

MEDICAL PHYSICS RESEARCH GROUP

FACULTY OF SCIENCE AND INFORMATION TECHNOLOGY



OVERVIEW

The Medical Physics Research Group comprises physicists based within the Radiation Oncology Department, Calvary Mater Newcastle Hospital. We are a member of the Centre for Information Based Medicine, University of Newcastle and Hunter Medical Research Institute. We are closely aligned with the Prostate Cancer Trials Group and the Trans-Tasman Radiation Oncology Group (TROG) which organise and conduct clinical trials throughout Australasia.

OBJECTIVES

The group is concerned with the physics that underlies the practice of radiation therapy for the treatment of cancer.

We aim through research to improve outcomes for cancer treatments, particularly through improving accuracy of current therapies, developing improved therapeutic techniques, and verifying accurate delivery of therapy.

The group supervise students and postdoctoral researchers through the University of Newcastle.

RESEARCH SUPPORT

We currently hold major research funding from the NHMRC, and Cancer Council NSW.

EXTERNAL COLLABORATORS

We have strong collaborative links with many centres:

- Australian eHealth Research Centre
CSIRO ICT Centre, Brisbane
- The Institute of Medical Physics,
University of Sydney
- Virginia Commonwealth
University, Richmond, USA
- BC Cancer Agency
- CancerCare Manitoba
- Peter MacCallum Cancer Centre
and St George Hospital
- Sir Charles Gairdner Hospital, Perth



EXAMPLES OF CURRENT PROJECTS

- Investigation of cone-beam CT scanning for adaptive planning of prostate radiotherapy.
- Mapping electron densities to MRI scans for dose planning using deformable image registration.
- Investigation of imaging devices to measure dose delivery for complex radiation treatment patterns.
- Miniature LiF:Mg,Cu,P thermoluminescent dosimeters to verify new treatment protocols for high dose rate brachytherapy treatments.
- Development of novel dosimeters for verification of radiation treatments.



RESEARCH OUTCOMES

- Our group has played a prominent role in the verification of dose delivery in clinical trials in Australia.
- We continue to make improvements for patient treatments in radiation oncology.



GROUP MEMBERS

Dr Lisa Duggan
Dr Peter Greer (Coordinator)
Kristie Harrison
Joan Hatton
Claire Hood
Dr Kym Nitschke
Dr Patricia Ostwald

RESEARCH TOPICS

The major research interests of the group include:

- Imaging and treatment targeting
- Brachytherapy
- EPI dosimetry
- Monte-Carlo modelling
- Clinical trial dosimetry

We welcome enquiries from potential students, sabbatical physicists or potential collaborators.

CONTACT

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