**DICOM Correction Proposal**

<table>
<thead>
<tr>
<th>STATUS</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Last Update</td>
<td>2014/04/04</td>
</tr>
<tr>
<td>Person Assigned</td>
<td>James Philbin</td>
</tr>
<tr>
<td>Submitter Name</td>
<td>Jonathan Whitby (<a href="mailto:jwhitby@vitalimages.com">jwhitby@vitalimages.com</a>)</td>
</tr>
<tr>
<td>Submission Date</td>
<td>2013/10/17</td>
</tr>
</tbody>
</table>

**Correction Number**  
CP-1363

**Log Summary:** Add SearchForPatient service to QIDO-RS

**Name of Standard**  
PS 3 2011, Sup 161, Sup 166

**Rationale for Correction:** Supp 166 received significant feedback during LB phase requesting a SearchForPatient service corresponding to the C-FIND Patient Root search.

**Correction Wording:**

Append to PS 3.2 Annex X.4.2.1 QIDO-RS Specifications

**X.4.2.1.X QIDO-RS Search For Patients**

**Table X.4.2-X**  
QIDO-RS SEARCH FOR PATIENTS Specification

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media Types</td>
<td>Restricted to “multipart/related; type=application/dicom+xml” or “application/json”</td>
</tr>
<tr>
<td>Matching Attributes</td>
<td>See Table X.4.2-Xa</td>
</tr>
<tr>
<td>Return Attributes</td>
<td>See Table X.4.2-Xa</td>
</tr>
<tr>
<td>Limit and Offset</td>
<td>Yes</td>
</tr>
<tr>
<td>Supported</td>
<td>Relational Queries Supported No</td>
</tr>
</tbody>
</table>

**Table X.4.2-Xa**  
QIDO-RS PATIENT attribute matching

<table>
<thead>
<tr>
<th>Key Word</th>
<th>Tag</th>
<th>Types of Matching</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PatientsName</td>
<td>00100010</td>
<td>S,*,U</td>
</tr>
<tr>
<td>PatientsID</td>
<td>00100020</td>
<td>S,*,U</td>
</tr>
</tbody>
</table>
Append below PS 3.17 Annex HHH.4.2.6 Mobile Device Access

HHH.4.2.7 Study Import Patient Check
An Imaging Clerk is registering a patient for a procedure. The patient has brought a CD containing an outpatient imaging study that may be a relevant prior. The import reads the patient demographics and performs a QIDO patient search to determine if other imaging studies exist for the patient. A match is found and the outpatient imaging study is imported and associated with the existing patient information.

Update PS 3.18 Section 6.1 INTERACTION as indicated.

6.1 INTERACTION
The interaction shall be as shown in Figure 6-1.

Multiple communications modes are possible:

--- URI based mechanism using HTTP Get: WADO-URI Type request

--- Web Services (WS*) using HTTP Post: WADO-WS, either:
  a. DICOM Requester (Retrieve Imaging Document Set)
  b. Rendered Requester (Retrieve Rendered Imaging Document Set)
  c. Metadata Requester (Retrieve Imaging Document Set Metadata)

--- RESTful Services (RS) using HTTP Get: WADO-RS, either:
  a. DICOM Requester (Retrieve Study, Series, or Instance DICOM Objects)
  b. Pixel Data Requester (Retrieve Instance Frame Pixel Data)
  c. Bulk Data Requester (Retrieve Study, Series, Instance bulk data)
  d. Metadata Requester (Retrieve Study Metadata)

--- RESTful Services (RS) using HTTP Get: QIDO-RS:
  a. Query Requester (Search for Study, Series or Instance DICOM Objects)
  b. Patient Requester (Search for Patient)
— RESTful Services (RS) using HTTP Post: STOW-RS, either:
  a. DICOM Creator (Store Instances)
b. Metadata and Bulk Data Creator (Store Instances)

**Update PS 3.18 Section 6.7 QIDO-RS REQUEST/RESPONSE as indicated.**

### 6.7 QIDO-RS REQUEST/RESPONSE

The DICOM QIDO-RS RESTful Service defines several action types. An implementation shall support the following action types:

- **SearchForStudies**
  This action searches for DICOM Studies that match specified search parameters and returns a list of matching studies and the requested attributes for each study.

- **SearchForSeries**
  This action searches for DICOM Series that match specified search parameters and returns a list of matching series and the requested attributes for each series.

- **SearchForInstances**
  This action searches for DICOM Instances that match specified search parameters and returns a list of matching instances and the requested attributes for each instance.

- **SearchForPatients (optional)**
  This action searches for Patients that match specified search parameters and returns a list of matching Patients and the requested attributes for each Patient.

### 6.7.1 QIDO-RS – Search

#### 6.7.1.1 Request

The specific resources to be used for the search actions shall be as follows:

- **Resource**
  - **SearchForStudies**
    - `{SERVICE}/studies[?query]`
  - **SearchForSeries**
    - `{SERVICE}/studies/{StudyInstanceUID}/series[?query]`
    - `{SERVICE}/series[?query]`
  - **SearchForInstances**
    - `{SERVICE}/studies/{StudyInstanceUID}/series/{SeriesInstanceUID}/instances[?query]`
    - `{SERVICE}/studies/{StudyInstanceUID}/instances[?query]`
    - `{SERVICE}/instances[?query]`
  - **SearchForPatients**
    - `{SERVICE}/patients[?query]`

where
- `{SERVICE}` is the base URL for the QIDO RESTful service. This may be a combination of scheme (http or https), host, port, and application.
— {StudyInstanceUID} is the unique Study Instance UID for a single study.
— {SeriesInstanceUID} is the unique Series Instance UID for a single series.

A QIDO-RS provider shall support the SearchForStudies, SearchForSeries, and SearchForInstances requests. Support for the SearchFor Patients request is optional.

— Method
  — GET

— Headers
  — Accept – The Media Type of the query results. The types allowed for this request header are:
    — multipart/related; type=application/dicom+xml (default)
      Specifies that the results should be DICOM PS3.19 XML (one part per result)
    — application/json
      Specifies that the results should be DICOM JSON
  A QIDO-RS service provider shall support both Accept header values
  — Cache-control: no-cache (recommended)
    If included, specifies that search results returned should be current and not cached.

— Query key=value pairs
  — {attributeID}={value}
    0-n / {attributeID}={value} pairs allowed
  — includefield={attributeID} | all
    0-n includefield / {attributeID} pairs allowed, where “all” indicates that all available attributes should be included for each response.

Each {attributeID} must refer to one of:
— Patient IE attributes
— Study IE attributes
— Series IE attributes (SearchForSeries or SearchForInstances requests only)
— Composite Instance IE attributes (SearchForInstances requests only)
— Additional Query / Retrieve Attributes (DICOM PS 3.4 C.3.4)
— Timezone Offset From UTC (0008,0201)

Each {attributeID} query value must be unique unless the associated DICOM Attribute allows UID List matching (see DICOM PS3.4 C.2.2.2.2), in which case each {value} will be interpreted to be an element of the UID List.

The acceptable values for {value} are determined by the types of matching allowed by C-FIND for its associated {attributeID} (see PS3.4 C.2.2.2). All characters in {value} that are disallowed for URLs must be URL encoded. See IETF RFC 1738 for details.
If an \{attributeID\} is passed as the value of an “includefield” query key this is equivalent to C-FIND Universal matching for the specified attribute (see DICOM PS3.4 C.2.2.2.3).

- fuzzymatching=true | false
- limit={maximumResults}
- offset={skippedResults}

\{attributeID\} can be one of the following:

- \{dicomTag\}
- \{dicomKeyword\}
- \{dicomTag\}.\{attributeID\}, where \{attributeID\} is an element of the sequence specified by \{dicomTag\}
- \{dicomKeyword\}.\{attributeID\}, where \{attributeID\} is an element of the sequence specified by \{dicomKeyword\}

\{dicomTag\} is the eight character hexadecimal string corresponding to the Tag of a DICOM Attribute (see PS3.6 Section 6).

\{dicomKeyword\} is the Keyword of a DICOM Attribute (see PS3.6 Section 6).

Note: Examples of valid values for \{attributeID\}:

- 0020000D
- StudyInstanceUID
- 00101002.00100020
- OtherPatientIDsSequence.PatientID
- 00101002.00100024.00400032
- OtherPatientIDsSequence.IssuerOfPatientIDQualifiersSequence.UniversalEntityID

Note: Examples of valid QIDO-RS URLs:

- http://dicomrs/studies?PatientID=11235813
- http://dicomrs/studies?PatientID=11235813&StudyDate=20130509
- http://dicomrs/studies?00100010=SMITH*&OtherPatientIDsSequence.00100020=11235813
  &includefield=00081060
- http://dicomrs/studies?PatientID=11235813&StudyDate=20130509-20130510
- http://dicomrs/studies?StudyInstanceUID=1.2.392.200036.9116.2.2.2.2.2162893313.1029997326.94587%2c1.2.392.200036.9116.2.2.2.2.2162893313.1029997326.94583

### Append to PS 3.18 Section 6.7.1.2.1 Matching

#### 6.7.1.2.1.4 Patient Matching

Providers of the SearchForPatients service shall support the search query keys described in Table 6.7-1c:

| Table 6.7-1c
| QIDO-RS PATIENT Search Query Keys

Page 5
Append to PS 3.18 Section 6.7.1.2.2 Query Result Attributes

### 6.7.1.2.2.4 Patient Result Attributes

For each matching Patient, the QIDO-RS provider shall return all attributes listed in Table 6.7.1-2c:

<table>
<thead>
<tr>
<th>Key Word</th>
<th>Tag</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific Character Set</td>
<td>(0008,0005)</td>
<td>If present in Study Related Instances</td>
</tr>
<tr>
<td>Patient’s Name</td>
<td>(0010,0010)</td>
<td></td>
</tr>
<tr>
<td>Patient ID</td>
<td>(0010,0020)</td>
<td></td>
</tr>
<tr>
<td>Patient’s Birth Date</td>
<td>(0010,0030)</td>
<td></td>
</tr>
<tr>
<td>Patient’s Sex</td>
<td>(0010,0040)</td>
<td></td>
</tr>
</tbody>
</table>

All other Patient Level DICOM Attributes passed as {attributeID} query keys that are supported by the service provider as matching or return attributes.

All other Patient Level DICOM Attributes passed as “includefield” query values that are supported by the service provider as return attributes.

All available Patient Level DICOM Attributes if the “includefield” query key is included with a value of “all”.

Study, Series Level and Instance Level attributes passed as “includefield” query values shall not be returned.

Note: The above list is consistent with the Patient IE attributes required for IHE RAD-14 (see [http://www.ihe.net/Technical_Framework/upload/IHE_RAD_TF_Vol2.pdf Table 4.14-1]).