Integration of Evidence Based Inquiry and Research (EBIR) into the LSI Curriculum
An Overview

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EBIR Learning Objectives

1) Define EBIR
2) Identify the 4 components of EBIR in LSI
3) Describe the role that patient care has in generating research questions
4) Describe the critical role of scientific discovery in advancing clinical practice
5) Describe the basis for EBIR in physician training
6) List research literacy skills acquired through research training which are included in the research advanced competency
Topics

1. Rationale for EBIR in LSI:
   • LCME ED-17A
2. LSI, EBIR Team & Philosophy
3. The Patient Care & EBIR Continuum
4. EBIR 4 Key Components
5. Competencies in Clinical & Translational Research
6. EBIR in Pts 1, 2, and 3 of LSI
7. Advanced Competency in Research
8. EBIR Pt 1 Content

Liaison Committee on Medical Education
LCME ED-17A

ED-17-A. The curriculum of a medical education program must introduce medical students to the basic scientific and ethical principles of clinical and translational research, including the ways in which such research is conducted, evaluated, explained to patients, and applied to patient care.
The EBIR Team

- Co-Chair, Ginny L. Bumgardner MD PhD
- Co-Chair, John Davis PhD MD
- Courtney Lynch PhD MPH
- Stephanie Schulte, MLIS
- Carol Powel Librarian (ret)
- Troy Schafernocker MD
- Ad hoc Faculty
- Medical Student Focus Groups

OSU EBIR Team Philosophy

EBIR: Why? & Who?
- Clinical encounters should lead to important research questions
- Scientific discoveries (including new research tools) should be applied to important clinical questions
- Biomedical Research contributes to existing evidence-based clinical care
- Patient participation in research through clinical trials offers patients advanced treatment opportunities
- Patients expect physicians and other caregivers to lead research which will improve health
- Development of critical thinking skills is necessary for physicians to become successful lifelong learners, even if they never wish to perform research themselves
The Continuum of Patient Care & Evidence Based Inquiry & Research

EBIR and Physician Training
Problem Solving

Health-----Disease-----Intervention-----Outcome & Assessment

In the new LSI……

- Ask Important Health Related Questions ↔ Inquiry
- Critical analysis of the Status Quo ↔ Literature review
- Learn how to Develop an Action Plan to Answer the Question ↔ Research Plan/Design
- Action (Intervention/Research) ↔ Methods
- Analyze the Results of the Action Plan ↔ Critique
- Communicate the Conclusions ↔ Publications, Presentations
EBIR 4 Components

**EBIR**

1. **Inquiry**
   - Analytical Approach to the Biomedical Literature

2. **Epidemiology/Biostatistics**
   - Analytical Approach to the Biomedical Literature

3. **Research Ethics**

4. **Research Literacy: Mentored Research Project**
   - Hypothesis Development
   - Research Design
   - Data Analysis
   - Science Presentation/Writing

**LSI**

- LSI Part I, Year 1
- LSI Part I, Year 2
- LSI Part II, Year 3
- LSI Part I, Year 1
- Summer Research Experience between Year 1 and 2
- LSI Part III, Year 4, Research Advanced Competency
- 1 year LOA (Yr 2/3, Yr 3/4)
- Part-time throughout Years 1-4

Competencies in Clinical & Translational Research

**Inquiry**

I. **Clinical & Translational Research Questions:** Identify major clinical/public health problems and relevant translational research questions

II. **Literature Critique:** Identify/interpret/critique literature/assess state of knowledge regarding problem

III. **Study Design:** Design and write protocol for clinical/translational research study for peer review

IV. **Research Implementation:** Study Methods/Design/Implementation

V. **Sources of Error:** Laboratory, Clinical and Population Research Methods

**Epi/Biostats**

VI. **Statistical Methods & Analysis**

VII. **Biomedical Informatics**
Competencies in Clinical & Translational Research

VIII. Conduct of Ethically Responsible Research
IX. Scientific Communication
X. Cultural Diversity
XI. Translational Teamwork
XII. Leadership (including mentorship)
XIII. Cross-disciplinary Training
XIV. Community Engagement

EBIR in Year 1, LSI Part I

- EBIR Overview (8.24.16)
- EBIR: Screening & Diagnostic Tests 8/10
- EBIR: Disease Frequency 8/24
- EBIR: Describing Data 9/7
- Intro to Inquiry
- EBIR: Principles of Study Design 9/27
- EBIR: Study Design - Observational Designs Cohort Studies 9/27
- EBIR: Describing Data II 9/29
- EBIR: Introduction to Survival Analysis 10/10
- CITI Research Ethics Training 9/30
EBIR in Year 1, LSI Part I

- Inquiry: Searching the literature for evidence
- Epi/Biostats: Describing Data II
- Epi/Biostats: Cohort Studies
- Epi/Biostats: Case-Control Studies
- EBIR Team-Based Learning
- Epi/Biostats: Interpreting Survival Curves

Year 3: LSI Part II and EBIR extensions

*in small group discussions, inpatient/outpatient rounds, journal clubs, specialty specific seminars*

- Clinical Syndrome
  - Gi Bleeding: Symptoms, Physical Exam, Evaluation, Diagnosis, Treatment Options
  - Etiology of the Gi Bleed...Peptic Ulcer Disease...H pylori

**EBIR Extension:**
- Discovery of H pylori----→ Koch’s postulates, Standard of care, Nobel Prize 2005
- Current research on H pylori, mutagenesis, carcinogenesis, H pylori genetic evolution and host/microbe interactions
- Current research on H pylori and immunity
Year 4: LSI Part III
Advanced Competency in Research

- Research Literacy: Mentored Research Project
  - Background, Unanswered Question & Significance
  - Hypothesis Development
  - Research Design
  - Experimental Methods
  - Data Analysis
  - Science Oral Presentation
  - Scientific Writing
    - Publication
    - Research Grant Awards
  - Scientific Interactions in Lab Meetings, Seminars, National Meetings (Debate & Critical Thinking)
  - Team Interactions & Collaboration
  - Awareness and Integration of Ethical Conduct of Research

Potential Timing of Research Experiences

- Med VI Advanced Competency in Research
  - Leave of Absence for year long research experience (LOA)

- Med III
  - Leave of Absence for year long research experience or
  - Year Long part time research project (LOA)

- Med II
  - Summer Research Project 8-10 weeks

- Med I
1. Quality clinical care should be informed by biomedical research.

2. Clinically important problems should stimulate biomedical research.

3. The appropriate use of clinical tests/algorithms can improve patient care and outcomes, but requires an appreciation of the context and limitations of the research on which they are based.

4. The value of biomedical research to society relies on the application of high ethical and professional standards to the responsible conduct of biomedical research.

5. Research literacy is integral to the development of all physicians as lifelong learners.

6. Independent scholarly work in evidence based inquiry and biomedical research is an important mechanism to develop critical thinking skills and establish a foundation for future growth and career development.

7. Given the interrelatedness and complexity of human disease, advances in modern biomedical research and evidence-based clinical care require physicians with mastery of multidisciplinary, collaborative, team-based skills.
What’s Next?
*Exploring Medical Research in the Summer*
How to Prepare a Research Scholarship Application to Fund your Research Experience
September 16th, 2016
LSI Module

*Medical Student Research Opportunities Fair*
Monday October 17th, 2016
5:00 - 6:30 pm
115 Biomedical Research Tower

*MDSRS Research Symposium*
Monday October 31st, 2016
115 Biomedical Research Tower
Medical Student Research Handbook

http://medicine.osu.edu/go/mdsr

Questions?