISE: Was an appropriate source of evidence obtained?
   a. Source or citation used:

   b. Relevance: Does the source answer the question?

   c. Currency: If a journal reference, does this reflect the most current evidence available?

   d. Validity: If a journal reference, was an appropriate study design used for the research?

   e. Level of evidence: Strong or weak?

                                                                (possible 30 pts.) _____

4. APPLY: Did the student correctly interpret and apply the evidence to the patient?
   a. Interpretation of the evidence:

   b. Application of the evidence to the patient:

                                                                (possible 20 pts.) _____

Evaluator: _____   JRice7-13-07

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**Template for Small Group Discussions at
CDIM Workshop**
2010 CDIM National Meeting
(part of Academic Internal Medicine Week)
A Multi-Faceted Approach to EBM OSCE Instruction

Where is your institution in this process now? (Have librarian input in OSCE,
Don't have, Are interested in having, Don't need it…)

Goal/Idea: (Description of course, students to be taught, group or
individual teaching sessions)

Persons to contact: (to teach the classes, will you need more than one teacher, why do
you need more than one teacher)

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Persons/Departments to contact: (to set up a new class for your organization)

Resources needed: (Databases, Handouts, what expertise is needed)

Facilities/Locations: (For each section of the class and what equipment is needed in each location)

TIME: (How much time; when should training be given, how long etc)

How to evaluate student performance: (pass/fail, grades, ?)

How to assess class? (evaluation, survey, etc.)

9/17/10

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Selected Resources

Greenhalgh, T., & Donald, A. (2000). *Evidence based health care workbook: understanding research for individual and group learning*. London: BMJ Books.

Heneghan, C., & Badenoch, D. (2006). *Evidence-based medicine toolkit*. Malden, Mass.: BMJ Books/Blackwell Pub.

Straus, S. E., Richardson, W. S., Glasziou, P., & Haynes, R. B. (2005). *Evidence-based medicine: how to practice and teach EBM*. Edinburgh: Elsevier/Churchill Livingstone.

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