RESEARCH & INNOVATION
Horizon 2020

U LISBOA | UNIVERSIDADE DE LISBOA

FACULDADE DE MEDICINA LISBOA

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MEDIRAD

Implications of Medical Low Dose Radiation Exposure

Infoday – IAEA + EURATOM

22 of February 2018

MEDIRAD – A multi-disciplinary consortium

European Medical Associations

European Association of Nuclear Medicine (EANM)

European Society of Radiology (ESR)

European Society for Radiotherapy and Oncology (ESTRO)

Non-medical European Associations

European Federation of Organisations for Medical Physics (EFOMP)

European Federation of Radiographer Societies (EFRS)

European platforms on radiation protection research

MELODI (Multidisciplinary European Low Dose Initiative)

EURADOS (European Radiation Dosimetry Group)

New medical research platform

EURAMED (European Alliance for Medical Radiation Protection Research)

34 institutes from 14 European countries

POLITÉCNICO DE COIMBRA

CCUL
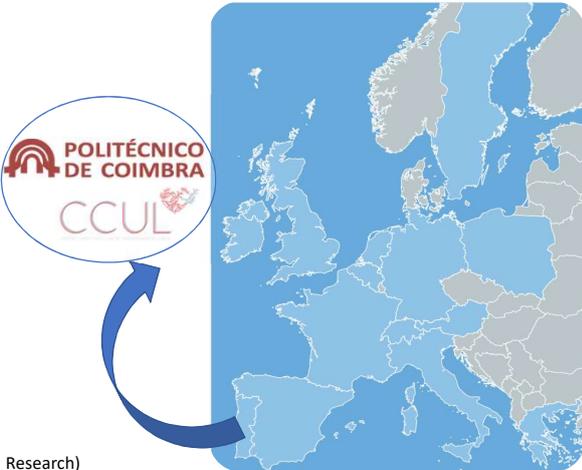
MEDIRAD – radiological protection (RP) in health

MEDIRAD addresses the need to better understand and evaluate the health effects of low-dose ionising radiation exposure from diagnostic and therapeutic imaging and from off-target effects in radiotherapy.

Pillar 1: development of innovative tools to increase the efficiency of future RP research activities and support good clinical practice

Pillar 2: improvement of the understanding of low-dose ionising radiation risks associated with major medical radiation procedures

Pillar 3: development of recommendations based on research results and establishment of information exchange infrastructures to facilitate consensus

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6 Work Packages (WP)   **4-year project**
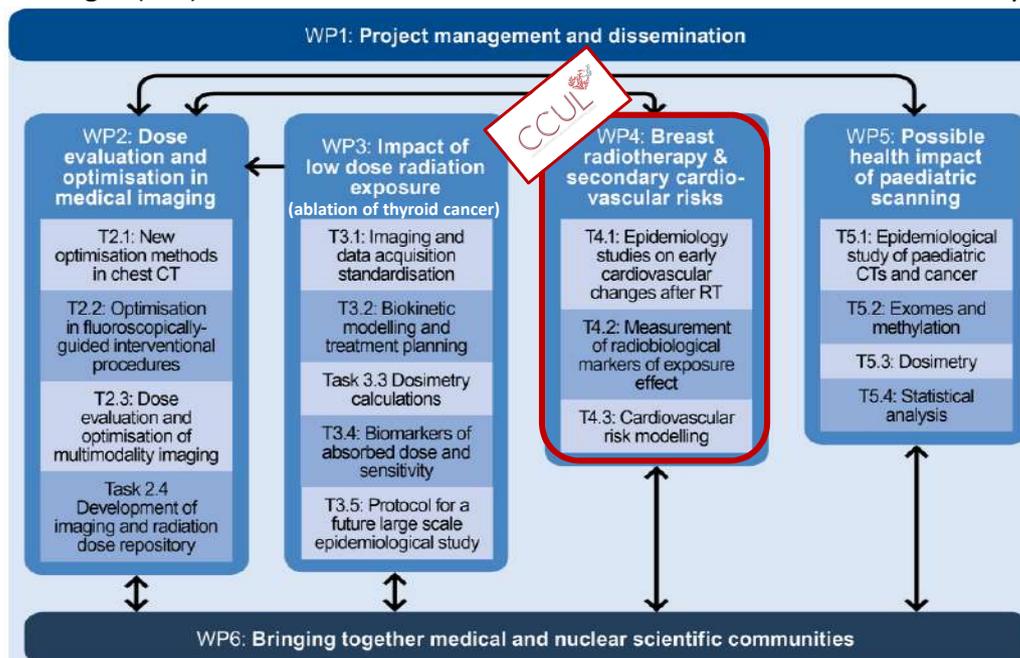
WP4 - specific aims

- **Identify and validate most important cardiac imaging and circulating biomarkers of radiation-induced cardiovascular changes arising in the first two years after breast RT**

- Develop individual risk models (Normal Tissue Complication Probability (NTCP) models) integrating these biomarkers combined with dose metrics of cardiac structures based on 3D-dosimetry

- Determine the relationship between 3D dose distributions in cardiac substructures and the risk of Acute Coronary Events (ACE) and other cardiac complications in breast cancer patients to develop an externally validated multivariable NTCP model to assess the risk of ACE in individual patients, based on cardiac dose metrics in the first 10 years after breast-cancer RT.

- **Investigate the biological mechanisms of heart damage, as a function of dose in rodents, for radiation qualities used in radiology and radiotherapy**

- Define a biomarker profile for cardiac damage induced by low to moderate dose exposure. Identification of relevant biomarkers from preclinical animal studies, validated in humans, will lead to refined models of the risk of cardiac and vascular toxicity after low-to moderate-dose radiation exposure.

- Describe cardiovascular risk by a mathematical model of disease development based on the findings from the above described aims.

WP4 - expected findings

- The results will contribute to more accurate risk estimations for radiation-induced cardiovascular biological and clinical events and provide potential targets for prevention

MEDIRAD – concluding remarks

❑ **MEDIRAD will allow a better evaluation of the risks from radiation and better quantification of the necessary precautionary measures, leading to a stronger system of protection for patents, workers, and the general public.**

❑ **MEDIRAD will achieve significant progress in the interaction between the radiation protection and medical scientific communities at the EU level.**

❑ **Impact on the European research and innovation capacity and European healthcare.**

❑ **Improve public perception of radiation-associated risks.**

Thank you all!

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