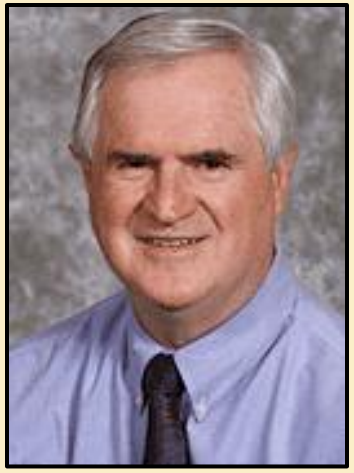
What Health-Professionals Should Know About Research and Why They Should Know It



Bill Galey
Director of Graduate and Medical Education Programs
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and
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IAMSE Web Seminar
January 10, 2013

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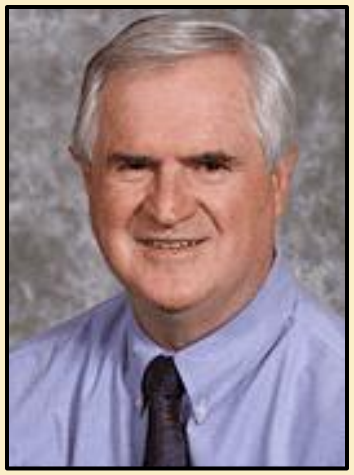

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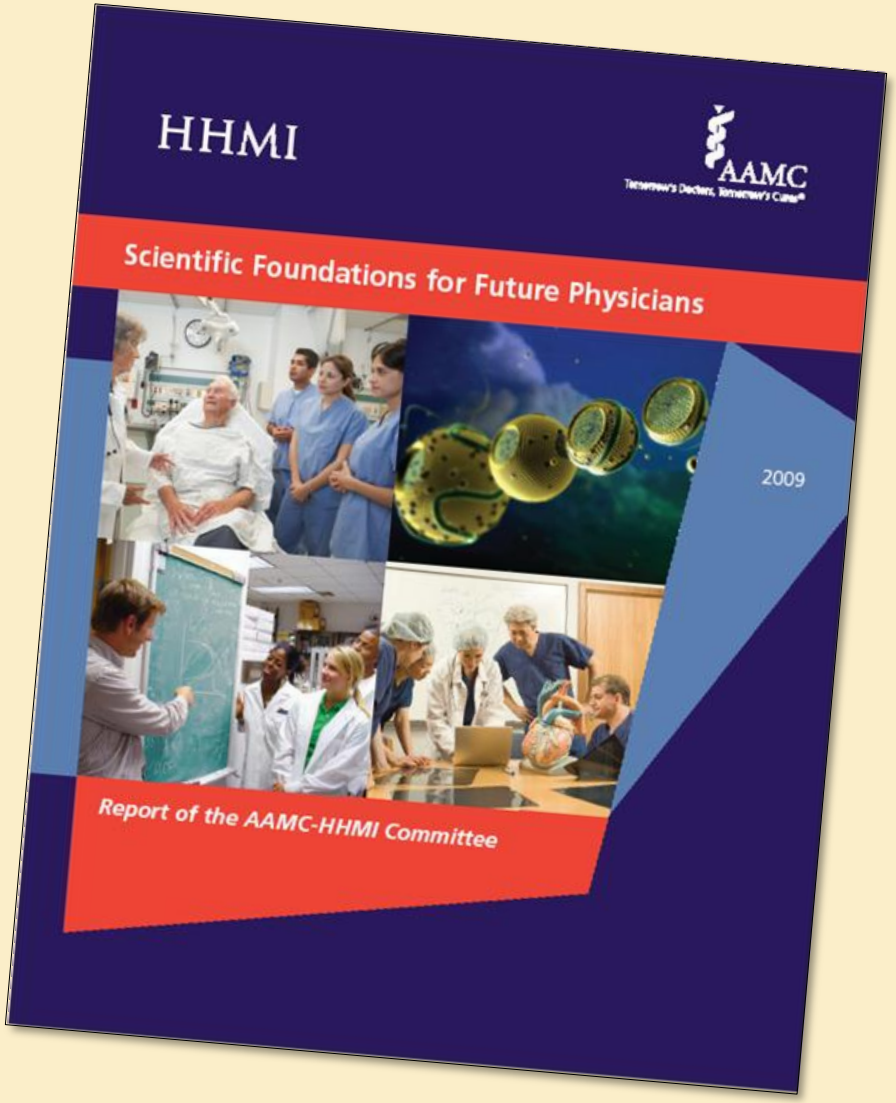
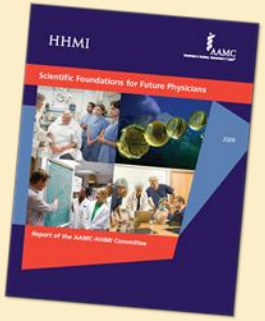
Scientific Foundations for Future Physicians



Scientific Foundations for Future Physicians

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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- **To evaluate the quality of a research publication**

An Example:

What students should know

to

EVALUATE THE QUALITY OF A PUBLICATION

HEALTH NEWS

Fathers can influence teens' sexual behavior, researchers say

BY KAREN ROWAN
MyHealthNewsDaily

Fathers' attitudes toward teen sex and the emotional closeness of their relationship with their teens have a sizable influence on their teens' sexual behavior, separate from the influence of moms, a new review of studies suggests.

The review showed that dads' attitudes toward teen sexual behavior were linked to the age at which teens first had sex. Teens whose dads approved of adolescent sexual activity tended to start having sex earlier than teens whose dads did not approve, according to studies in the review.

In addition, teens who were close to their fathers tended to start having sex later, the studies showed.

The findings "suggest that fathers may distinctly influence the sexual behavior of their adolescent children," said study researcher Vincent Guilamo-Ramos, a professor of social work at New York University. "Fathers may parent in ways that differ from mothers, and therefore represent an additional opportunity to support adolescent health and well-being," he said.

A better understanding of the role dads play in their teens' sexual behavior and reproductive health could help researchers identify which parenting practices have the biggest impact on teens and lead to better intervention strategies that include both moms and dads, the researchers said.

A 2011 survey by the Centers for Disease Control and Prevention showed that 47 percent of high school students had ever had intercourse and 40 percent of those who were sexually active did not use a condom when they last had sex.

Previous studies have linked positive parent-teen relationships with teens' sexual behavior. For example, researchers have shown that parents who monitor and discipline their teens and communicate with them reduce the risk of their teens' being involved in sexually risky behaviors.

"Evidence increasingly suggests that mothers and fathers independently shape areas of child development, such as academic success and peer relationships," the researchers wrote in the study, published last week in the journal Pediatrics.

This article can be read in its entirety at *myhealthnewsdaily.com*.

HEALTH SCAN

BREAST CANCER

Do all those 'cure' walks really help?

"PINK RIBBON BLUES: HOW BREAST CANCER CULTURE UNDERMINES WOMEN'S HEALTH," BY GAYLE A. SULIK

Do pink ribbons undermine the women's health movement? Gayle Sulik, a medical sociologist, thinks so. In "Pink Ribbon Blues," a 2010 book that was updated and re-released this month, Sulik says that the movement surrounding the breast cancer cause isn't actually doing much to help eradicate the disease, and that some money for the "cure" effort comes from companies that add to a more carcinogenic environment. Sulik examines advertisements, walks "for the cure" and awareness campaigns, and includes interviews with those affected by the disease. "As the inner workings of pink culture and industry become more visible, largely through the misconduct of breast cancer charities and profit-driven indus-

CONSUMER REPORTS INSIGHTS

Add a healthy dose of skepticism

Health reporting often follows an all-too-familiar pattern: New drugs or therapies are introduced with glowing accounts, followed a few years later by headlines warning about their dangers. Some people react to that uncertainty by dismissing all health and medical news, while others overreact by adopting — or abandoning — strategies too soon. ¶ Part of the confusion stems from the normal unfolding of scientific knowledge, which is constantly evolving as new evidence adds to the existing body of research. But fault also lies in the way that medical research is published and pushed through the media, creating a broken system that has tremendous potential to harm consumers, says Gary Schwitzer, publisher of HealthNewsReview.org, a watchdog Web site that tracks the quality of health reports.

The following checklist will help you sift through the rubble of medical news you find online, on TV and in print.

● **Check the background.** Was the study published? If you don't see the name of a peer-reviewed medical journal and a publication date in an article, either pass or take the findings as preliminary. The journalist might be covering early research that is often presented at medical conferences. Such presentations aren't peer-reviewed, and the findings might change if or when they are published.

● **Who paid for it?** Health-care research is rife with potential conflicts of interest. Pharmaceutical firms have provided almost 60 percent of all biomedical research funding in the United States, raising questions about the integrity of some drug studies. In January 2007, the online journal PLoS published an analysis of nutrition studies involving soft drinks, juice or milk; it found that more than half had industry funding. More important, the studies' conclusions directly correlated with who funded them.

● **What's the context?** A single study seldom constitutes strong evidence of anything and is even more rarely considered a clinical game changer. Instead, new conclusions should be presented in the context of what is already out there. Does the finding support existing evidence? Suggest a new benefit that warrants investigation? Raise safety concerns that earlier studies didn't? Knowing where the new research fits in the body of existing data can help you decide what to make of it.

ISTOCKPHOTO

● **Examine the methodology.** Was it a controlled clinical trial or an observational study? The gold standard in medical research is the double-blind, randomized, controlled clinical trial, in which subjects are randomly assigned to a control (placebo) or experimental (active drug, substance or therapy) group. Neither the subjects nor the researchers know who is in which group until the study ends. In general, the more people who are in a clinical trial — ideally, hundreds or even thousands — the more weight you can put on the findings.

Observational studies, in contrast, compare large populations of people and look for connections between their habits and behaviors and various health outcomes. Those studies can suggest a link — say, between eating blueberries and strong brain function, or laughing a lot and lower blood pressure — but can't prove a causal effect.

● **Did it address confounders?** That's the umbrella term for all of the other possible factors that might explain a study result. For example, research may find that the risk of lung cancer is higher in factory workers. But before the reporter or study's author pins the blame on the workplace, he or she must investigate the confounders, such as whether the workers were more likely than other people to smoke cigarettes.

● **How long was the study?** Studies done to gain approval for new drugs and devices can last for as little as a few weeks, and they rarely run more than a few months, which might not be long enough for potential risks to emerge.

● **Grade the journalism.** "More often than not, when we hear about new stuff, benefits are maximized and harms are minimized, and that is simply a bias and imbalance that we have to overcome," Schwitzer says. "If you are hearing a message that sounds too good to be true, it is, because there are always harms."

Don't rely on a single news report. Check whether other stories give details or perspectives that provide a fuller picture. Also, look for responses from governmental agencies and reputable organizations, which can often help gauge how seriously to take the news.

● **Determine what the news means.** Do the findings apply to you? Many drugs that show promise in the test-tube stage or in animal research don't turn out to be safe or effective in humans. And in human trials, some treatments are tested only in men or women, others only in young, healthy or sick people. So the less you resemble the subjects, the more reason to temper your enthusiasm.

● **Do you have access to the care that the study participants did?** Research on new medical treatments is often conducted by the best doctors in the best hospitals, skewing the results away from the average patient. Physicians at medical schools or large hospitals might have better equipment and training than your local doctor or medical center.

● **What does your doctor think?** Talk with your health-care provider about new treatments or other findings you've read about before rushing to judgment.

For further guidance, go to www.ConsumerReports.org/Health, where more detailed information, including

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

Gaining the needed competencies

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- **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