Introduction to Non-Clinical Career Paths for Medical Physicists

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Learning Objectives

Learning Objectives:
- Participants will become familiar with the wide variety of non-clinical medical physics careers
- Participants will become familiar with characteristics and skills that are desirable in non-clinical medical physics roles
- Participants will become familiar with the AAPM resources available for seeking and maintaining a non-clinical medical physics career

Working Group To Promote Non-Clinical Career Paths for Medical Physicists

- Started in
- Charge
  - To identify medical roles in non-clinical careers
- To recommend appropriate training and skills to supplement the traditional clinical education pathways
Student Survey Results

- According to the 2015 AAPM Professional Survey, 20% of medical physicists stated that they primarily worked in areas other than clinical.
- However, a 2014 survey of medical physics students found less than 50% of students felt knowledgeable about non-clinical career paths (165 respondents).

Disconnect

Why?

Students do not have exposure to non-clinical career opportunities

- Courses taught by clinical physicists & academic research people
- Residency Programs do not lend themselves to non-clinical programs

Why is this important?

- In 2015, 322 students graduated however only 108 residencies existed.
- In 2018, 204 applicants for 129 residencies

What will the rest do?
Non-Clinical Careers

- Non-clinical careers normally do not need certification
- Pay comparable with work/life balance
- Range tends to follow at 80-90% AAPM survey clinical average
- Work hours tend to be more reasonable
- Effect many more patients
- Cutting Edge of Technology
- Travel

*Caution: Does not apply in all cases

Countries

1. Austria
2. Belgium
3. Bulgaria
4. Canada
5. Canary Islands
6. China
7. Columbia
8. Czech Republic
9. Denmark
10. Egypt
11. England
12. France
13. Germany
14. Greece
15. Hungary
16. India
17. Ireland
18. Israel
19. Italy
20. Japan
21. Lichtenstein
22. Mexico
23. Netherlands
24. Romania
25. Russia
26. Scotland
27. South Africa
28. South Korea
29. Spain
30. Sweden
31. Switzerland
32. Taiwan
33. Turkey

Industry Positions

- Research and Development
  - Programming skills
  - Quality Processes (FMEA, SPC, etc.)
  - Regulatory (Good Manufacturing Processes, ISO, IEC, FDA)
  - Show completion of at least 1 large comprehensive project
Industry Positions

- Sales & Marketing
  - People Skills (names, titles, interests, etc.)
  - Ability to determine real need vs. requested need
  - Understand clinical implication of new technology

Industry Positions

- Customer Support
  - Patient
  - Flexible – "quick on your feet"
  - Adaptable - Adjust to changing conditions

Skills

- Organizational
- Interpersonal – work well as a member of a team
- Communication – present & communicate effectively
Is it right for me?

- Paid Internships (Elekta & Varian)
- I-Corps programs by NIH & NSF to fund promising academic research
  - Do It Depends

Academic Research & Education

- Academic Research & Education
  - Universities
  - Government research positions – tend to be grant based
  - High School Physics Teacher
  - Industry Research

Radiation Safety and Health Physics

- Health physicists monitor doses and design and implement new measures for controlling dose
  - Nuclear power plants
  - Pharmaceutical companies
  - NRC
  - Hospitals
  - US armed forces, State Department, CIA
- Internships available at nuclear power plants, pharma
Regulatory
- FDA
  - Review the safety and effectiveness of new devices
- NRC
  - License new medical devices
  - Hospital compliance with regulations
  - Setting new licensing guidelines
- NIST
  - Standardization for calibration protocols and phantoms

Other
- Science Policy
- Science Writing
  - Tend to have more flexible working hours

Additional Resources
- Annual Student Meeting
- Residency Fair
- Career Expo
- Student Night Out
- Interview Workshop
- http://www.aapm.org/students/
- WG for Non-Clinical Professionals
A Personal Journey

Man plans, God laughs*

*Old Yiddish proverb

High School Teacher

- BS in Physics
- Working on Masters in Secondary Education

Researcher at University

- Worked for Professor as an undergrad
- Compositional analysis of thin field high temperature superconductors (experience with ultra-high vacuum systems)
Physical Analytical Chemist
- Equipment was similar to that at university
- SOP, FMEA, SPC, customer support troubleshooting

Masters in Medical Physics

Customer Support Medical Physicist
- High School Teacher
- Designed first in-house treatment planning course
- Training, support, hardware install
- 3 Year assignment in Europe
Clinical Medical Physicist
- Experience from CMS with XIO Treatment Planning System
- While buying a CyberKnife.....

Customer Support Medical Physicist
- Prior support experience
- International experience
- Product design
- Regulatory compliance
- Involvement with International Electrotechnical Commission
- International Travel

Elekta MR-Linac
Conclusion

- Working Group to Promote Non-Clinical Career Paths
- Multitude of Non-Clinical Opportunities
- AAPM resources

Thank You