Weill Cornell Medicine-Qatar
Continuing Professional Development

The Future of Radiation Physics in Medicine

September 2 & 9, 2023
Live Webinar (Zoom)

AGENDA:

Day 1 (September 2, 2023)

Time (Doha)	Topic	Session Learning Objectives	Speaker
3:00-3:15 pm	**Introduction**	1. Outline an overview of the course's topics and its relevance to the attendees. 2. Identify the speakers and their areas of expertise. 3. Support active participation and engagement from attendees.	**Dr. Mohammad Yousef** Weill Cornell Medicine-Qatar
3:15-4:20 pm (Q&A 4:15-4:20 pm)	**A brief history and a glimpse into the future of Radiotherapy**	At the end of this session, learners will be able to: 1. Outline an overview of the major milestones that impacted the field of radiotherapy. 2. Identify the major areas in radiotherapy such as dosimetry, treatment planning and quality assurance. 3. Discuss the recent developments that will shape the future of the field.	**Dr. Ziad Saleh** Washington University School of Medicine
4:20-5:25 pm (Q&A 5:20-5:25 pm)	**Medical Physics: Behind the Machine**	At the end of this session, learners will be able to: 1. Explain the overall process for the patient from simulation to treatment. 2. Discuss different planning techniques; 3D, IMRT, VMAT, SBRT, SRS. 3. Compare Different calculation algorithms.	**Mr. Ryan Pennell** NewYorkPresbyterian-Weill Cornell
5:25-5:35 pm	Break		
5:35-6:45 pm (Q&A 6:35-6:45 pm)	**Computed tomography from the recent history to the future perspectives**	At the end of this session, learners will be able to: 1. Review the technologies of computed tomography (CT) developed since the late 1980s.	**Dr. Eslam Kamal** Pittsburgh University

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		2. Outline an overview of recent CT technologies including dual energy and photon counting computed tomography. 3. Discuss the future of computed tomography 4. Show the role of artificial intelligence in patient dose optimization.	
6:45-7:50 pm (Q&A 7:45-7:50 pm)	**MRI of the past and into the future: A Journey**	At the end of this session, learners will be able to: 1. Outline an overview of the history, current state and focus on the future of MRI technology. 2. Explain the breakthroughs in physics and engineering that have improved image quality and diagnostic capabilities. 3. Discuss the challenges and limitations of MRI and explore the ongoing research and development efforts to address them. 4. Demonstrate how MRI has revolutionized medical imaging and improved patient care. 5. Show a glimpse into the future of MRI technology. 6. Illustarte the cutting-edge research and innovation that is such as the development of faster and more powerful MRI machines, novel contrast agents, and the integration of AI and machine learning algorithms.	**Dr. Nader Metwalli** National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK/NIH)
7:50-8:55 pm	**Panel Discussion**	1. Discuss the findings and the learning lessons from each talk.	**Dr. Mohammad Yousef** **Dr. Ziad Saleh** **Mr. Ryan Pennell** **Dr. Eslam Kamal** **Dr. Nader Metwalli**

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Day 2 (September 9, 2023)

Time (Doha)	Topic	Session Learning Objectives	Speaker
3:00-3:15 pm	**Introduction**	1. Outline an overview of the course's topics and its relevance to the attendees. 2. Identify the speakers and their areas of expertise. 3. Support active participation and engagement from attendees.	**Dr. Mohammad Yousef** Weill Cornell Medicine-Qatar
3:15-4:20 pm (Q&A 4:15-4:20 pm)	**Physics in Nuclear Medicine**	At the end of this session, learners will be able to: 1. Outline the physics of nuclear decays and how those can be translated into medicine to detect, diagnose, and treat different diseases. 2. Explain nuclear medicine. 3. Discusss the advancement and future frontiers in nuclear imaging technologies. 4. Show examples from cancer, cardiac, and neurology applications.	**Dr. Sadek Nehmeh** Weill Cornell Medicine
4:20-5:25 pm (Q&A 5:20-5:25 pm)	**Quantitative Nuclear Medicine**	At the end of this session, learners will be able to: 1. Discuss examples of how physics approaches to make clinical nuclear medicine applications quantitative with specific examples in oncology, neurology, cardiology, and theranostics. 2. Describe the concept of internal dosimetry, nuclear image-guided radiotherapy, and radio-immunotherapy.	**Dr. Sadek Nehmeh** Weill Cornell Medicine
5:25-5:35 pm	Break		

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5:35-6:50 pm (Q&A 6:40-6:50 pm)	**Radiometals for Therapy and Diagnosis**	At the end of this session, learners will be able to: 1. Outline an overview of the relevant radiometal isotopes used for different therapeutic and diagnostic applications. 2. Describe the chemistry requirements for developing radiopharmaceutical agents based on these radiometal ions. 3. Summarize current clinical status of these radiometal-based radiopharmaceutical agents.	**Dr. Justin Wilson** Cornell University
6:50-7:55 pm (Q&A 7:50-7:55 pm)	**Artificial Intelligence: A Transformative Technology in Medical Physics**	At the end of this session, learners will be able to: 1. Describe the various roles of AI in medical physics from process automation to personalized predictions. 2. Illustrate examples of AI current and potential applications. 3. Recognize the challenges for AI clinical implantation. 4. Discuss solutions to current challenges for AI in the clinic.	**Dr. Issam El Naqa** Moffitt Cancer Center
7:55-8:55 pm	**Panel Discussion**	1. Discuss the findings and the learning lessons from each talk.	**Dr. Mohammad Yousef** **Dr. Sadek Nehmeh** **Dr. Justin Wilson** **Dr. Issam El Naqa**

Overall Objectives:

At the end of this activity, learners will be able to:

- Analyse the latest developments and trends advancements in medical physics, with a focus on potential impact on the field's evolution.
- Identify the most promising areas of research and innovation in medical physics exploring potential impact on healthcare and patient outcomes.
- Collaborate with experts in the field of medical physics, promoting an open exchange of ideas.
- Express creativity and strategic thinking with regards to the future direction of the field.

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The scientific planning committee has reviewed all disclosed financial relationships of speakers, moderators, facilitators and/or authors in advance of this CPD activity and has implemented procedures to manage any potential or real conflicts of interest.

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Ministry of Public Health
State of Qatar • دولـــة قطـــر

Weill Cornell Medicine-Qatar is accredited as a provider of Continuing Medical Education (CME) and Continuing Professional Development (CPD) by the Department of Healthcare Professions (DHP) of the Ministry of Public Health.

This activity is an Accredited Group Learning Activity (Category 1) as defined by the Ministry of Public Health's Department of Healthcare Professions-Accreditation Section and is approved for a maximum of 11.5 hours.