



Tomorrow's Doctors, Tomorrow's Cures

# The Physician Scientist Workforce: The Critical Role of Academic Medical Centers in the US

David Korn, M.D.  
Vice-Provost for Research  
Harvard University  
Professor of Pathology  
Harvard Medical School  
April 14, 2009

---

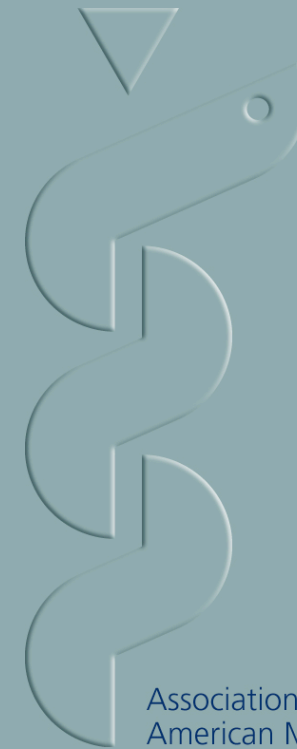
Learn

---

Serve

---

Lead



Association of  
American Medical Colleges

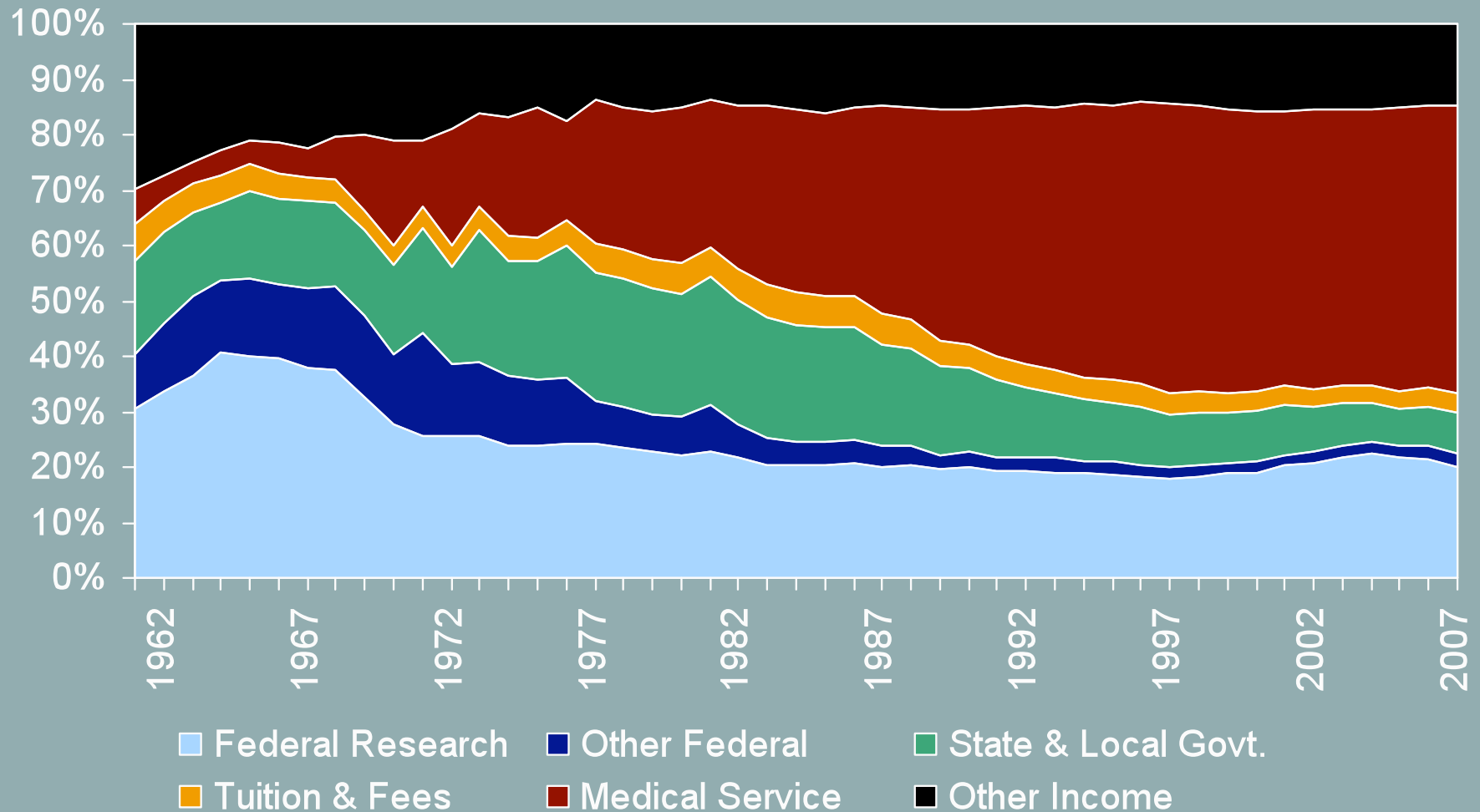
# Why a Critical Role?

- Medical Schools and Teaching Hospitals receive more than 55% of the total NIH extramural budget in competitive research and research training awards.
- Medical schools are the sole source of education of MD-PhDs.
- Medical schools educate more than 50% of the PhD research workforce in the life sciences.

# Why a Critical Role?

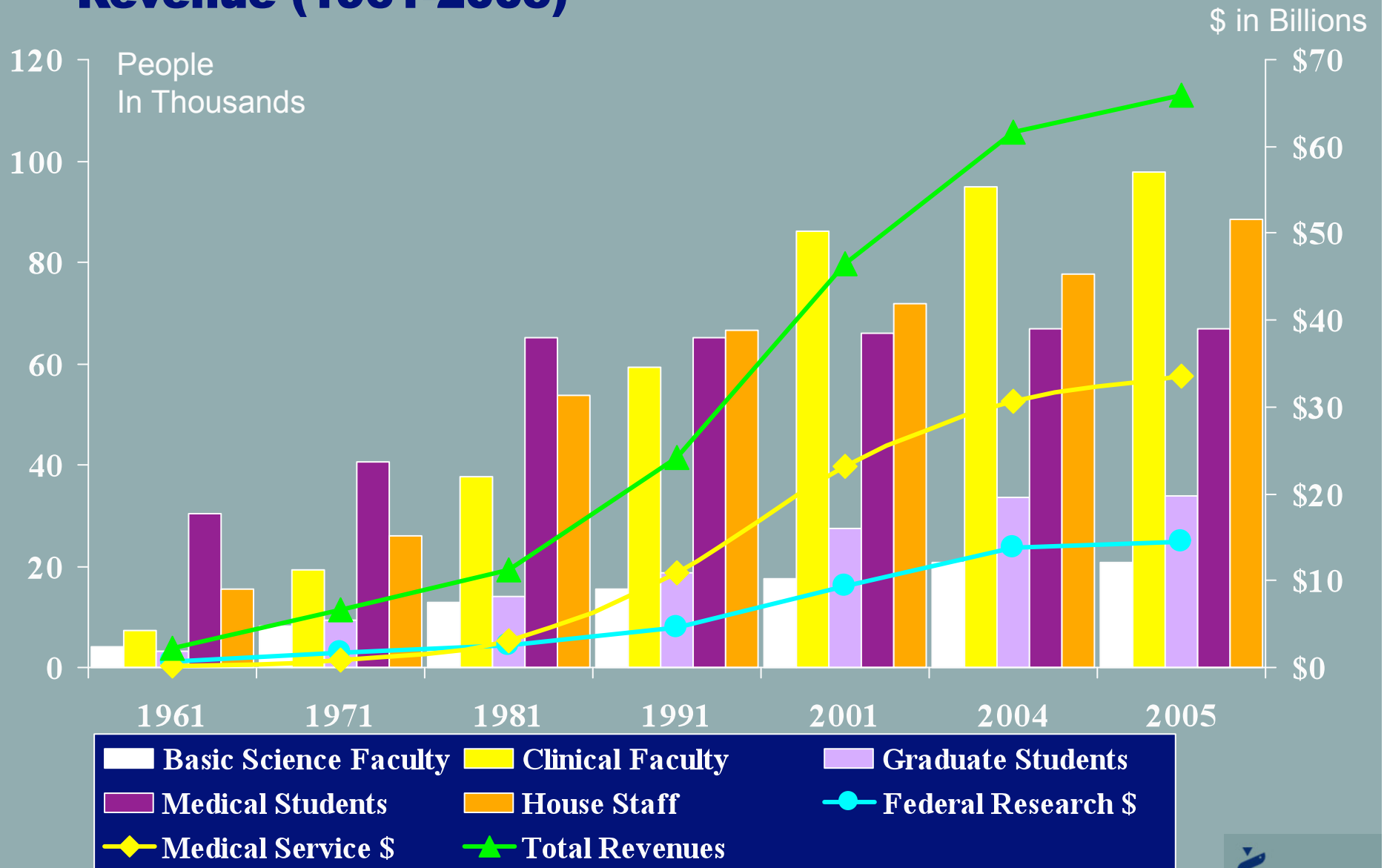
- The “ecology” of medical schools and teaching hospitals determines
  - The composition of the student body
  - The rigor of the scientific foundations of medical education
  - The exposure of medical students and residents to clinical research and researchers
  - Whether there is a supportive, indifferent, or hostile environment for C&T research

# U.S. Medical School Revenue and Expenditures as a Percent of Total Revenue, FY1961–FY2007



Source: LCME Part I-A Annual Financial Questionnaire (AFQ), FY1961–FY2007

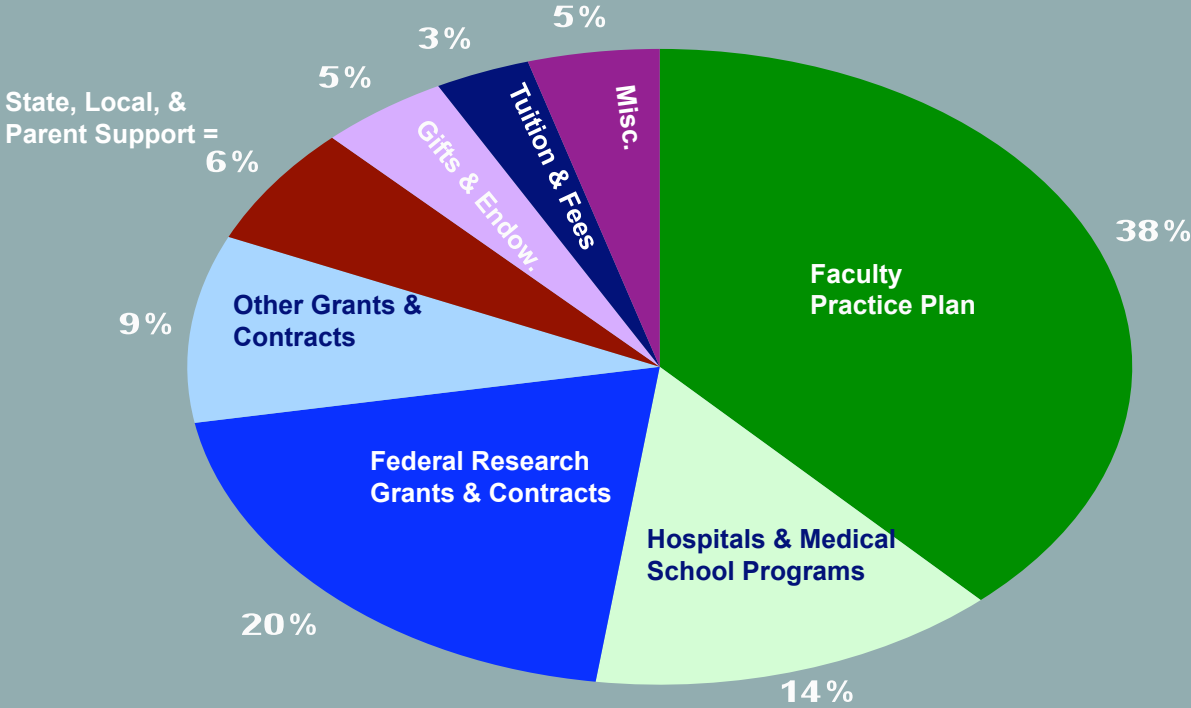
# Growth in Medical School Faculty, Students, and Revenue (1961-2005)



Source: AAMC Medical School Profile System



# Total Medical School Revenue by Source, FY2007



All Medical Schools (n=126)

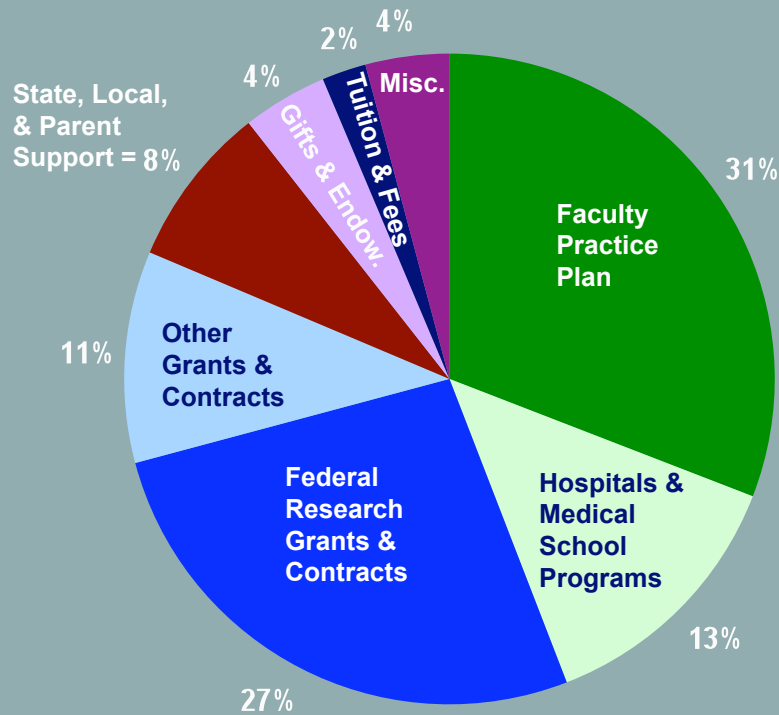
Median = \$407.8M

Source: LCME Part I-A Annual Financial Questionnaire (AFQ), FY2007  
\* Based on Direct Federal Research Grants and Contracts expenditures reported on the AFQ



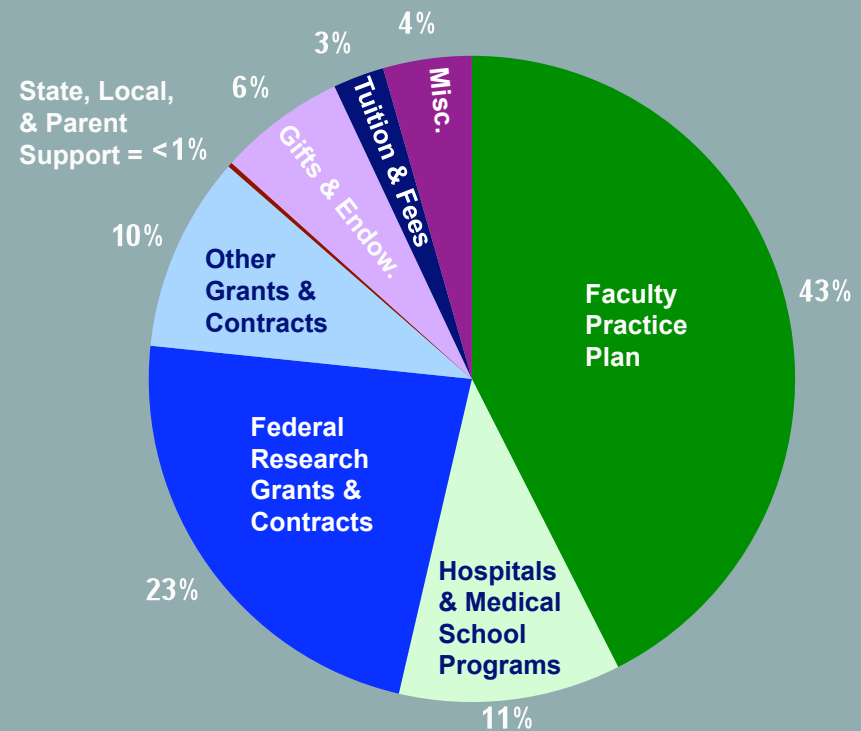
# Total Medical School Revenue by Source, FY2007

## Top 40 Research Intensive Medical Schools\*



Public Medical Schools (n=16)

Median = \$809.5M



Private Medical Schools (n=24)

Median = \$1,066.3M

Source: LCME Part I-A Annual Financial Questionnaire (AFQ), FY2007

\* Based on Direct Federal Research Grants and Contracts expenditures reported on the AFQ

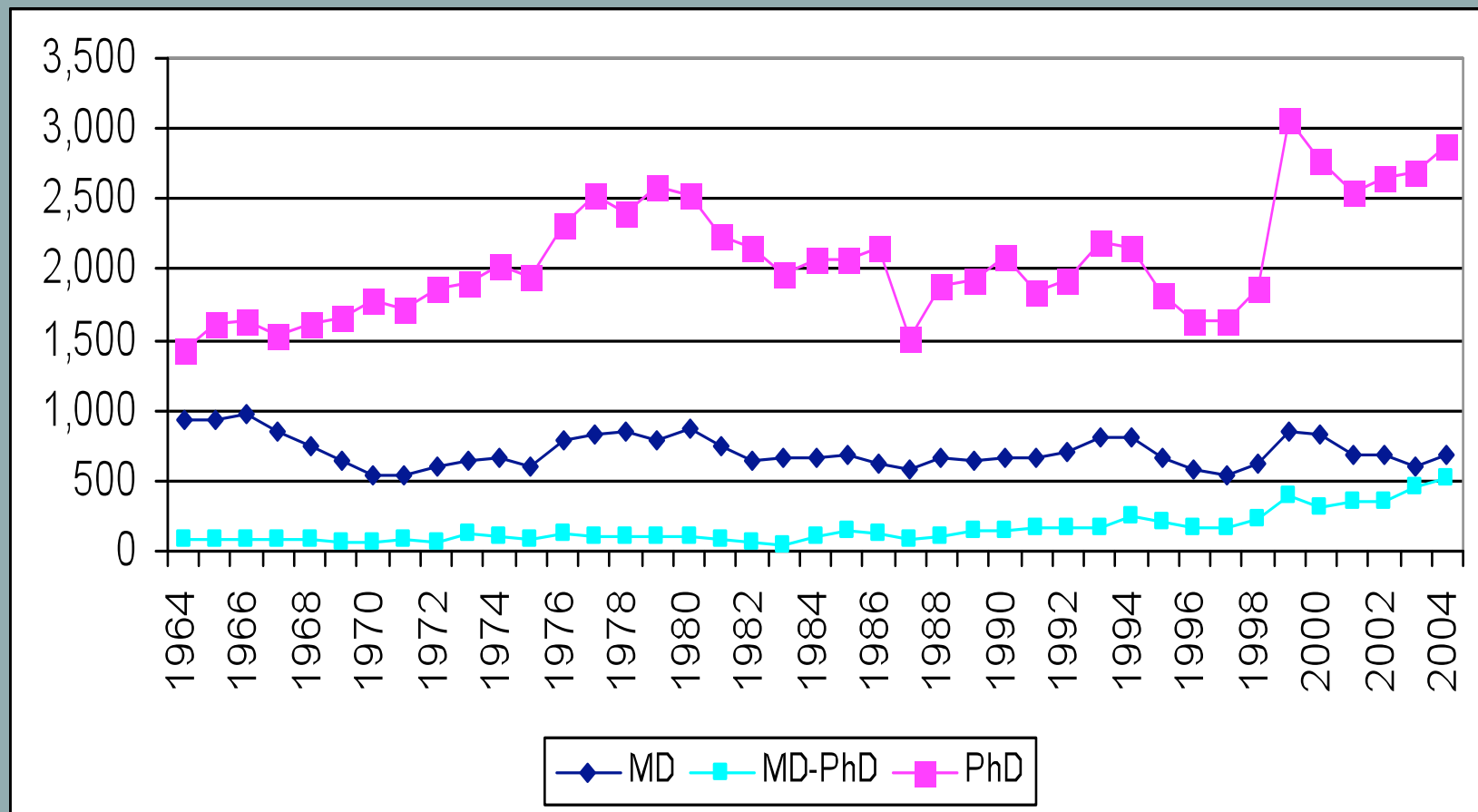
# Stresses and Strains on Academic Clinical Research

- Repeated warnings that physician clinical researchers are becoming an “endangered species,” *and even that*
- Physician Investigators will “disappear” from the NIH applicant pool

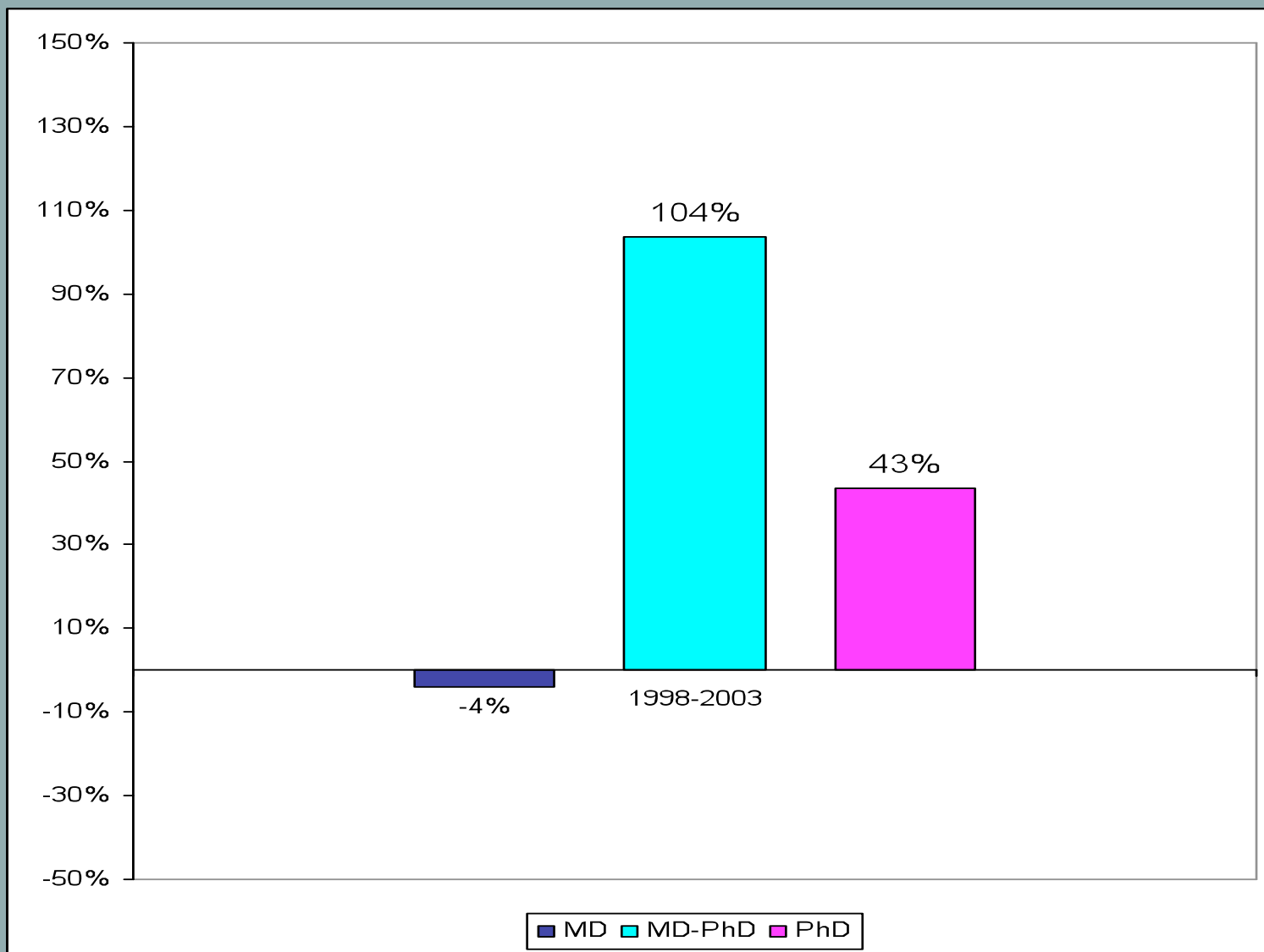
What’s the evidence?



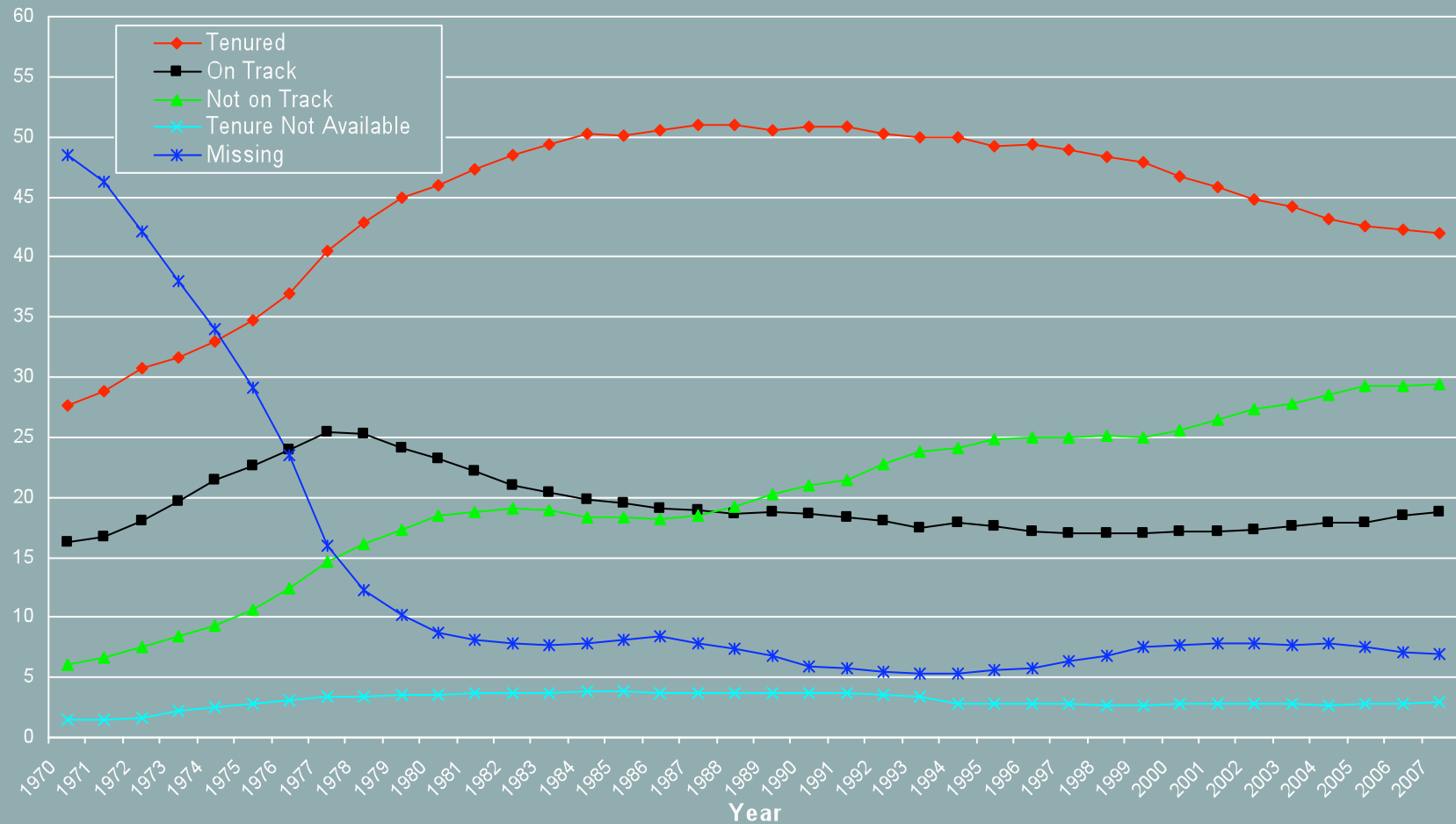
# Number of First-Time Applicants for R01 Grants, 1964-2004



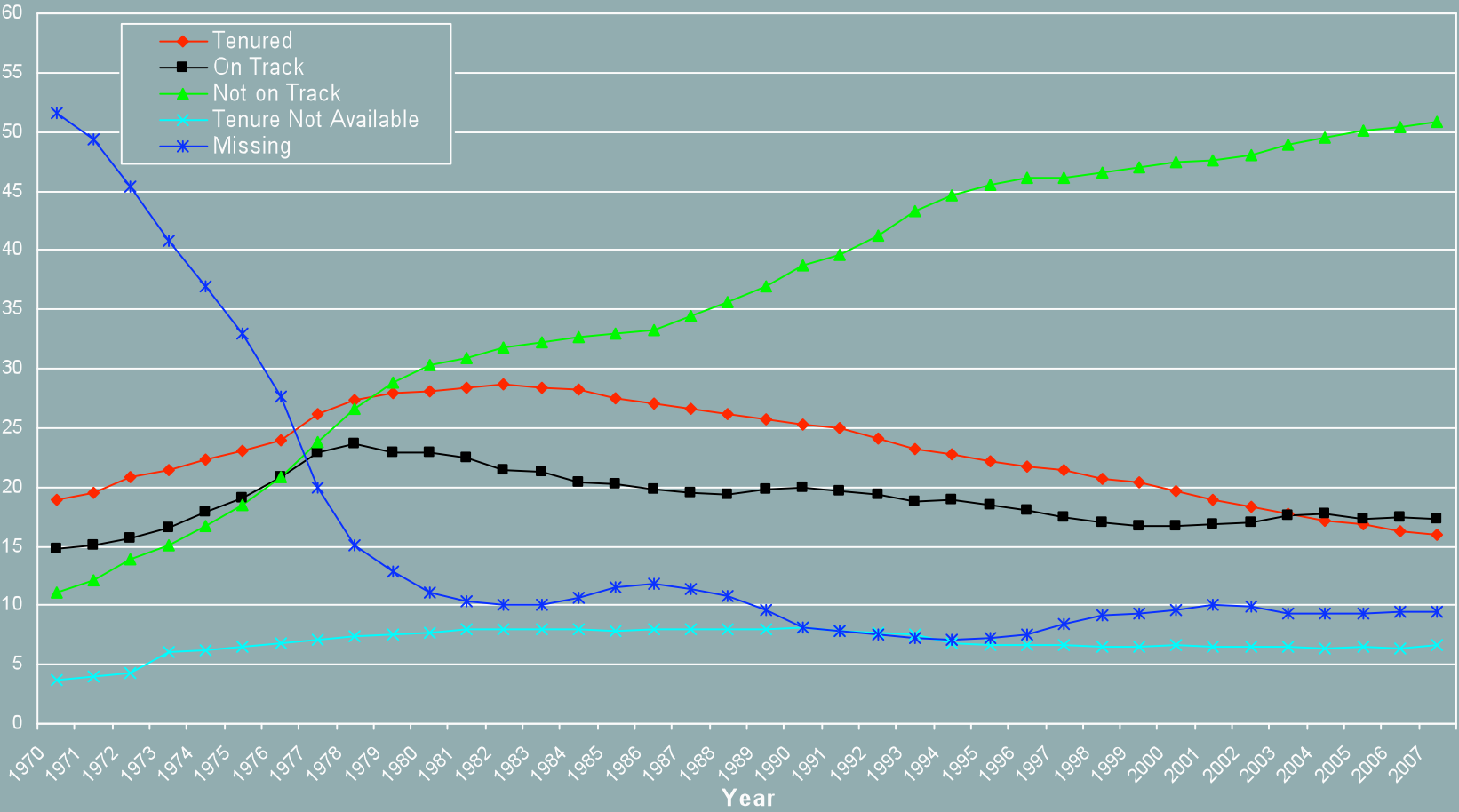
# Percentage Increase in Number of First-Time Applicants for R01s during NIH Doubling



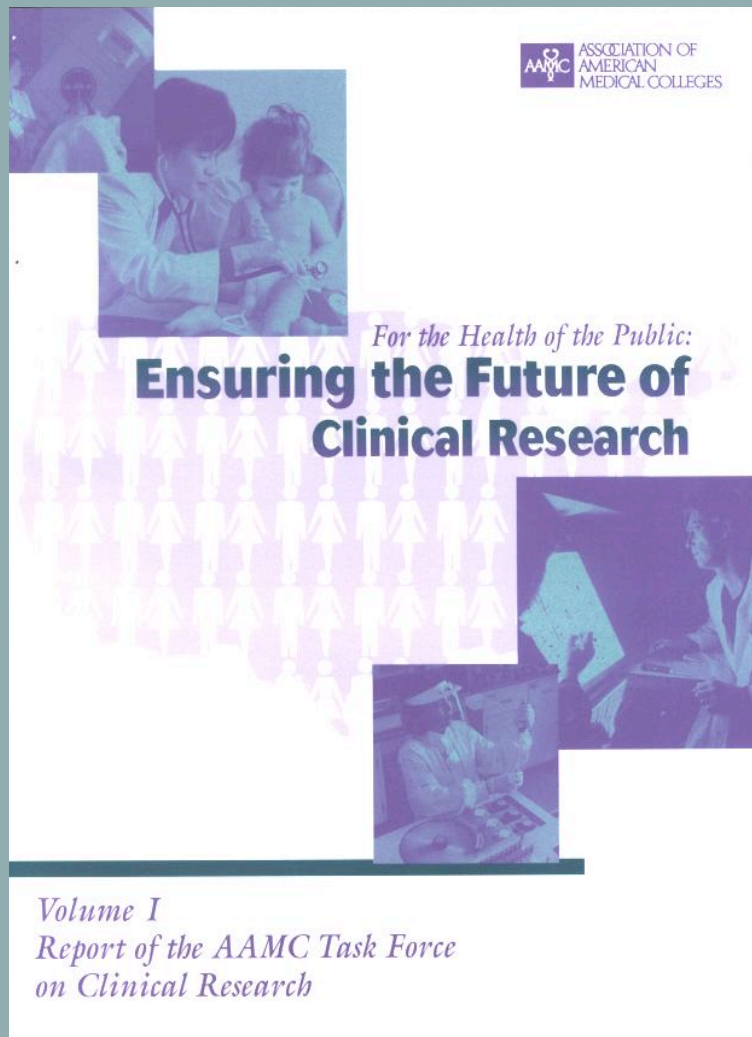
# Tenure Status as a Percent of all Full-time Basic Science Faculty, All Ranks and Degrees



# Tenure Status as a Percent of all Full-time Clinical Faculty, All Ranks and Degrees



# AAMC Task Force I on Clinical Research



- Convened Feb. 1998  
Report Jan. 2000

# 1. The Current State of Education and Training

- Medical schools and teaching hospitals need to develop a culture supportive of clinical research and transmit the excitement of clinical research to medical students, residents, and fellows.
- Clinical research training programs must define a rigorous set of competencies, skills, and knowledge-based requirements.
- Medical schools and teaching hospitals should develop model training programs and credentialing for clinicians who wish to participate in clinical trials.

## 2. The Optimal Infrastructure for Clinical Research

- The leadership of the medical school, the affiliated health system, and the university should engage in a strategic planning process for clinical research.
- Each medical school and teaching hospital should develop and provide focused resources and dedicated administrative support for clinical research.
- An effective, efficient, and responsive human subjects protection and compliance process must be in place and be well supported by the institution.

## Promoting Translational and Clinical Science: The Critical Role of Medical Schools and Teaching Hospitals

Report of the AAMC's Task Force II on Clinical Research





# **Goal of the Task Force**

**Make recommendations to medical schools and teaching hospitals on how best to recruit, train, nurture and sustain the next generation of translational and clinical physician-scientists**

# Recommendation 1

Every future physician should receive a thorough education in the basic principles of translational and clinical research, both in medical school and during residency training.

Sends clear signal that translational and clinical research are part of the core mission of academic medicine, and that understanding of translational and clinical research should be part of the core education of every physician.

*Why?*

# Recommendation 1

To equip future physicians to:

- be able to read their own literature with discernment and become active participants in realizing evidence based medical practice
- communicate with clinical researchers
- refer appropriate patients for screening for clinical trials
- explain translational and clinical research to patients in comprehensible language
- be powerful advocates for translational and clinical research

*To enhance opportunities for medical students to consider careers in translational and clinical research*

## Recommendation 2

The Liaison Committee on Medical Education (LCME) should add education in translational and clinical research to the requirements for medical school accreditation, and

The Accreditation Council for Graduate Medical Education (ACGME) should embed understanding of translational and clinical research within its required core competencies.

# Responses of the Accrediting Bodies

## New **LCME** Standard:

**The curriculum must introduce students to the basic principles of clinical and translational research, including how such research is conducted, evaluated, explained to patients, and applied to patient care.**

# Responses of the Accrediting Bodies

## New **ACGME** Common Program Requirement:

**The curriculum must advance residents' knowledge of the basic principles of research, including how research is conducted, evaluated, explained to patients, and applied to patient care.**

# **The AAMC-HHMI SFFP Project**

## **Scientific Foundation for Future Physicians**

# Recommendation 3

Training for translational and clinical investigators should comprise completion of an advanced degree with a thesis project (or an equivalent educational experience), tutelage by an appropriate mentor, and a substantive postdoctoral training experience.

- Increased complexity requires degree programs (Master's degree minimum, with core curriculum and mentored thesis)
- Additional 2-3 years of mentored, rigorous "postdoctoral" experience to:
  - Prepare for independence
  - Develop record of accomplishment
- Centralized oversight and monitoring and standardized trans-institutional expectations helpful



# **Recommendation 4**

**Sufficient support should be given to new junior faculty who are translational and clinical investigators to maximize their probability of success.**

- Three years of protected time (salary)
- Resources to access necessary infrastructure (e.g., biostatistics, study coordinators, laboratory and imaging cores, and informatics)
- Dedicated space
- Continued mentoring

***Scrupulous protection of “protected time” is critical.***

# **Recommendation 5**

**Training in translational and clinical research should be accelerated through comprehensive re-structuring so that translational and clinical scientists can become independent clinicians and investigators at the earliest possible time.**

- Develop translational and clinical research tracks that span undergraduate, graduate and fellowship education
- Pilot with “pioneer” medical schools and some specialty boards
- Goal: a fully trained and independent translational or clinical investigator with a record of accomplishment by mid-thirties

## **Recommendation 6**

**Institutions, journals, the NIH, and other research sponsors should take steps to facilitate appropriate academic recognition of translational and clinical scientists for their contributions to collaborative research.**

—

- Role of individual investigators in team science must be documented
- Journals should document role of all authors
- NIH should document role of all co-PIs and co-investigators in their CRISP database

# Recommendation 7

The NIH should modify the K23 and K24 awards to enhance their value in supporting clinical and translational research training and mentoring.

- K23 should provide full salary up to cap for all effort and, in the last 3 years of the award, support for awardees' own projects↑
- Would lead to fewer K23 awards without↑ funds
- K24 should be flexible and support 10-50% effort of NIH funded translational and clinical investigators for mentoring only

# **Recommendation 8**

**Institutions should provide central oversight, administration, and support for the essential infrastructure required by the translational and clinical research enterprise.**

Centralized leadership, strategic planning and target investment can:

- Promote cohesion and partnerships among components
- Create a culture of vibrant and visible translational and clinical research
- Ensure continued investment in cutting edge infrastructure
- Retain key non-faculty personnel

## **Recommendation 8**

Centralized oversight and support of cores can provide:

- Fair and unimpeded access
- Cost savings and efficiencies
- Continuity of funding
- Availability of back-up personnel
- Uniform operating procedures and training to improve compliance
- Uniform standards for the qualifications and experience of support personnel

# **Recommendation 12**

**Medical schools and their affiliated teaching hospitals should explicitly recognize and vigorously promote translational and clinical research as a core mission, and accord it a high priority for institutional funding.**

Institutional leaders always have discretionary funds and make conscious choices on how those funds are deployed.

# **Concluding Comment**

**(from the CRTFII Charge)**

*“The AAMC believes that it is uniquely the responsibility of medical schools and teaching hospitals, in partnership with the NIH and other federal agencies, to provide both the supportive institutional environment and the rigorous training necessary to maintain high quality clinical research and produce and nurture physician-scientists, equipped to exploit the many novel and exciting scientific opportunities that have appeared in recent years....”*