

# 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

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

- Started in
- Charge
  - To identify medical
  - To recommend clinical e



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### 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**

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### 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

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### Why is this important?

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

**What will the rest do?**



2018 Residency Match program

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### 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

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### Countries

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

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### 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

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### Industry Positions

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

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### Industry Positions

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

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### Skills

- Organizational
- Interpersonal – work well as a member of a team
- Communication – present & communicate effectively

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### Is it right for me?

- ❖ Paid Internships (Elekta & Varian)
- ❖ I-Corps programs by NIH & NSF to fund promising academic research
- **Dr. It Depends** ?

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### Academic Research & Education

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

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### 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

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### 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

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### Other

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

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### Additional Resources

- Annual Student Meeting
- Residency Fair
- Career Expo
- Student Night Out
- Interview Workshop
- <http://www.aapm.org/students/>
- [WG for Non-Clinical Professionals](#)

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## A Personal Journey

Man plans, God laughs\*

\*Old Yiddish proverb

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## High School Teacher

- BS in Physics
- Working on Masters in Secondary Education

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## Researcher at University

- Worked for Professor as an undergrad
- Compositional analysis of thin field high temperature superconductors (experience with ultra-high vacuum systems)

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### Physical Analytical Chemist

- Equipment was similar to that at university
- SOP, FMEA, SPC, customer support troubleshooting

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### Masters in Medical Physics

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### Customer Support Medical Physicist

- High School Teacher
- Designed first in-house treatment planning course
- Training, support, hardware install
- 3 Year assignment in Europe

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### Clinical Medical Physicist

- Experience from CMS with XIO Treatment Planning System
- While buying a CyberKnife.....

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### Customer Support Medical Physicist

- Prior support experience
- International experience
- Product design
- Regulatory compliance
- Involvement with International Electrotechnical Commission
- International Travel

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### Elekta MR-Linac

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### Conclusion

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

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Thank You

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