



# Multidisciplinary Teamwork: Medical Physics Challenges and Future Opportunities

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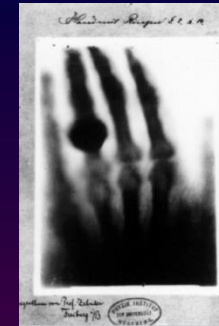
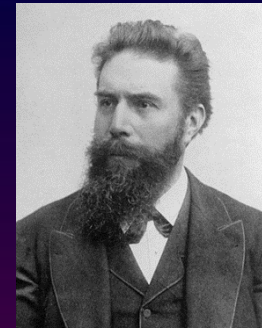
# Outline

- Historic development of medical physics
- Definition of qualified medical physicists (QMP)
- Scope of practice for clinical medical physics
- Challenges and opportunities facing medical physics and the multidisciplinary team

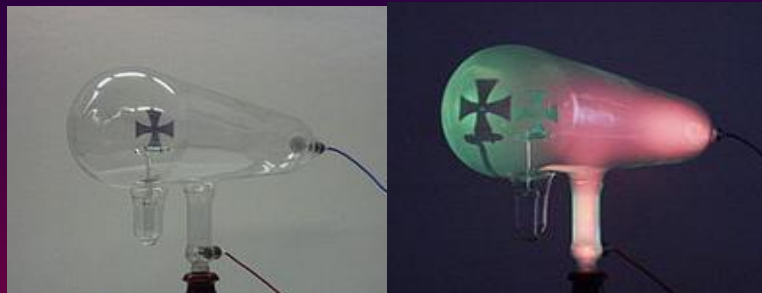


# The Discovery of X-Rays (Imaging)

Roentgen discovered x-rays in 1895



Crookes tube



Brain surgery guided by x-ray image in 1897

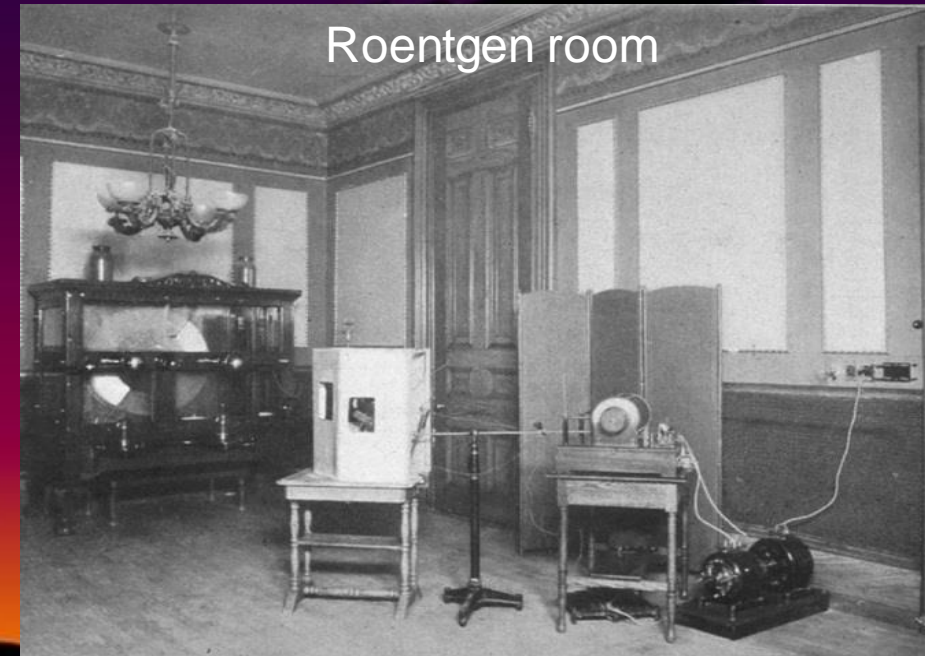
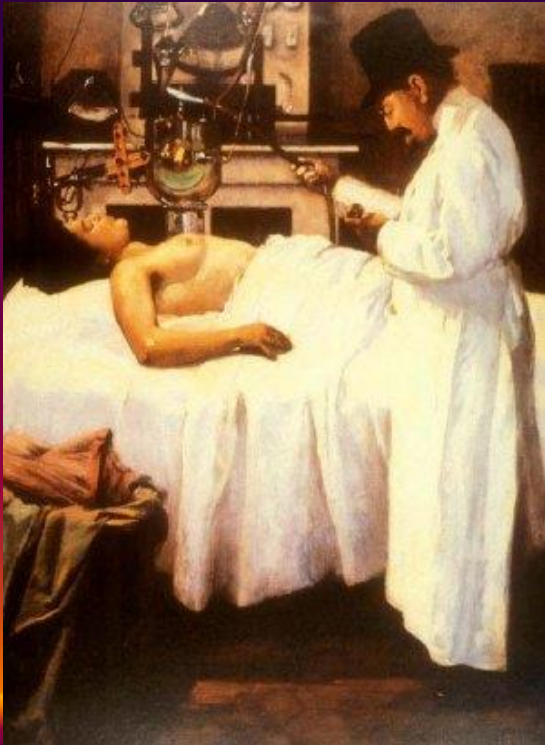


X-ray image of a hand deformity in 1896

# The Discovery of X-Rays (Therapy)

Emil Grubbe (1875-1960)

First use of radiation to treat breast cancer in 1896 (1h, 18 days)



Fox Chase Cancer Center x-ray therapy 1905

# Historic Developments of Radiology



W Roentgen  
x-rays 1895



M&P Curie  
Radium 1898

## Imaging

## Therapy



I Donald & T Brown  
ultrasound 1955



WD Coolidge  
x-ray tube 1913



J Robertson  
PET 1961



R Wilson  
Proton therapy  
1946



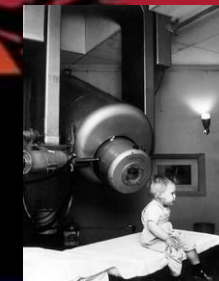
G Hounsfield  
CT 1967



H Johns  
Cobalt-60 unit  
1951



P Lauterbur  
MRI 1973



Linear Accelerator  
UK 1953  
US 1956

# Radiology

Departments separated in 1970s-1980s

Diagnostic Imaging

ACR (1923)

ABR (1934)

AAPM (1958)

Radiation Oncology

Therapeutic Medical Physics

Diagnostic Medical Physics

Medical Nuclear Physics

Medical Health Physics

Magnetic Resonance Imaging Physics

# Definition of QMP

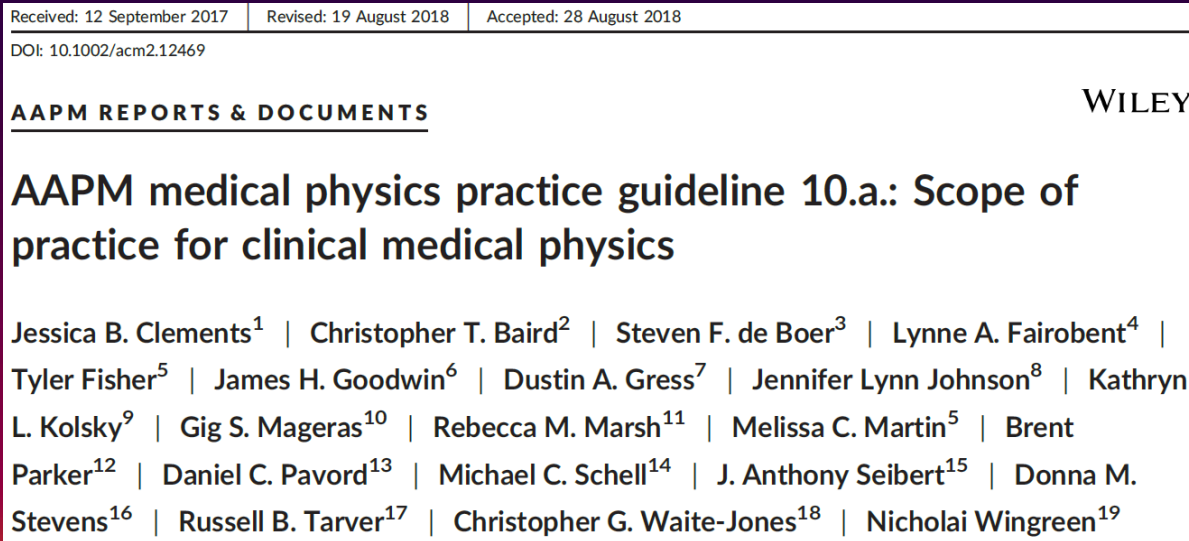
AAPM definition of Qualified Medical Physicist (QMP):

- Who has earned a master's or doctoral degree in physics, med phys, biophysics, or equivalent disciplines from an accredited university;
- Who has been granted certification in the specific subfield(s) of med phys by an appropriate national certifying body; and
- Who abides by the certifying body's requirements for continuing education.

Certifying bodies: ABR, ABMP, CCPM, ABSNM, ABHP

# AAPM MPPG10.a. (2018)

## Scope of practice for clinical medical physics



QMP's medical physics areas:

- Administrative
- Clinical services
- Education
- Informatics
- Equipment performance evaluation
- Quality
- Safety



# AAPM MPPG10.a. (2018)

## Scope of practice for clinical medical physics

AAPM's recommendation on the involvement of the QMP:

1. Activity must be performed by a QMP
2. Activity must be performed or supervised by a QMP
3. Activity should include a QMP

A QMP is a member of the multidisciplinary healthcare team.

# AAPM MPPG10.a. (2018)

## Administrative tasks **must be performed by a QMP**

- Supervises medical physics staff, including physicists, physics assistants, med phys residents and students in compliance with all relevant regulatory requirements and appropriate professional documents
- Ensures that all regulations and accreditation requirements as relating to med phys are met and maintained
- Oversees QA and QC programs to meet all regulations, accreditation standards, and national recommendations
- Establishes training and competency requirements and monitors maintenance of competencies for clinical med phys tasks

# AAPM MPPG10.a. (2018)

## Administrative tasks **should include** a QMP

- Participates in operations management
  - Participates in staffing and budget discussions
  - Participates in facility planning
  - Consults on selection of new equipment prior to purchase
  - Participates in coding/billing (documentation)
- 
- A silhouette of a tree is visible on the right side of the slide, set against a background of a sunset or sunrise with a gradient from orange to purple.

# Clinical Services

## Must be performed by a QMP

- Develops procedures for initial acceptance testing and ongoing equipment testing (e.g., annual testing, post-service testing)
- Develops and oversees processes to authorize release of clinical equipment after service

## Must be performed or supervised by a QMP

- Reviews service activities (e.g., software updates) that may impact dose or image quality and determines if further med phys follow-up is required

## Should include a QMP

- Participates in research and development including support for clinical trials
- Communicates with and educates patients, including discussions of risk

# Recent Technical Developments



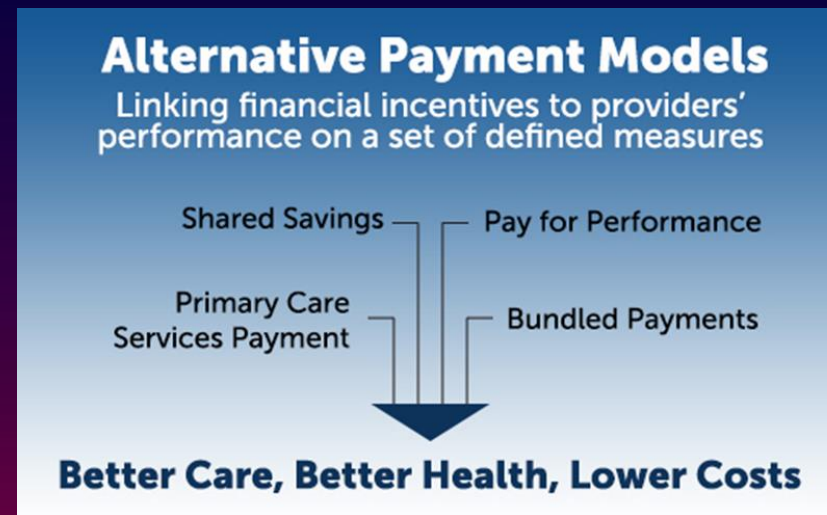
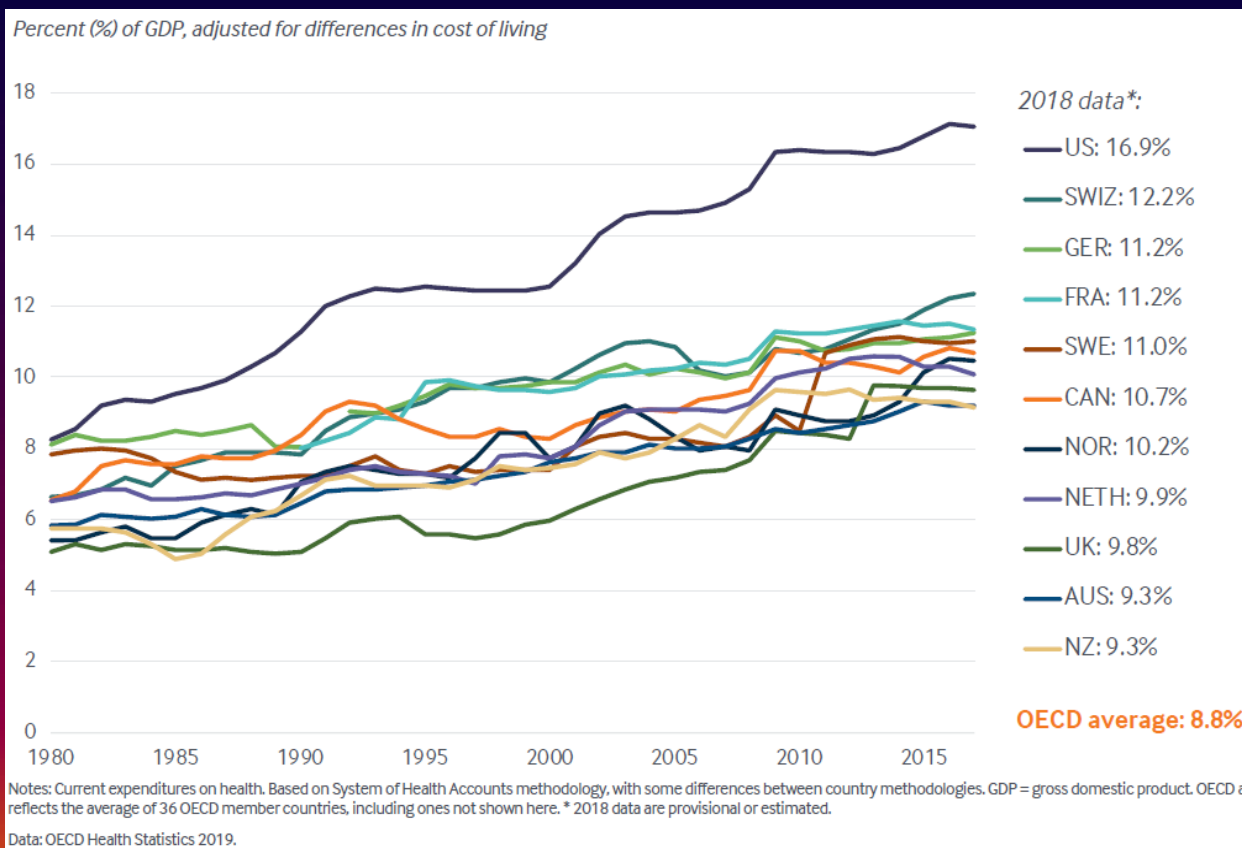
The role of  
Medical Physicists?

Automation in RT

- Auto contouring
- Auto planning
- Automated QA
- Adaptive therapy

# Financial Challenges Facing US Healthcare

## The value of Medical Physicists



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### 2022 Medicare Physician Fee Schedule Proposed Rule Summary

On Tuesday, July 13, 2021, the Centers for Medicare & Medicaid Services (CMS) issued the 2022 Medicare Physician Fee Schedule (MPFS) [proposed rule](#), which estimates an 8.75% cut to radiation oncology services for 2022. ASTRO is very disappointed in the Administration's

When written in Chinese,  
the word "crisis" is  
composed of two  
characters. One represents  
danger and the other  
represents opportunity.

危机



**John F. Kennedy**  
35th U.S. President  
(1917-1963)

QuoteHD.com

**AAPM**

# Strategic Planning

2018-19 Discussing strategic planning

2019-20 Defining strategic goals and objectives

2020-21 Implementing strategic goals and objectives

# AAPM Strategic Goals (SG)

SG01 Innovation

SG02 Membership

SG03 Leadership

SG04 Education

SG05 Organization management

SG06 Communication

SG07 Patient care

SG08 Diversity and inclusion





# Unit 64 - Strategic Goal 01:

## Drive scientific and clinical innovation in med phys to improve human health

(S Benedict, R Howell, M Huq, C Ma (chair), A Maidment, M Matuszak)

### Strategic Objectives:

1. Encourage and explore new med phys applications
2. Encourage R&D to advance med phys and related professions
3. Catalyze translation from research to clinical applications
4. Improve med phys research funding
5. Strengthen the skills of med physicists as leaders in innovation

# AAPM Areas of Strategic Focus

(approved by the Board on Mar 30, 2022)

- **Articulating Our Value:** Develop and implement a plan to advocate for our value as med physicists within the healthcare enterprise and broader medical communities.
- **Expanding our Scope and Presence in Medicine:** Identify future directions in the science and practice of med phys and consider possible areas in which AAPM could invest to ensure our success in the years ahead. Develop a plan to establish and maintain active relationships with the greater medical community beyond traditional, existing relationships for AAPM.

**"NEVER LET A GOOD CRISIS GO TO WASTE"**



**-WINSTON CHURCHILL**

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**I never worry  
about action,  
but only inaction.  
-Winston Churchill**



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*Thank you!*

