

## What Health-Professionals Should Know About Research and Why They Should Know It

Bill Galey

Director of Graduate and Medical Education Programs  
Howard Hughes Medical Institute  
and  
Professor Emeritus University of New Mexico School of Medicine

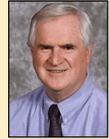


IAMSE Web Seminar  
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Opinions expressed are my own and don't necessarily represent the position of HHMI.

## Scientific Foundations for Future Physicians



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The 2009 report

- Established **Competencies** as the goal of medical education
- Established 8 Competencies and associated Learning Objectives for science education of
  - Graduating Physicians (M1-8)
  - Students entering medical school (E1-8)
- Established “**11 Overarching Principles**” for medical Science education



### SFFP

#### “Overarching Principles”

5. “Effective problem solving and the ability to evaluate competing claims in the medical literature and by those in medical industries depend on the acquisition, understanding and application of scientific knowledge and scientific reasoning based on knowledge.”



### SFFP

#### Overarching Principles

6. “It is essential not only to **read the medical and scientific literature** of one’s discipline, but to **examine it critically** to achieve lifelong learning. These activities require knowledge and skills in critical analysis, statistical inference and experimental design.”

## ACGME\* “Core Competencies”

### MEDICAL KNOWLEDGE

Residents must demonstrate knowledge about established and evolving biomedical, clinical, and cognate sciences and the application of this knowledge to patient care. Residents are expected to:

- Demonstrate an investigatory and analytic thinking approach to clinical situations.

### PRACTICE-BASED LEARNING AND 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:

- Locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems.
- Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.

\*Accreditation Council for Graduate Medical Education 1999

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5. To support ones continuing self-education

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9. To appreciate the difference between “correlations” and “cause and effect” relationships

### What do Medical Professionals need to learn about experimental research?

- What is a testable hypothesis?
- How does one design experiments to test a hypothesis?
- What are appropriate controls and methodologies?
- What are confounding factors and uncontrolled variables?
- What are the appropriate analytical & statistical approaches to evaluate a given set of data?
- Are the conclusions of the authors justified by the data?
- What is the statistical strength of the results?
- What do the results mean for patient care?

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An Example:  
What students should know  
to

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5. **Who sponsored the research?**

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10. **What do other “professionals” in the field think?**

Gaining the needed competencies

### **HOW CAN STUDENTS LEARN WHAT THEY NEED TO KNOW ABOUT RESEARCH?**

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- By doing research!
- **Others?**

### Summary

- It is evident that Health Professionals need to be able to read, understand, interpret, communicate and apply research.
- We know the competencies they must obtain.
- We know many venues and ways the learner can obtain the needed experiences and learning opportunities.

### Our Challenge:

to ensure that curricular elements exist to provide the needed learning opportunities to all medical professionals during their training!

# Thank You!

I'm happy to answer your questions  
and to hear your ideas!

Bill Galey