

**HelsIT Helseinformatikkuka i Trondheim 26 – 30. september 2011**  
**Parallel session P4: Radiology Thursday 29.9 13.00-16.00 (language English)**

**Automated quality assurance and dose reporting in radiology**  
**– The EPI-CT project, PACS data harvesting and CT dosimetry**

The Norwegian Radiation Protection Authority (NRPA) and the Norwegian Cancer Registry are partners in a 7<sup>th</sup> framework EU project named “EPI-CT” [1]. It is a multinational epidemiological study aimed to quantify the radiation risks related to pediatric computed tomography (CT) examinations. The radiological departments in Norway have been asked to appoint contact persons and provide the necessary data from RIS and PACS. The session is dedicated to these RIS/PACS professionals to introduce them to the software tools provided by the EPI-CT project. Radiologists, health IT managers/workers, medical physicists, RIS/PACS vendors and others concerned are also very welcome.

CT machines currently provide quantities such as the CT dose index (CTDI) and dose-length product (DLP). The data has not however been stored in machine-readable formats but in CT dose report images. The Henry Tudor Public Research Centre in Luxembourg [2] is partner in EPI-CT, and responsible for developing software tools to gather individual CT scan information from the PACS and do organ dose reconstruction accordingly. In advance, information from RIS will be used to establish the cohort of children. The information from RIS alone may also be used to establish estimates of the radiation doses in cases when PACS data are not available.

Software for automated dose reporting and quality assurance in radiology will be an important tool in the coming years. The session will include both general information about the EPI-CT project, practical information about the Permos software, as well as related tools for dose reporting and quality assurance.

**Useful links**

- [1] StrålevernInfo 3:2011 Epidemiologisk studie av risiko knyttet til CT av barn – EPI-CT  
[www.nrpa.no](http://www.nrpa.no) (klikk publikasjoner/StrålevernInfo/2011)
- [2] <http://santec.tudor.lu>
- [3] DICOM: Digital Imaging and Communications in Medicine (DICOM) Supplement 127: CT Radiation Dose Reporting (Dose SR) [ftp://medical.nema.org/medical/dicom/final/sup127\\_ft.pdf](ftp://medical.nema.org/medical/dicom/final/sup127_ft.pdf)
- [4] IHE: [http://www.ihe.net/Technical\\_Framework/upload/IHE-RAD\\_TF\\_Suppl\\_Radiation-Exposure-Monitoring\\_TI\\_2008-07-03.pdf](http://www.ihe.net/Technical_Framework/upload/IHE-RAD_TF_Suppl_Radiation-Exposure-Monitoring_TI_2008-07-03.pdf)
- [5] IAEA: <http://rpop.iaea.org/RPOP/RPoP/Content/News/extraction-radiation-dose-information.htm>

## PROGRAMME

### P4 Thursday afternoon – Parallel session 13.00-16.00 (language English)

#### Automated quality assurance and dose reporting in radiology – The EPI-CT project, PACS data harvesting and CT dosimetry

Chair: Hilde Olerud

Time	Heading	Lecturer
13:00	The EPI-CT project <ul style="list-style-type: none"> <li>– Introduction to the project</li> <li>– How to establish the cohort from RIS</li> <li>– Pseudonymisation, data security, ethics committee approval</li> </ul>	Kristina Kjørheim, Cancer Registry of Norway
	Dose reconstruction based on RIS and PACS data <ul style="list-style-type: none"> <li>– Retrospectively based on 1995 national CT survey</li> <li>– Practical dose parameters in CT (CTDI and DLP) and how they currently are recorded in the PACS</li> </ul>	Hilde M. Olerud, NRPA
14:00	<i>Coffee break</i>	
	PerMoS: Automated data collection from PACS based on DICOM <ul style="list-style-type: none"> <li>– Introduction to the PerMos software</li> <li>– Data security</li> <li>– Initial experiences</li> </ul>	Andreas Jahnen, Tudor Research Centre, Luxembourg
	Software tools for automated dose reporting and quality assurance in radiology based on DICOM <ul style="list-style-type: none"> <li>– Optimage quality assurance software</li> <li>– Tudor DICOM software framework</li> </ul>	Andreas Jahnen
15:30	<i>Discussion</i> Logistics, staff involvement, time schedule	All
16:00	END	

**(Preliminary)**

Vi ber om at de som planlegger å delta på sesjonen P4:Radiologi gir oss beskjed om dette til: [silje.flatabo@nrpa.no](mailto:silje.flatabo@nrpa.no).

**Reisestøtte:** For Helseforetakets utpekte RIS/PACS-kontaktperson til EPI-CT-prosjektet kan Statens strålevern etter søknad bidra med reisestøtte på kr. 2500,-. Reisestøtte er aktuelt for dem som skal bidra til datahøsting i de radiologiske avdelingene.

## **PerMoS: Automated data collection and CT dosimetry from PACS for epidemiological research**

Andreas Jahnen<sup>1</sup>, Johannes Hermen<sup>1</sup>, Prof. Dr. Peter Mildenberger<sup>2</sup>,  
PD Dr. Gerald Weisser<sup>3</sup>, Lucian Krille<sup>2</sup>

*Public Research Centre Henri Tudor, Luxembourg*  
*University Medical Centre Mainz, Germany*  
*University Medical Centre Mannheim, Germany*

### **Abstract:**

The EPI-CT project aims to collect an international cohort of paediatric patients undergoing CT examinations to estimate cancer risk after exposure to low doses of ionizing radiation. This is done by linkage with national cancer registries and analysis of cancer incidence in respect of individual radiation doses. The dosimetry information is calculated based on the technical parameters of the images acquired during scan.

The PerMoS – Performance and Monitoring Server for Medical Data is used to perform the data collection from PACS. The lightweight, easy to install PerMoS Upload Client is used to query, treat and securely collect the pseudonymous technical DICOM header metadata and transfer it to the central PerMoS Server. Each study participant can securely access the collected data with the PerMoS Data Manager - depending on their role within the study. Special Calculator Components at the server provide different evaluations, like different CT dosimetry calculations.

Based on the aim and design of the European EPI-CT study, the software's specific functionality and design will be demonstrated. First implementations in Germany revealed preliminary results on performance and acceptance during data collection as well as challenges in dosimetry and special characteristic of the retrieved data will be shown based on the experiences from the University hospitals Mainz and Mannheim.

The presentation will outline the aims and the design of the EPI-CT study as well as the software design and the software functions. The conclusions include first results, discuss the challenge of dosimetry, the experiences during data collection and characteristics of the collected data.