

Radiophysics and Radioprotection

Group leader

Carrasco De Fez, Pablo (FGS)

Researchers

Anson Marcos, Cristina (FGS)

Barcelo Pages, Marta (FGS)

Gallego Franco, Pedro (FGS)

García Apellaniz, Nagore (FGS)

Jornet Sala, Nuria (FGS)

Perez-Alija Fernández, Jaime (FGS)

Ruiz Martinez, Agustin (FGS)

Tejedor Aguilar, Natalia (FGS)

Vivancos Bargallo, Helena (FGS)

Research Technician

Pallerol Pinzano, Rosa Maria (FGS)



DESCRIPTION

The Radiation Physics and Radiation Protection research group carries out applied research on three fields of application of ionising radiation in medicine: radiation therapy, nuclear medicine, and radiology. This research is intended to solve gaps of knowledge in the safe application of radiation in medicine due to new technology, new techniques, new procedures, or application of new legislation.

MAIN LINES OF RESEARCH

- Clinical Audits in Radiotherapy. Line shared with the Radiation Oncology department. At the Radiation Physics and Radiation Protection department this line is conducted by Núria Jornet.
- Standardization in Nuclear Medicine. Line conducted by Agustí Ruiz and Marta Barceló.
- Diagnostic Reference Levels (DRL) using a radiation dose management solution. Line conducted by Marta Barceló and Agustí Ruiz.
- Biological Dosimetry. Line conducted by Pablo Carrasco and Jaime Pérez-Alija.

SCIENTIFIC CHALLENGES

- To derive clinically relevant tolerance actions for EPID-based in vivo dosimetry on each anatomical treatment site in radiation therapy.
- To make radiotherapy treatment planning less person-dependent, to decrease variability, and optimise treatment plans.
- To define a strategy to perform clinical audits in radiotherapy at a regional level that could be escalated to national and international levels.

5.1.6 Associated Groups

- To set up clinical audits in radiotherapy in Catalonia.
- To standardise quantitative image acquisition in PET and SPECT imaging.
- To get all imaging modalities integrated into the dose management system provided from the Catalan government, and to derive DRLs values for all the equipment at HSCSP.
- To manage DRLs and compare them against regional, national, and international values.
- To update the dose-biological effect calibration curve, relating chromosomal aberrations to radiation absorbed dose, based on modern automatic systems.
- To derive an easy test to classify irradiated individuals from a potential accident into those that would require special following and treatment and those that were exposed to non-critical doses.

ACTIVE GRANTS

- Barcelo Pages, Marta. International study of patient doses and tissue reactions from fluoroscopy guided interventional procedures. IAEA. Duration: 2023-2023.
- Jornet Sala, Nuria. EU-REST (European Union Radiation, Education, Staffing & Training). HA-DEA/2022/OP/0003. UE. Duration: 2022-2024. (FGS).
- Jornet Sala, Nuria. SAMIRA study on the definition of Key Performance Indicators on Quality and Safety of medical applications of ionising radiation. ENER/D3/2023-101-1. UE. Duration: 2023-2023 (FGS).

GRANTS AWARDED

- Jornet Sala, Nuria. Catalan Clinical Audit network for Quality Improvement in RT [CAT-ClinART]. EU4H Action Grants 2023. UE. 374.999,92 € (FGS).
- Tejedor Aguilar, Natalia. Desarrollo y evaluación de modelos de inteligencia artificial para predicción de dosis y generación automática de planes clínicos para tratamientos de mama con IMRT. SEFM 2023. Duration: 2023-2025. 2.000,00 €.

SCIENTIFIC PRODUCTION

- Aznar MC, carrasco de fez P, Corradini S, Mast M, McNair H, Meattini I, Persson G, van P. ESTRO-ACROP guideline: Recommendations on implementation of breath-hold techniques in radiotherapy. *RADIOTHERAPY AND ONCOLOGY*. 2023; 185:109734. DOI:10.1016/j.radonc.2023.109734. PMID:37301263. IF:5,700 (Q1/2D). Document type: Article.
- Bravo A, Fontanet S, Skolarikos A, Gozen AS, Somani BK, Traxer O, Papatsoris A, Ruiz-Martinez, A, Keller EX, Pietropaolo A, Tonyali S, Taily T, Esperto F, Liatsikos E, Kanashiro AK, Angerri O, Emiliani E. Estimated Radiation Dose to the Lens During Endourologic Procedures: The Role of Lead Glasses and the ALARA Protocol-An ESU/ESUT-YAU Endourology Group Collaboration. *JOURNAL OF ENDOUROLOGY*. 2023; 37(8). DOI:10.1089/end.2023.0061. PMID:37337653. IF:2,700 (Q2/5D). Document type: Article.
- Howlett DC, Brady AP, Hierath M, Clark J, Wadsak W, Giammarile F, Jornet N, Coffey M. QuADRANT: a study on uptake and implementation of clinical audit of medical radiological procedures in Europe—expert recommendations for improvement, endorsed by the ESR. *Insights into Imaging*. 2023; 14(1):81. DOI:10.1186/s13244-023-01416-7. PMID:37173522. IF:4,700 (Q1/3D). Document type: Article.
- Jornet N, Strojjan P, Howlett DC, Brady AP, Hierath M, Clark J, Wadsak W, Giammarile F, Coffey M. The QuADRANT study: Current status and recommendations for improving uptake and implementation of clinical audit of medical radiological procedures in Europe. The radiotherapy perspective. *RADIOTHERAPY AND ONCOLOGY*. 2023; 186:109772. DOI:10.1016/j.radonc.2023.109772. PMID:37385381. IF:5,700 (Q1/2D). Document type: Review.
- Latorre A, Jornet N, Sempau J. On the beam hardening correction of the Transit-Guided Radiation Therapy attenuation model. *PHYSICA MEDICA-EUROPEAN JOURNAL OF MEDICAL PHYSICS*. 2023; 112:102660. DOI:10.1016/j.ejmp.2023.102660. PMID:37562234. IF:3,400 (Q2/4D). Document type: Article