A Canadian Radiation Oncologist's Perspective on Re-Irradiation

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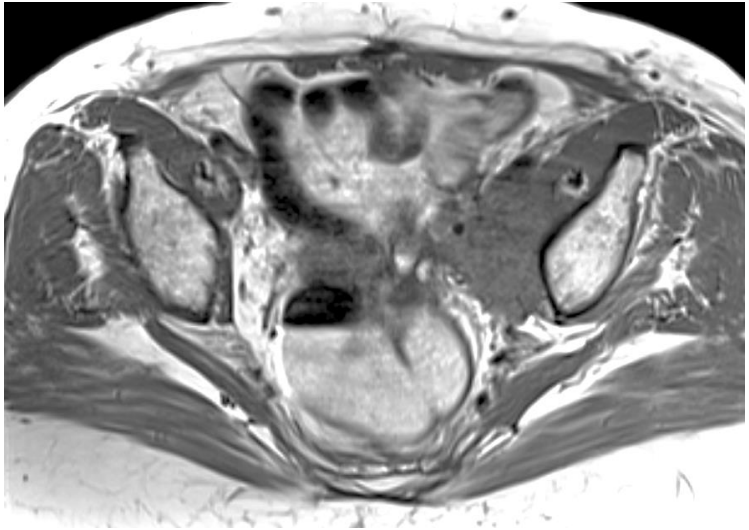
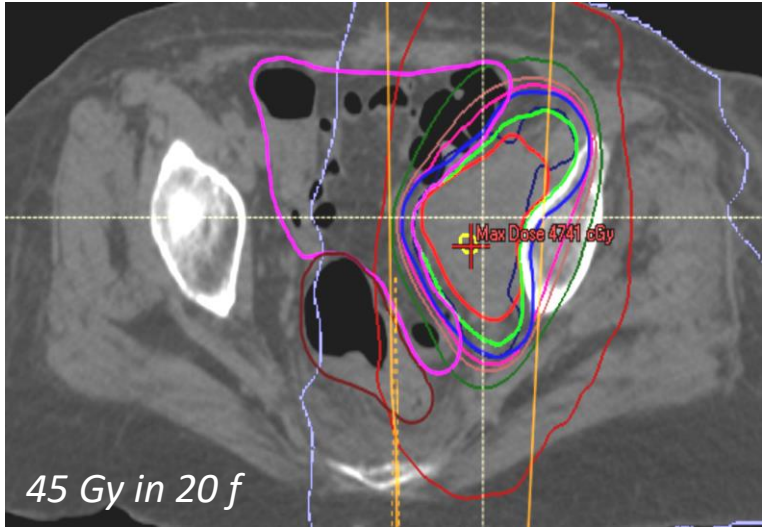
Disclosures

I have no conflicts of interest to disclose.

Re-Irradiation in Clinical Practice

LN recurrence 10 years after prior RT for endometrial cancer

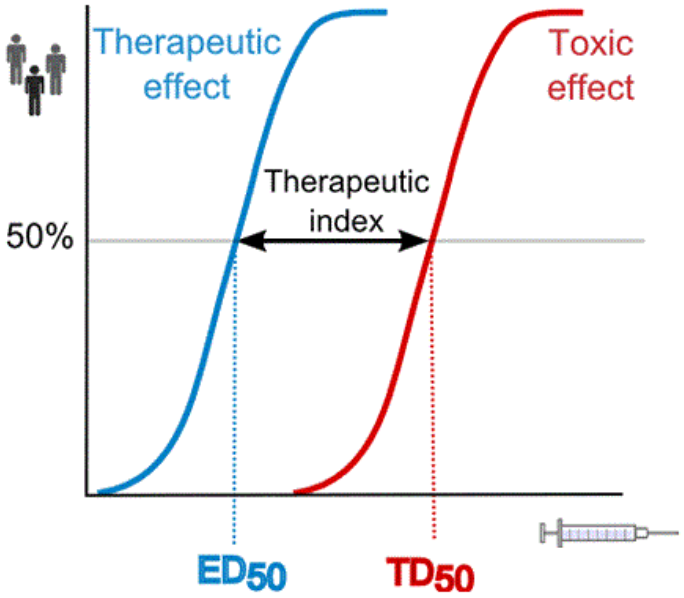




Clinical Considerations

Key Consideration: Tumor control vs. toxicity

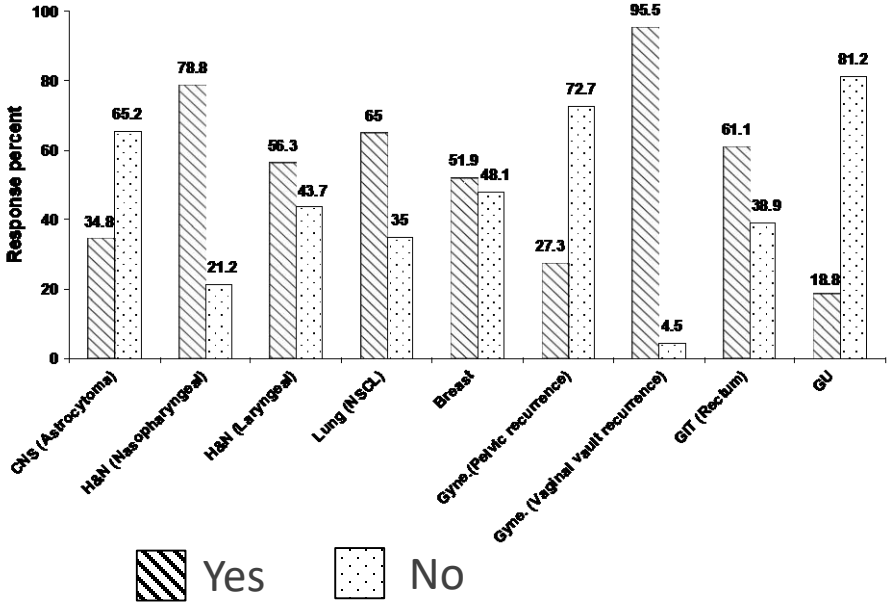
- Patient's perspective (goals of care)
- Other medical problems
- Performance status
- Clinical evidence of normal tissue injury
- Current target size, shape, position
- Prior treatment prescription
- Prior dose to critical OARs
- Interval since prior treatment



Canadian Re-Irradiation Patterns of Practice

Survey of 185 Canadian radiation oncologists

- Wide practice variation
- Goal: Local control or QoL
- Clinical Considerations: Good PS, long interval from 1st RT, no side effects, 'radiosensitive' tumor
- Dose based on clinical judgement (83%) and BED calculations (43%)
- Close monitoring for disease progression or side effects



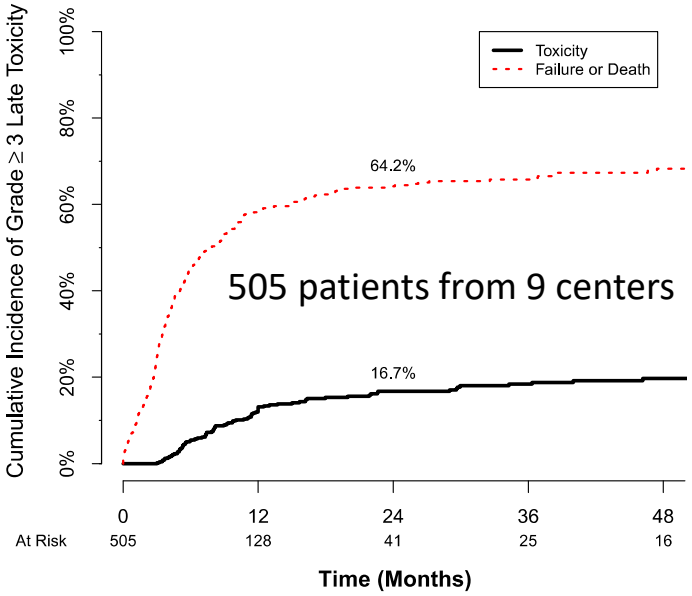
Jones and Levin, 2008

Head/Neck Re-Irradiation

Competing risk model of late toxicity after re-irradiation

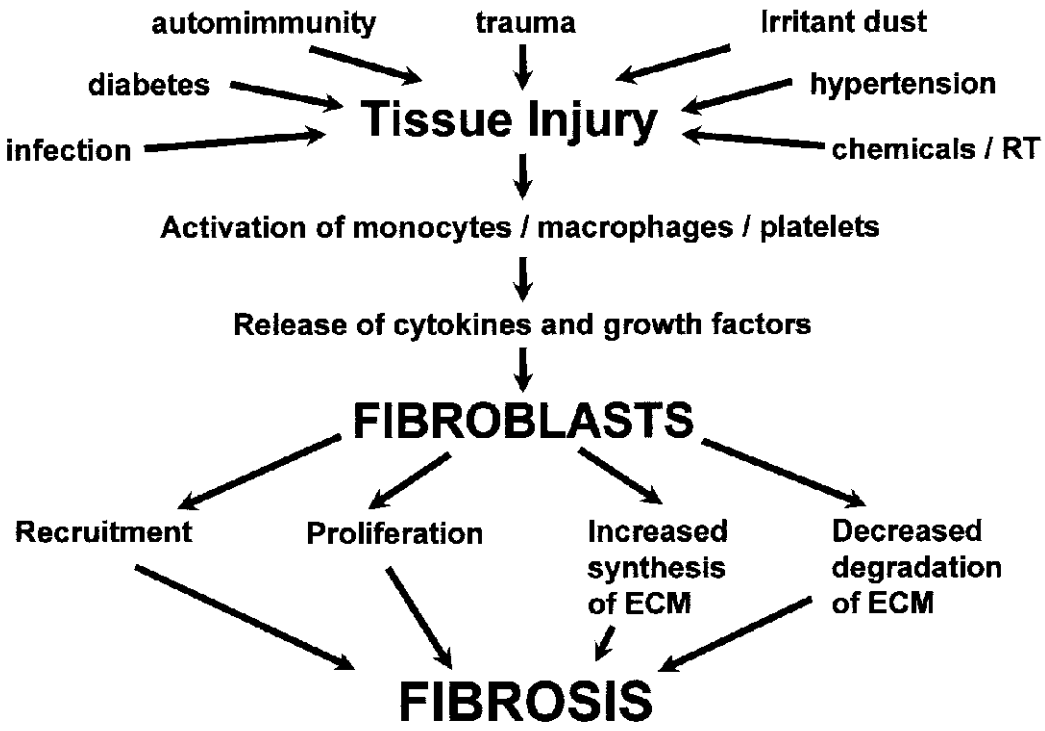
Multivariate Competing Risk Model

- Prior RT dose (Gy)
- Organ dysfunction (Y/N)
- Age (years)
- Recurrence vs. 2nd primary
- HN site (OPX, larynx, HPX, other)
- Any surgery (Y/N)



Warde, Multi-Institutional Re-Irradiation Collaborative, 2019

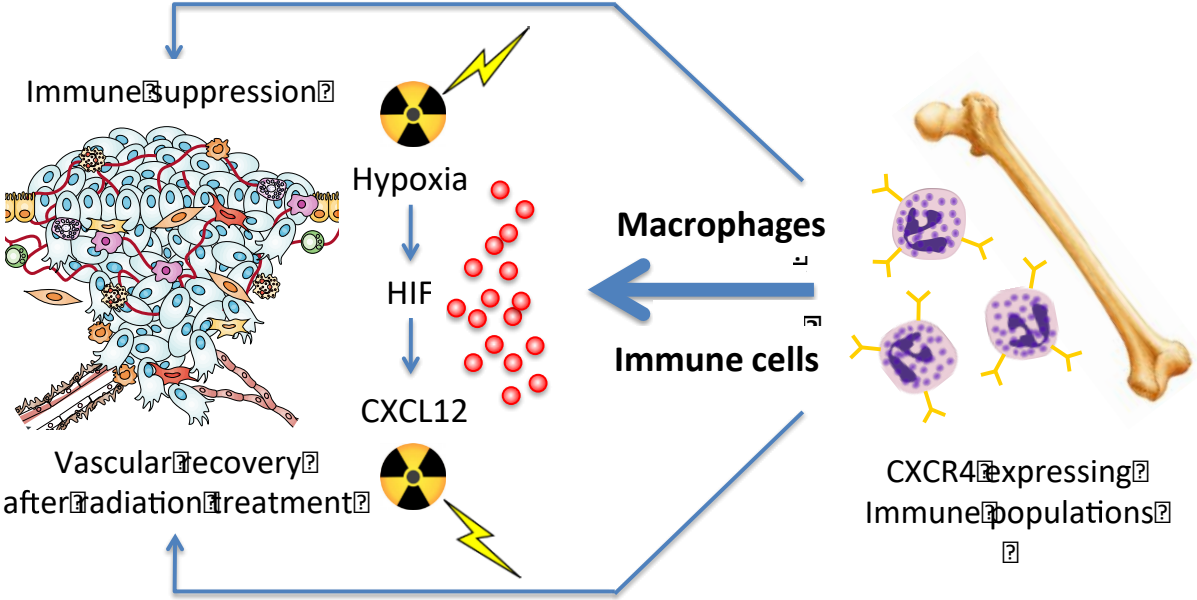
Pathophysiology of Late Radiation Toxicity



O'Sullivan and Levin, 2003

CXCL12/CXCR4 Chemokine Pathway

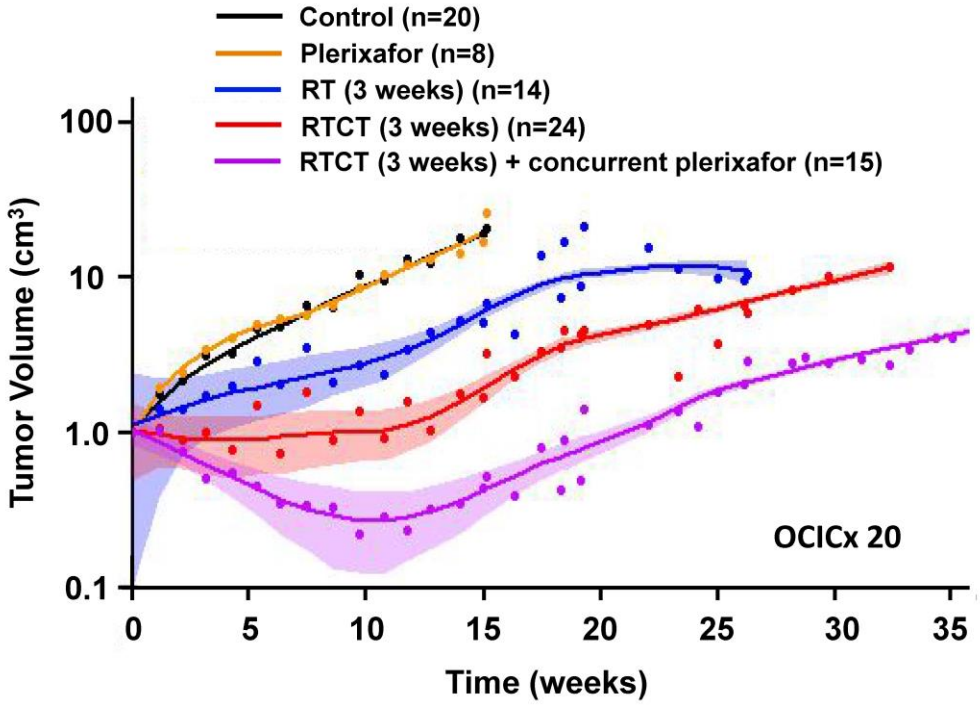
Macrophage recruitment impairs primary tumor response



Macrophage Exclusion after Radiation Treatment (MERT)*

** Martin Brown, Stanford*

Better primary tumor response with a CXCL12/CXCR4 inhibitor



Lecavalier and Milosevic, 2019

Macrophage Exclusion after Radiation Treatment (MERT)*

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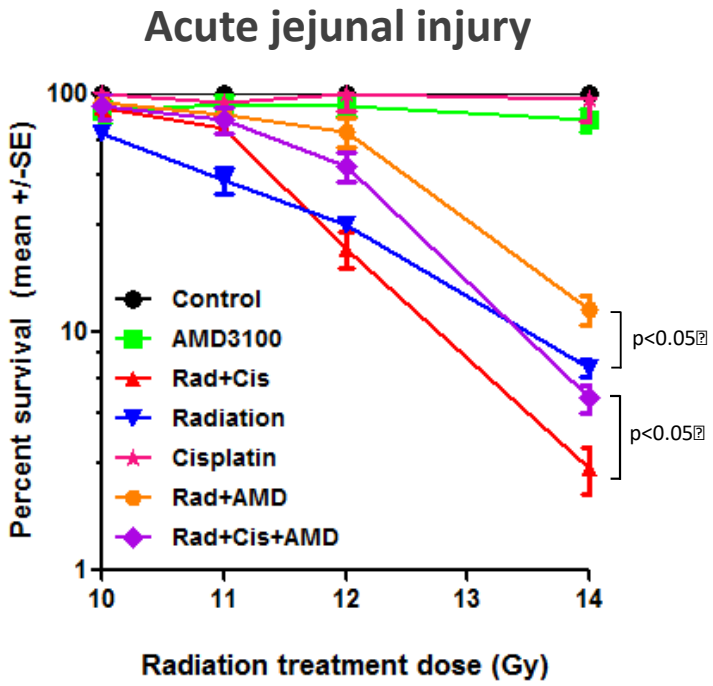
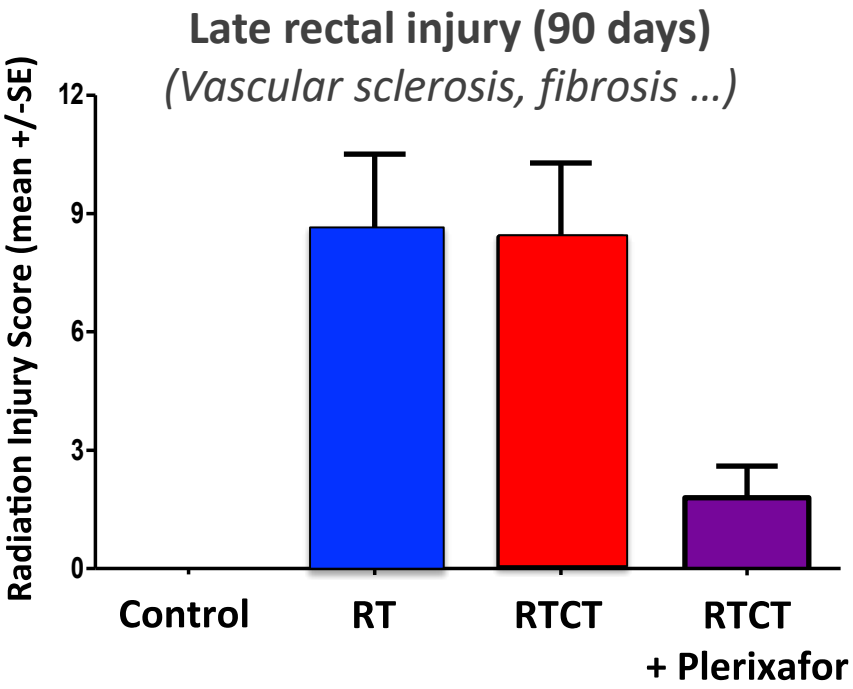
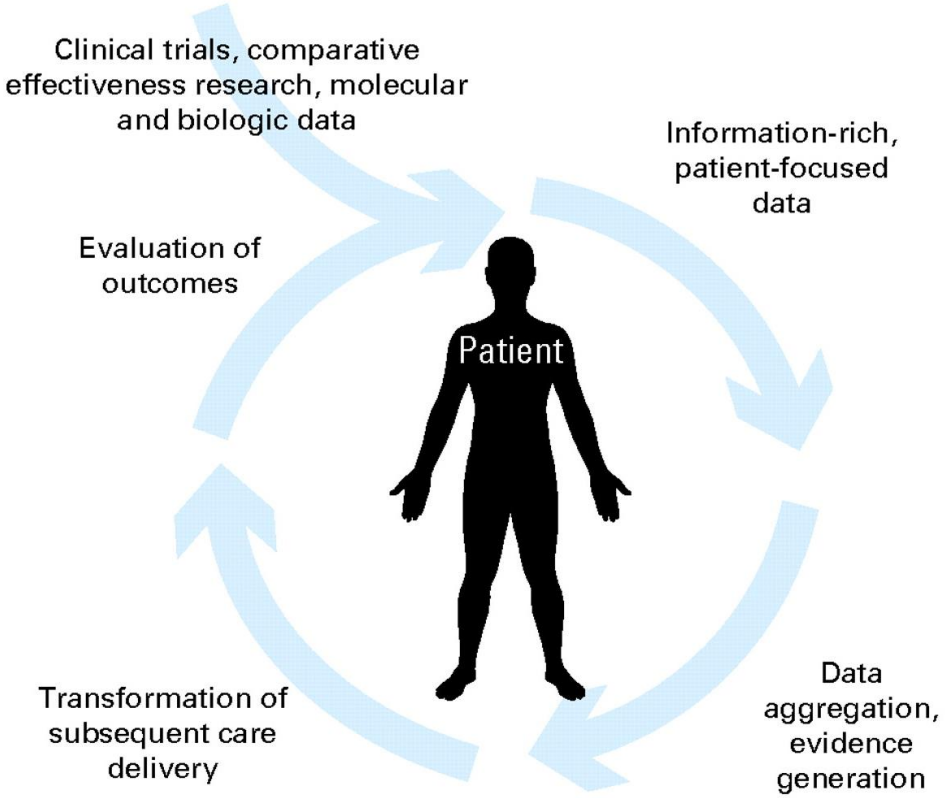
Less acute and late gut injury with a CXCL12/CXCR4 inhibitor





Lecavalier and Milosevic, 2019

The Way Forward: *Learn from our patients*



Abernethy, JCO 2010

Canadian Partnership for Quality Radiotherapy (CPQR)

Canadian Association of Radiation Oncology (CARO)

Canadian Organization of Medical Physicists (COMP)

Canadian Association of Medical Radiation Technologists (CAMRT)

Canadian Partnership Against Cancer (CPAC)

CPQR Mandate

To support and promote the universal availability of best-practice radiotherapy for all Canadians through initiatives to harmonize practice, improve quality and mitigate risk

CPQR
Canadian Partnership for Quality Radiotherapy
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Partenariat canadien pour la qualité en radiothérapie

CPQR Key Programs

- National RT accreditation
- National RT incident reporting system (NSIR-RT)
- Technical (equipment) quality control guidelines
- Patient engagement and PRO guidelines
- ‘Big data’ harmonization

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www.cpqr.ca or www.pcqr.ca

CPQR Vision for 2020 and Beyond

- Universal access to radiotherapy in Canada
- Pan-Canadian collection of patient-reported outcomes, linked to
- Detailed radiation treatment dosimetry

Motivation: Quality improvement, system performance improvement and research

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Canadian Big RT Data Initiative

Harmonization of nomenclature and dose reporting

There is variation in RT prescribing practice and plan nomenclature across Canada

Standardized RT plan nomenclature (TG-263) is foundational

Standardized RT plan nomenclature will improve quality and efficiency and enable data sharing for research

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Summary and Conclusions

- Re-irradiation can provide real clinical benefit.
- Clinical benefit hinges on balancing efficacy and safety.
- Patient selection is critical …

  … just because we can, doesn't mean we should …
- Learning and practice harmonization though collaboration is the way forward.
- Funding for re-irradiation research needs to be prioritized.