The European Federation of Organisations for Medical Physics
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PROPOSAL FOR A NEW WORKING GROUP (WG)

Name of WG[1]:	DICOM-QSPECT-MRT
Parent Committee(s)[2]:	Science Committee
Keywords[3]:	Molecular radiotherapy (MRT), dosimetry, SPECT, quantification, DICOM
Chair(s)[4]:	Suggested chair: Jaroslav Ptáček, Ph.D.
Expected outcome[5]:	Publication in the European Journal of Medical Physics with the recommendation regarding additional information tags required for the DICOM-MRT standard, as well as a proposed pipeline on how these can be implemented
Target audience[6]:	Medical Physics Experts, Health Professionals, MRT dosimetry companies, SPECT/CT scanner manufacturers
Rationale[7]:	Unlike PET, the current SPECT DICOM standard does not include mandatory fields for quantitative imaging (e.g., SUVs) and is poorly suited to MRT absorbed dose calculation traceability. The later requires collecting a range of parameters, of which: • some are already present but not often informed in vendor workstations, or • some may be erased during the anonymization process, as they are not defined as essential. • Some are currently absent, such as time-related parameters (effective half-life, type of fit for time-absorbed dose rate and time -activity curves, time-integrated activity coefficients are only some examples of variables that have no existing DICOM tags. As a result, only partial information about the clinical dosimetry workflow (CDW) used to calculate the absorbed dose can be retrieved from currently existing the patients' DICOM headers. This significantly limits reproducible science, information exchange between multiple centers, and holds back personalized dosimetry developments in MRT. In summary, quantitative procedures in clinical nuclear medicine and the traceability of both diagnostic and therapy dosimetry require the documentation of several variables/tags, and their storage. In the proposed WG we aim to bring together key stakeholders to identify the way in which a future MRT-DICOM standard should be implemented. The identification of pre-existing tags, or tags that could be used for this

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	purpose, will be carried out and then translated into a joint recommendations.
Coordination[8]:	EFOMP Science Committee

This proposal form must be filled by the EFOMP parent committee chair.

Category:	WGs are classified into the following categories depending on their topic and purpose. Please choose the most appropriate.
X	**New Horizons**. The topic involves new scientific developments, methods, technology or clinical applications that have not yet emerged into clinical practice.
X	**State of Art**. The topic involves codes of practice, protocols, recommendations or guidelines for activity which are expected to become enduring practice.
X	**Focus Area**. The topic involves certain specific area of clinical interest, modality or method which may include a technical or methodological challenge to be solved.
	Educational or Informational. The topic involves education or informing the members in a relevant area of clinical practise, technology, methods, research or training.
X	**Consensus Document**. The topic involves a consensus of the medical physics community on a certain area of interest that the EFOMP will endorse. This category may include e.g. safety issues or professional issues.

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Members[9]:	It is important for this working group that the output is supported and represents a consensus between the four major professional associations, namely the EFOMP, AAPM, EANM and the SNMMI. In addition, the major dosimetry software and manufacturer of SPECT/CT cameras should be consulted. We therefore propose to include 2 WG members per professional association (one for the SPECT/CT imaging/physics aspect and one for MRT dosimetry), each nominated by the corresponding association. Suggested composition: 4 members from EFOMP 2 members from the SNMMI (preferably, from the Physics and MIRD Committees) 2 members from the EANM (preferably, from the Physics and Dosimetry Committees) 2 members from the AAPM Manufacturer representatives in the role of consultants only. The proposed nomination period is July-September 2024, resulting in the launch of the WG in October 2024.
Consultants/Observers[10]:	The call for WG members may produce consultants and observers.
Funding[11]:	Communication between WG members will be restricted to email and video calls. A possible face-to-face meeting(s) will be agreed with the participants. Travel costs coverage for EFOMP members only, with a cap of 500 EURO/member/year.

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Timeline[12]:	WG duration is assumed to be 24 months. The project will include several critical steps Month 0-12 Full characterization of the variables required for quantitative SPECT/CT imaging and clinical nuclear medicine dosimetry in collaboration with the recently created SIG-FRID FG5, and RATIONALE COST WG4 (dosimetry). Study of existing DICOM tags that could be used in a context of clinical dosimetry characterisation. Some work has already been done within the European project MEDIRAD. Namely the definition of a specific ontology adapted to Molecular Radiotherapy (MRT) dosimetry was initiated, but the work stopped at the end of the project and should be revived. Requesting a new DICOM standard revision at the DICOM Com Month 12-18 Suggesting a new DICOM QSPECT-MRT standard, validating the suggested standard by implementing and testing it on certain specific applications (for example diagnostic and therapeutic absorbed dose calculation protocols, patient SUV calculations in multi-center set-up). Software (open source software such as OpenDose3D) could be used for that purpose, clinical situations of representative nuclear medicine therapies (involving but not limited to SPECT/CT images) and a specific nuclear medicine dosimetry database that would allow queries on the various defined tags. Interact with the NM DICOM committee in order to prepare the ground for the implementation of a new SPECT DICOM standard Month 18-24: Preparing the report
Proposed outline of the final report[13]:	Introduction, unmet need: limitations of the current DICOM standard, description of the suggested DICOM-MRT structure, proof of concept testing, recommendations.

Legend

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1) **Name of WG** - Including an indication of the WG type - i.e. if the WG will be a Joint WG.
2) **Parent Committee(s) -** Relevant EFOMP Committee.
3) **Keywords -** include at least 3 keywords.
4) **Chair(s)** - The chair of the parent committee will propose the chair of the WG.
5) **Expected outcome** - Description of the relevant results expected from the WG.
6) **Target audience -** e.g. Medical Physicists, Vendors.
7) **Rationale -** What is the justification and need for the proposed WG.
8) **Coordination -** The parent committee chair has to specify if there is a coordination or collaboration with other EFOMP Committees, WGs and/or scientific organisations.
9) **Members -** Proposed list of active members based on the feedback on the WG announcement from NMOs, potentially interested experts within the medical physics community and the EFOMP Governing committee will be composed by the parent committee chair together with the proposed WG chair. The proposed member list has to be approved by the EFOMP Governing committee. WG members have to create an efficient and optimal composition of expertise and professional coverage. WG members can be updated also later if and when needed.
10) **Consultants/Observers** - Proposed other WG participants who are indicated as consultants or observers. The parent committee chair together with the proposed WG chair will identify possible consultants/observers.
11) **Funding** - Description of the WG funding needs (meetings, etc.) and how the finances will be acquired and managed. This part is optional and can also be zero.
12) **Timeline -** WG timetable described by main milestones and reporting. Interim progress reporting must be provided at least in 6 months intervals.
13) **Proposed outline of the final report** - What should be included in order to reach the planned outcome.