

the greatest source of exposure to ionising radiation for people living in Ireland and the leading cause of lung cancer after smoking. It is estimated that exposure to radon accounts for approximately 14% of all lung cancers in Ireland, which equates to around 300 lung cancer cases annually. In November 2011 the then Minister for the Environment, Community and Local Government, announced the Government decision to establish an Inter-Agency (IA) group to develop a national radon control strategy (NRCS) for Ireland. The purpose of the strategy is to reduce the number of lung cancers in Ireland that are caused by radon. The IA group comprises experts from the key Government Departments and State Agencies relevant to tackling the radon problem in Ireland. A Research Working Group (RWG) was established by the IA group to identify knowledge gaps and to point to areas where further targeted research could support and improve the effectiveness of the NRCS. The RWG reviewed the research ideas collected during the development of the NRCS including those raised in the stakeholder and public consultations. The research ideas were divided into four thematic areas, this paper will present an overview of the EPA funded radon research that falls under the theme that focuses on radon preventive measures and also outline the impact of this work at a national and international level.

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History of Medical Physics and Physics in Medicine in Ireland

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Medical Physics and contributions from physics to medicine are relatively well developed in Ireland, although no comprehensive account of both is available. This paper will endeavour to address both, emphasising the former, but not overlooking the latter. The methods employed include documentary research and interviews with some of those that made significant contributions from time to time. Documentary evidence for historical aspects of the development of medical physics is relatively sparse. However, several good sources have been identified and accessed covering periods C, D, and E below. Good sources for Irish contributions/contributors from physics to medicine have been identified and are available over a longer period since the seventeenth century British enlightenment, and especially for the nineteenth and early twentieth centuries. Sources for G and H, education/training and international contributions, are limited but archival material is available. Professional bodies will be treated, where relevant, under each heading. This paper will present a summary of findings from these sources under headings including: A. The Enlightenment (17th century) period (Multiple sources) B. Nineteenth and early twentieth centuries (Multiple sources) C. Twentieth century up to late 60's/early 70's (>5 sources) D. Twentieth century from 70's to 90's (>3 sources) E. Period since the 90's (>3 sources) F. Statutory developments and National Benchmarks (Multiple sources) G. Education and training initiatives (>3 Sources and archival material) H. Contributions to the international community (Archival material) The findings from this investigation provide a rich context and heritage for medical physics in Ireland.

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Poster Session : P1

Yttrium-90 selective internal radiation therapy: Are patient radiation protection contact restrictions necessary?

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Yttrium-90 (90Y) microspheres are used for selective internal radiation therapies (SIRTs) to treat patients with hepatocellular carcinoma (HCC) or metastatic colon cancer to the liver, with doses of up to 150 Gy delivered per treatment. 90Y is a pure beta emitter with a decay energy of 0.94 MeV and half-life of 64.2 h. While external beta exposure from the patient is negligible, there can be a considerable associated Bremsstrahlung radiation exposure component. Previous studies in the US, towards establishing radiation dose rates from patients, have deemed radiation protection precautions post-therapy to be unnecessary in most cases; however, the question remains as to whether precautions are necessary within the EU, where more conservative dose constraints are employed. Accordingly, dose rates from 28 patients, treated over a three year period (2016–2018) were measured post therapy at distances of 0.3 m and 1 m, and in contact with the patients' upper abdomen. Dose rates were compared with theoretical predictions and used as model inputs for calculating radiation doses received by family members and carers based on interaction patterns previously described in the literature. The work demonstrated restrictions to be advisable considering the dose constraints employed within the EU. Indeed, while this study examined dose rates for 90Y Therasphere patients, another 90Y therapeutic pharmaceutical, namely SIRSpheres, require reportedly similar treatment activities, leading to similar Bremsstrahlung radiation dose rates. Thus, in accordance with EU dose constraints, radiation protection precautions are necessary for those individuals in regular contact with patients having undergone SIRT procedures.

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Poster Session : P2

Quantifying tumor heterogeneity from multi parameter magnetic resonance images for prostate using texture analysis

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Tumor spatial heterogeneity is a key prognostic indicator, which is reflected in medical images. Heterogeneity in tumor images can be