IHE Multi Country Work Group (MCWG)

MCWG Recommendation on Metadata and Linkages for sharing imaging information at the national/regional level

Effective sharing with linkage between imaging requests (clinician, imaging production), imaging reports, imaging examinations. Setting an imaging metadata strategy for key filtering elements in queries.

Final Version for Publication – December 4th, 2023

For use by IHE MCWG Member Countries

Scope of Recommendation on Metadata and Linkage FG of MCWG

- This recommendation was initially developed by a Focus Group of IHE MCWG in October and November 2023 and submitted to the MCWG plenary for approval. **The purpose of MCWG is to develop recommendations by national ehealth projects interested to facilitate their deployments while increasing consistency to ease market adoption and cross-border exchanges.**
- The scope of the development of such an MCWG recommendation is: *Strategies on metadata definitions for filtering access in queries (key filtering elements) and linkages between orders, reports and imaging studies.*
- *This recommendation is a critical complement to the* ***MCWG Recommendation on Standards Positioning for sharing imaging information at the national/regional level -*** *Positioning HL7 FHIR and DICOM along with the related IHE profiles such as MHD (FHIR), XDS-I, XCA-I, WIA (DICOMweb).- November 2, 2023.*

Objectives of this Recommendation on Metadata and Linkages

1. The use case scope is the **sharing of imaging information within a country or a region** between:
   - imaging systems and their professionals that create such imaging information in the form of imaging reports and imaging studies available nationally and/or regionally and need to view, process and analyze images across time,
   - any health professional and patient that need to access imaging reports and view related imaging studies
2. The focus of the present recommendations is on:
   - ***The filtering in initial queries*** **:** what criteria are needed for health professionals (imaging specialists and others) when they are exploring a patient imaging records, both for an initial request (shorter list or level 1) and a subsequent selection (visually or level 2) among the list of initial responses. All level 1 criteria can be used as level 2.
   - ***The linkages or relationships between various entities*** such as the clinical request, the imaging procedure requests, the acquired imaging study(ies) and the resulting report(s). Our goal is to ensure that those are clearly identified, allowing simple navigation between them in various types of relationships (e.g. one clinical order, but multiple studies and reports).

Assumptions Made in this Recommendation on Metadata and Linkages

1. **The present recommendation builds upon a companion recommendation** on the basic transactions to publish imaging studies and reports along with the positioning of the standards. The reader is encouraged to read this companion recommendation before considering the present recommendations.
2. The national/regional environment unique identification of patients and health professionals involved, along with the necessary security and privacy framework are assumed to be in place.
3. It is also assumed that the sharing of other types of information (patient summaries, laboratory reports, hospital discharge summaries, etc.) may already be in place or is intended to coexist in the future along with the sharing of imaging information.
4. **The proposed approach is :**
    1) First to analyse metadata that is specific to imaging,
    2) Second to consider the needed linkages or relationships between the imaging specific entities
    3) Third to analyse metadata that is non-imaging specific but useful to imaging queries and selection
    4) And finally, to review some variants of imaging worklfows (trigger to share, without orders).

Overview of Imaging-Specific Metadata For Filtering Access in Queries

Following slides discuss details on the recom-mended metadata

Metadata element[1]	Description	Query level[4]	Type of value	Primary: system where metadata element value is created			
				Order Placer / EHR	Order Filler / RIS	Modality	radiology/ specialty PACS or VNA
Anatomical Regions	**Set by RIS per each imaging procedure code**	1 (or 2)	See slide 8 Classification	-	Primary	-	Secondary (via HL7)
Study level modality[2]	**Set by RIS per each imaging procedure code**	1 (or 2)	See slide 10 Classification	-	Primary	-	Secondary (via HL7)
Study Instance UID[2,3]	**Set by RIS (sometimes by modality)**	2 (or 1)	None - Identifier	-	Primary	Secondary (via DMWL)	Secondary (via C-STORE & HL7)
Accession number[3]	**RIS generated imaging procedure request identifier**	2 (or 1)	None - Identifier	-	Primary	Secondary (via DMWL)	Secondary (via C-STORE & HL7)
Placer number[3]	**From ordering module EHR/EMR**	2 (or 1)	None - Identifier	Primary	Secondary (via HL7)	-	Secondary (via HL7)
Imaging Procedure Code	**Set by RIS per each performed procedure code**	2	See slide 12 Display Name	Secondary	Primary	Secondary (via DMWL)	Secondary (via HL7)

Note 1: The imaging Manifest (associated to a single imaging study) and the Imaging Report share the same metadata. The table covers the imaging specific metadata elements (Patient demographics is outside the table scope) as speciied in XDS-I.

Note 2: A code of "Study Level Modality" as opposed to "Series level Modality" should be employed here, see slide 4

Note 3: Many to many cardinality between all three identifiers: Accession number, Study Instance UID and Order Placer number.

Note 4: Level 1 Query is an initial query to filter on coded metadata to return a "shorter list" (not all reports/studies for a patient). Level 2 is a visual selection based on the entire metadata returned in the "shorter list" to retrieve the most relevant.

Recommendation for Anatomical Region (1/3) – Value Set

It must be possible to filter studies based on anatomic regions in the list of value below:

SNOMED CT Code	Patient Friendly Name*	Display name EN
63337009	Lower trunk	Abdominopelvic segment of trunk
38266002	Whole body	Entire body as a whole
53120007	Arm	Upper limb structure
61685007	Leg	Lower limb structure
67734004	Upper trunk	Thoracic segment of trunk
774007	Head and neck*	Structure of head and/or neck
113257007	Cardiovascular system	Structure of cardiovascular system
80891009	Heart	Heart
76752008	Breast	Breast structure
737561001	Spine*	Structure of vertebral column and/or spinal cord

Note: It is advisable to use “Patient Friendly Names”, meaning it is understandable for most patients. The values in the column “Patient Friendly Name” are official acceptable terms in SNOMED CT, except the values of two terms where the word “structure” has been removed. When the list is final, we can ask SNOMED CT to include them as official acceptable terms.

Recommendation for Anatomical Region (2/3) – Key Rationale

1. All imaging studies fall under at least one anatomic region.
2. Anatomic regions may include major body parts (e.g. upper limb, thorax), organs (e.g breast or heart) or systems (e.g. cardiovascular system) that are very frequently searched for are included explicitly.
3. This list covers > 90% of the users needs for searches, based on discussions with doctors.
4. The list is kept simple; no deep medical knowledge is needed to be able to classify studies into these regions or to use the classification.
5. By design, one should keep between 10 and 15 the number of anatomic regions in the list:
   - short enough to be of simple use and avoid misclassification
   - long enough to be have a clear distinction between anatomic regions
6. If the future requires more values e.g. because more –ologies are added, there is still some room. Therefore, it is recommended to start with 10 values.
7. Each Anatomic Region metadata element is a triplet: (1) Coding Scheme (2) Code Value (3) Code Display Name. Multiple instances of the different metadata element may be present.

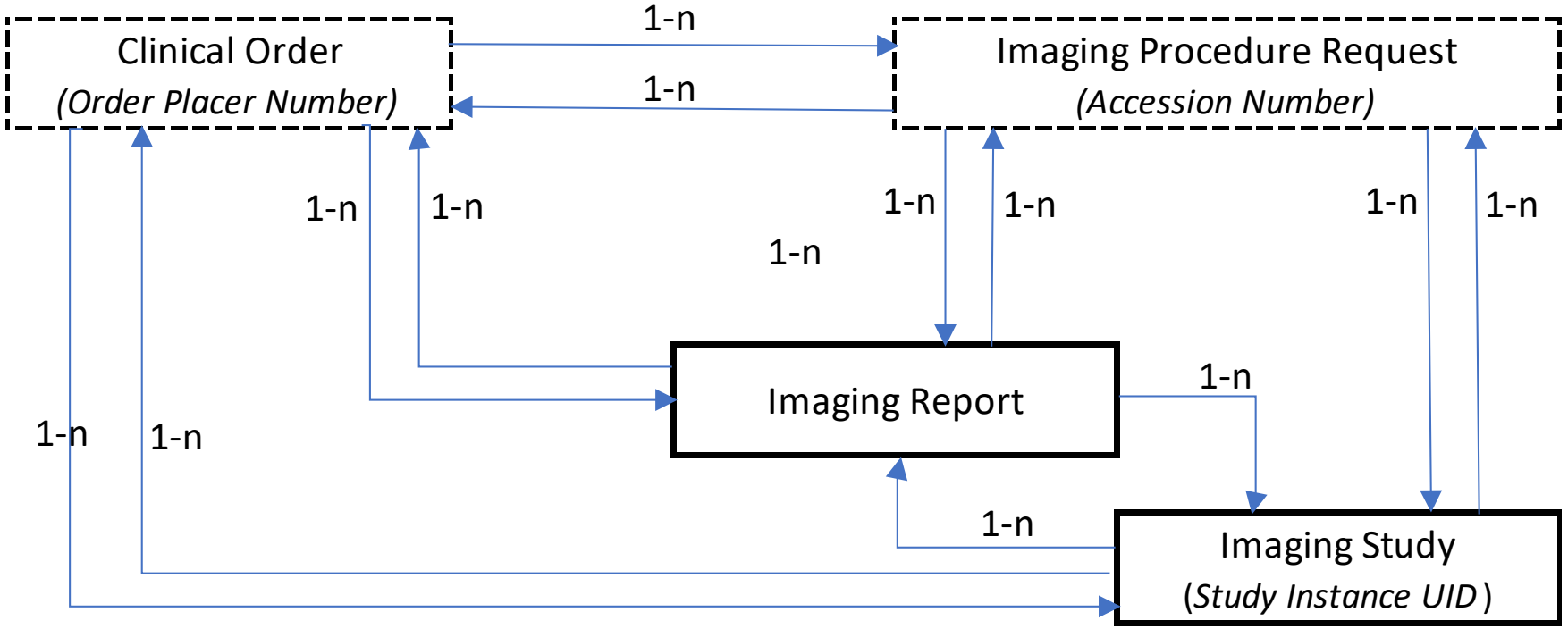
Recommendation for Anatomic Region (3/3) – Use of Anatomic Regions

- **The Anatomic Region metadata is associated to a list of values.**
  - **When a study falls into more than one anatomic region** (e.g. shoulder) the study metadata "anatomic region" shall be created with both regions in the metadata (Registry entry sharing). This ensures match when filtering either on "Upper trunk" or on "Arm".
  - **When a document query is issued for a specific anatomic region, the complete list is returned.** For example, for a query for the SNOMED CT code in the eventCodeList attribute of XDS, XCA or MHD (FHIR) (e.g. Upper Trunk '67734004'), the responding system (registry or peer responding gateway) may answer to this eventCodeList with the list of the two code triplets ('53120007' head and neck' and Upper Trunk '67734004'), if the imaging manifest or report covers both regions.
- **The assignation of value(s) for Anatomic Regions** is typically a RIS centric process that is quite simple and need not imply imaging modalities.
  - When processing incoming ***clinical orders,*** *a typical* RIS helps derive the supporting one or more ***imaging procedure request***(s) to which is assigned an imaging procedure code.
  - Such imaging procedure code come from a value set (typically around a thousand values) that may be locally defined or nationally standardized, based on an ad-hoc or international terminology.
  - Despite such a variety of code types, it is straightforward to map each Imaging Procedure Code to one or more Anatomic Region(s) (about 10 coded values).

Recommendations for Introducing a Study Level Modality

- **Study Level Modality** is associated with the imaging procedure and represents the category of acquisition device used to carry out the primary part of imaging information acquisition (including waveforms).
  - Such codes are obtained from the DICOM acquisition modalities CID 29.
  - **It is typically assigned by the RIS and used as an important category indicator for any imaging study.**
  - There may be more than one instance of study level modality code for an imaging study (e.g. PET/CT).
- Per DICOM, Acquisition Modality devices assign a **Series Level Modality** code for each series of images created, according to the imaging acquisition technology used.
  - **Series Level Modality** codes can be of the type "acquisition" or "non-acquisition".
  - Acquisition series-level modality codes are enumerated in DICOM CID 29 value set and non-acquisition series level ones in DICOM CID 32.
- The images or measurements that are obtained from a transformation or processing of acquired images, are called non-acquisition modality codes. These non-acquisition images are recorded in distinct specialized series that also bear a **Series Level Modality** code .
- The use of a modality code for XDS/MHD query filtering (Level 1) should be done with the **Study Level Modality** code (unlike a DICOM C-FIND that relies on the series level modality code).
- The **Study Level Modality** Code value is typically present among one or more of the **Series-level Modality** codes.

Entities Identifiers and their linkages. All relationships are « many to many »



An intensive care physician orders a series of portable chest x-ray for a patient, every 12 hours over 72 hours.
- 1 Clinical Order
- 6 Accession numbers, 6 imaging studies and 6 reports

An ED physician orders a chest and an abdominal CT for a patient in a tertiary care center. A combo chest/abdominal CT is carried out. The two components are read by two different radiologists.
- 2 clinical orders
- 1 accession number
- 2 imaging studies and 2 reports

An angiography procedure is ordered by a vascular surgeon. During the course of this radiology intervention, an ultrasound exam is performed in the angio room.
- 1 clinical order
- 1 accession number
- 2 imaging studies
- 1 report

Note: The ***Order Placer Number*** identifies a Clinical Order (for an order-based workflow) as a workflow entity not as an order instance (a revised order has a different instance ID) to keep a stable ***Order Placer Number.***

Legend:

Imaging Study (*Study Instance UID*) — *Document/object being exchanged with its unique identification (shown between brackets), if needed as metadata*

Imaging Procedure Request (*Accession Number*) — *Workflow entities referenced (objects may not be exchanged or exchanged in the future)*

Management of imaging reports

1. Publication

a) Over time, multiple version of an imaging report may be published (ex. preliminary, finalized, addendum).

b) At any given time, the latest version of the report shared by the report creator is the one which should be presented to a requestor.

c) Presenting an earlier version is typically not necessary (with a few exceptions, medico-legal inquiries…).

d) When is a report is amended, we recommend that it results into a new version of the report. The necessity and the way to incorporate the revised text with the original text is left as a local governance decision.

e) The source behavior should be such that when a new version of a report (ex. through an HL7 v2.x ORU) is received, the source should deprecate the document containing what was the latest version up to that point in time and issue a new publication with the new report.

2. Consumption

a) At any given time, the consumer will find only one active document containing a report, which is necessarily the latest version of the report, insofar as 1d) above holds true.

b) Presenting any other version than the latest one should be done with considerable caution, and the utmost effort should be made to indicate that such version is NOT current (e.g. deprecated status in XDS/MHD).

Recommendation on Imaging Procedure Codes

- At this time, the MCWG recommendations do not cover the inclusion of the imaging Procedure Codes value set as a metadata query filter of level 1. The rationale is the following:
  1. It is rare for users to specifically search (query level 1) for a specific procedure code given the large number of procedure codes (typically 1000 or more to cover medical imaging)
  2. There is currently very little harmonization in procedure codes, even within most countries, which may entail the need to interpret local imaging procedure codes and/or study descriptions for national sharing.
  3. The terminologies for imaging procedures are in state of evolution. The investment made by the RSNA in RADLEX, now being adopted by LOINC is likely to result in phasing out the old LOINC imaging procedure codes. The SNOMED-CT imaging procedure codes are deployed in very few countries. A SNOMED-LOINC convergence may result in the alignment on RADLEX which seems the most robust approach, although, not yet widely adopted.
  4. Including the possibility to search on procedure codes exposes a privacy risk as knowledge of imaging procedure codes for a patient is easily linkable to diseases.
- This MCWG recommendation is to focus on providing **textual imaging procedure display name** for level 2 selection:
  1. This allows the health professional to visually select (Level 2) relevant entries among the returned level query responses.
  2. This does NOT require standardized **Imaging Procedure codes** in Metadata. Over time, one should progressively introduce them, first within Imaging Reports and in a later phase in Metadata (if allowed by the national privacy policy)
  3. Imaging Procedure Codes may be included into the metadata even if they are from a local coding scheme, as only the Imaging Procedure DisplayName needs to be displayed. This is a preferred approach than to rely on the DICOM Study Description or Performed Procedure description, as there is an uneven quality in the way they are created today, in addition to be language specific.

Laterality and Imaging Procedure Code Value Sets

- Laterality (left or right) is a unique issue in coding medical procedures.
  - Laterality can either be pre- or post-coordinated with the procedure code.
  - Pre-coordinating the laterality (when needed) is integrated with the procedure. It results in the need for more codes to be defined.
  - In post-coordinated coding schemes, procedure code remain independent of laterality (single concept), But with a post-coordinated coding system, adding a modifier is required to remove the laterality ambiguity. Thus, fewer procedure concept code values would need to be defined along with a modifier that shall be transported and stored with the procedure code.
  - RadLex Playbook uses all pre-coordinated codes. We suggest the use of RadLex (or LOINC that now includes RadLex).
  - SNOMED CT prefers post-coordinated codes, but also supports the use of pre-coordinated codes.
- Recommendation is to use a pre-coordinated procedure code value set, which is the most widely used world-wide.
- Laterality is important for a level 2 selection (on the procedure display name) made visually by a user on the list of imaging reports and imaging studies returned from a level 1 query.
- So, based on our recommendation to use a pre-coordinated procedure code value set, the use of procedure display name is adequate for managing laterality for both the imaging report and the imaging study manifest.

Recommendations on Non-imaging specific Metadata (Level 1) used for imaging

IHE has published a whitepaper regarding "Metadata for exchange medical documents and images".

In Appendix B, multiple metadata items have been identified for which a typical role is assigned in term of level 1 query key:

XDS METADATA ATTRIBUTE	METADATA ATTRIBUTE DEFINITION	Recommendations
METADATA USE FOR BROAD SEARCHES		
classCode	The code specifying the particular kind of document. Shall have a single value. Coded with a coarse level of granularity. No specialty embedded.	**IMAGES, REPORTS** from value set: https://wiki.ihe.net/index.php/XDS_classCode_Metadata_Coding_System
practiceSettingCode	The code specifying the clinical specialty where the act that resulted in the document was performed (e.g., Intensive care, Laboratory, Radiology). Coarse level of granularity. Single value.	**Covers:** radiology, cardiology, endoscopy, surgery, emergency, etc (SNOMED-CT)
eventCodeList	This list of codes represents the main clinical "key words" for queries specific to certain document content (e.g. test panel code for laboratory results).The value chosen shall not conflict with the values selected in the classCode, practiceSettingCode or typeCode, as such a conflict would create an ambiguous situation.	**Covers:** Modality, Anatomic Region, Imaging Procedure (see specific slides from this recommendation)
METADATA USE FOR TARGETED SEARCHES		
healthcareFacilityTypeCode	This code represents the type of organization where the clinical encounter during which the documented act occurred. The value chosen in the value set needs to avoid conflict with the value used in the typeCode, as such a conflict would create an ambiguous situation. Has a single value.	**Country specific** (e.g. general hopsital, regional hospital, specialty hospital, clinic, imaging center, etc.)
Reference ID List	Accession number, Study Inst. UID, Order Placer Number	**Covers:** Modality, Anatomic Region, Imaging Procedure (see specific slides from this recommendation)
Date and Time	See Slide 16	

Recommendation on Non-imaging specific Metadata (Level 2) used for imaging

Level 2 Metadata attributes are returned by the response to the level 1 query. Those level 2 metadata are used to make a selection to either retrieve (1) the report content, or (2), retrieve the image series or entire exam after additional information may be added by the imaging study manifest. Metadata items in term of level 2 query keys:

XDS METADATA ATTRIBUTE	METADATA ATTRIBUTE DEFINITION	Recommendations
METADATA USE FOR FILTERING QUERY RESPONSES BEFORE RETRIEVING		
classCode	**IMAGES, REPORTS**	See Level 1 query metadata attribute
practiceSettingCode	**radiology, cardiology, endoscopy, surgery, emergency, etc (SNOMED-CT)**	See Level 1 query metadata attribute
eventCodeList	**Modalities** (Study Level), **Anatomic Regions, Imaging Procedure** (DisplayName)	See Level 1 query metadata attribute
healthcareFacilityTypeCode	**Country specific** (e.g. general hopsital, regional hospital, specialty hospital, clinic, imaging center, etc.)	See Level 1 query metadata attribute
Reference ID	**Accession number, Study Inst. UID, Order Placer**	See Level 1 query metadata attribute
typeCode	The code specifying the precise kind of document (e.g., Pulmonary History and Physical, Discharge Summary, Ultrasound Report). Shall have a single value.	**Country Specific:** The code specifying the precise type of document from the user perspective (e.g. LOINC code).
author	Represents the humans and/or machines that authored the document and contains the following sub-attributes: **authorInstitution, authorRole, authorSpeciality**	**AuthorSpecialty** Consistent with practiceSettingCode, but more precise (subspecialty)
ADDITIONNAL INORMATION (From Imaging Manifest) FOR RETRIEVING IMAGES		
Study Description	Textual description	Obtained by opening the Imaging Study Manifest (For a more complete list, see companion MCWG Recommendation)
List of Series	One or more series	
- Modality for each series	Series Modality	
- Number of images	Counted from the number of images instances	
- Series Description	Textual description	

Recommendation on Non-image specific Metadata for imaging - Date and Time

1. **Managing date and time for level 1 query filtering for imaging.** The use of Date and Time for query (level 1) is not an imaging specific need. Both MHD (FHIR) and XDS offer the ability to set a date and time range within which to filter on "service date and time" metadata.

2. **Managing Time Zone (UTC) in imaging info sharing.**
   a) Images, when accessed by WADO-RS, are sent with date and time attributes in the source local time zone. The DICOM UTC Offset attribute is rarely populated by Modality and PACS.
   b) Rather than adding the UTC Offset attribute in each one of the retrieved image, it is preferred to require that such a UTC Offset be present in the Imaging Manifest (DICOM KOS). This way, the UTC Offset from the KOS provides the consumer of images, the information to either adjust to local time or add this UTC Offset in the images when imported (while coercion of other attributes has to happen).

Example of metadata for an imaging study and associated imaging report

Consider a CT HEAD performed by radiology resulting in a DICOM imaging study and an imaging report.

- **When the imaging manifest is registered, the imaging manifest metadata would be:**

Document Class	➔ **classCode = IMAGES**
(Study) Modality	➔ **eventCode = 'CT, Computed Tomography, DCM'**
Anatomical Region	➔ **eventCode = '774007, Head and neck, SCT''**
Imaging Procedure	➔ **eventCode = '123245', Head and neck Scan, SCT''**
Document Type	➔ **typeCode = 'CTHDC'**
Specialty	➔ **practiceSettingCode = '123…., radiology, SCT'**
Study Instance UID	➔ **referencedId = 'studyInstanceUID=1.2.45.678…'**
Accession Number	➔ **referencedId = 'accessionNumber=^123^^1.2.4…'**
Order Placer Number	➔ **referencedId = 'orderPlacerNumber=^567^^1.2.5…'**

- **When the imaging report is registered, its metadata* would be:**

Document Class	➔ **classCode = REPORTS**
(Study) Modality	➔ **eventCode = 'CT, Computed Tomography, DCM'**
Anatomical Region	➔ **eventCode = '774007, Head and neck, SCT'**
Imaging Procedure	➔ **eventCode = '123245', Head and neck Scan, SCT''**
Document Type	➔ **typeCode = '4261000179100, Computed tomography imaging report, SCT'**
Specialty	➔ **practiceSettingCode = '123…., radiology, SCT'**
Study Instance UID	➔ **referencedId = 'studyInstanceUID=1.2.45.678…'**
Accession Number	➔ **referencedId = 'accessionNumber=^123^^1.2.4…'**
Order Placer Number	➔ **referencedId = 'orderPlacerNumber=^567^^1.2.5…'**

Note: eventCode for imaging reports and imaging manifests use the eventCode specification per IHE XDS-I

Metadata for identifying health professionals

1. Two types of health professionals are involved in the production of an imaging document

a) Result author (interpreter)
   a) The result author is the health professional who produces the report.
   b) The result author may change during the lifecycle of a given study, for instance when a preliminary report from a radiology resident is approved by a supervising radiologist.
   c) It is always present in the report metadata.

b) Referring or requesting professional (requestor)
   a) Is the creator of the clinical request (placer order).
   b) Receives the report(s) and imaging study(ies) resulting from the clinical request fulfillment to that order.

2. Recommendation

a) The health professional who produces the results should be stored as XDS AuthorPerson.
   a) Includes last/first name, license or professional reference # and the identity of the organization which issues the reference #.

b) The license or professional # of the health professional who requested the order should be stored as a reference ID. From this stems the following requirements
   a) The consumer may issue a query with his license or professional # as an additional reference ID in order to obtain reports and imaging studies that relate to the requesting professional.
   b) The XDS registry actor should support the **Reference ID Option** in order to allow for a reference Id to be used as query argument.

Recommendation on Non-imaging specific Metadata for practiceSettingCode

PracticeSettingCode metadata draws from a high-level list of Specialties (without details on the subspecialties) to enable filtering in association with classCode metadata (e.g., report + cardiology, summary + acute care). Every document shall be assigned one practiceSettingCode.

The value set list is kept at a coarse level (without drilling into close to 2000 sub-specialties recorded by SNOMED), as the intended use is to perform document query filtering at a high level. This ensures a simpler and more robust process for the document source to assign values without risks of misclassification.

The proposed Value Set is defined by combining two partial trees of SNOMED concepts in a flat value set:

1. **SNOMED Medical Specialties (without lower levels concepts)**
2. **SNOMED Clinical Specialties (without lower-level concepts) and without:**
   - Medical Specialties and sub-tree (already included in Medical Specialties)
   - Clinical Oncology concept (already included in Medical Specialties).
   - Obstetrics Oncology concept (already included in Medical Specialties).

IHE-MCWG-Practi
e Setting Value Se

The value set provided in the attached spreadsheet is for illustration (88 values). It is derived from the present version of SNOMED-CT and the extraction rule is the recommendation. This value set has been originally specified by IHE PCC IG DAF National-Extension, section B.1.3.

The Practice Setting Code is a coarse grain indication of the healthcare specialty that created a shared document. A finer grain author specialty is part of the author metadata structure (See previous slide). **A small subset is used or imaging information sharing** (radiological specialties, cardiological specialties, surgical specialties, etc), .

Imaging reports header metadata and publication trigger policy

- **MCWG Recommendations on Standards and Profile Positioning enables the use of:**
  - **FHIR Documents or CDA documents for unstructured imaging reports with a header plus a PDF body**
  - **FHIR Documents for structured imaging reports with a header* plus a structured body**

- **A choice among two different imaging manifest publishing policies is recommended:**

  Why ? Imaging Manifests creation requires data from PACS/VNA and from RIS to ensure its metadata consistency with imaging report. The report header is the simple integration platform independent of specific RIS/PACS integration. Thus, Manifest publication trigger is dependent on the Report publication as a trigger (workflow and data consistency).

Case A: Validated Imaging Report used as trigger to publish the imaging manifest. The structured header (CDA or FHIR) of the imaging report shall convey key attributes (also used for imaging report metadata):

- *National Patient ID, Local Patient ID*
- *Modality (Study Level), Anatomical Region*
- *Imaging Procedure Code*
- *Legal Author*
- *Study Instance UID, Accession Number, Order Placer Number*

This Imaging Report Header is used as input:

- to the creation of the Imaging Study Manifest content
- to the creation o the Imaging Study Manifest metadata
- Ensures consistency between the Imaging Report Metadata and the Imaging Study Manifest Metadata

Case B: Imaging Manifest published before the Imaging Report is validated and published. The structured header (CDA or FHIR) of the imaging report shall convey key attributes (also used for imaging report metadata)::

- *See metadata list in Case A*

The imaging manifest metadata must be:

- created with incomplete metadata information, if the PACS does not hold complete information about the associated clinical order(s) and imaging procedure(s).
- Updated later, when the imaging report is validated or published. Its header information should be used to update the imaging manifest metadata and content (see case A).

Note: The trigger event for the manifest publication in Case B is workflow specific and is left to a local implementation decision.

Addressing Imaging Studies from Encounter-Based Imaging Workflows

- *What is Encounter-Based Imaging Workflows (EBIW): It* creates imaging studies that do not result from an ordering/scheduling process:
  - Radiology is typically order based, but Point of Care Ultrasound, Endoscopy or Surgery are often not order-based.
  - In such cases, the requestor and interpreter are typically the same person
  - They group their imaging data by referencing encounter information, such as admission/visit event to link together encounter documentation of various types
- *How does the EBIW workflow works*: Its orchestration follows the use case of a non-ordered exam:
  - Initiated by the encounter manager, that generates an encounter-based number used by the acquisition modality (accession number). Images are stored as such by PACS/VNA and the EMR is notified.
  - Without a "placer order number" (EBIW: Fields OBR-2 Placer Order Number and OBR-3 Filler Order Number will typically be empty in the case of encounter-based imaging since that is usually unordered).
- *Metadata in support of EBIW type workflow.* It is designed as follows:
  - In the case of lightweight modalities (e.g. endoscopy using appointment data, wound care, POCUS), an Encounter Manager system drives the metadata (Accession Number, Study Instance UID, Visit workflow).
  - In the case of logistically complex imaging workflows (e.g. cardiac imaging, ophthalmic imaging, etc.), using a RIS (departmental order filler) drives the metadata (Accession Number, Study Instance UID, Visit workflow).
  - The trigger event for the manifest publication is workflow specific and is left to a local implementation decision
- ***The metadata in support of the national sharing of imaging studies and reports resulting from an EBIW type workflow is "missing" the Order Placer Number*** (as there is no associated order).

Open Issues (Dec 4th, 2023)

1. **No Open issues, at the time of publication.**
2. **There are companion recommendations, to the present recommendation, the reader is encouraged to consider:**
   a) **Recommendations on Standards Positioning for sharing imaging information at the national/regional level completed in November 2023.**
   b) **Recommendations on the Imaging Study Manifest, planned for December 2023.**
   c) **Additional Recommendations are considered on Product alignment for deployment.**
3. **IHE-Europe and IHE Catalyst welcome the participation of additional countries.**

Questions, Comments and Suggestions are welcome and should be sent to the IHE-Europe Secretariat:
secretariat@ihe-Europe.net