Population-based planning of radiotherapy services in Québec

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The (not so distant) past…

• At the end of the 1990s, a crisis in radiation oncology in Québec
  – A third of patients needing radiotherapy were waiting >8 weeks to start treatment
  • Increasing number of patients
    – Growing/aging population
    – Introduction of a screening program for breast ca
    – Changing practice/increased use of radiotherapy e.g., prostate, rectal ca
My presentation today

• Describe our response to the crisis
  – Long-range planning 2000-2004
  – Follow up from 2004 onwards
• The situation today
• A vision for the future
First response 1999

- Creation of a partnership between the Québec Ministry of Health and the professionals working in the field
  - A working group
    - Led by an experienced radiation oncologist
    - Included representation from university and regional centres (n=9) and from all professional groups
    - Technical support from the Ministry of Health
    - Coordinated by an experienced, committed, and influential bureaucrat
  
- A report that documented the situation in each of the centres and compared equipment and staffing levels with other jurisdictions
The findings

- Lack of equipment
- Lack of staff
## Equipment

<table>
<thead>
<tr>
<th></th>
<th>Québec</th>
<th>Ontario</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of linear accelerators</td>
<td>32</td>
<td>51</td>
<td>121</td>
</tr>
<tr>
<td>Patient treated/megavoltage unit</td>
<td>443 (260-542)</td>
<td></td>
<td>392</td>
</tr>
<tr>
<td>Ratio low:high energy linac</td>
<td>1:1</td>
<td>1:4</td>
<td>1:2</td>
</tr>
</tbody>
</table>
Equipment

• Very few centres with up-to-date technology
  – High energy, bi-modality linear accelerators
  – Accessories e.g., portal imaging, multileaf collimators

• Majority of centres did not have CT simulators
## Professional staff

<table>
<thead>
<tr>
<th>Role</th>
<th>Québec</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients treated/ radiation oncologist</td>
<td>467 (260-622)</td>
<td>244</td>
</tr>
<tr>
<td>Patients treated/ medical physicist</td>
<td>532 (260-1036)</td>
<td>405</td>
</tr>
<tr>
<td>Patients treated/ radiation therapist</td>
<td>95 (51-120)</td>
<td>73</td>
</tr>
<tr>
<td>Patients treated/ dosimetrist</td>
<td>823 (208-1233)</td>
<td>469</td>
</tr>
</tbody>
</table>
Support staff

- Almost complete lack of dedicated specialist support staff e.g., engineers, IT specialists
First response 1999

- Immediate solutions
  - To contract with centres in the United States for treatment there for patients with breast and prostate cancer
  - To increase the hours worked by the radiation therapists

Politically difficult

Aggravated an already very difficult work climate
Next steps

• Creation of a committee of the Ministry of Health
  – Clear mandate
    • To recommend to the Ministry strategies that would ensure access to quality care in radiation oncology
Next steps 2000-2001

• A comprehensive long-range plan for radiation oncology for Québec
  – Equipment
    • Upgrades in all centres to state-of-the-art
    • Additional linear accelerators in existing centres
  – New centres
  – Manpower
    • Radiation oncologists
    • Medical physicists
    • Radiation therapists
Next steps 2000-2004

• With close oversight
  – Système de gestion d’accès aux services (SGAS)
    • From 2004 onwards, weekly, standardised reporting to the Ministry of Health
      – Definitions e.g., “treatment course”
      – According to defined priorities (4 categories)
        » <24 hours, <3 days, <2 weeks, <4 weeks
        » Accepted/adopted by the Collège des médecins
Next steps 2000-2004

• And some temporary measures
  – Transfer of patients between centres in Québec
  – Special overtime payments to staff
Great improvement...

- T/F to USA discontinued in January 2002
- By May 2004, few patients waited >8 weeks, almost none >12 weeks

Total # of patients treated in 6 US centres = 1610
in other Québec centres = 3068
Ensuring access 2004 onwards

• Target established
  – >90% of patients ready for treatment to be treated <4 weeks

• Follow up/regular updating of long-term plans using real-time data (“patients treated”)

• New elements:
  – A budget for upgrading and replacing equipment
    • Linear accelerators Q10years
  – Tighter control of distribution of manpower between the centres
Current situation: wait times

In 2011-2012, target met for all now 12 centres combined.
Current situation: equipment

• All centres upgraded, equipped for modern radiotherapy
• Two smaller regional centres each have 3 linear accelerators
• Two new centres opened in 2011

• Total # of linear accelerators has increased from 32 in 1999 to 62 in 2012
## Current situation: manpower

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2011-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation oncologists</td>
<td>43</td>
<td>133</td>
</tr>
<tr>
<td>Medical physicists</td>
<td>38</td>
<td>135.5</td>
</tr>
<tr>
<td>Radiation therapists</td>
<td>256</td>
<td>521</td>
</tr>
</tbody>
</table>
Current situation: manpower

- Number of training positions for MDs determined according to long-range population-based need since 2001
- Positions for new graduates (MDs, medical physicists and radiation therapists) allocated according to needs of centres
  - Patients treated, taking into account place of residence-based redistribution of patients after opening of new centres
Lessons learned

• Transferring large numbers of patients for treatment is difficult, resource intensive, and costly
  – To the USA
  – Between centres in Québec

• Planning resource needs in radiation oncology in an exclusively public health care system is not difficult
Elements key to success

• Political will and courage
• Involvement of/leadership by professionals working in the field to anticipate and plan for new developments
• Common/clear objectives, close monitoring, early successes
• Involvement of others as needed e.g., the Ministry of Education, the universities, the professional orders and associations....
• Continued support/regular reviews/updates of plans
What now/next?
Radiotherapy today

• Radiotherapy practice is evolving
• Tremendous advances in radiotherapy technology
  – Early 1990s
    • CT simulation, 3D conformal radiotherapy
  – 2000s onwards
    • Intensity modulated radiotherapy
    • Image guided radiotherapy
    • Adaptive radiotherapy
      – Anatomic and functional
    • New modalities e.g., protons
Planning for the future

• Assure availability and appropriate use of new techniques and modalities
  – The concept of a network of complementary services, expertise
The RUIS network in Québec

• A useful framework for radiation oncology
• In 2004
  – Comité de radio-oncologie reorganized
    • The heads of radiation oncology of the 4 university hospitals
    • Medical physicists named by the Québec Association of Clinical Medical Physicists (AQPMC)
    • Radiation therapists named by the « tableau des chefs »
The advantages of working in a (radiation oncology) network

• Assure equal access to highly specialized services and optimal care for all patients
• Avoid unnecessary duplication of services
• Support the development and implementation of new techniques and technologies
• Assure access to continuing education for staff
• Facilitate planning throughout the network
Four examples within one network
The McGill radiation oncology network

• McGill RUIS
  – 23% of population
  – Vast territory

• 3 radiotherapy centres
  – MUHC, JGH and Gatineau

• Two major issues
  – Utilisation < provincial average in 2 regions
  – Need to ensure access to ultra specialised care
Improving utilisation

• Valleyfield
  – Regional hospital 1½ hours from Montréal
  – Since 2011, access to consultation with radiation oncologists on site and by teleconferencing → avoids unnecessary displacement of patients
    • Utilisation of radiotherapy has increased
    • High level of patient and provider satisfaction
Improving utilisation

• The Abitibi-Témiscamingue region
  – Vast area, closest community to Montréal 522km
    • Limited success of various attempts to improve access
  – The solution proposed: a new centre with one linear accelerator partnered with the MUHC
    • A single electronic record
      – Distant planning/review
      – Specialist MD, medical physics support
    • Linear accelerator twinned with another at the MUHC
      – Easy transfer of patients in case of breakdown/other
Ensuring access to best care

• Gatineau
  – Approximately 1000 patients treated each year
  – Access to specialist radiation oncologists by teleconferencing, tumour boards for less common tumour types/more complex situations
  – Regular rounds, teaching sessions available by teleconferencing
  – On-site support of MDs, medical physicists as needed
    • e.g., introduction of new technologies
  – Easy transfer for ultra specialised care
Ensuring access to highly specialized equipment/modalities

- Proton therapy
  - A “new” modality with a unique dose distribution/reduced exposure of non-target tissues
    - Costly initial outlay, requires special support and expertise
  - The solution proposed: distributed planning
    - Local patient evaluation → central planning
      - Estimate potential benefit over best treatment available locally
      - Oversight by MSSS committee of experts
    - Ensure access for patients who will benefit most whether within Québec or as now in the USA
Summary/conclusions

• “Teamwork” within the milieu, with government, other stakeholders, is essential
• Planning for radiotherapy is not difficult and a network that supports best care including optimal use of currently available/new/costly technology is to everyone’s advantage
Thank you!

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