Sixth Annual Conference
Particle Therapy Cooperative Group
North America
New Frontiers in Particle Therapy

October 14-16, 2019
Hilton Miami Dadeland Hotel, 9100 North Kendall Drive, Miami, Florida

Presentation slides available at:
BaptistHealth.net/CMEPresentations

Hosted by
Miami Cancer Institute, a part of Baptist Health South Florida
October 14, 2019

On behalf of the Particle Therapy Co-Operative Group-North America (PTCOG-NA) and the 2019 Conference Planning Committee, we are excited to welcome you to the Sixth Annual PTCOG-NA Conference to explore New Frontiers in Particle Therapy.

We anticipate that you will find numerous opportunities to share technical and clinical experiences, network with colleagues and communicate with industry partners. The setting and the format allow you to learn in a relaxed environment with plenty of opportunity for interaction with faculty, peers, poster presenters and exhibitors to expand your clinical knowledge base of proton therapy for cancer treatment.

- Days one and two (Monday and Tuesday) consist of morning and afternoon talks with lunches and breaks. Day three (Wednesday) will be similar, with midday adjournment.
- At the conclusion of day one, you will have the opportunity to tour the state-of-the-art Miami Cancer Institute Proton Therapy Center.
- During our Miami City Night event on Tuesday, we will relax and enjoy the company of old and new friends.

In addition, we hope you allowed yourselves time to spend a day or so exploring Greater Miami and the Beaches.

This year’s conference focuses on the latest clinical applications, outcomes, and physics and biology experiences with particle therapy. With more than 140 abstract submissions, we are pleased to offer an unprecedented number and quality of scientific contributions. Dedicated sessions on basic science, translational research in radiobiology and medical physics will be paralleled by preclinical and clinical results.

Our goal is that you will leave this conference with expanded expertise about best practices for proton therapy patient selection, including maximum opportunity for toxicity reduction and/or tumor control probability improvement. Additionally, you should be better able to identify patients for clinical trials and employ resources to overcome barriers to improve enrollment; determine when to implement advanced treatment planning approaches such as Monte Carlo, relative biological effectiveness (RBE) and linear energy transfer (LET); and consider limitations of proton therapy to distinguish when applications of dual modality or non-proton therapy options are indicated to achieve optimal patient outcomes.

We are pleased to welcome you to the Sunshine State and Greater Miami!

Sincerely,

Eugen B. Hug, M.D.
President, PTCOG North America

Minesh P. Mehta, M.D.
Miami Cancer Institute Host Committee Chair
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GETTING STARTED

Sign in Daily for CME/CE Credits and Attendance Records
Sign in at the beginning* of each day in order to receive credit for attending each day of this conference. *Dosimetrists must also sign out each day as required by the Medical Dosimetrists Certification Board. Please see the important notice regarding partial credit on page 23.

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  Christine Baldwin, Registrar | ChristineB@BaptistHealth.net
  For all other questions regarding the organization of this conference, please contact:
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  Stay Informed: BaptistHealth.net/CMEStayInformed

- Particle Therapy Co-Operative Group North America
  For any questions about PTCOG-NA, please contact PTCOG-NA_membership@c-in.eu
  Subscribe to PTCOG-NA updates at ptcog-na.org.
COMMITTEES

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Hesham E. Gayar, M.D., Vice-President
Anita Mahajan, M.D., Secretary
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SCHEDULE

DAY 1 – Monday, October 14

07:00  Registration, Continental Breakfast, Visit Exhibits and Posters

07:45  Welcome and Opening Remarks • Eugen Hug, Michael Chuong

08:00  KEYNOTE LECTURE 1 - GI Oncology: An Emerging Frontier • Michael Chuong

EDUCATIONAL SESSION 1 - Toxicity Is The Difference Maker
Moderator: Hesham Gayar

08:30  Proton Therapy Is All About Reducing Late Toxicity
   ▪ The Pediatric Experience • Torunn Yock
   ▪ At the Heart of the Matter • Rachel Jimenez

09:30  Break, Visit Exhibits and Posters

10:00  Proton Therapy Is All About Reducing Acute Toxicities
   ▪ Head and Neck • Steven Frank
   ▪ Bowel and GI Toxicities • R. Charles Nichols

11:00  PANEL SESSION: Challenges of Incorporating Proton Therapy into Cooperative Group Clinical Trials and Practical Hurdles of Proton Studies • Nancy Mendenhall, Daniel Ma
Moderator: William Hartsell

12:00  PTCOG-NA Seattle Planning Meeting • by invitation only

12:00  Lunch

12:20  Industry Product Theater (30 minutes) - Optional non-CME session concurrent with lunch.

ORIGINAL CONTRIBUTIONS SESSION 1 - Breast and Genitourinary
Moderators: Lisa McGee, Samantha Hedrick

13:00  #41 Should We Contour to the Skin? The Evaluation of Skin Dose During Pencil Beam Proton Therapy for the Chest Wall • Nicholas Marsh

13:10  #21 Clinical Outcomes After Proton Partial Breast Radiotherapy for Early Stage, Hormone Receptor Positive Breast Cancer: Three-Year Outcomes of a Phase II Trial • Isabelle Choi

13:20  #83 Insurance Coverage for Adjuvant Proton Therapy in the Definitive Treatment of Breast Cancer • William Mendenhall

13:30  #39 Patterns of Care and Referral for Proton Therapy in Breast, Lung and Prostate Cancer • Shaakir Hasan

13:40  #13 Initial Clinical Outcomes for Prostate Cancer Patients Undergoing Adjuvant or Salvage Post-Prostatectomy Proton Therapy (PT) • Andrew Barsky

13:50  #19 Postoperative or Salvage Proton Radiotherapy for Prostate Cancer Following Radical Prostatectomy • Shivam Kharod

14:00  #30 Ten-Year Outcomes from Three Prospective Clinical Trials of Image-Guided Proton Therapy in Prostate Cancer • Nancy Mendenhall

14:10  #115 Evaluation of U-net Based Synthetic CT for MRI-only Treatment Planning of Prostate Cancer Proton Therapy • An Qin

14:20  #99 The Impact of Dose Algorithms on Tumor Control Probability in Intensity-Modulated Proton Therapy for Breast Cancer • Xiaoying Liang

14:30  KEYNOTE LECTURE 2 – Improving Dosimetric Precision: Clinical Implementation of Dual Energy CT for PT Planning • Kevin Teo
15:00  **INVITED LECTURE - Multi-Organ Toxicity Prediction Approach for Proton Planning** • Soren Bentzen

15:30  **Adjourn and Closing Remarks** • Michael Chuong

15:40-16:40  **Mentor-led Abstract Poster Walk (non-CME session)** • Charles Simone, Chris Beltran

17:15  **Depart for Miami Cancer Institute**  ([transportation is provided or a 15-minute walk](#)).

17:30-19:00  **Reception and Tour - Miami Cancer Institute Proton Therapy Center.**

**MENTOR-LED ABSTRACT POSTER WALK**

**Selected Posters**

#45  **Effect of Prospective Use of Relative Biological Effectiveness Modeling in Treatment Planning on Magnetic Resonance Imaging Radiation-Related Changes in Pediatric Patients with Brain Tumors Treated with Pencil Beam Scanning Proton Therapy**
Warissara Rongthong, M.D., Kristofer Roberts, M.D., Hok Seum Chan Tseung, Ph.D., Laurence Eckel, M.D., Amulya Negeswara Rao, M.D., Anne Bendel, M.D., Mary Skrypek, M.D., Anita Mahajan, M.D., Chris Beltran, Ph.D., Nadia Laack, M.D.

#106  **Efficiency and Safety Improvements for Proton Treatment Plan QA by Automation**

#16  **Proton Partial Breast Irradiation Preferentially Spares the Heart and Lungs over Modern Whole Breast Radiotherapy**

#65  **A Dosimetric Comparison of Prostate Boost Treatment with Intensity Modulated Protons Versus Photons**
Adeel Kaiser, M.D., Jill S. Remick, Pouya Sabouri, Mingyao Zhu, Young Kwok, Soren Bentzen

#72  **Development of an Innovative Tool to Account for Prior Radiotherapy During Treatment Planning**
Fazal Khan, CMD, Noah Kalman, M.D., Alonso Gutiierrez, Ph.D., Rupesh Kotecha, M.D.

#61  **IMPT Whole Lung Irradiation vs. IMXT Whole Lung Irradiation**
Thomas Bradley, CMD, Alan Kraling, CMD, Anita Mahajan, M.D., Nadia Laack, M.D.
DAY 2 – Tuesday, October 15

07:00  Registration, Continental Breakfast, Visit Exhibits and Posters
07:00  PTCOG-NA Executive Committee Meeting • by invitation only
07:55  Welcome and Opening Remarks • Craig McKenzie
08:00  RBE/LET Planning: A Realistic Assessment, Pros and Cons • Chris Beltran, Daniel Indelicato

ORIGINAL CONTRIBUTIONS SESSION 2 - Other Topics
Moderators: Eugen Hug, Soren Bentzen
08:45  #1 Average LET of X-rays and Gamma Radiation for Radiobiological Modeling • Oleg Vassiliev
08:55  #46 Evaluating Proton Relative Biological Effectiveness for Spinal Cord Toxicity • Chris Beltran
09:05  #33 Concurrent Pencil Beam Scanning Proton Therapy and Hyperthermia: Growing Experience with Promising Results • James Snider
09:15  #124 The Impact of Dual Energy CT Scans on TPS Calculated Dose Accuracies for Biological and Non-Biological Samples • Pouya Sabouri
09:25  #23 Comparative Effectiveness of Proton Therapy Versus Photon Therapy as Part of Concurrent Chemo-Radiotherapy for Locally Advanced Cancer: Analysis of Patients with Private Health Insurance • Brian Baumann
09:35  #82 Impact of Proton Technology Evolution on Patient Volumes at a Large Academic Medical Center • Isabella Amaniera
09:45  #63 Treatment Planning Strategies to Mitigate the Relative Biological Effectiveness Uncertainty in Proton Therapy for Targets in the Brain • Narayan Sahoo
09:55  #86 Improving Proton Plan Robustness Evaluation Standardization and Efficiency Through Scripting • Samantha Hedrick
10:05  #52 Carbon Ion Dose Constraints for Organs at Risk at MedAustron • Piero Fossati
10:15  Break, Visit Exhibits and Posters

EDUCATIONAL SESSION 2 - Emerging Clinical Data
Moderator: Carl Rossi
10:45  Protons and Cognition • Rupesh Kotecha
11:15  Lung Cancer Conundrum • Charles Simone
11:45  Lunch
12:05  Industry Product Theater (30 minutes) • Optional non-CME session concurrent with lunch.

ORIGINAL CONTRIBUTIONS SESSION 3 - CNS and Pediatrics
Moderators: Matthew Hall, Chris Beltran
12:45  #18 Outcomes After Proton Therapy for Skull-Base Chordoma: A Prospective Study • Adam Holtzman
12:55  #48 Pilot Study on Critical Structure Dosing for Ocular Melanoma Radiation Techniques: An Analysis of 1-125 Brachytherapy Plaque and Dedicated Proton Eye Beamline Treatment Planning Dosimetry • Jessica Scholey
13:05  #135 Routine Neurocognitive Testing of Patients Treated with Proton Therapy on a Prospective Registry Study - Feasibility and First Results • Petra Georg
13:15  #59 Outcomes of Intracranial High-Grade Glioma Treated with Proton Therapy • Julie Bradley
13:25  #6 What’s Gone Wrong in Head and Neck Rhabdomyosarcoma? • Dana Casey
13:35  #81 Proton Therapy for Pediatric Bladder Rhabdomyosarcoma • Michael LaRiviere
13:45  #31 Computer-Based Assessment of Neurocognitive Decline in Pediatric Patients Treated with Proton Therapy: A Prospective Study • Amar Srivastava
13:55  #28 Organ Sparing with Proton Radiation Therapy for Pediatric Hodgkin Lymphoma • Leslie Modlin
14:05 #129 Proton Irradiation Using Pencil Beam Scanning (PBC) Correlates with Taste/Odor Changes Identified by the Layer Defined Dose and Bragg Peak Delivery to the Olfactory Structure (OS) for Brain Tumors • Terri Bevolo

14:15 PTCOG-NA General Assembly Meeting

15:00 Break, Visit Exhibits and Posters

ORIGINAL CONTRIBUTIONS SESSION 4 - Physics
Moderators: Mark Pankuch, Alonso Gutierrez

15:30 #36 Clinical Sensitivity of a Prototype Proton Radiography System • Mark Pankuch
15:40 #50 Deep Learning Based Relative Stopping Power Mapping Generation for CBCT-Guided Adaptive Proton Radiotherapy • Joseph Harms
15:50 #44 Clinical Workflow to Evaluate and Incorporate a High-Density Implant into Pencil Beam Scanning Proton Therapy Planning • Weili Zheng
16:00 #47 Real-Time, Patient-Specific Quality Assurance • Daniel Mundy
16:10 #98 Evaluations of a Flat-Panel Based Compact Daily QA Device for Proton Pencil Beam Scanning (PBS) System • Zhong Su
16:20 #109 Status on Carbon Ion Commissioning at MedAustron Ion Therapy Center • Markus Stock
16:30 #117 Reducing Pencil Beam Proton Lateral Penumbra by Using Layer-by-Layer Adaptive Aperture, Bolus and Smaller Air Gap • Peter Ahn
16:40 #118 A Sub-Cubic Millimeter Single Particle Sensor for In Vivo Dosimetry • Mekhail Anwar
16:50 #92 Feasibility of Predicting Proton Stopping Power Ratio Using the MRI-Measured Material Hydrogen Density • Sina Mossahebi

17:00 INVITED LECTURE - Hyperthermia and Protons: Is This the Safe Way to Get the “Carbon Effect”? • Zeljko Vujaskovic

17:30 Adjourn and Closing Remarks • Michael Chuong

18:00 Depart for City Night Miami (transportation is provided. Please arrive 15 minutes before the departure time.)

19:00-21:00 City Night Miami

21:30 Transportation departs the City Night Miami venue.
DAY 3 – Wednesday, October 16

07:00  Registration, Continental Breakfast, Visit Exhibits and Posters

07:25  Welcome and Opening Remarks • Anita Mahajan

07:30  KEYNOTE LECTURE 3 – FLASH • James Metz

08:00  Challenging Cases with Audience Participation • Miami Cancer Institute: Protons Are Not a Panacea • Michael Chuong, Marcio Fagundes, Alonso Gutierrez, Craig McKenzie

Moderator: Minesh Mehta

ORIGINAL CONTRIBUTIONS SESSION 5 - Lung and Motion

Moderators: Jing Zeng, Paige Taylor

08:45  #4  A University of Florida and Proton Collaborative Group Phase I/II Study of Hypofractionated Proton Therapy with Concurrent Chemotherapy for Stage II-III NSCLC • Bradford Hoppe

08:55  #76  Interplay Evaluation of High-Frequency Percussive Ventilation (HFPV) for Motion Greater than 10 MM During Proton Beam Scanning • Ina Sala

09:05  #10  Image-Guided Hypofractionated Proton Therapy in the Management of Early Stage Non-Small Cell Lung Cancer • Shivam Kharod

09:15  #22  Using Breath Hold at the End of Exhale for Lung Treatment in Pencil Beam Scanning Proton Therapy • Limin Song

09:25  #15  Clinical Outcomes Following Proton Beam Therapy for Locally Advanced Non-Small Cell Lung Cancer: Analysis of a Multi-Institutional Prospective Registry • Aurelien Jongen

09:35  #49  Dual-Energy CT-Based Accurate Relative Stopping Power Mapping Using Deep Learning • Joseph Harms

09:45  #111  Evaluation of the Gain in Using Higher Order Components of the Thoraco-Abdominal Surface to Estimate Volumetric Tidal Flow • Sina Mossahebi

09:55  #112  Evaluation of Stopping Power Ratio Prediction of Lung Tissue from Dual-Energy CT • Sina Mossahebi

10:05  #101  Effectiveness of Motion Interplay Effect Mitigation Using Spot-Scanning Proton Arc (SPArc) Therapy in Lung Stereotactic Body Radiotherapy (SBRT): A Quantitative Comparison Study Based on a Digital Phantom • Gang Liu

10:15  Break, Visit Exhibits and Posters

ORIGINAL CONTRIBUTIONS SESSION 6 - Head and Neck and Gastrointestinal

Moderators: Adeel Kaiser, Jen Yu

10:30  #3  Intensity Modulated Proton Therapy Using Dose-Painting Pencil Beam Scanning for High-Risk Hepatocellular Carcinomas • SmithApisarnthanarax

10:40  #20  Re-irradiation with Proton Therapy for Recurrent Malignancies of the Esophagus and Gastroesophageal Junction: Results of the Proton Collaborative Group Multi-Institutional Prospective Registry Trial • J. Isabelle Choi

10:50  #5  Early Results of Re-irradiation for Rectal Cancer Using Pencil-Beam Scanning Proton Therapy Are Promising • Antony Koroulakis

11:00  #27  Minimal Severe Acute Toxicity in Anal Cancer Patients Treated with Proton Beam Therapy • Michael Chuong

11:10  #134  Estimating the Individual Quality of Life Benefit and Cost Effectiveness of Proton Therapy for Patients with Oropharyngeal Cancer • Patrik Brodin

11:20  #62  Quantification and Verification of Skin Dose for Patients with Head and Neck Cancer Receiving Intensity Modulated Proton Therapy • Narayan Sahoo

11:30  #100  Spot-Scanning Proton Arc Therapy (SPArc) for Improved Optic Pathway Sparing in Paranasal Sinus and Nasal Cavity Cancer Treatment • Rohan Deraniyagala

11:40  #113  The Importance of Verification Computed Tomography Quality Assurance Scans in Patients Treated with Spot-Scanning Intensity Modulated Proton Therapy for Head and Neck Cancers • Scott Lester

11:50  #110  Enhancing LET in Proton Beam Therapy for Pancreas Cancer • Jiasen Ma
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<td>12:00</td>
<td>Adjourn and Closing Remarks</td>
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<tr>
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<td>PTCOG-NA Post-Conference Executive Committee Meeting</td>
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LEARNING OBJECTIVES

As a result of attending this conference, participants should be better able to:

- Maintain best practices for proton therapy patient selection by recognizing maximum opportunity for toxicity reduction and/or tumor control probability improvement.
- Appropriately identify patients for clinical trials and employ resources to overcome barriers to improve enrollment.
- Determine where and when to implement advanced treatment planning approaches such as Monte Carlo, relative biological effectiveness (RBE) and linear energy transfer (LET).
- Consider limitations of proton therapy and recognize when applications of dual modality or non-proton therapy options are indicated to achieve optimal patient outcomes.

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- When credits are awarded for each day or for specific sessions, individuals must attend the entire day or session in order to receive credit. Attendees who do not attend full days or conference sessions in their entirety receive no credit for that day or session. We apologize for any inconvenience.

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Product Theaters are optional and concurrent with lunch which will be served in Table 55. Food and beverages are allowed in the Product Theaters.

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Date: Monday, October 14
Time: 12:20 – 12:50 p.m.
Location: Banyan

Product Theater sponsored by Varian Medical Systems
Date: Tuesday, October 15
Time: 12:05 – 12:35 p.m.
Location: Banyan
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**Thank you!**
SPECIAL EVENTS

Miami Cancer Institute Tour and Reception
Transportation provided or a 15-minute walk.

Date: Monday, October 14
Location: Miami Cancer Institute Proton Therapy Center
Time:
5:15 p.m. Shuttle from the main lobby of hotel to Miami Cancer Institute
5:30 p.m. Reception and tour of Proton Therapy Center
7:00 p.m. Shuttle from Miami Cancer Institute to hotel

City Night Miami
Calle Ocho in Miami’s “Little Havana”
Transportation provided.

Date: Tuesday, October 15
Location: Ball & Chain
1513 SW 8th Street, Little Havana, Florida 33135 | 305-643-7820
Time:
6:00 p.m. Transportation from the main lobby of the hotel
6:45 p.m. Approximate arrival
7:00 p.m. Event begins
9:00 p.m. Event ends
9:30 p.m. Transportation to hotel

What to expect...
Join us for an authentic Havana experience at Ball & Chain in the historic and lively neighborhood of Calle Ocho, an area increasingly considered to be the center of Miami’s “Little Havana”. Sip a welcome Mojito or a drink of your choice from the open bar. Watch the paella chef prepare a delicious traditional dish on site, and sample authentic Latin specialties. Entertainment before, during and after dinner includes dancing – complete with salsa lessons – and more!

Please wear the blue wristband provided in your conference package.

Pre-registration was required for this event. On-site registration is not available.

Attire: Business casual. This is an outdoor event.

Contacts: Rossy Martinez, cell 786-355-6061 | Julie Zimmett, cell 305-321-5744
### POSTER PRESENTATIONS

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