



Addendum
to HERCA CT Position paper
The process of CT dose optimisation
through education and training
and the role of the manufacturers

November 2015

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Feedback on the HERCA CT position paper¹ from:

- the European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry (COCIR),
- the European Society of Radiology (ESR),
- the European Association of Nuclear Medicine (EANM),
- the European Federation of Radiographer Societies (EFRS) and
- the European Federation of Organisations for Medical Physics (EFOMP)

On 1st April 2015, HERCA (Heads of the European Radiological protection Competent Authorities) organised a multi-stakeholder meeting kindly hosted by the French Nuclear Safety Authority (ASN) in its premises in Paris.

The stakeholders included:

- COCIR, supported by the main manufacturers of CT equipment (GE, Philips, Siemens and Toshiba),
- The professional organisations: ESR, ESPR, EFRS, EANM, ESTRO and EFOMP,
- The international organisations IAEA, EC, and the US FDA (present as observers).

The objective of the meeting was to exchange views with a variety of key stakeholders on issues with regard to the optimised use of computed tomography (CT) scanners. **The ultimate goal of this focus on dose optimisation is to ensure the best patient care by providing an optimised balance between image quality and dose.**

At the multi-stakeholder meeting COCIR, ESR, EANM, EFRS and EFOMP provided HERCA with feedback on the HERCA CT position paper ¹.

The feedback received is presented in this addendum.

¹ HERCA position paper "The process of CT dose optimization through education and training and role of CT Manufacturers" (available on herca.org website http://www.herca.org/herca_news.asp?newsID=39)

1. COCIR (European Coordination Committee of the Radiological, Electromedical and Healthcare IT Industry)

COCIR expressed its support of the HERCA CT position paper and expressed its will to continue to collaborate with the other stakeholders present at the meeting on the issue of the training and education on CT dose optimisation.

2. ESR (European Society of Radiology)

ESR welcomes HERCA’s multi-stakeholder approach in regard to the improvement of optimisation of the use of CT scanners.

ESR agrees with the importance of justification, the concept of a team working together on the optimised use of CT and the importance of clinical audit. Concerning the team ESR underlines the important role and responsibility of the head of department in regard to ensuring the team effort.

Regarding dose reduction tools ESR proposes that a given piece of equipment should include as a default all the relevant protective tools and the features that provide the greatest control over patient radiation protection. ESR considers that paring the price back by removing radiation protection and safety options in order to gain a sale is not acceptable. Facility management should not be placed in a position of saving money at the expense of compromising radiation safety.

Regarding dose management tools ESR proposes that access to PACS and modern management tools should be increased in order to facilitate the establishment of protocols and dose optimisation.

Regarding dose and image quality ESRs view is that “Appropriate image quality” is not easy to assess. Many medical physicists have used Signal to Noise Ratio (SNR) and Contrast to Noise Ratio (CNR) to test it but this does not tell us whether the quality is adequate to answer a concrete clinical question. In other words image quality has to be analysed together with exposure. There is a need to develop and to standardise automatic systems for dose optimisation based on image quality.

Regarding education and training ESR suggests the following:

- Improving the training focus,
- Explaining how and what should be trained,
- Including reference to the MEDRAPET project,
- Defining KSC regarding CT optimisation syllabus proposal in an annex,
- Emphasising strongly the teamwork concept,
- Limiting the role of the industry to the delivery step,
- Considering the European heterogeneities in training and certification.

3. EANM (European Association of Nuclear Medicine)

In answer to HERCA's CT position paper, EANM stresses that hybrid systems have gained importance within nuclear medicine in the past years and realises that the use of these hybrid modalities must be optimised to assure that patients obtain the correct diagnostic test without unnecessary radiation dose.

EANM underlines that although the use of CT in hybrid modalities spans from low-dose acquisitions purely applied for orientation and attenuation correction to high-end diagnostic examinations, it is important that adequate use is performed of current techniques to improve image quality while limiting dose.

EANM cannot dictate to member's specific procedures, parameters or quality controls. However, EANM has a long tradition for publishing procedural guidelines on most major diagnostic and therapeutic areas of general interest. Further, EANM has continuous medical education sessions within the frame of the annual congress as well as courses at the European School of Nuclear Medicine.

4. EFRS (European Federation of Radiographer Societies)

EFRS shares HERCA's vision that CT dose optimisation is of great importance and welcomes HERCA's initiative in developing a position paper entitled "The Process of CT dose optimisation through education and training and role of CT Manufacturers". The complexity of this issue requires the involvement of key stakeholders including manufacturers, medical doctors, radiographers (generic term to be preferred to CT technologists according to EFRS) and the medical physicists.

Regarding the role of radiographers in CT imaging, EFRS stresses the point that their competences are wider than those described in the HERCA position paper. Their shared responsibilities for image quality, dose optimisation and choice of adapted clinical protocol should be mentioned.

Regarding dose management tools, EFRS recommends that exported data reveal the names of both the Radiologist and the Radiographer.

Regarding the dose optimisation tools identified by HERCA, EFRS recommendations are the following:

1. The training curricula provided by the CT manufacturers should be adapted to meet the needs of the focus group (radiographers, radiologists...) who have different roles in CT imaging;

EFRS suggests that the training curriculum for radiographers should include:

- CT Technology
- Description of all settings, parameters
- Optimisation procedures of vendor protocols on a patient selective basis
- Dose considerations for different patient size in particular for paediatric patients
- Image Quality and techniques to be used for different clinical indications
- Steps on how to adopt to different noise textures
- CT dose quantities
- Relevance of CT DRL's
- Warning and Reference levels in CT
- CT dose metrics and patient dose estimation

- Quality Assurance
 - Radiation safety issues
2. Beyond dedicated education, the importance of regular Continuing Professional Development for radiologists, radiographers and physicists should be emphasized to maintain their knowledge, in particular given the speed of change of technology in CT;
 3. Newly developed dose optimisation tools by the manufacturer should be made freely available and their utilisation should be encouraged at the site, to minimise patient dose;

5. EFOMP (European Federation of Organisations for Medical Physics)

EFOMP responded to HERCAs CT position paper with a number of positive responses as well as a number of comments.

EFOMP agrees with the proposal suggested in the CT position paper of a Multi-disciplinary team however it underlines the need to include the medical administration and the legislators. These two stakeholders are in most cases not included in the team even though they also play an important role in CT dose optimisation by ensuring that current legislation is respected.

EFOMP agrees with the responsibilities of the CT manufacturers, the medical physicists and the radiographers as described in the paper. It also agrees with the creation of a clinical team comprising radiologists, other imaging specialists, medical physicists and radiographers who will work together in the process of optimisation and who will define the diagnostic quality of the CT images required.

EFOMP proposes that the clinical team should review protocols and the audit process regularly in order to raise awareness, achieve constant improvement and achieve patient dose reduction.

EFOMP proposes that legislative improvements be made in assuring the implementation of the COUNCIL DIRECTIVE 2013/59/EURATOM by:

- Incorporating education and training requirements for all disciplines
- Requiring medical administrators to provide support for this by allowing time for the hospital staff to be trained and by providing the required financial support.

EFOMP is very interested in commitment 1: “Characterisation of CT systems standardised benchmarking” of the HERCA WP “CT manufacturers’ involvement”.

EFOMP believes that the CT dose efficiency concept is a concept on which all the stakeholders should work together. Therefore EFOMP proposed that this commitment could be opened up to other stakeholders.

For EFOMP the promotion of a Radiation Safety Culture through the investigation of “events” is very important. This can be achieved through the recording and analysis of events. This can be implemented by:

- Creating a Blame-free situation, which encourages the recording of events
- Opening discussions on the events taking place
- Creating national databases where the events are recorded
- An example of such a database is the following: OTHEA/RELIR <http://relir.cepn.asso.fr>

In conclusion to this addendum HERCA greatly appreciates the feedback received from the stakeholders on the CT position paper and will take into account all comments received in its future collaboration with the stakeholders involved.