CASE STUDIES IN RESEARCH

OVERVIEW: The Case Studies in Research version of the Research-Based PME event allows host institutions to feature a selection of researchers who have conducted or are conducting notable medical research and convey information about medical research generally. Participants rotate through presentations from various researchers, discussing the specific projects, relating them back to the broad body of medical research, and weaving in the key topics below throughout the day.

OBJECTIVES:
- Explain how medical research is conducted and funded.
- Discuss the institutions and individuals involved in research and their roles.
- Describe the various funding sources of medical research.
- Discuss various career options for medical researchers and explain the training pipeline.
- Provide various examples of current vital medical research studies happening at your institution.

SUGGESTED PRESENTERS:
- Dean of research
- Hospital CEO or director of research
- Medical researchers
- Medical or MD-PhD students
- Research residents or fellows

SUGGESTED TIME: 1−1½ days

KEY TOPICS:
- Why is medical research important?
  - Medical research is the beginning of hope for millions of Americans suffering from debilitating diseases.
  - Medical researchers are working toward future cures and prevention methods and providing millions of Americans with a longer and higher-quality life.
  - Federally funded medical research accelerates local economies by spurring jobs and innovation.

- What are the different types of medical research?
  - Basic science research, which provides the foundation of knowledge for the applied science that follows.
  - Clinical research, which determines the safety and effectiveness of medications, devices, diagnostic products, and treatment regimens.

- o Community and population research, which characterizes, explains, and influences the levels and distributions of health within and across populations.
- o Health services research, which studies access and consumption of health care services, focusing on utilization, costs, quality, delivery, organization, financing, and outcomes.
- o Translational research, which applies findings from each type of research described above and "translates" it to the next stage (for example, from basic to clinical, from clinical to community, and from community to basic research).

- How do you become a researcher?
  - o Discuss institutional and national efforts to support new and early-stage investigators.
  - o Describe efforts to increase the diversity of the medical research workforce.
  - o Discuss the MD-PhD track curriculum.
  - o Explain the National Institute of General Medical Sciences (NIGMS) Medical Scientist Training Program (MSTP).
  - o Discuss the PhD track curriculum.
  - o Describe ways for an MD to become a researcher.
  - o Talk about postdoctoral training.
  - o Discuss the costs of an education in research.

- How is medical research funded?
  - o Much of medical research is funded through the National Institutes of Health (NIH), a federal agency within the Department of Health and Human Services.
    - Much of NIH-funded research does not occur at its Bethesda headquarters, but at research facilities across the country.
    - Half of all external research funded by the NIH is performed at teaching hospitals and medical schools nationwide. (Share examples of the research your institution conducts that is funded by NIH grants.)
  - o Other research is funded by the Department of Veterans Affairs (VA) or other federal agencies. (Share examples of the research your institution conducts that is funded by VA or other federal agency grants.)
  - o Research can also be funded by industry. (Discuss how your institution manages conflicts of interest, especially with regard to industry-funded research.)
  - o Discuss how your institution covers costs that are not covered by the NIH, VA, other agencies, or industry, how much that is, and what types of costs those tend to be.
  - o Explain the timeline for going from bedside to bench to community and how and where government funding occurs.

- What are the benefits of research for patient care and treatment?

- How does having a robust research enterprise enhance medical education?

- How does your institution work with potential beneficiaries of research to understand what outcomes matter to them?
  - Discuss how patient engagement is crucial to understand the outcomes that matter most to individuals and their families, who are affected directly by new drugs and devices.
  - Explain how community engagement can identify research questions that matter to area residents, health and health care needs that can be addressed through science, and community assets that can assist with the development, implementation, and evaluation of clinical and community-based interventions.
  - Explain how all research—from basic to clinical to population—can be conducted through a lens of health equity in order to describe avoidable and systematic group differences in health, understand why such gaps exists, and develop interventions that ensure that all Americans have the opportunity to attain their best possible health.

ACTIVITIES:
- Have medical researchers discuss projects in a laboratory setting. Encourage hands-on participation. For example, have participants look through microscopes, examine results, and conduct tests.

- Tour your institution's laboratories.

RECOMMENDATIONS:
- Encourage presenters to interact with participants. Make this a dynamic discussion, rather than a one-way flow of communication. Set this tone for the day early in the program by telling participants that you want the day to be a dialogue and inviting them to interrupt presenters to ask questions. Always attempt to make presentations more hands-on.

- When recruiting presenters, select those who have a history of effective communication with lay audiences. Most PME participants come from a background with little knowledge of medical science. Presenters should not assume that the audience has knowledge of basic medical concepts. Stay away from medical jargon. Coach presenters prior to the event and encourage them to be mindful of their audience when presenting.

- Prepare and distribute a list of significant medical discoveries or innovations in patient care from your institution. Focus on discoveries that directly affect patients or are easily understandable.

- If possible, avoid conducting labs or experiments involving animals. Medical schools and teaching hospitals closely adhere to high ethical standards when using animals in medical research; however, this is a controversial issue. If the program does expose participants to animal research, be sure to follow your institution's guidelines and to prepare for questions.

- If possible, avoid conducting labs or experiments involving fetal tissue or human embryonic stem cells (as opposed to adult stem cells or induced pluripotent stem cells) as well. Although these types of research are important to human medicine and are strictly controlled for ethical standards, they nevertheless remain controversial with some sectors of the public. The importance of such research can be demonstrated in other, topical forums.

- Describe the challenges in securing funding for this complex process and the necessity of forming research partnerships with private-sector businesses, as well as conflict-of-interest policies.

RESOURCES:

Medical Research (webpage)

Medical Research Funding and Regulation (webpage)

The Economic Impact of AAMC Medical Schools and Teaching Hospitals (2018) - Research (website)

Academic Medicine Investment in Medical Research (PDF)

Research Means Hope (website)

The Value of NIH-Funded Research at Medical Schools and Teaching Hospitals (infographic)