



i-Violin (Implementing verifiable oncological imaging by quality assurance and optimisation)

i-violin is a 24-month project (September 2022 – August 2024) co-funded by the EU under the EU4Health programme 2021-2027, EU4H-2021-PJ-03 Action grants for a project on the quality and safety of radiation technology in diagnosis and treatment of cancer. This project brings together 10 partners from 9 countries.

i-Violin Objectives

The main objectives of i-Violin are:

1. To implement a standardised way of optimisation in oncological imaging approaches in clinical practice by adapting and deploying tools for quantifiable image quality assessment as well as by validating commercially available software solutions for patient dose determination in imaging procedures, using the output of the MEDIRAD and other EC-funded projects.
2. To implement such tools and the proposed optimised procedures in (university) hospitals throughout Europe that are members of the i-Violin consortium,
3. To disseminate these tools and optimised procedures to interested hospitals and healthcare providers in Europe to contribute towards a harmonised and standardised oncological imaging approach.

4. To provide a suitable education and training programme for radiologists, radiographers and medical physicists to be able to use the harmonisation tools.
5. To disseminate the results to policymakers, the medical societies and other relevant stakeholders to foster uptake and implementation.

To achieve its objectives, i-Violin's work has been divided into 7 work packages.

Work Package 1: Project management and coordination

Work Package 2: Dissemination and communication

Work Package 3: Impact evaluation

Work Package 4: Adaptation of existing image quality evaluation tools and dose evaluation for CT imaging in cancer patients

Work Package 5: Clinical database implementation and data collection

Work Package 6: Optimisation of oncological imaging procedures (CT) based on protocols for selected clinical indications

Work Package 7: Education and training on image quality evaluation tools and corresponding optimisation

UoC's role

1. Radiation dose and image quality assessment

For optimisation of the oncological CT procedures especially with respect to radiation protection of the patients for different imaging indications (diagnosis, therapy planning, staging, follow-up) it is necessary not only to determine the necessary and achieved image quality but also the corresponding dose distributions. Performing new Monte-Carlo simulations for all body regions of interest (chest imaging, abdominal imaging and pelvic imaging) would mean to gather large amounts of imaging data, segment them and perform the simulations, which is far beyond the scope of a two-year implementation project. Therefore, i-Violin will choose a different approach. Commercially available patient dose evaluation tools will be compared for chest imaging with the CTRAD software developed in MEDIRAD EC Horizon project by the Medical Physics team of the University of Crete to

validate the commercially available software tools and quantify deviations. This will be done for different imaging indications (diagnostic, therapy planning, staging, follow-up). For the other body regions (i.e., abdomen and pelvis) the output of the commercial dose evaluation tools will be used, taking into account the uncertainties as derived from the comparison to CTRAD for chest CT.

For the image quality evaluation, submission of relevant data with representative images, dose information, and additional information is essential. The UoC will contribute to the collection of deidentified data and to the subjective assessment of image quality by an experienced radiologist.

2. Education and Training

This task will develop the structure and content of an E&T programme on optimisation of CT procedures, including the use of image quality and dose assessment tools. The E&T programme will be developed by using the relevant outputs from recent European projects, such as MEDRAPET, EUCLID, MEDIRAD and EURAMED rocc-n-roll. It will include the teaching model, the practical hands-on approach and the assessment methodology. The European professional societies (ESR, EFRS and EFOMP) will be consulted for the definition and promotion of the structure and content of the E&T programme and invited to support/endorse the programme.

EIBIR project page: <https://www.eibir.org/projects/i-violin/>



**Co-funded by
the European Union**

This project is co-funded under the EU4Health Programme 2021–2027 under grant agreement no. 101056832.

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