

20th EURADOS Webinar:

Out-of-field doses for paediatric
and pregnant patients in
radiotherapy

Eurados European Radiation Dosimetry Group

- The association (established in 1982) serves the promotion of R&D and European cooperation in the field of the dosimetry of ionizing radiation
- The scope of EURADOS: **radiation protection, retrospective dosimetry, individual and environmental radiation monitoring, radiobiology, and diagnostic and therapeutic applications of radiation in medicine**
- More than 80 members (institutions) and 600 associate members (scientists), 8 working groups
- <https://eurados.sckcen.be/>



Members of EURADOS

EURADOS Working Groups

WG2 Harmonization of Individual Monitoring (M.A Chevallier, FR)

WG3 Environmental Dosimetry (A. Vargas, Spain)

WG6 Computational Dosimetry (H. Rabus, Germany)

WG7 Internal Dosimetry (D. Broggio, France)

WG9 Dosimetry in Radiotherapy (L. Stolarczyk, Denmark)

WG10 Retrospective Dosimetry (L. Ainsbury, UK)

WG11 High-Energy Radiation Fields (M. Caresana, Italy)

WG12 Dosimetry in Medical Imaging (Z. Knezevic, Croatia)

<https://eurados.sckcen.be/working-groups/wg9-radiation-dosimetry-radiotherapy>



EURADOS Working Group 9 Radiation Dosimetry in Radiotherapy

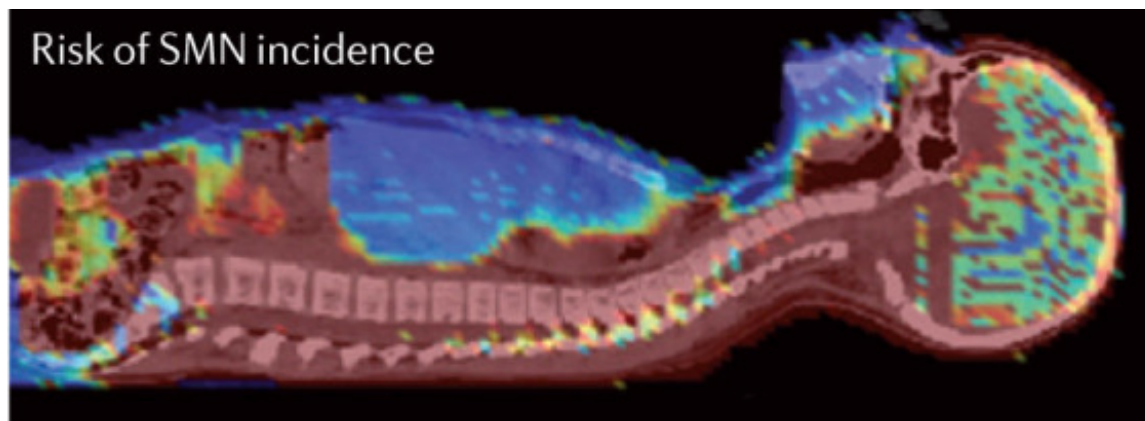
- Task Groups

- Small field photon beam dosimetry (Hrvoje Hršak)
- Out-of-field doses in brachytherapy (Joao Santos, Saveta Miljanic)
- Computational methods in medical physics (Hrvoje Brkić)
- Hadron radiotherapy programme (Pawel Olko)

- Scientific programme

- **Dosimetry of out-of-field patient dose**
- Total dose to the patient from therapy and imaging
- Small field dosimetry
- Specific developments in proton and neutron dosimetry
- Monte Carlo simulation studies
- New and emerging dosimetric techniques and materials





Newhauser W., Durante, M., Assessing the risk of second malignancies after modern Radiotherapy. Nat Rev Cancer. 2011 June ; 11(6): 438–448.

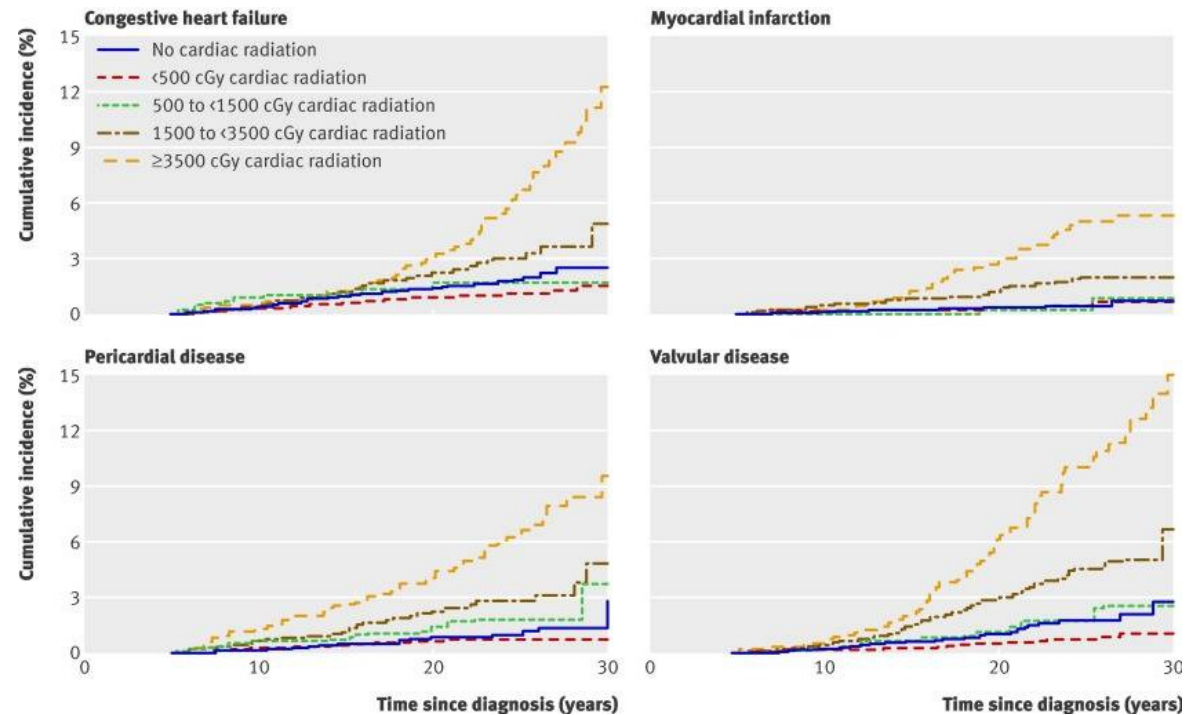
AAPM TG 158 Report:

‘It is the **physicist’s responsibility to appropriately determine relevant nontarget doses** and contribute to strategies to minimize these doses as needed.

Once dose data are available and treatment options have been explored, it is then the treating **physician’s responsibility to assess the risks** and benefits of the radiation treatment so as to make a sound and informed assessment of all possible treatment options.’

Concerns with respect to nontarget radiation

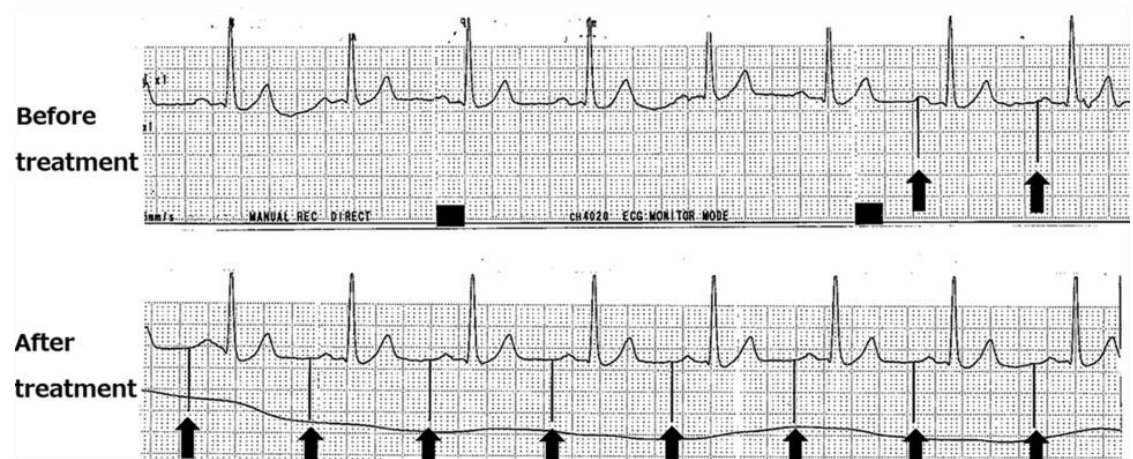
- Cardiac toxicity
- Implantable pacemakers and other electronic devices
- Cataracts
- Skin dose
- Secondary cancers
- Foetal dose estimates



Mulrooney, Daniel A et al. "Cardiac outcomes in a cohort of adult survivors of childhood and adolescent cancer: retrospective analysis of the Childhood Cancer Survivor Study cohort." *BMJ (Clinical research ed.)* vol. 339 b4606. 8 Dec. 2009, doi:10.1136/bmj.b4606

Concerns with respect to nontarget radiation

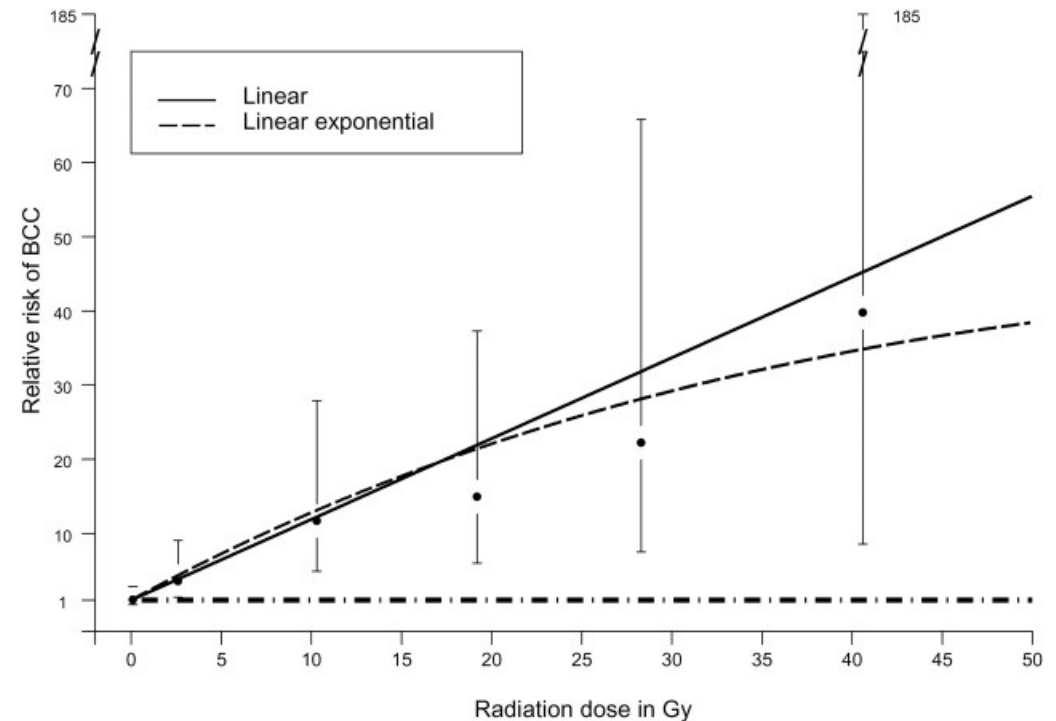
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Ueyama T, Arimura T, Ogino T, et al. Pacemaker malfunction associated with proton beam therapy: a report of two cases and review of literature-does field-to-generator distance matter?. *Oxf Med Case Reports*. 2016;2016(8):omw049. Published 2016 Aug 29. doi:10.1093/omcr/omw049.

Concerns with respect to nontarget radiation

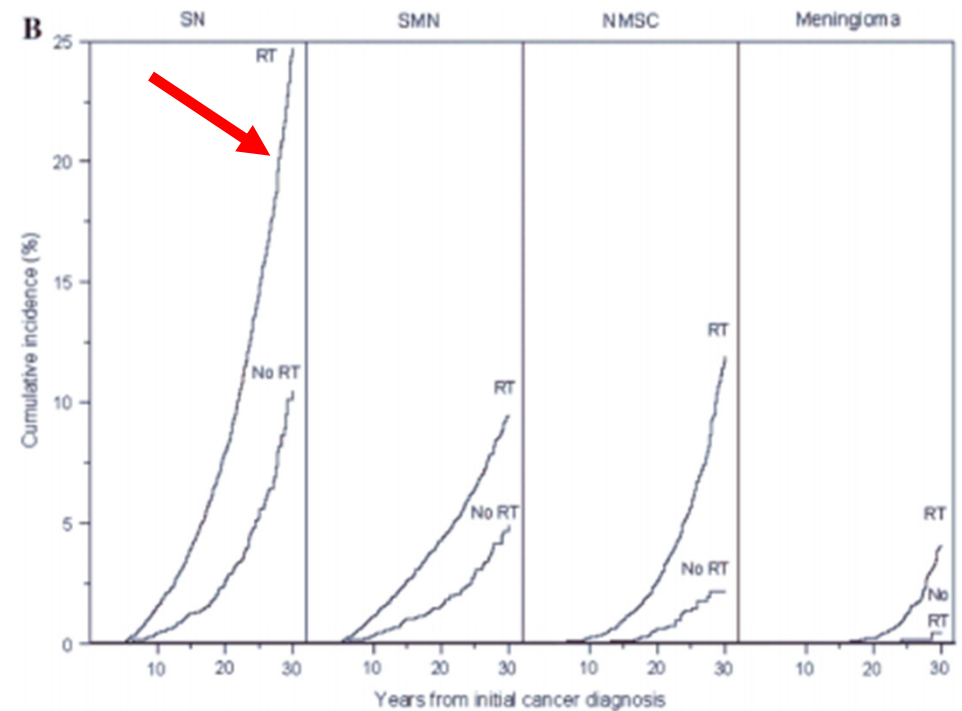
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Watt TC, Inskip PD, Stratton K, et al. Radiation-related risk of basal cell carcinoma: a report from the Childhood Cancer Survivor Study. *J Natl Cancer Inst.* 2012;104(16):1240–1250. doi:10.1093/jnci/djs298.

Concerns with respect to nontarget radiation

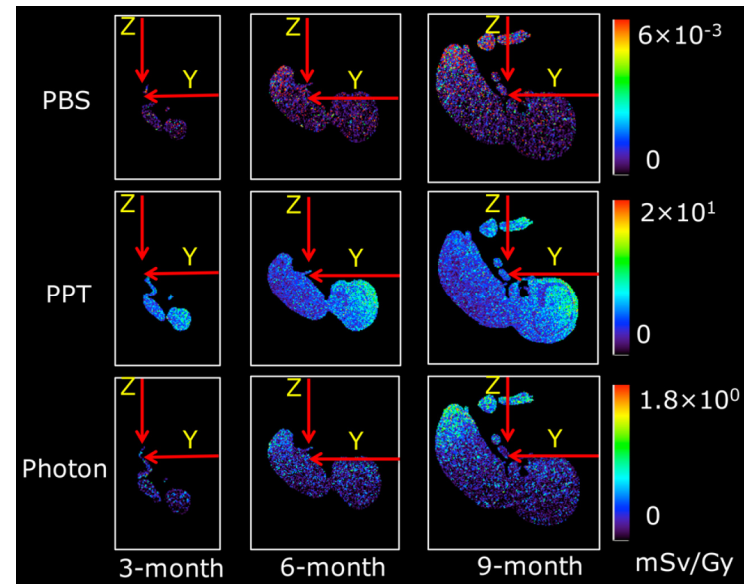
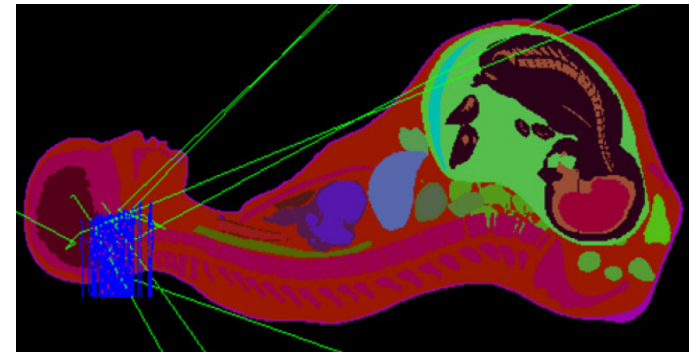
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Friedman et al., Subsequent Neoplasms in 5-Year Survivors of childhood cancer: the childhood cancer Survivor Study JNCI J Natl Cancer Inst (2010) 102(14): 1083-1095.

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<https://www.123rf.com/clipart-vector/quizz.html>