Collaboration between medical physics and radiation oncology residency programs

McGill University Residency Program in Radiation Oncology Physics

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Program History (2000-2015)

- CAMPEP accreditation in 2000, started by Ervin Podgorsak
- Based at Montreal General Hospital until 2015
- Jewish General Hospital affiliated with program since 2000
- 4 additional affiliated sites since 2010
- 35 CAMPEP graduates

Program History (2015-2016) – “the move”
Cedars Cancer Centre
Radiation Oncology

- 70,000 sq. foot facility
- 150 staff including:
  - 14 MDs + 14 residents
  - 1 physicists + 10 dosimetrists + 4 residents
  - 45 RTTs
- 2,500 new patient starts per year
- 160 treatments per day
- 80 MD visits per day
- 7 treatment units
- 5 CTs
- 1 brachytherapy
- 1 MRI
- 50 planning stations
Program Curriculum - nutshell

- **Rotations (6 months each)**
  1. Treatment Planning 1
  2. Treatment Planning 2
  3. QA, Rad Safety, professional
  4. Clinical

- **Exams/Evaluation**
  - Oral exam after each rotation, plus final exam encompassing entire program

- **Weekly teaching sessions**
  - 1 hour teaching
  - 1 hour case review

- **Clinical project**
  - Collaborate with MD residents
Current Program

12 residents
- 10 Canadian
- 1 US
- 1 Oman
4 affiliate sites:
- JGH - Montreal
- CHUM - Montreal
- CHUQ - Quebec
- SPH - Albany

- Administered at MUHC site
- All exams have director or clinical coordinator present
- Teaching sessions at main site
- Large number of staff available to residents

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<td>Steering:</td>
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<td>Alberta, M.D., FRCPC, Program Director</td>
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<td>Lothar Lemke, Ph.D., FRCPC, Associate Program Director</td>
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<td>Students:</td>
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<tr>
<td>Donat, E.D., M.D., MSc, CCHP, General Clerk</td>
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<td>Clinical Directors:</td>
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<td>Sabine, A.B., M.D., MSc, CCHP, Director</td>
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<td>Muriel, A.B., M.D., MSc, CCHP, Director</td>
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<tr>
<td>Noline, A.B., M.D., MSc, CCHP, Director</td>
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Collaboration with RO program

- RO program director is member of RTPC
- MP program director is member of ROTPC
- Exploit common learning opportunities
- Share common teaching opportunities

Collaborations with RO program

- Projects and presentations
- Case review rounds
- Shadowing
- Friendly quizzes
- Common teaching sessions
RO residency training program

- Accredited by RCPSC
- 14 residents, 5 fellows
- 2 sites plus community rotation
- 5 year program

- Heavy emphasis on physics:
  - 4 fundamental courses: Properties of Radiation, Apparatus, Dosimetry 1 and 2
  - Weekly clinical physics sessions (1.5 hrs)
  - Bi-weekly case review (1 hr)

Project or review

- Clinical project
  - Residents must make an alliance with RO resident (or staff) and work on a short project/review topic and co-present results internally
  - Stimulates cooperation, collaboration, and understanding

- Examples
  - Re-commissioning rotational total skin electron irradiation
  - Intra-fraction tumor assessment for lung SBRT in patients treated without an immobilization device
  - Moving towards a linac based TBI technique
  - Hippocampal sparing in prophylactic cranial irradiation
  - DIBH experience at MGH

Deep inspiration breath hold example project

- RO resident presented studies about radiation-induced heart disease following radiotherapy at RO rounds
Deep inspiration breath hold example project

- Physics resident provided information about implementation of DIBH and specific examples

Case re-review rounds

- Weekly 1 hour sessions reviewing interesting cases from case review rounds
- Physics residents and RO residents in attendance
- Cases chosen by residents and staff participating in the rounds
- Try to mix medical and physics aspects in discussion

Streaking artifacts

Motion artifacts

Is the shoulder in the field?

Does this require a new plan?

Is the chin in the field?

What is this? Can we treat through it?
Shadowing program* (new this year)

- For one week at the beginning of residency, MP and RO residents will be paired and shadow each other's activities
- The goals:
  - MP resident to get to know RO residents and vice versa
  - MP resident attends clinics and experiences what MDs deal with

Common teaching sessions

- Clinical physics course for RO residents are useful for MP residents
- MP residents will be aware of level of physics that ROs have
- Sessions are didactic/discussion
- Fosters camaraderie between professions

Let's finish with a Quiz! - Quizzes

- Twice a year
- Formative quizzes
- Taken together
- Graded together
- Based 100% on clinical cases
Rad Onc Residents
End of year Quiz

2016

WBI

• Estimate the dose to the lenses?
• What are the black lines indicated by A?
• What is the dose under A?

WBI

• What is the expected maximum dose for a case like this (A)?
• Is B a hot spot or cold spot?
**Hip hop...**

- What energy was used for this treatment?
- What information do you need to assess if the PTV is covered by the RX dose?

**Breast setup**

- Identify the markers A – E.
- Are heterogeneity corrections on?

**Breast and Super C: Are these acceptable?**
Ear, ear, electrons!

- Why is the wax there?
- Rx is 8 Gy / 1 at 80% with 6 MeV electrons:
  - What is the max dose?
  - What is the surface dose?

Tell me the dose...iso gets 100% - 10 MV

Summary

- Collaborations between MP and RO residency programs are beneficial to both groups
- Encourages new teaching methods and revamping educational opportunities
- Examples at McGill:
  - Projects and presentations
  - Case review rounds
  - Shadowing
  - Friendly quizzes
  - Common teaching sessions