2017 AAIM Research Directors Summit and the Need to Move Forward

Melvin Blanchard, MD
PSTP training directors impact

• Society and trainees have great expectations
  • Create 25% of the physician-scientists
  • Who utilize and inform research to advance:
    • Health of patients & communities
    • Efficiency of healthcare
    • Prosperity of the US and world
Outline

• Why be concerned about how we train physician-scientists?

• How best to train physician scientists
  • Curriculum and infrastructure
  • Recruitment and selection of trainees
  • Mentorship
  • Funding of PSTPs and their trainees
  • Tracking success

• Where do we go from here?
Why are we concerned about how we train?
Why be concerned about training?

• Training is about value for society

• Training is about value for our trainees

• Training is about bridging basic discoveries and clinical medicine
Value for Society

• Benefit
  • Patients, communities, population
  • Feeling and functioning
  • Living longer
  • Cost savings in healthcare

• Cost
  • Cost of training and research

Government provides support for research training and research and Society expects something in return
# Value of Biomedical Research

<table>
<thead>
<tr>
<th>Period</th>
<th>Annual NIH Expenditure [today’s dollars]</th>
<th>Biomed Publications/yr</th>
<th>Gain in life-expectancy Mo/yr in period (age ➞ age)</th>
<th>Cost per extra month of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900 – 1950</td>
<td>$7,900,000.00</td>
<td>18,866</td>
<td>5.16 (48.0 to 69.5)</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>1951 – 2000</td>
<td>$9,936,000,000.00</td>
<td>83,181</td>
<td>1.76 (69.5 to 76.9)</td>
<td>$5,645,000,000</td>
</tr>
<tr>
<td>2001 – 2016</td>
<td>$34,750,000,000.00</td>
<td>298,928</td>
<td>1.27 (76.9 to 78.6)</td>
<td>$27,362,000,000</td>
</tr>
</tbody>
</table>

CDC Life expectancy tables
Value for Trainee

- **Benefit**
  - Grant funding
  - Publications
  - Faculty position
  - Promotion and tenure
  - Career advancement
  - Patents

- **Cost**
  - Time investment in training
  - Cost of education and opportunity costs

Trainees invest time in training (missed opportunities) and expect something in return
<table>
<thead>
<tr>
<th>Year</th>
<th>Pic</th>
<th>Career Step</th>
<th>Cum Time</th>
<th>Personal $</th>
<th>Societal$</th>
<th>Societal benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-22</td>
<td></td>
<td>Undergrad</td>
<td>4 yrs</td>
<td>$70,000.00</td>
<td></td>
<td>Peer reviewed pubs: 76 Rev/ch/ed: 23</td>
</tr>
<tr>
<td>22-30</td>
<td></td>
<td>MD/PhD</td>
<td>12 yrs</td>
<td>$35,500</td>
<td>$234,500</td>
<td>H-Index: 43 I10-index: 69</td>
</tr>
<tr>
<td>30-32</td>
<td></td>
<td>Residency</td>
<td>14 yrs</td>
<td></td>
<td>$78,407</td>
<td></td>
</tr>
<tr>
<td>32-37</td>
<td></td>
<td>Fellowship Heme/Onc</td>
<td>19 yrs</td>
<td></td>
<td></td>
<td>$170,871 T32, NIH Loan repayment, ASCO</td>
</tr>
<tr>
<td>37-43</td>
<td></td>
<td>RO1</td>
<td>25 yrs</td>
<td></td>
<td></td>
<td>Citations: 12,725 New approaches to activate NK cells, CMI.</td>
</tr>
<tr>
<td>43-65</td>
<td></td>
<td>Faculty – Medicare Salary range</td>
<td>22 years remaining</td>
<td></td>
<td></td>
<td>Clinical studies led to adoption of Lenalidomide for Hodgkin lymphoma</td>
</tr>
<tr>
<td>65</td>
<td></td>
<td>Retirement and Medicare</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Retirement age 62
Some trainees not so fortunate

Xx% leak from pipeline
Narrowing the chasm

8 bytes core memory
8 billion bytes semiconductor
Bottleneck – need physician scientists
Best Practices for Training Physician Scientists
Conceptualization of PSTP Process

**Recruitment**
- Educational background
- Publication record
- Personal characteristics

**Infrastructure**
- Mentoring
- Culture
- Funding
- Curriculum
- Administration

**Trainee achievements & Impact**
- Publications
- Grant funding
- Patents
- Promotion, tenure retention, AAP, ASCI

**Success Predictors**

**Success Outcomes**

**Continuous Improvements**

**Incoming Recruits**

**Training Environment**

**Graduate Outcomes**

Washington University in St. Louis
School of Medicine
We had benefit of variation
Curriculum and Infrastructure

• Combined residency and fellowship training

  • Most desirable program feature\(^1\)
    • Requires integration between core IM, subspecialty, PSTP director

  • Contingent on satisfactory performance

  • Incorporate flexibility for undecided trainees

\(^1\)Todd Acad Med 2013 Nov;88(11):1747-53
Curriculum and Infrastructure

• Need a core curriculum

• Delivery via:
  • Didactics
  • Panel discussions
  • Use existing offerings
  • Alumni events
  • VPs
  • Near to peer mentoring

• Core curriculum
  • Study design
  • Biostatistics
  • Team science
  • Ethics
  • Scientific regulatory requirements
  • IRB application
  • Grant writing
  • Time management
  • Leadership
  • Work/life balance
  • Mentor/mentee relations
Curriculum and Infrastructure

- Directors of PSTPs should organize nationally
  - Regular national meetings
  - Host a shared database to track outcomes

- Share best training practices
  - Curriculum
  - Garnering funding for training
  - Keeping trainees engaged

- National database of trainees
  - Identify success factors
  - Continuous improvement

- Develop scouts for sourcing IMGs

- Address clinical training time

- How to be an effective PSTP director
Curriculum and Infrastructure

- PSTP directors should have protected time
  - ~ 10-20% of FTE

<table>
<thead>
<tr>
<th>Annual compliment</th>
<th>Duration of PSTP training</th>
<th>Sub-specialty similar size (fellows/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>&lt;5 7</td>
<td>GI (3), Rheum (2), Endocrine (2), ID (2), Renal (2)</td>
</tr>
<tr>
<td>1</td>
<td>5 7</td>
<td>Cardiology (3), Pulm/Crit Care (3)</td>
</tr>
<tr>
<td>2</td>
<td>10 14</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>15 21</td>
<td>Heme/Onc (4)</td>
</tr>
<tr>
<td>4</td>
<td>20 28</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>25 35</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>30 42</td>
<td></td>
</tr>
</tbody>
</table>
Recruitment & Selection of Trainees

• Best candidates will have significant research experience and a balanced commitment to both science and medicine.
  • Should have multiple “on-ramps” into PSTPs
    • MSTP graduates
    • Combined MD/PhD programs
    • Graduate level degrees prior to MD
    • Late bloomers, identified in categorical residency
Recruitment and Selection of Trainees

- Increasing diversity must be a priority
  - Effort required to **identify qualified** candidates
    - Women (38%)
    - URM (13%)
  - Research observerships
  - URM mentors

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Recruitment and Selection of Trainees

• Recruit qualified IMGs as trainees
  • Untapped pool of applicants
    • Problem: Green card or citizenship required for T-32 & K training grants
  • Determine quality of international research mentorship
  • Determine quality of UME clinical training and readiness for US hospitals
Mentorship Practices

• Mentors need training and recognition

• Effective mentoring plays a critical role in success of trainees

• Must have an organized approach to developing mentors
  • Providing feedback to mentors
  • Train-up mentors
  • Mentor accomplishments should be considered in promotions
  • Protected time for mentoring
  • Awards for mentoring
Mentorship Practices

• Mentoring teams are essential for PSTP trainees and should be carefully crafted.
  • Formal process
    • Mentoring contract
    • Individual development Plans
  • Mentoring biosketch
    • Help choose mentor
  • Clinical mentorship
  • Avoid overburdening mentors
Funding of PSTPs and their trainees

• The success of PSTPs and their trainees is highly dependent on strong institutional support
  • AMCs should articulate the value placed on training PSTP
    • Provide uninterrupted funding
      • 3 years on T-32 often insufficient
      • Bridge funding

• Sharing programmatic resources across PSTPs
  • Leading from Deans office
  • (we integrated with Peds, now path and Rad/Onc joining)
Funding of PSTPs and their trainees

• Trainees should be strongly encouraged to apply for individual career development awards, since receipt of these awards has been correlated with future career success.
  • NIH institutional and individual awards
  • VA Career development awards
  • Howard Hughes awards
  • DDCF Clinical scientist development awards
  • RWJ clinical scholars awards
  • Damian Runyon (sp)
  • Subspecialty societies
  • Burroughs Welcome
Tracking Success of PSTPs and Their Graduates

- Success factors of PSTPs and their graduates should be tracked
  - Number of applicants easily obtained
  - Completion rates, diversity, length of time to complete
  - % who pursue academics
  - External research funding
  - Publication record
  - Promotion and tenure
  - Honors and awards
  - Impact on society?
Sustaining PSTPs & Employing Continuous Improvement Practices

• A PSTP’s sustainability is contingent on institutional support and an adequate census of qualified applicants.
  • Programs should consider closing (or changing PD) if not viable
    • Lack of institutional support
    • Declining applicants
    • Lack of mentors
    • Failure to attract qualified applicants in 3 consecutive years
Where do we go from here?
Organize as a community

• Create a space for learning, sharing and professional development for PDs

• Be the generator of innovation in effective physician-scientist training

• Create national standards for structure, resources/funding, and program leadership (with ABIM)

• AAIM is considering a communication platform

• Meetings once per year like this during AAIM Week, under the Research Committee
Build a national database of trainees

- Track trainees success and impact
- Use tracking data to drive continuous improvement and effectiveness of training
Work to increase the pool of applicants

- Advance diversity
  - Women
  - URM

- Scout international sources of applicants
  - Advocate for training grants
Provide Value

• To:
  • Society
  • Trainees
And Do so with the leverage afforded by learning how to do this together!