



# Collaboration on Innovative Solutions to Support Quality and Safety in Radiotherapy

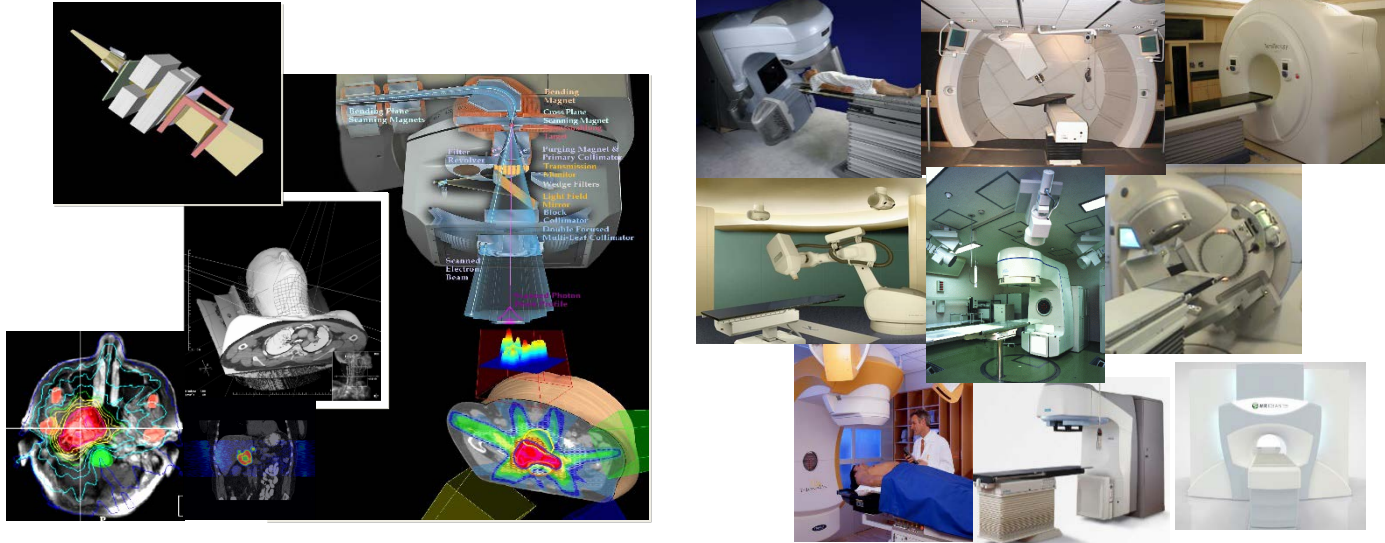
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Jatinder R Palta PhD, FAAPM, FASTRO, FACR



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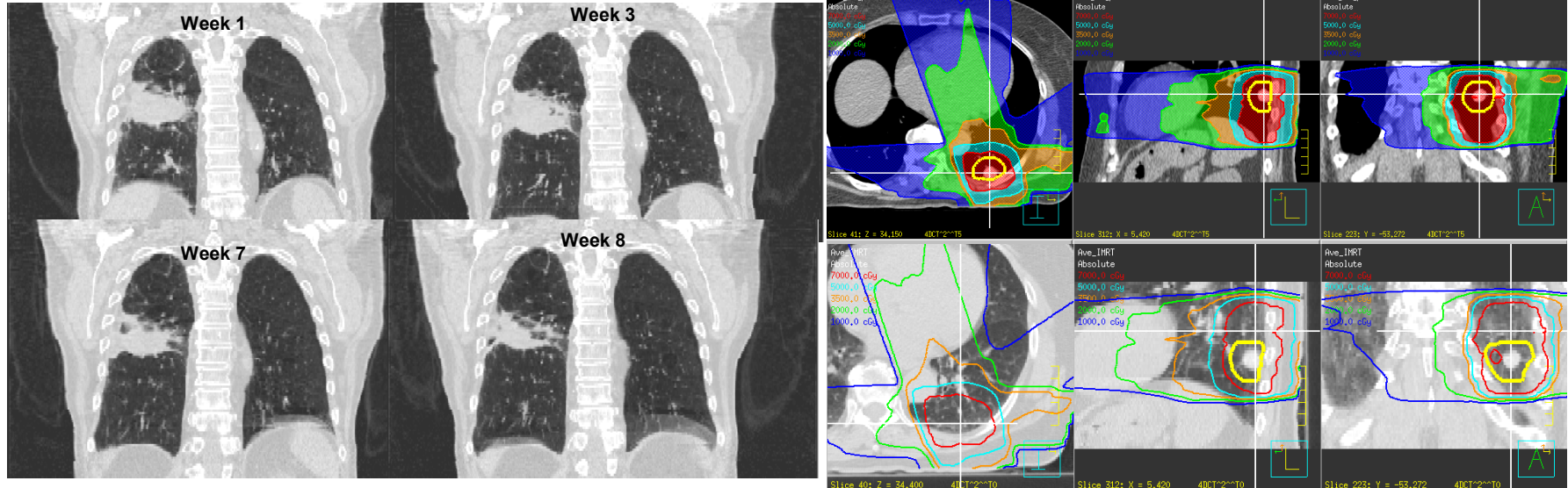
Radiotherapy is the use of high-energy radiation from x-rays, gamma rays, neutrons, protons, and other sources to kill cancer cells and eradicate/shrink tumors



We made great progress in optimizing the planning and delivery of radiotherapy Circa 2022

# What is quality and safety in Radiotherapy?

Ensuring that the prescribed radiation dose is delivered to the target tumor precisely and accurately while minimizing dose to the surrounding normal tissue



- taking into account inter- and intra-fraction motion (organs & tumor) and physiological changes

# Opportunities for collaboration amongst global stakeholders

## 1. **The quality of radiotherapy in facilities globally is highly variable; ranging from outstanding to needs improvement**

- There is an opportunity to identify and improve substandard practices, as well as move the average towards higher quality and improved patient care.

## 2. **Radiation Oncology is a technology driven medical specialty**

- There is an opportunity to deploy cutting-edge, effective, and safe technologies that adhere to consensus clinical practice guidelines.
  - Guidelines must recognize local environment

## 3. **Radiation Oncology is a team-orientated medical specialty**

- There is an opportunity to have well-educated, trained, disciplined and attentive healthcare team members.

# Opportunities for collaboration amongst global stakeholders

- 4. Development of a radiotherapy treatment plan requires acquisition and synthesis of patient data from disparate sources and the stepwise generation of new data from patient intake to plan development to treatment.**
  - There is an opportunity to develop artificial intelligence and machine learning-based clinical/technical processes to improve quality and consistency of radiotherapy delivered globally
- 5. Radiotherapy vendors often sell complex and expensive radiotherapy imaging and treatment delivery hardware and software without much consideration to local physical infrastructure.**
  - There is an opportunity to deter such practices by ensuring resource-stratified radiotherapy equipment acquisition

## A few words about AAPM

- American Association of Physicists in Medicine (AAPM) is a scientific and professional organization composed of more than 8000 scientists whose clinical practice is dedicated to ensuring accuracy, safety and quality in the use of radiation in medical procedures such as medical imaging and radiation oncology.
  - Notable AAPM work products include; scientific guidance document, medical physics practice guidelines, training and education curricula, medical physics program accreditation, credentialing services, medical physics code of practice, code of practice for radiotherapy planning and delivery

# AAPM's scope of global engagement

1. Regional collaboration
  - Comprehensive need assessment in collaboration with regional organizations
2. Communication and collaboration with all global stakeholders
  - Harmonizing global activities amongst all stakeholders.
3. Support education programs for medical physicists based on comprehensive assessment of local needs and resources
  - Virtual educational courses followed by on-site practicum
4. Provide resource-stratified clinical training for medical physicists, radiation oncologists, and allied health professionals
  - Virtual training followed by “Boots-on-the-Ground”

# AAPM's scope of global engagement

## 5. Professional activities

- Accreditation of medical physics and residency programs globally.

## 6. Scientific Innovation and Exchange

- Developing technologies and identifying novel medical devices and hardware or software solutions to improve patient care under challenging environments

## 7. Facilitate global medical physics research activities by providing mentoring opportunities and exchange of scientific data

- Webinars highlighting global research, grantsmanship, research mentoring, etc.

## 8. Develop and maintain a comprehensive electronic platform to support various global initiatives

- Work with global partners ( global medical physics organizations, NGOs (e.g. IAEA).



# Opportunities for strengthening collaboration between AAPM and IAEA

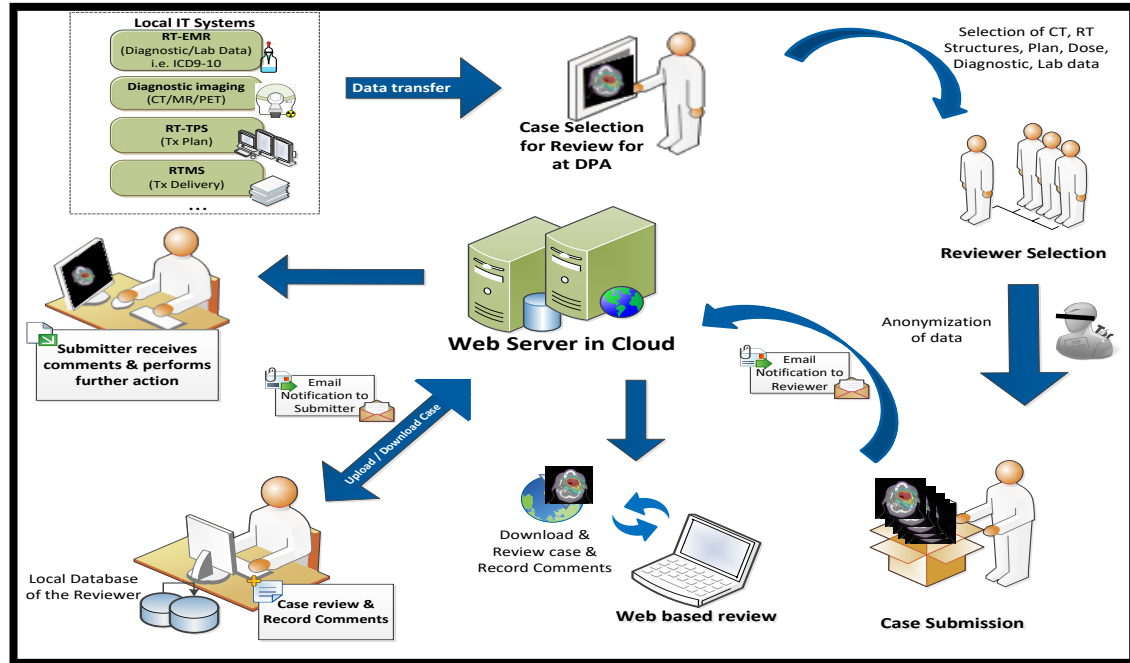
AAPM and IAEA has a long history of collaborating on IAEA scientific and technical publications, training courses, guidelines, and clinical practice standards. There is an opportunity to expand this collaboration in several areas that include;

- Need-assessed training and education courses,
- Providing subject matter experts for potential AAPM-IAEA Academy
- Research projects on cost-effective technologies
- *Collaborative research projects on cost-effective technologies, network of professional societies, unifying AAPM developing countries educational resources – IAEA Human health campus e learning, advocacy-professional recognition, QUATRO*

# Facilitating Global Collaboration

- Leveraging electronic infrastructure for remote collaboration

Cloud-based Collaboration for  
Global Radiotherapy Clinical  
Trials, Research and Training



# Summary

- **Safe implementation of advanced radiotherapy technologies globally requires special consideration of the local environment**
  - Resources, physical and personnel infrastructure, training and education, etc.
- **Global stakeholders must collaborate and harmonize their activities**
  - Avoid duplication of effort to preserve resources
    - IAEA can uniquely fulfil this role
- **Electronic infrastructure (cloud-based) can facilitate rapid interaction, peer review, and clinical collaboration amongst global radiation oncology community**
  - Opens the door for collecting real-world data that is needed for the development of robust decision support systems in radiotherapy