Careers in Health Physics

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September 2017

What Is Health Physics?

- Study of radiation and its effects on people
- Multidisciplinary
  - Physics
  - Biology
  - Chemistry
  - Environmental Science
  - Nuclear Engineering
  - Government and Policy

A Wide Range of Capabilities

- Radiation Detection
- Dosimetry
- Operational Monitoring
- Radiological Security
- Radiation Effects
- Radiation Risk
- Environmental Cleanup
- Radiological Waste Disposal
- Radiochemistry
- Radiation Policy and Regulation

Many Applications

- Career opportunities for such positions as technicians, scientists, project managers, supervisors and directors in various areas:
  - Accelerators
  - Power Reactors
  - Medical Fields
  - Environmental Health
  - University/Research
  - Industrial
  - Military and Government Facilities

Education & Curriculum Resources

- Education
  - Broad background in applied sciences and mathematics
  - Associate's, bachelor's, master's and doctoral programs
- Work Experience (Internships)
- Certifications
  - American Board of Health Physics (ABHP) – Certified Health Physicist (CHP)
  - American Association of Physicists in Medicine (AAPM)
  - National Registry of Radiation Protection Technologists (NRRPT)

The Need for HP Professionals

- Operation of nuclear power plants
- Decommissioning of nuclear power plants
- New applications of nuclear technologies
- New diagnostic and radiation therapy modalities
- Large number of HPs reaching retirement age
- Number of HP graduates down 55% since 1995
- Supply will NOT meet demand

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HPS

Medicine and Research

- Universities
- Medical Offices/ Clinics
- Hospitals
- Pharmaceutical
- Research and Development

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Medical Health Physicists

Work wherever radiation sources are used to diagnose and treat human diseases

Medical health physicists are needed to ensure proper and safe working conditions for patients and medical staff

Types of X-ray Machines

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Radiation Therapy

Targeting cancer cells

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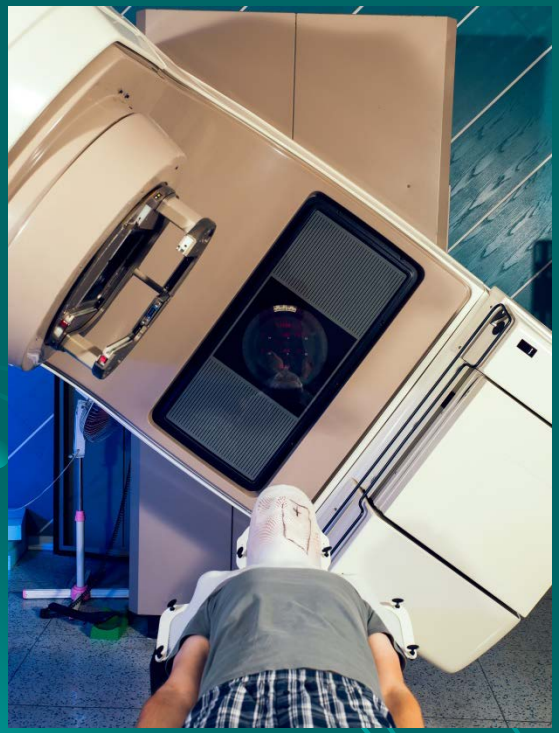
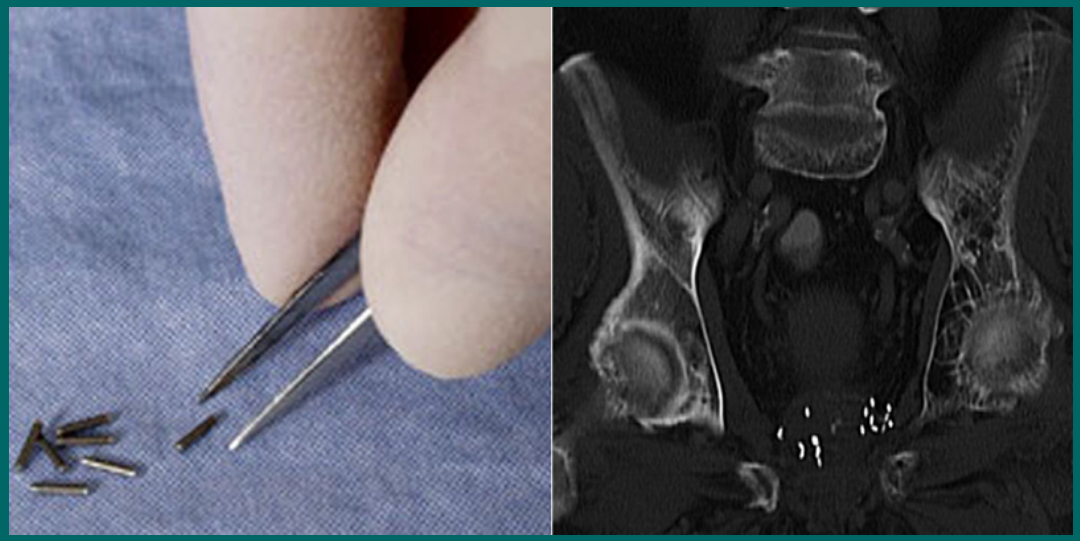


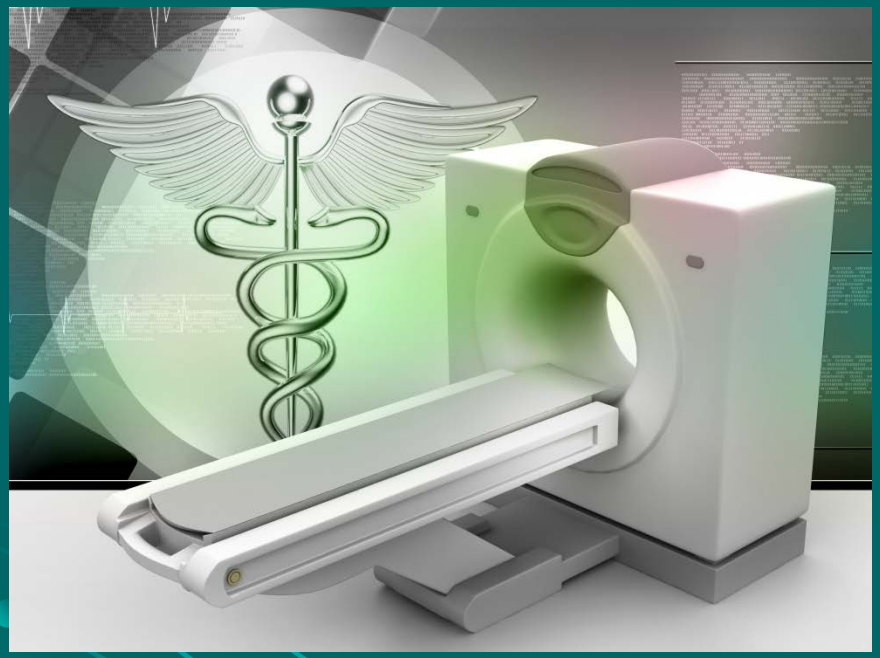
External Beam



Credit: ORAU Professional Training Programs

Brachytherapy (Implants)

Types of Therapy Machines



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Credit: ORAU Professional Training Programs

Nuclear Medicine

Radiation Safety Officers

Health Physics Tools

Geiger Counter

Liquid Scintillation Counter

X-ray Fluorescence Analyzer

Power Generation

- Nuclear power supplies about 20% average of energy mix in U.S.
- About 100 operating nuclear power plants in U.S.

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Power Reactor Health Physicists

Responsible for all phases of radiation protection at nuclear reactor sites

Power reactor health physicists assess potential environmental impact of operations and to ensure the facilities comply with federal regulations

Environmental Health Physicists

Health Physicists Regulators

Many occupational opportunities in the regulatory enforcement and occupational safety sectors

Regulators guide work operations for nuclear power, medical, industry, environmental restoration, waste management and educational uses of radioactive materials

Government and Military Health Physicists

Responsible for radiation safety and radiological engineering at facilities that process, store & assemble/disassemble nuclear weapons and associated operations including materials science, emergency response, and basic research in physics

Health Physicists Educators and Researchers

Teaching opportunities within many programs in U.S.

Research areas in health physics include:

- Improved radiological protection of workers, the public and environment from radiation exposures
- Improved monitoring, detection and assessment of radioactivity in the environment
- Better understanding of the biological effects of exposure to ionizing radiation (e.g. low-dose radiation effects)

Example Radiation Research Areas

- Refined radiation dose and risk estimates for occupational, nuclear medicine, nuclear security, and space exploration
- Improved radiation protective measures
- Development of novel radiation detection instrumentation
- Improved decontamination techniques
- Modeling of complex environmental pathways

Health Physics Resources

- Health Physics Society (HPS) website: http://www.hps.org
- HP Academic Education Resource Information: http://hps.org/academiceducation/index.html/

Nuclear Science Careers

- Help meet the growing global demand for electricity
- Contribute to minimize environmental impact
- Make a significant contribution to sustainable development
- Promote improved health and quality of life
- Enable scientific discovery leading to brighter futures, exciting technologies and brilliant discoveries

For information, contact the Health Physics Society

http://www.hps.org

Health Physics Society
Specialists in Radiation Safety