European Study on Clinical Diagnostic Reference Levels for X-ray Medical Imaging (EUCLID)

Poster No.: ESI-0115
Congress: EuroSafe Imaging 2019
Type: EuroSafe Imaging
Authors: J. Damilakis\(^1\), G. Frija\(^2\), ESR Office\(^3\); \(^1\)Faculty of Medicine, University of Crete Iraklion/GR, \(^2\)Hopital Européen Georges Pompidou Paris/FR, \(^3\) Vienna/AT
Keywords: Radiation safety, Fluoroscopy, CT, Radioprotection / Radiation dose, Action 2 - Clinical diagnostic reference levels (DRLs), Action 6 - Clinical audit tool for imaging, Quality assurance
DOI: 10.26044/esi2019/ESI-0115

This PDF document has been automatically generated from a digital poster submitted online, and is meant for personal use only. Copyright restrictions might apply. Certain materials like for example videos - or multimedia files other than images in general, are not included in this PDF.
Background/introduction

Different image quality is needed for different clinical indications of the same anatomical area. For this reason, diagnostic reference levels (DRLs) should be established for a given clinical indication rather than an anatomical area. The European Commission (EC) launched the 'European study on clinical diagnostic reference levels for x-ray medical imaging' (EUCLID) project in August 2017 to provide up-to-date clinical DRLs.

Fig. 1: EUCLID logo

References: Medical Physics, Faculty of Medicine, University of Crete - Iraklion/GR

The EUCLID project is divided into 5 interrelated work packages (WPs), which cover specific tasks leading to the common objective to carry out a European study on clinical DRLs for x-ray medical imaging:
Fig. 2: EUCLID work programme

References: Medical Physics, Faculty of Medicine, University of Crete - Iraklion/GR

The 33-month EUCLID project is led by the European Society of Radiology (ESR).

The project has received funding from the European Commission under Service Contract No° ENER/2017/NUCL/SI2.759174.
Description of activity and work performed:

The main objectives of EUCLID are to conduct a European survey to collect data needed for the establishment of DRLs for the most important x-ray imaging tasks in Europe (from the radiation protection perspective) on the basis of the clinical indication, and to specify up-to-date DRLs for these examinations. A workshop will be organised by the end of 2019 to disseminate and discuss the results of this project. An External Advisory Panel has been set-up to be consulted on the main project activities and outcomes.

During the first months of EUCLID, a comprehensive review was carried out to identify the status of existing clinical DRLs for CT, interventional radiology (IR) and radiography in Europe and beyond. This was done by analysing recent studies, standards and publications. Information about existing clinical DRLs was collected from national competent authorities and other organisations involved in the project. The findings were taken into consideration during the finalisation of the list of clinical indications for which EUCLID is going to establish DRLs (Tables 1 and 2).

EUCLID has developed and implemented an EU-wide survey to collect data from 20 participating hospitals from 13 different European countries (Figure 3), chosen among the EuroSafe Imaging Stars network. The data is collected using a secure online web application for building and managing online surveys and databases. All data shall be continuously reviewed until the end of the data collection period (Q1 of 2019) in an attempt to avoid inaccurate records. Data will be prepared for the analysis to be sure that they are in the correct format and truthful. Moreover, a Scientific Board has been set up for the verification of data collected for the establishment of clinical DRLs. Board members are representatives of national regulatory authorities and national scientific/professional societies from the countries in which data is being collected. Twenty-fifth percentiles, medians, and 75th percentiles for dose quantities and dose indices will be calculated for each of the clinical indications and procedures. CT DRLs will be defined in terms of CTDI\textsubscript{vol} and DLP (Dose length Product). IR DRLs will be defined in terms of KAP (Kerma Area Product), cumulative air kerma at the patient entrance reference point, fluoroscopy time, and total number of images. EUCLID will also investigate the possibility of defining IR DRLs in terms of complexity. The final data analysis methodology is currently being discussed and will be finalised in consultation with the External Advisory Panel and the Scientific Board.

Table 1: List of CT clinical indications

<table>
<thead>
<tr>
<th>Clinical task</th>
<th>Anatomical location</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke</td>
<td>Head</td>
<td>All Phases</td>
</tr>
<tr>
<td>Clinical task</td>
<td>Anatomical location</td>
<td>Procedure</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Arterial occlusive disease of iliac arteries</td>
<td>Pelvis</td>
<td>Recanalisation &amp; Stenting</td>
</tr>
</tbody>
</table>

Table 2: List of Interventional radiology procedures
| Angiographic diagnosis and endovascular treatment of arterial stenosis or occlusion causing intermittent claudication or ischemia | Liver | Transarterial (chemo)embolisation of tumor vasculature and feeding hepatic arteries |
| Localization and treatment of hepatocellular carcinoma | Liver | Transarterial (chemo)embolisation of tumor vasculature and feeding hepatic arteries |
| Arterial occlusive disease of femoropopliteal arteries | Lower extremity | Recanalization and angioplasty + stenting |
| Angiographic diagnosis and endovascular treatment of arterial stenosis or occlusion causing intermittent claudication or ischemia | Lower extremity | Recanalization and angioplasty + stenting |
| Biliary drainage | Abdomen | Percutaneous transhepatic cholangiography and biliary drainage |
Fig. 3: Data collection from 13 European countries.

References: Medical Physics, Faculty of Medicine, University of Crete - Iraklion/GR
Conclusion and recommendations

A workshop will be organised by the end of 2019 to disseminate and discuss the results of this project. The final results of the EUCLID project, i.e. the clinical DRLs for the studied indications will be available in 2020.

The EUCLID project is led by the European Society of Radiology (ESR). The following ESR experts are involved in the project:

- Prof. John Damilakis, project manager
- Prof. Guy Frija, project co-manager
- Prof. Werner Jaschke
- Prof. Graciano Paulo
- Dr. Jacques Repussard
- Dr. Alexander Schegerer
- Dr. Virginia Tsapaki
- ESR Project Office: Monika Hierath, Ulrike Mayerhofer-Sebera

Please do not hesitate to contact eu-affairs@myesr.org in case of any questions.

Further project information is available at:

Personal/organisational information

The project has received funding from the European Commission under Service Contract No° ENER/2017/NUCL/SI2.759174.
References

http://www.eurosafeimaging.org/euclid