Non-Clinical Career Paths for Medical Physicists: A student’s perspective

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NCCAAPM Fall 2015 Meeting
Outline

- Goals of this talk
- What is WGNCMP?
- Motivation to investigate non-clinical careers
- Non-clinical opportunities
- Survey results
- Recommendations for graduate programs
- Conclusions
Goals of this talk

- **Students:** Consider non-clinical careers

- **University faculty:** Consider what needs to change in training of students to better prepare students for non-clinical careers

- **Clinical professionals:** Remember the strengths medical physicists in non-clinical careers bring to the community
What is WGNCMP?

- Working Group to Promote Non-Clinical Career Paths for Medical Physicists
- AAPM formed us to investigate non-clinical options
  - Educate physicists about existing careers
  - Recommend training to better prepare students

Sean Tanny
Co-Chair

John Ready
Co-Chair

Alan Cohen
Consultant

Dr. Yan Yu
PC Liaison
Motivation for WGNCMP

- Only 112 residency spots were available in the recent match
  - There were 402 applicants
- There simply aren’t enough CAMPEP accredited residencies to fill the demand!

Applied to Residency
402 Applicants

Participated in Match
185 Applicants

Accepted to Residency
108 Residents

Role of WGNCMP

- Gathering data
  - Interviews
    - Industry
    - Academia
    - Regulation
    - Health Physics
  - Surveys
    - Students
    - Program Directors
    - Clinical Physicists

- Prepare recommendations and reports

- Presentations
  - 2015 AAPM Annual Meeting poster
  - AAPM Chapter meetings

- Promote opportunities
What non-clinical options are out there?

- **Industry**
  - Varian, Elekta, Sun Nuclear, Standard Imaging, Phillips, etc.
- **Academia and research**
  - Large scale universities with dedicated research staff
- **Regulation**
  - NRC, IAEA, NIST, FDA, IEC, state health departments, etc.
- **Health physics**
  - DOD, DOE, RSO positions, etc.
Why work in industry?

- Impact patient care globally
- Opportunities to innovate
- Develop new tools for clinical application
- More flexible schedule

Roles in Industry:
- R&D scientist
- Clinical validation scientist
- Business support scientist
- Clinical medical physicist
- Business (non-science role)

Credit: Erin Angel
Academia and Research

- Prepare and mentor future medical physicists
- Academic research is 5-10 years ahead of industry
- Good for people who want to be where we’re going, not where we are
- Drivers of innovation
- Self-defined hours and projects
Regulation

- Policy and regulation of radiation safety
- Clinical impact without working in the clinic
- Exposed to new technology as it is released
- Overlaps with health physics
Health Physics

- Mainly deals with radiation protection and monitoring
- Alternative certification: CHP
- Serve as RSOs
- Can work for other agencies
  - Fire departments, research labs, DOD, NASA

The Lighter Side, HPS, www.hps.org/lighterside/
Are these careers being pursued?

Graduating student destinations

<table>
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<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
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</thead>
<tbody>
<tr>
<td><strong>Ph.D. Students</strong></td>
<td></td>
<td></td>
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<tr>
<td>Post-doc</td>
<td>14 (21%)</td>
<td>15 (22%)</td>
<td>11 (14%)</td>
<td>18 (16%)</td>
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<tr>
<td>Another degree</td>
<td>2 (3%)</td>
<td>2 (3%)</td>
<td>1 (1%)</td>
<td>3 (3%)</td>
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<tr>
<td>Position in industry</td>
<td>7 (10%)</td>
<td>4 (6%)</td>
<td>9 (11%)</td>
<td>9 (8%)</td>
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<tr>
<td><strong>Total</strong></td>
<td>23</td>
<td>21</td>
<td>21</td>
<td>30</td>
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<tr>
<td><strong>MS/MSc Students</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Another degree</td>
<td>22 (14%)</td>
<td>20 (14%)</td>
<td>49 (25%)</td>
<td>27 (17%)</td>
</tr>
<tr>
<td>Position in industry</td>
<td>8 (5%)</td>
<td>12 (9%)</td>
<td>6 (3%)</td>
<td>17 (11%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30</td>
<td>32</td>
<td>55</td>
<td>44</td>
</tr>
</tbody>
</table>

*Data Courtesy of Brenda Clark, Ph.D.*
Shortfalls of CAMPEP statistics

- Not very specific (beyond job in industry)
  - Doesn’t specify post-docs with clinical focus
  - Doesn’t address regulatory positions
  - What is the other degree? Ph.D. for MS?

- Also doesn’t highlight the true level of interest from students
  - Only way to assess this is to ask them directly
WGNCMP SURVEY DATA
WGNCMP student survey

- Surveyed students and trainee members of the AAPM
- 165 responses

Areas of study for student respondents:

- Therapy: 52%
- Diagnostic: 37%
- Health Physics: 6%
- Other: 5%

Students knowledge of non-clinical opportunities:

- Yes: 40%
- No: 60%
WGNCMP student survey

Student Level of Interest in Non-Clinical Careers

- None: 8%
- Minor: 21%
- Intermediate: 48%
- High: 23%

Non-Clinical Areas of Interest for Student Respondents

- Industry: 41%
- Academic Research: 12%
- RSO/Health Physics: 12%
- Regulation: 35%
- Other: 10%
Interest Level in Non-Clinical Careers by Degree Program

- None
- Minor
- Intermediate
- High

Ph.D. vs. MS/MSc
Surveyed clinical physicists who had become full AAPM members in the last 5 years
135 responses

Awareness of non-clinical opportunities when starting career

- Yes: 68%
- No: 32%
WGNCMP director survey

- Surveyed CAMPEP accredited graduate program directors
- 30/42 responses

Do CAMPEP and AAPM have a responsibility to prepare students for non-clinical careers?

- Yes, 55%
- No, 45%
HOW TO PREPARE FOR NON-CLINICAL CAREERS?
Non-clinical education

- Non-medical physics classes
  - Business
  - Entrepreneurship
  - Law
- Career counseling
- Seminars/network with professionals outside of the clinic
- Career days
- Manage salary expectations
- All faculty work at least part time out of the clinic teaching!
Other non-clinical preparation

- Internships
- Network with alumni
- Further skills training
  - Grant writing
  - Interviewing and resume writing
  - Seminars outside of medical physics
Future of medical physics education

- Do students who do not wish to pursue clinical careers need to meet TG-197 requirements?
  - Could they take modified medical physics curriculum to allow them to pursue external interests?

- Do current classes train students to be physicists or clinicians?
  - Should clinicians be physicists at heart?
Conclusions

- Not all students will be clinical medical physicists.

- It is the responsibility of the students and educators to seek out information about non-clinical careers – and not just as a backup plan!

- The future of medical physics education is up to us, let’s prepare students for a variety of career paths to meet the broadening of our field.
Acknowledgements

- Working Group is a strong team effort
  - Sean Tanny (University of Toledo)
  - John Ready (UC Berkeley)
  - Anna Rodrigues (Duke)
    - STSC Liaison
  - Chris Peeler (MD Anderson)
    - WGSTR Liaison
Student Opportunities in DC!

- The Student and Trainee Subcommittee is already hard at work to increase the number of student opportunities at the 2016 Annual Meeting
  - Student Annual Meeting
  - Student Night Out
  - Partners for the Future
  - Residency and Career Fairs

- WGSTR is hosting another student luncheon!
Thank you!
Any questions?