Management of Acquisition Protocols (MAP)

IHE Radiology Domain
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Motivation

One Scanner can have 100 or more protocols…

Quality of Care
– Good, consistent image quality depends on good protocols, used consistently

Efficient Workflow
– Hanging Protocols, Image Processing, Reporting Workflow depends on consistent series names, procedure codes, etc.

Dose Management
– Managing dose depends on managing protocols

Analytics
– Summarizing data depends on consistent tagging
Management of Acquisition Protocols (MAP) Profile

Centralized, cross-vendor review and approval
- Upload protocols
- Periodically review & approve
- Modify (within limits)
- Re-distribute protocols and approvals
DICOM CT Defined Procedure Protocol IOD
  – Encodes a complete protocol

DICOM Protocol Approval IOD
  – Encodes list of protocols and associated approvals

DICOMweb - NPI Service
  – RESTful transactions to Store, Query, and Retrieve Non-patient Instances
**Defined Protocol**

- Device=Aquilion Series
- Pat. Pos.: Feet First / Supine
- Pat. Instruct: Single Breath Hold / Full Inspiration
- kVp: 80~140
- Slice Thickness: 1.0~2.5mm
- Recon. Kernel: Std.

**Performed Protocol**

- Device=Aquillion ONE
- Version=3.0.4
- Pat. Pos=Feet First / Supine
- Pat. Instruct=Given
- kVp=120
- Slice Thickness=1.0mm
- Recon. Kernel=FC12

**tba...**
Defined Protocol Details

- Scanner transcodes to / from internal format
- Vendor/Model Specific content
  - No expectation to execute on different models
  - Private tags expected for model-specific details
- Private Tag Dictionary
  - Private Data Element Characteristics Sequence (0008,0300)
  - Supports better review & comparison
- Specifies Constraints on Parameters
  - Specific value, set, range, etc.
  - Constraint Violation Significance (0082,0036)
    - Informative, Warning, Failure
- Instructions Sequence
  - Can be used as instructions to tech (brief & long versions)
Defined Protocol Details

• Specification Sequences constrain parameters for
  – **Equipment**
    • What scanner make / model / version, etc.
  – **Patient**
    • What age, sex, weight, etc.
  – **Acquisition Elements**
    • Acquisition element = localizer, helical, etc.
    • Parameters = kVp, revolution time, table height, **Dose Check**, etc.
  – **Reconstruction Elements**
    • Reconstruction element = thin slice recon, thick slice recon, etc.
    • Parameters = kernel, slice thickness, spacing, series description, etc.
  – **Storage Elements**
    • Storage element = send-to-PACS, send-to-3DWS, etc.
    • Parameters = destination AETitle, DICOMweb URL, XDS, etc.

• Scanner only encodes details it needs / supports
## Protocol Approval Details

<table>
<thead>
<tr>
<th>Approval Subject Sequence:</th>
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<tbody>
<tr>
<td>Referenced SOP Instance UID</td>
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### Approval Sequence:

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<th>Assertion Code</th>
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<td>Person Name</td>
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RESTful NPI Store

- POST Operation
- [https://image-archive/defined-procedure-protocols/uid](https://image-archive/defined-procedure-protocols/uid)
- Content-Type: application/dicom or application/dicom+json
- Payload: binary DICOM object or JSON

```json
"00080070": {
    "vr": "LO", "Value": ["Acme Corporation"]
},
"00081090": {
    "vr": "LO", "Value": ["Prime CT"]
},
"00181000": {
    "vr": "LO", "Value": ["A72309234M43"]
},
"00181030": {
    "vr": "LO", "Value": ["Std Adult Head w Contrast"]
},
"00080012": {
    "vr": "DA", "Value": ["20170317"]
},
"00080013": {
    "vr": "TM", "Value": ["1305"]
}, ...
```
Additional Use Cases
Questions?

Thank you for attending!