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

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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 simultaneous efforts)
• “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

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

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%)

Attrition (??%)

Attrition (??%)

Attrition (??%)

< 100 finish here (R01)

J Clin Invest 2015 Oct 1;125(10):3742-7
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.

NIH PSW-WG, 2014
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

- Significant growth of Asian and Hispanic awardees 
- Less growth of African-American and Native American awardees
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.
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