Regional Community of Practice Efforts to Enhance Radiotherapy Peer Review Practices in Radiation Oncology

Natalie Pomerleau-Dalcourt, MSc MCCPM, Amanda Caissie MD PhD, Robin Campbell, Maria Corsten, Helmut Hollenhorst MD, Paul Jugpal BSc RTT, Larry Pan MD, Lisa Sinclair, Jennifer O’Donnell, Michael Brundage
What is Radiotherapy (RT) Peer Review?

Which answer is false?
A) all of the above
B) none of the above
C) 2
D) 2 and 3
E) 1, 2 and 3

1) evaluation of a radiation oncologist’s (RO) proposed contours by a second RO
2) evaluation a RO’s proposed contours by a radiologist
3) evaluation of a RO’s proposed treatment plan (dosimetry) by a physicist
4) evaluation of a RO’s proposed treatment plan (dosimetry) by a multidisciplinary group including RO, physics and therapy
Accurate target contours are critical
Accurate contours of normal structures are critical
RT Planning

Avoidance of normal structures is critical
ie overdose of spinal cord = paralysis
Why is RT Peer Review Important?

Research with Clinical Impact
Quality Assurance (QA)

Fig 3. Time to locoregional failure by deviation status. The four cohorts are (1) compliant from the outset (n = 502), (2) made compliant following a review by the Quality Assurance Review Center (n = 96), (3) noncompliant but without predicted major adverse impact on tumor control (n = 105), and (4) noncompliant with predicted major adverse impact on tumor control (n = 87). Overall $P < .001$. Pair-wise tests were not statistically significant except for cohort 1 versus cohort 4 ($P < .001$), cohort 2 versus cohort 4 ($P = .004$), and cohort 3 versus cohort 4 ($P = .006$). TCP, tumor control probability; RT, radiotherapy.

Fig 2. Overall survival by deviation status: (1) compliant from the outset (n = 502), (2) made compliant following a review by the Quality Assurance Review Center (n = 96), (3) noncompliant but without predicted major adverse impact on tumor control (n = 105), and (4) noncompliant with predicted major adverse impact on tumor control (n = 87). Overall $P < .001$. Pair-wise tests: not statistically significant except for cohort 1 versus cohort 4 ($P < .001$), cohort 2 versus cohort 4 ($P = .041$), and cohort 3 versus cohort 4 ($P = .006$). TCP, tumor control probability; RT, radiotherapy.

Peters LJ et al. Critical Impact of Radiotherapy Protocol Compliance and Quality in the Treatment of Advanced Head and Neck Cancer: Results From TROG 02.02. JCO 2010
Why is RT Peer Review Important?

- Ideally, both short-term and long-term patient outcomes are improved by peer review

- Effective in
  - refining departmental policies and treatment planning processes
  - reducing variation in practice
  - improving department efficiency/decreasing replan rate
  - providing a venue for multidisciplinary communication
  - increasing staff/trainee awareness of evolving treatment processes
RT Peer Review: a National Perspective

Canadian Partnership for Quality Radiotherapy

Quality Assurance Guidelines for Canadian Radiation Treatment Programs

A guidance document on behalf of:

Canadian Association of Radiation Oncology
Canadian Organization of Medical Physicists
Canadian Association of Medical Radiation Technologists
Canadian Partnership Against Cancer

September 1, 2013
QRT.2013.09.02

In 2013, CPQR included 3 key quality indicators (KQI) related to peer review in their Quality Assurance Guidelines for Radiation Oncology programs

<table>
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<th>Key Quality Indicators #33, 34, 35</th>
<th>Indicator Measure</th>
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<td>Percentage of adjuvant or curative radiotherapy treatment plans that undergo Radiation Oncologist peer review prior to the start of treatment.</td>
<td>0-100 %</td>
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<tr>
<td>Percentage of adjuvant or curative radiotherapy treatment plans that undergo Radiation Oncologist peer review at any point in time.</td>
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19.7 Radiotherapy only: Each client's radiotherapy treatment plan is peer reviewed by a radiation oncologist.

Guidelines
Peer review includes the review of the full treatment plan, including contouring of all structures. Radiotherapy treatment plans are peer reviewed before treatment has begun. When peer review is not available prior to the beginning of treatment, it is completed before 25% of the total prescribed dose has been delivered.
Looking forward: Accreditation standards

27.10 Radiotherapy only: Data are collected about peer review rates for radiotherapy treatment plans.

**Guidelines**

Peer review by a second independent radiation oncologist should occur prior to the beginning of treatment. When this is not possible, treatment plans are reviewed before 25% of the treatment has been completed. The team tracks data about when this occurs and uses it to implement strategies to increase peer review rates.

Data are reported to relevant provincial and/or federal bodies for benchmarking.
Peer Review Research: a National Perspective

National Radiation Oncology Peer Review Study

- led by Dr Michael Brundage
- supported by the CPQR and CPAC (Canadian Partnership Against Cancer)

Aim: to support the implementation and development of peer review programs across Canadian RT centres
Ontario-based survey of RT centres 2011
- identified significant variability of peer review practices within a cancer system that has provincial oversight
- follow-up of Ontario progress (Cancer Care Ontario)

Atlantic Canada Peer Review Group, June 2014
# Atlantic Canada Peer Review Group

<table>
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<tr>
<th>Location</th>
<th>Members</th>
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<tr>
<td>Moncton, NB</td>
<td>Natalie Pomerleau-Dalcourt, MSc MCCPM</td>
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<td>Saint John, NB</td>
<td>Amanda Caissie, MD PhD</td>
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<td>Robin Campbell, RTT</td>
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<td>Halifax, NS</td>
<td>Helmut Hollenhorst, MD</td>
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<td>Christine Baillie MRT(T)</td>
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<tr>
<td>Sydney, NS</td>
<td>Lisa Sinclair, CMD, RTT</td>
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<tr>
<td>St. John’s, NL</td>
<td>Maria Corsten, MSc MCCPM</td>
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<td>Charlottetown, PEI</td>
<td>Larry Pan, MD</td>
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Under the guidance of CPQR and funding provided by CPAC, the Atlantic Provinces Working Group will work towards a strategy to accelerate the uptake of peer review for radiation treatment. It will lead the peer review process, both to improve compliance of individual centers in Atlantic Canada and collect rates of peer review and outcomes of the process.
Atlantic Provinces Working Group: Function

- Review and document present peer review practice in participating departments
- Define regional standards for peer review consistent with the CPQR national standards
- Develop a strategy for implementation of a standardized peer review process across the region
- Develop and implement a record of peer review applicable to the region
- Monitor ongoing challenges and successes of the regional peer review programs
- Generate data and reports of regional activities, to support regional peer review initiatives and provide routine updates to the National Committee
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Review & document peer review practice

- National survey completed by all participating departments
- Review of regional practices by Atlantic Working Group
- Sharing of lessons learned, identification of common challenges and successes of individual departments
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Saint John, NB: Successes

- consistent, multidisciplinary attendance
- standardized format to increase efficiency
  - high rate of radical case review
- improved timing of case review

**Graphs:**
- Bar chart showing # of participants across weekly rounds.
- Donut chart showing % radical cases over time (Sept, Oct, Nov, Dec).
- Column chart illustrating % radical cases with Post-RT, Post-RT<25%, and Pre-RT categories.
Saint John, NB: Challenges

- Increasing review of
  - radical cases in radiation oncologist absence
  - palliative cases

- Documentation
  - group (contours/dosimetry) VS one-on-one (contours pre-plan)
Halifax, NS: Successes

- Standards and Guidelines
  - For all cancer sites for all radical cases
  - Developed and maintained by (DAL-DRO) site teams
  - ARIA Care-Paths assigned for peer review task for all radical cases (almost 100% compliance)

- Legal Framework in place
Halifax, NS: Challenges

- **Quality of peer review**
  - When is peer review done?
  - Level of peer review (contours vs. full plan)
  - Outcomes of peer review

- **Efficiency and Documentation**
  - Standardized documentation
  - Data processing, reporting, follow-up
Halifax, NS: Proposal for Peer Review Descriptors

**Peer Review (PR) Descriptors and Codes**

1) When is PR done?
   i) Prior to treatment \( PRXT1 \)
   ii) Prior to 25\% \( PRXT2 \)
   iii) Prior to completion of treatment \( PRXT3 \)

2) Reason PR does not occur
   i) Critical mass of Radiation Oncologists \( PRXB1 \)
   ii) Time constraint \( PRXB2 \)
   iii) Technology restriction \( PRXB3 \)
   iv) Other \( PRXB4 \)
Halifax, NS
Proposal for Peer Review Descriptors, cont.

3) Peer Review (Contour):
   i) OAR contour no change PRXC1
   ii) OAR contour minor change PRXC2
   iii) OAR contour major change PRXC3
   iv) Target Volume contour no change PRXC4
   v) Target Volume contour minor change PRXC5
   vi) Target volume contour major change PRXC6

4) Peer Review (Plan):
   i) no plan change PRXR1
   ii) minor plan change PRXR2
   iii) major plan change PRXR3
Sydney NS: Successes

- Efficiency
- Quality
- Quantity
- Replan
- Supportive working environment
- Education
Sydney NS: Challenges

- Time: getting through the task
- Resources: attendance
- Culture change: difference in opinions
- Documentation
Moncton, NB: Successes

- **Care Plan Model:**
  - 100% of cases with an assigned Care Plan are reviewed against established standard
  - Efficient: avg. 4 minutes per case (14 cases per hour)
  - Minimal debate: standard already established
  - Clear classification (Category 1, 2, 3)
  - Continual evolution/development of Care Plans
  - Site teams allow true multi-disciplinary review

- **Paperless & automatic process & documentation (QCL, Checklist, Scripts)**
  - Automatic case selection, prioritization, presentation and data capture
Moncton, NB: Peer Review Process

- Presentation of each case by treating physician with support from physics/dosimetry
- Peer Review of treatment plan, target and OAR contours, DVHs as compared to Care Plan objectives
- Classification in one of three categories:
  
  **Category 1:** Conforms to Care Plan  
  **Category 2:** Minor deviation from Care Plan, no adjustment necessary  
  **Category 3:** Deviation from Care Plan, adjustment required

If plan is assigned Category 2 or 3, reason is documented in checklist (and becomes part of e-chart)
Émis par : Denise Roy, RT

Approuvé par :
(signatures et date)

Rendez-vous du patient :
CT Sim : durée de 45 minutes.
Traitement : Synergy
30 min (MEP + 1er Tx), 15 min (Tx # 2-30)
Nombre de traitements total : 30 traitements/6 semaines

Positionnement :
Décubitus dorsal
Vac lock
Bras relevés

CT-Simulation :
Protocole « Onco Chest with Gating »
Série Body, Helical : inclure les 2 poumons au complet et en inférieur le foie au complet
Série Pulmo Gating, Helical : inclure la masse et une marge pour inclure le mouvement.
Marquer reflext sur série Body, Helical, au centre du champ avec limites préliminaires
Importer série Body Helical et MIP dans Pinnacle, MIP dans Secondary Images.

Commentaires ou particularités :
Contours fait sur le MIP fusionné avec la série d'images sans gating.

Date d'entrée en vigueur: 29 novembre 2013

Date de révision précédente : N/A

Prescription de dose :
Dose totale : 60 Gy/30 tx
Dose/fraction : 200 cGy
Fréquence : quotidienne

Volume traité :
Contours(Dosi) : Poumons, canal médullaire, canal médullaire PRV 3mm, poumons-GTV, esophage, cœur, foie (lobe pulmonaire inférieur seulement), plexus brachial (à la demande du médecin)
Contours (MD) : GTV (iGTV), CTV(ITV)= iGTV+ extension microscopique (0.5-1 cm)
(Dosi) : PTV : CTV+0.7 cm

Dosimétrie :
Technique : Radiothérapie conforme 3D (3D-CRT), ≤6 champs
Énergie : Photons 6 ou 10 MV
PTV : D95%≥100%, Dmax ≤115% (2cc)
Canal médullaire : Dmax ≤4500 cGy (0.03 cc)
PRV (moele+3mm) : ≤5000 cGy (0.03 cc)
Poumons- GTV : V30 ≤30%, V15 ≤40%, V5 ≤50%, MLD ≤18 Gy
Esophage : V20 ≤17%, V50 ≤60%, mean ≤34 Gy, max ≤105% de la prescription (63 Gy).
Cœur : V40<60%, V50<30%, mean ≤35 Gy.
Foie : documentation de la dose reçue pour référence au besoin seulement.
Plexus brachial : Dmax ≤66 Gy (à la demande du R.O)

Imagerie :
MEP+TRT de chaque plan : Imagerie de positionnement (CBCT)
+Imagerie de vérification du traitement (images portales avec MLC) d'au moins 2 incidences
TRT #2-30 : Imagerie de positionnement (CBCT)
CBCT : Fusion des repères osseux suivi de la vérification du 'match' tissus mou
**CARE PLAN:** NSCLC limité inoperable 60 Gy/30 tx

**FRACTION:** 0

**IMAGES DIAGNOSTIQUE:** PET

**LATÉRALITÉ VÉRIFIÉ:** OUI - OUI

**CONTOURS**

- **OAR:**
- **GTV révisé?:** OUI - OUI
- **CTV révisé?:** OUI - OUI

**OBJECTIFS & CONTRAINTES**

- **PTV:**
- **OARS (SELON CARE PLAN):**

**COMMENTAIRE:** Compromis couverture/dose OAR - Compromis couverture/dose OAR

**COMMENTAIRES (FREE TEXT):**

**CATÉGORIE:** 2 - 2 - DÉVIATIONS MINEUR, AUCUN CHANGEMENT NÉCESSAIRE

*PEER REVIEW (RO CURATIF) Will Be Added*
Moncton, NB: Challenges

• Peer Review requires approved Care Plan
  June 2014: ~ 40% of cases
  June 2015: ~ 70% of cases
  - Care plan development is resource-intensive (but worth it!)
  - High efficiency lends itself to “rubber stamping” (vigilance)

• Limited resources: radiation oncologists & physicists
  - Not all sites have 2 expert reviewers
  - Review delayed during RO absences

Looking forward:
↑ Care Plans, ongoing evolution (site specific sessions, some off-line, external/regional review)?
St. John’s, NL: Successes

- Weekly site-based peer review groups
- Multidisciplinary weekly rounds
- Brachytherapy peer review
- Peer Review task and site based work-lists
- Improvement in % of patients peer review in short time frame
- Increased educational opportunities
St. John’s, NL: Challenges

- Continue to improve % of cases peer reviewed
- Documentation of quality of peer review
  - Contours
  - Plans
  - Imaging
- Workload/time/resources/efficiency
- ? absence of attending radiation oncologist
Common Themes

- Perceived importance of peer review & collaboration
- Aims: Quantity/efficiency & Quality
- Challenges
  - Culture change
  - Time/resources
  - Medicolegal implications/documentation
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Generate data and report on regional activities

- Service agreement for national study reviewed by all participating centers

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- Liability concerns have delayed data submission in at least one center – waiting for update from national committee
Generate data and report on regional activities

- Data collection for national study is in progress or complete in all participating centers

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• Smaller centers may have only one RO treating a particular site – making appropriate PR problematic
• Multi-centre collaboration: model?
  Weekly site specific group review?
  Offline case review by RO?
  Technology requirements? Privacy concerns?
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