

BrachyNext



Working Together to Shape the Future of
Brachytherapy

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Brachytherapy

“The Concept of an Interconnected Global Brachytherapy Community ”

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Disclosures

- CHU de Québec is an Elekta center of excellence
- Contribution to various advisory boards (pharmaceuticals) over the years
- Medical advisor for:
 - Polymer Robotics (no salary or shares)



Plan

- Interest
- Language
- Sharing knowledge
 - Sharing data
- Solving common questions
- Providing a better cure

Same interest

- Cancer cure
 - Is the main goal for us all
 - It unites us
 - We share the same technical approach to it...



Same interest

- Brachytherapy
 - From the Greek word “*brachys*”, meaning “short-distance”
 - Can be used to treat tumors in \approx all body sites
 - Brachytherapy is what bring us close, together as a group...

Same interest

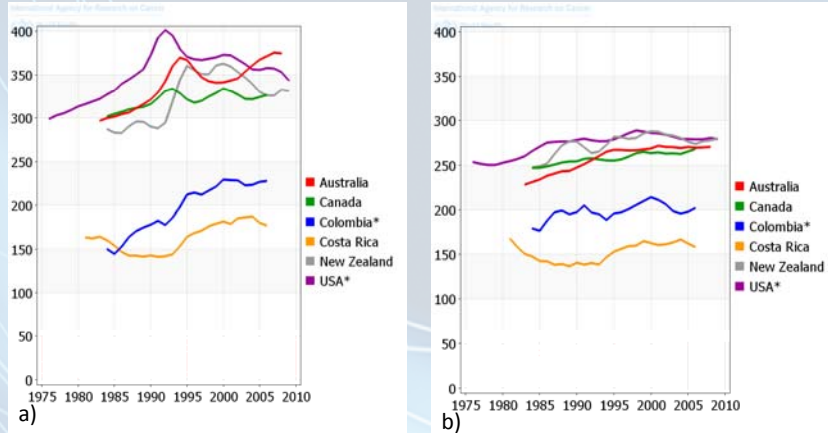
- WHO
 - Cancers is one of the **leading causes of death worldwide, 8.2 M deaths in 2012.**
 - Lung, liver, stomach, colorectal & breast cancers cause most cancer deaths/year.
 - About 30% of cancer deaths are due to the five leading behavioural and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, alcohol use.
 - Tobacco use is the most important risk factor for cancer causing over 20% of global cancer deaths and about 70% of global lung cancer deaths.
 - Cancer causing viral infections such as HBV/HCV and HPV are responsible for up to 20% of cancer deaths in low- and middle-income countries.
 - **> 60% of world’s total new annual cases occur in Africa, Asia and Central and South America.**
These regions account for **70% of the world’s cancer deaths.**
 - It is expected that annual cancer cases will rise from 14 million in 2012 to **22 within the next two decades.**

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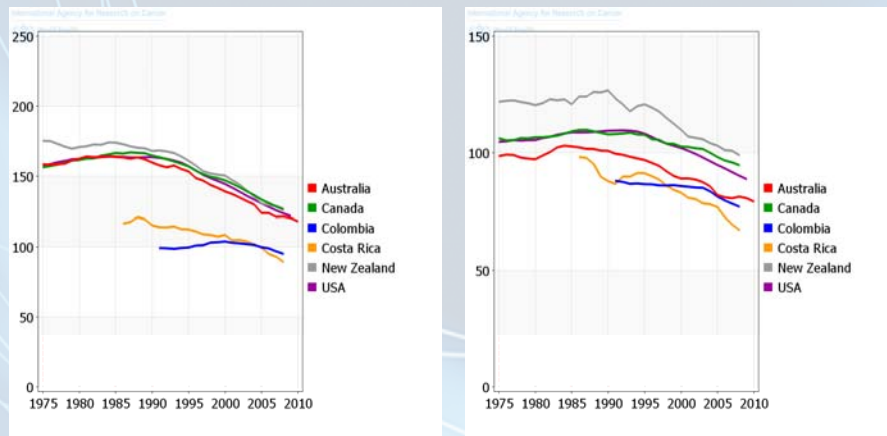


Same interest



Trends in incidence of cancer in selected countries:
a) age-standardised rate (W) per 100,000, men
b) age-standardised rate (W) per 100,000, women
<http://globocan.iarc.fr/old/FactSheets/cancers/all-new.asp>

Same interest



Trends in **mortality** of cancer in selected countries:
a) age-standardised rate (W) per 100,000, men
b) age-standardised rate (W) per 100,000, women
<http://globocan.iarc.fr/old/FactSheets/cancers/all-new.asp>



Same interest

- Brachytherapy
 - Most developed countries form their scientific society
 - *American Brachytherapy society*
 - <https://www.americanbrachytherapy.org/>
 - Groupe Européen de Curiethérapie (GEC-ESTRO)
 - <http://www.estro.org/>
 - Canadian Brachytherapy Group (in CARO)
 - <http://www.caro-acro.ca/>
 - Grupo Latino Americano de Curieterapia

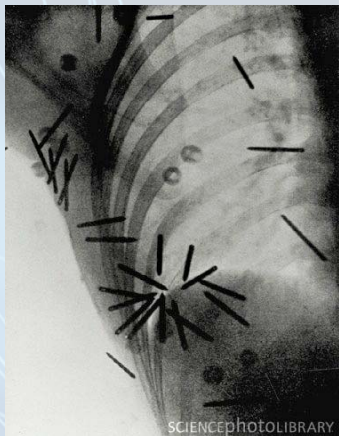
Same interest

- Brachytherapy
 - Form most developing countries
 - There is a need*
 - Develop access to diagnosis or treatment
 - Lack of 5000 radiotherapy machines
 - 19 countries of Africa have none
 - Resulting in death of curable cancer

*World Cancer Day 2014 (ESTRO February 4th, 2014)- Statement by Kwaku Aning
IAEA Deputy Director General and Head of the Department of Technical Cooperation



Same Brachytherapy Interest



Radium therapy. Chest X-ray of a woman with breast cancer receiving radiotherapy from implanted radium needles in 1929. Her ribs are visible as grey bands. In this technique around 40 needles (black) were placed into the cancerous areas of the breast. Each needle emitted radiation into the surrounding tissue, giving a total dose of over 16,000 milligram-hours of radium.

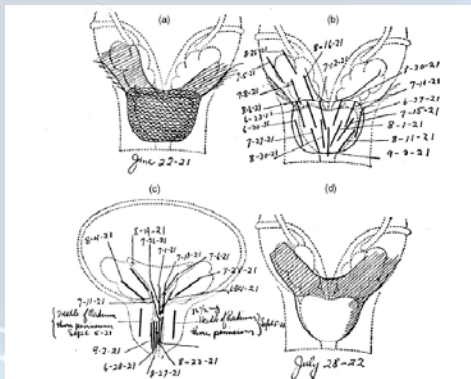


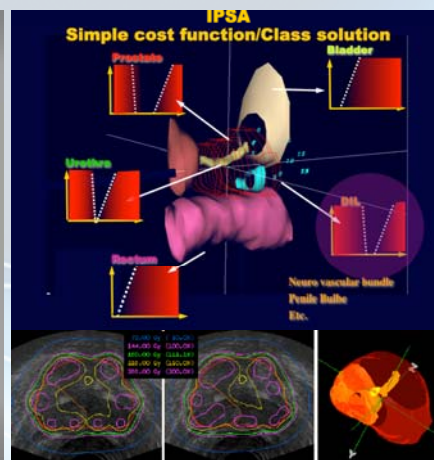
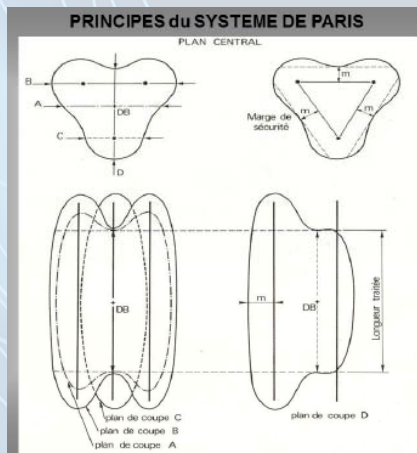
Fig. 1. Record of a course of intracavitary brachytherapy as delivered by Hugh Hampton Young. (a) Map of prostate and seminal vesicles as determined by rectal examination. Parallel lines indicate regions of irradiation, and cross hatch indicates stony hardness. (b) Record of rectal applications. (c) Record of urethral, bladder neck, and trigonal applications. (d) Palpable findings 10 months after therapy completion. From Young (6), public domain.

Young HH. The use of radium in cancer of the prostate and bladder: A presentation of new instruments and new methods of use. *JAMA* 1917;68:1174-1177.

Ref. Aronowitz JN. *Int J Radio Oncol Biol Phys* 2002; 54(3): 712-18

Same language

- We realize that we need to standardize





Same language

Same language

Exploring catheter patterns for prostate brachytherapy

2005: Paris declares its system obsolete

Dosimetric equivalence of non standard patterns

Bulb sparing patterns

NPIP: A skew line needle configuration optimization system for HDR brachytherapy
Stavrou et al. NPIP: Needle planning for HDR. Med. Phys. 39 (7), July 2012

Optimization of skew line catheters

Adaptation of the CVT algorithm for catheter optimization in high dose rate brachytherapy
Medical Physics 40, 111724 (2013); doi: 10.1118/1.4826335
Eric Poulin, Charles-Antoine Collin Fekete, Mélanie Létourneau, Aaron Fenster, Jean Pouliot, and Luc Beaulieu

Optimization of catheter patterns

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Reproduction authorised by Dr. Jean Pouliot (presentation of May 2014 @ CHU de Québec)

Same goal

- Improve our ways to treat

Radiotherapy and Oncology 103 (2012) 217–222



ELSEVIER

Contents lists available at SciVerse ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com



Phase III randomised trial

Randomised trial of external beam radiotherapy alone or combined with high-dose-rate brachytherapy boost for localised prostate cancer

Peter J. Hoskin^a, Ana M. Rojas^{a,*}, Peter J. Bownes^b, Gerry J. Lowe^a, Peter J. Ostler^a, Linda Bryant^a

^aCancer Centre, Mount Vernon Hospital, Northwood, UK; ^bSt. James's Institute of Oncology, St. James's University Hospital, Leeds, UK



Share knowledge

- Know how...
 - I solved this problem, doing this...
- In such situations
 - It turns out to give such results

Share data

- May help do large population trials

Radiotherapy and Oncology 109 (2013) 204–210

Contents lists available at [ScienceDirect](#)

 Radiotherapy and Oncology 

journal homepage: www.thegreenjournal.com

Prostate cancer

The prostate cancer risk stratification (ProCaRS) project: Recursive partitioning risk stratification analysis 

George Rodrigues^{a,*}, Himu Lukka^b, Padraig Warde^c, Michael Brundage^d, Luis Souhami^e, Juanita Crook^f, Fabio Cury^g, Charles Catton^h, Gary Mok^c, Andre-Guy Martin^g, Eric Vigneault^g, Jim Morris^h, Andrew Warner^h, Sandra Gonzalez Maldonado^h, Tom Pickles^h, on behalf of the Genitourinary Radiation Oncologists of Canada (GUROC)

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Multiple minds

- Each of the players will see the problem with their individual experience.
- Looking at different approaches to solve the problem (different quests for a solution)
- Single problem may find multiple solutions

Multiple outcomes

- Multiple analysis and papers are produced with different views
 - **Stereotactic Ablative Radiotherapy Versus Low Dose Rate Brachytherapy: A Propensity Matched Analysis Of Canadian Data**
 - cf. ASTRO Annual meeting 2014

D. Andrew Loblaw

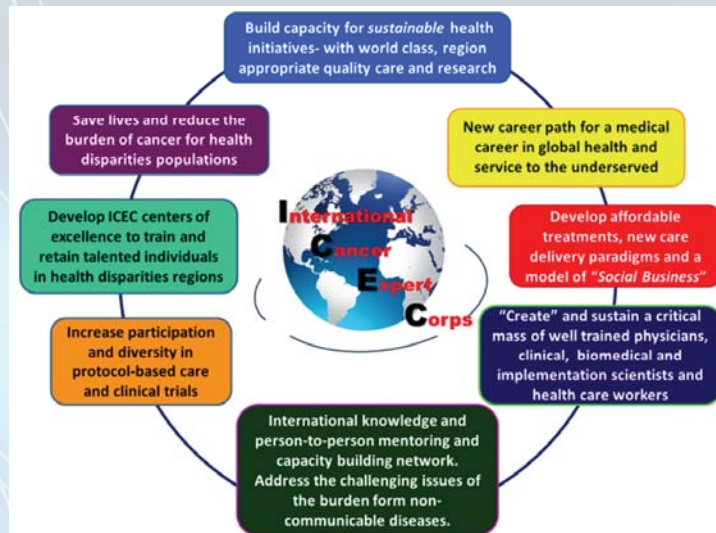
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 6-Juravinski Cancer Center, Hamilton, ON, Canada,
 7-Sunnybrook Odette Cancer Centre, Toronto, ON, Canada,
 8-Sunnybrook Health Sciences Centre, Toronto, ON, Canada,
 9-London Health Sciences Centre, London, ON, Canada



Same goal

- One same goal:
providing better treatments for patients.
- We're all doctors trying to cure our patients,
our parents (relatives)...

<http://www.iceccancer.org/>



<http://www.iceccancer.org/>



<http://www.iceccancer.org/>

- **Mission:**
 - to reduce mortality and improve the quality of life for populations with cancer in low- and middle income countries and regions worldwide. The ICEC will address this mission through a mentoring network of cancer professionals who will work with local and regional in-country groups to develop and sustain expertise for better cancer care.
- **Vision:**
 - The ICEC envisions a world in which everyone has access to interventions to prevent and treat cancer and its symptoms using high-quality best practices for the local circumstances. Addressing, realizing and sustaining this vision can benefit people everywhere because of the scientific, societal, humanitarian and diplomatic consequences of the ICEC activities.

Title

**« Shouldn't we all join our efforts
to make this world
a better one for all of us ? »**

Thank you.



One great platform

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