MINUTES

JOINT DICOM WORKING GROUP TWENTY EIGHT (Physics Strategy)
AND WORKING GROUP TWO (Projection Radiography)
Version 1

Date: May 22-24, 2017

Place/Time: 9:30AM – 5:30PM
University Hospital Son Espases
Room: A 201 - Módulo L (2nd Floor)
Carretera de Valldemossa, 79
07120 Palma de Mallorca (Spain)
http://www.hospitalsonespases.es/

Presiding Officers: Annalisa Trianni Co-Chair
Donald Peck Co-Chair

Secretaries: Alberto Torresin (EFOMP)
Shayna Knazik (AAPM)

Members Present (Non-Voting):

<table>
<thead>
<tr>
<th>Voting Members Present</th>
<th>Represented by</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAPM</td>
<td>Donald Peck</td>
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<tr>
<td>AAPM</td>
<td>Nick Bevins</td>
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<tr>
<td>EFOMP</td>
<td>Annalisa Trianni</td>
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<tr>
<td>GE Healthcare</td>
<td>Francisco Sureda</td>
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<tr>
<td>Bayer HealthCare</td>
<td>Ting Lu</td>
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<tr>
<td>FDA</td>
<td>Yuan Fang</td>
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<tr>
<td>Philips Healthcare</td>
<td>R. Karthigai Balan</td>
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<tr>
<td>PACS Health</td>
<td>Steve Massey</td>
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<td>GE Healthcare</td>
<td>Pierre Guntzer</td>
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<tr>
<th>Voting Members Not present</th>
<th>Represented by</th>
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<tbody>
<tr>
<td>Siemens Healthcare GmbH</td>
<td>Heinz Blendinger</td>
</tr>
<tr>
<td>AAOMR</td>
<td>Allan Farman</td>
</tr>
<tr>
<td>ADA</td>
<td>Veeratrishul Allareddy</td>
</tr>
<tr>
<td>PixelMed</td>
<td>David Clunie</td>
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1. Opening
   a. The meeting was called to order at 9:30am on May 22, 2017. Members identified themselves and their employers. A quorum was present.
   b. Co-Chair Donald Peck reminded the group of DICOM antitrust rules.
   c. The meeting agenda was reviewed and approved.
   d. The minutes from the previous meeting in New Orleans, Louisiana from March 2017 were reviewed and approved.

2. Updated DICOM Strategy Document for WG-28
   b. The final version of the document was sent to Luiza Kowalczyk and posted on DICOM website.

3. Supplement 191
   a. Reviewed Supplement 191 and several changes were made.
   b. The updated document was uploaded to the WG-28 webpage.

4. Continue development of New Work Item on Radiation Dose Structured Reporting for Cone Beam CT
   a. To be discussed at the next meeting in Rome in October 2017.

5. Review Dose SR extensions and potential requirements for RDSR/P-RDSR
   a. Members reviewed the outcomes of the discussion with Kevin O-Donnell/WG-06 about CP-1635 Equipment Landmark graphic correction. The CP-1653 will be in June Voting Packet.
   b. RDSR is necessary for all image modality and is not complete enough for some modalities. This implementation will allow more detail for all modalities to allow for input per radiation event, quality assurance, and optimization. WG-28 needs to get the support of other Working Groups to get support for that concept.
      i. **ACTION TO GROUP:** Prepare a power point presentation for RSNA to present to other WG’s with the goals of explaining the motivation of these new supplements and the necessity of the new integration connected with the P-RDSR document where all the dosimetric info should be integrated.
c. Discussed the need for unity in extracting dosimetric information with new RDSR/P-RDSR. We will use all the existing definitions and content of the existing RDSR defined with different modalities and will change what is necessary for dosimetric integration.

d. The scope and field of application was defined and discussed.

e. Different definition and contents of TID's were created and defined.

f. The relationship and time window was discussed and defined for individual TID's.

g. New version of the document (ver.2) was saved into the DICOM web site.

6. Review current Work Items, Supplements and CP

a. Reviewed WG-21 Supplement 188 on Multi-energy (ME) CT scanners. WG-28 and WG-02 received a request to support the new Display functionality in PACS or workstations concerning the new Display functionaltiy for Multi-Energy (ME) CT scanners.

b. Three volunteers will attend next meeting to discuss the content and to plan future cooperation of WG28.

c. Original email from WG-21:

From: Carey, Cheryl
Sent: Friday, May 5, 2017 3:14 PM
Cc: 'Ruf, Reinhard'; Kowalczyk, Luiza; Carey, Cheryl
Subject: An Invite to WG11 from WG21: Doodle by May 12

Dear members of WG11,
During our (WG21) internal discussions and comments during public comment phase of Supplement 188, questions concerning Display functionality in pacs or workstations have been raised. We are interested in your thoughts, specifically on the topics outlined below, before Sup 188 goes for final ballot. Refer to Sup 188 overview (attached). As such, we’d like to allot one (1) hour during WG21’s two (2) day meeting prior to SIIM 2017, to meet with you at a convenient time. Before completing the Doodle below, here are the topics:

Open Topic 1:
A naïve display system can receive a multi-energy (ME) image and will not recognize it as ME-image but rather display the image as a conventional CT image. What risks does this pose and how shall we mitigate them?

Examples of potential clinical misinterpretation
For virtual mono-energetic images (VMI, images similar to those obtained with mono-energetic x-ray beam, in keV), attenuation highly depends on the beam energy (keV), so CT pixel values in VMI images can be very different from those in conventional CT images. Without proper labeling of such images, including the specific keV value used, the reviewer can come to wrong conclusions.
HU-based ME images where CT pixel values have been modified for specific materials (suppressed, highlighted, etc.) look similar to conventional CT images. Without proper labeling of such images, including the identification of the affected materials and the way of modification, the reviewer can come to wrong conclusions.

In certain types of ME images (effective atomic number, electron density, material-specific image containing material concentration), CT pixel values do not represent HU values. Common ROI tools used on such an image will measure and display an average value. Since non-HU values are quite unusual in CT IOD images, there is a significant risk that a common “naïve” display will either omit the units of measurements (leaving user to assume the material or units), or (which is even worse) will display “HU” units instead.

In case of Virtual Non-Contrast images, the pixel values are modified (contrast is removed and pixel values may have been corrected for displacement of one material by another material). Since pixels are modified, there is a risk that the modification is incomplete or the replacement is not adequate.

Another Open Topic 3:
Is there a need to support synthetic KVP?
Currently we support the possibility to set the attributes for KVP in the standard CT Image. The KVP attribute can be used in case of synthetic KVP in a Multi-energy CT Image. This means the image is identical as if it was generated by a single energy acquisition.
Decision AAPM & WG21: We start with a new attribute for “synthetic” KVP (what are the implications on naïve display system)

As mentioned, we’d like to schedule one (1) hour to meet with you during May 30-31, 2017 to clarify these items. You can join our meeting in person or via telephone.

Doodle: Of the times listed, indicate all timeslots you are available here http://doodle.com/poll/xcsxnf3c8ic8yqzk Please complete the Doodle by Friday, May 12:

With best regards,

Reinhard Ruf, Chair WG21
Siemens Healthcare GmbH
Diagnostic Imaging
Computed Tomography

Cheryl Kreider Carey, CAE
General Secretary, DICOM Digital Imaging and Communications in Medicine
Director, Operations & Administration, MITA Medical Imaging & Technology Alliance
A Division of NEMA, the association of electrical equipment and medical imaging manufacturers
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WG-28 of the DICOM Standards Committee
d. **ACTION TO GROUP:** finish reviewing document and share any comments with WG-21.

e. Jointly reviewed with WG-02 and WG-28 the advances of the CPs discussed during the last meeting, and reviewed new CPs related to the scope of WG-28.

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<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Submitted</th>
<th>Assigned</th>
<th>Coded</th>
<th>Status</th>
<th>Comments/Actions for WG-02</th>
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<tbody>
<tr>
<td>CP 1319</td>
<td>Frame Of Reference Reliability</td>
<td>Francisco Sureda, et al.</td>
<td>Ulrich Busch</td>
<td>Assigned</td>
<td>To follow up.</td>
<td></td>
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<tr>
<td>CP 1513</td>
<td>Clarification of meaning of entrance dose</td>
<td>Ting Lu</td>
<td>Kevin O’Donnell</td>
<td>Final Text</td>
<td></td>
<td>CPACK 90</td>
</tr>
<tr>
<td>CP 1646</td>
<td>Add repeat flag and reason to RDSR to help with outlier analysis</td>
<td>David Clunie</td>
<td>David Clunie</td>
<td>Final Text</td>
<td></td>
<td>CPACK 90</td>
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<tr>
<td>NEW</td>
<td>Add Radiation Dose units to CID 7181 to be used with Dose Quantities in Parametric Maps.</td>
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<td>Refer to CP 1665, for the new way to define specific units to specific concepts.</td>
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7. Discuss any potential New Work Item’s
   a. None at this time.

8. Reports from liaisons with other groups and organizations
   a. Reviewed IEC issues and documents
   b. FDA Report
      i. Medical X-ray Imaging Device conformance to IEC Standards: FDA moderated a special interest session at the CRCPD Annual Meeting on May 10th, 2017 related to medical x-ray imaging device conformance to IEC standards. This topic was introduced to the draft guidance Medical X-ray Imaging Devices Conformance with IEC standards (https://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM514283.pdf) and presented to the Technical Electronic Product Radiation Safety Standards Committee (TEPRSSC) on October 25-26, 2016. (https://www.fda.gov/AdvisoryCommittees/CommitteesMeetingMaterials/RadiationEmittingProducts/TechnicalElectronicProductRadiationSafetyStandardsCommittee/ucm526004.htm)
      
      ii. This work would permit manufacturers of medical x-ray imaging devices to demonstrate conformance to certain applicable IEC standards in lieu of federal (EPRC) performance standards. The Agency recognizes that certain IEC standards can provide the same or improved level of protection of the public health and safety from electronic radiation as certain EPRC
performance standards, and at the same time would be less burdensome for manufacturers. This action would meet the requirements of recent federal policy as expressed in the revised OMB Circular A-119, which became effective in January 2016. This effort is related to WG-28 and WG-02 due to incorporation of DICOM (e.g. RDSR) in IEC standards.

9. Planned Future Meeting Dates
   a. October 11-13, 2017 – Rome, Italy
   b. 2018 schedule
      i. US meeting: March 12-14, 2018 – Hawaii, San Francisco, or Miami
      ii. European summer meeting: June 4-8, 2018 – Prague

Reported by: Shayna Knazik (AAPM), Secretary of WG-28
Submitted by: Luiza Kowalczyk, DICOM Secretary
Reviewed by: Clark Silcox, Legal Counsel