The Challenge of Maintaining our Physician-Scientist Workforce (Rare Breed/Endangered Species)

Epidemiology & Anecdotes

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Disclosure

• I have no actual or potential conflict of interest in relation to this program/presentation.
Outline

• Who makes up the P-S workforce?
• What are their demographics?
  – Age
  – Gender
  – Race/Ethnicity
  – Specialty
• What Challenges do P-S face?
History

1979: James Wyngaarden, NIH Director - rang warning bells that PS with medical degree was ‘an endangered species’ (NEJM)

1996: ‘Nathan Committee’ to address perceived shortfall of PS. Recommended career development grants and LRP's to offset PS education debt and encourage research careers.
Physician-Scientist – Who are they?

- Scientists
- With professional degrees
- With training in clinical care
- Engaged in independent research (basic or clinical)
- MD, DO, DDS, DVM ± PhD
- (Not necessarily simultaneously)
- “Bridge”
  - Bench ↔ Bedside
Size and Composition

- Numbers hard to capture
- NIH-funded workforce
- ‘Invisible’
  - Industry
  - Non-NIH funded
  - Unfunded
- 2 categories:
  - Clinical research with patients in practice
  - Laboratory-based research

Figure 2.1. NIH-funded Physician-Scientist Workforce (FY2008-2012)

NIH PSW-WG, 2014
P-S Pool is Decreasing

Figure 3.1. Number of Physicians Reporting Medical Research, Medical Education as Primary Practice Areas (2003-2012)

- Total
- Medical Education
- Medical Research

SOURCE: Those MD-holding Physicians that indicated they were in primarily Medical Education or Medical Research from the American Medical Association (AMA) Physician Masterfile Annual Year-end Snapshots.

AMA data from NIH PSW-WG, 2014
Pipeline

If 100 start here

- MD/PhD students (22–30 yrs old)
- Residents and fellows (30–35 yrs old)
- Holding Zone (35–40-yr-olds who are neither fellows nor faculty)
- Junior faculty (40–44 yrs old)

Attrition
- (10%–15%)
- (?)%
- (?)%
- (?)%

< 100 finish here (R01)
Pipeline: NIH P-S Pathway
P-S Pool is Aging

- Age profile has increased over past decade.
  - Decline 31-60 years
  - Increase ≥60 years

NIH PSW-WG, 2014
NIH Funded P-S Pool is Aging

• Average Age of P-S with NIH RPGs (Research Project Grants) has increased
  – Decline 31-50 years
  – Increase ≥50 years

NIH PSW-WG, 2014
Average Age of First Time RPG Awards Increasing

Figure 3.11. Average Age of First-time NIH Research Project Grant Awardees, PhD, MD, and MD/PhD Degree (FY1999-2012)
P-S Pool is Aging

- Longer training times
- Higher grant success rates for established investigators
- Postponement of retirement
Unequal Participation by Women

- 42% F MD/PhD Grads
- Gender gap with entrance into and promotion in AMC

AAMC, 2013-2014
Unequal Participation by Women

- Large difference in number of M and F applicants.
- No difference in NIH RPG award rates by gender.
Unequal Participation by Women

• Work – Life Balance

• Women still share disproportionate burden for family care responsibilities
  – Child-bearing
  – Start of Lab

• Boundaries
Unequal Participation by Minorities

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>US Population*</th>
<th>NIH Applicants†</th>
<th>NIH Awardees†</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>64%</td>
<td>70%</td>
<td>74%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>16%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>African Am</td>
<td>12%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Asian</td>
<td>5%</td>
<td>23%</td>
<td>20%</td>
</tr>
</tbody>
</table>

* Wikipedia (Demography of the United States)
† NIH PSW-WG, 2014
(rounded to nearest whole numbers)
Unequal Participation by Minorities

- Sig growth of Asian and Hispanic awardees #s
- Less growth of African-American and Native Am #s
Disparities by Specialties

• 5 career groups:
  1. Medical Specialties (Allergy, Cards, Derm, GI, Neuro)
  2. Surgical specialties (Surg, Urol, Ophtho, Otolaryn)
  3. Other (Phys Med & Rehab, Psych, Other)
  4. Primary care (FP, IM, OBG, Peds)
  5. Hospital-based (Anesth, ED, Path, Rad)
Challenges

• **Financial**
  – **Individual:**
    • Increasing education cost & training length - ↑ Debt
      – MD vs MD/PhD
    • ↓ Income Potential
  – **Institutional:**
    • Certainty of Clinical Revenue – Salary support
    • Uncertainty of Research Funding – Expensive hobby
  – **Funding Environment**
Challenges

• Time
  – Increased training length
  – All things to all people? – mission tensions
  – Pressures related to finances
  – Work-life balance
  – ‘Tyranny of the Urgent’

• Timing
  – Start clinical care, lab, & family and lab
  – Age out of young investigator perks
Challenges

- Confidence
- Contribution
- Competitiveness
  - RVUs
  - Grants
  - Reviewer perceptions
- Competence
- Coaching (mentors; protectors)
Rewards

• The Bridge
• Personal satisfaction
  – Greater good, more than the individual
  – Intellectual stimulation
  – Thrill of discovery
• Perseverance, tenacity, grit
• Future leadership relevance
Summary

• PS are a rare breed/endangered species.
• PS workforce is aging.
• Women and minorities are underrepresented.
• The challenges are numerous.
• The rewards are great.
• We need to redefine the PS and address supports.
DEAN - Summary

• Value of Physician-scientists remains central to mission of academic medicine
• Challenges have stabilized but require ongoing affirmative efforts
• Specific purposeful mechanisms must be developed to ensure ongoing viability of physician-scientist role