Digital Imaging and Communications in Medicine (DICOM)

Supplement 122: Specimen Module and Revised Pathology SOP Classes

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Table of Contents

Table of Contents 2
Scope and Field of Application 5
New Specimen Module at the level of the Image 5
Accession number 5
Model 5
Existing IODs 5
Modality Worklist 6
Modality Performed Procedure Step 6
Image Query 6
Changes to NEMA Standards Publication PS 3.17-2008 7
Annex SS – Specimen Identification and Management 8
SS.1 PATHOLOGY WORKFLOW 8
SS.2 BASIC CONCEPTS AND DEFINITIONS 8
SS.2.1 Specimen 8
SS.2.2 Container 9
SS.3 SPECIMEN MODULE 9
SS.3.1 Scope 9
SS.3.2 Relationship with the Laboratory Information System 10
SS.3.3 Case Level Information and the Accession Number 10
SS.3.4 Laboratory Workflows and Specimen Types 10
SS.3.5 Relationship Between Specimens and Containers 11
SS.3.6 Relationship Between Specimens and Images 12
SS.4 SPECIMEN IDENTIFICATION EXAMPLES 13
SS.4.1 One Specimen Per Container 13
SS.4.2 Multiple Items From Same Block 13
SS.4.3 Items From Different Parts in the Same Block 14
SS.4.4 Items From Different Parts on the Same Slide 15
SS.4.5 Tissue Micro Array 16
SS.5 STRUCTURE OF THE SPECIMEN MODULE 17
SS.6 EXAMPLES OF SPECIMEN MODULE USE 17
SS.6.1 Gross Specimen 17
SS.6.2 Slide 20
Changes to NEMA Standards Publication PS 3.3-2008 24
7.X EXTENSION OF THE DICOM MODEL OF THE REAL WORLD FOR SPECIMENS 25
7.X.1 Specimen 25
7.X.2 Container 25
7.X.3 Container Component 25
7.X.4 Preparation Step 26
10.X HL7V2 HIERARCHIC DESIGNATOR MACRO 26
A.2.3 CR Image IOD Module Table 27
A.3.3 CT Image IOD Module Table 27
A.4.3 MR Image IOD Module Table 28
A.5.4 NM Image IOD Module Table 28
A.6.4 US Image IOD Module Table 28
A.7.4 US Multi-Frame Image IOD Module Table 28
A.8.1.3 SC Image IOD Module Table 29
A.8.2.3 Multi-frame Single Bit SC Image IOD Module Table 29
A.8.3.3 Multi-frame Grayscale Byte SC Image IOD Module Table 29
A.8.4.3 Multi-frame Grayscale Word SC Image IOD Module Table 29
A.8.5.3 Multi-frame True Color SC Image IOD Module Table 30
A.14.3 XA Image IOD Module Table 30
A.16.3 XRF Image IOD Module Table 30
A.21.3 PET Image IOD Module Table 30
A.26.3 DX Image IOD Module Table 31

A.27.2 Digital Mammography X-Ray Image IOD Module Table 31
A.28.2 Digital Intra-oral X-Ray Image IOD Module Table 32
A.32.1.2 VL Endoscopic Image IOD Entity-Relationship Model 32
A.32.2.1 VL Microscopic Image IOD Description 32
A.32.2.2 VL Microscopic Image IOD Entity-Relationship Model 32
A.32.3.2 VL Slide-Coordinates Microscopic Image IOD Entity-Relationship Model 33
A.32.4.2 VL Photographic Image IOD Entity-Relationship Model 34
A.32.5.2 Video Endoscopic Image IOD Entity-Relationship Model 35
A.32.6.1 Video Microscopic Image IOD Description 35
A.32.6.2 Video Microscopic Image IOD Entity-Relationship Model 35
A.32.7.2 Video Photographic Image IOD Entity-Relationship Model 36
A.35.1.3 Basic Text SR IOD Module Table 37
A.35.2.3 Enhanced SR IOD Module Table 37
A.35.3.3 Comprehensive SR IOD Module Table 38
A.35.4.3 Key Object Selection Document IOD Module Table 38
A.35.5.3 Mammography CAD SR IOD Module Table 38
A.35.6.3 Chest CAD SR IOD Module Table 39
A.36.2.3 Enhanced MR Image IOD Module Table 39
A.36.2.3.1 Enhanced MR Image IOD Content Constraints 39
A.36.3.3 MR Spectroscopy IOD Module Table 39
A.37.3 Raw Data IOD Module Table 40
A.38.1.3 Enhanced CT Image IOD Module Table 40
A.38.1.3.1 Enhanced CT Image IOD Content Constraints 40
A.39.1.3 Spatial Registration IOD Module Table 41
A.39.2.1.2 Deformable Spatial Registration IOD Module Table 41
A.40.3 Spatial Fiducials IOD Module Table 41
A.41.2 Ophthalmic Photography 8 Bit Image IOD Entity-Relationship Model 42
A.41.3 Ophthalmic Photography 8 Bit Image IOD Modules 42
A.42.2 Ophthalmic Photography 16 Bit Image IOD Entity-Relationship Model 42
A.42.3 Ophthalmic Photography 16 Bit Image IOD Modules 42
A.43.2 Stereometric Relationship IOD Modules 43
A.45.1.3 Encapsulated PDF IOD Module Table 43
A.46.2 Real World Value Mapping IOD Module Table 43
A.47.3 Enhanced XA Image IOD Module Table 44
A.47.3.1.2 Overlay Plane ~~Module~~, Curve ~~Module and VOI~~, LUT and Specimen Identification Modules 44
A.48.3 Enhanced XRF Image IOD Module Table 44
A.48.3.1.2 Overlay Plane ~~Module~~, Curve ~~Module and VOI~~, LUT and Specimen Identification Modules 44
A.51.3 Segmentation IOD Module Table 45
C.4.10 Scheduled Procedure Step Module 46
C.4.15 Image Acquisition Results 46
C.7.1.2 Specimen Identification Module 47
~~C.7.1.2.1~~ ~~Specimen Module Attributes~~ 47
~~C.7.1.2.1.1~~ ~~Specimen Accession Number~~ 47
~~C.7.1.2.1.2~~ ~~Specimen Identifier~~ 47
C.7.2.1.1 General Study Attribute Descriptions 48
C.7.2.1.1.2 Accession Number 48
C.7.6.2x Specimen Module 49
C.7.6.2x.1 Specimen Module Attributes 51
C.7.6.2x.1.1 Container Identifier and Specimen Identifier 51
C.7.6.2x.1.2 Specimen Identifier and Specimen UID 52
C.7.6.2x.1.3 Specimen Preparation Sequence and Specimen Preparation Step Content Item Sequence 52
C.7.6.2x.1.4 Specimen Localization Content Item Sequence 52
C.8.12.1 VL Image Module 53
Changes to NEMA Standards Publication PS 3.4-2008 54
C.6.1.1.5 Composite Object Instance Level 55
F.7.2.1.1 Modality Performed Procedure Step Subset Specification 56

K.6.1.2.2 Modality Worklist Attributes 57
Changes to NEMA Standards Publication PS 3.6-2008 58
Changes to NEMA Standards Publication PS 3.16-2008 60
2 Normative references 61
TID 1009 Subject Context, Specimen 61
Content Item Descriptions 61
TID 3112 Specimen Obtained 62
TID 3516 Blood Lab Measurements 62
CID 8101 Container Types 63
CID 8102 Container Component Types 63
CID 8103 Anatomic Pathology Specimen Types 63
CID 8104 Breast Tissue Specimen Types 64
CID 8109 Specimen Collection Procedure 64
CID 8110 Specimen Sampling Procedure 65
CID 8111 Specimen Preparation Procedure 65
CID 8112 Specimen Stains 66
CID 8113 Specimen Preparation Steps 71
CID 8114 Specimen Fixatives 71
CID 8115 Specimen Embedding Media 72
CID 4014 View for Mammography 72
TID 8001 Specimen Preparation 73
Content Item Descriptions 73
TID 8002 Specimen Sampling 74
Content Item Descriptions 74
TID 8003 Specimen Staining 75
TID 8004 Specimen Localization 75
Content Item Descriptions 75

Scope and Field of Application

This supplement to the DICOM standard introduces a new mechanism of pathology specimen identification, and revisions to composite Information Object Definitions to use that mechanism. It specifies the use of specimen identification attributes in the Modality Worklist and Modality Performed Procedure Step SOP Classes to support the imaging workflow in the pathology department.

Please see the informative appendix to PS3.17 for a discussion of the concepts and encoding of specimen identification and description. That appendix immediately follows this introduction. This introduction describes the changes to the data structures defined in the DICOM Standard.

While DICOM Supplement 15 added the concept of specimens, the location of specimens in the DICOM information model has not been explicitly stated in either the real-world model in PS3.3 Section 7, or in the composite E-R model in PS3.3 Section A.1.2. However, various IODs include the Specimen Identification Module in the Patient Information Entity, and that Module is defined in Section C.7.1 Common Patient IE Modules; by implication, current specimen identification is at the Patient level.

New Specimen Module at the level of the Image

This Supplement introduces a new Specimen Module to the Image IE, which formally defines specimen attributes at the image level. The old Specimen Identification Module is retired.

This is based on the concept that the appropriate level in the information model to specify a specimen that is the subject of a DICOM image is the Image Level. In the Supplement, the specimen that forms the immediate subject of the image is identified, together with critical specimen information, such as description, specimen ancestry and processing, necessary to interpret the image

The specimen attributes do not require that the full history of specimen processing be included in every SOP Instance, but they do allow that processing history to be encoded. However, a unique specimen identifier should be useful to link a subject specimen to its processing history as managed by a Laboratory Information System.

The Specimen Module has been harmonized with the HL7 v2 SPM segment and the HL7 v3 draft Specimen Domain Information Model. The intent for the DICOM Specimen Module is not to duplicate all the features of the HL7 information constructs, but rather to provide sufficient linkages so that the DICOM SOP Instances can fit into an overall pathology laboratory environment that may use HL7 v2 or v3 messages for workflow management (orders and observations).

Accession number

The concept of an “accession” in pathology has been determined to be sufficiently equivalent to an “accession” in radiology that the existing Accession Number at the study level may be reused for the same purpose and with essentially the existing definition.

In pathology the Accession number corresponding to the Study is defined at the level of the Requested Procedure. A Requested Procedure is a unit of work resulting in one report with associated codified, billable acts.

Model

No changes to the information or real world models in DICOM are required since the Specimen was never actually defined as an entity in the model (though it should have been). An extension of the DICOM information model for specimen-related information is provided in the addition to Part 3.

Existing IODs

As noted above, the old Specimen Identification Module is retired from all IODs in which it occurred. The identification of the specimen using the new Specimen Module has been added to all Image IODs with usage Mandatory, Conditional, or User Optional as appropriate.

Retirement of the old Specimen Identification Module theoretically may affect existing implementations that, based on previous editions of the DICOM Standard, model and store specimen information derived from composite objects at the patient level. DICOM WG6 has not been able to identify any such implementations.

This proposal does not address extending the Visible Light (VL) Microscopic IODs to include multi-frame images (other than the existing Video Microscopic IOD), such as might be used for encoding multiple depths in a confocal image. It is expected that this capability will be addressed in the context of new IODs being developed for whole slide imaging.

Modality Worklist

To support the imaging workflow in the pathology department, it is necessary to have a mechanism by which the modalities can obtain the specimen identification, and include it in the acquired images. This mechanism is Modality Worklist, through which a departmental information system provides the attributes of the imaging subject to modalities. In radiology, the imaging subject is the patient; in pathology, the imaging subject is the specimen derived from the patient. The Laboratory Information System needs to provide the attributes of the Specimen Module for each specimen being imaged.

Simply adding the Specimen Module to the Modality Worklist definition raises some DICOM specification issues. Therefore, the attributes of the Specimen Module have been defined in a 'Macro' construct, and added to the Scheduled Procedure Step Module of Modality Worklist. Conceptually, then, the Procedure Step is scheduled for the imaging of one or more specimen containers.

While the use of the specimen attributes is optional according to the Standard for any Modality Worklist implementation, an implementation guide for a particular context, such as an IHE Profile, may require their use for effective interoperability.

Modality Performed Procedure Step

To support the review workflow in the pathology department, it is necessary to have a mechanism by which the Laboratory Information System can obtain the list of images created for each specimen. This mechanism is Modality Performed Procedure Step, through which a modality provides the attributes of the imaging acquisition results to the departmental information system. The MPPS IOD has been modified such that the modality can provide the identity of each specimen seen in each image object. Again, use of this capability is optional, but it may be required in an implementation guide such as an IHE Profile.

Image Query

The standard Query service provides a mechanism by which an image display station can obtain the list of images created for an identified patient, accession, and/or study. But to support the review workflow, it is necessary to also have a mechanism by which a display station can obtain the list of images created for each specimen. The container and specimen identifiers are therefore added as optional keys to the Image Level Query. While the classic implementation would be for the image storage system (PACS) to implement these keys, it is also possible for a Laboratory Information System to implement the Query service if it manages a database linking the patient, accession, study, specimen, and image identifiers, and simply pointing to the PACS for image retrieval.

260

Changes to NEMA Standards Publication PS 3.17-2008

Digital Imaging and Communications in Medicine (DICOM)

Part 17: Explanatory Information

Annex SS – Specimen Identification and Management

This annex explains the use of the **Specimen Module** for pathology or laboratory specimen imaging.

SS.1 PATHOLOGY WORKFLOW

The concept of a specimen is deeply connected to analysis (lab) workflow, the decisions made during analysis, and the "containers" used within the workflow.

Typical anatomic pathology cases represent the analysis of (all) tissue and/or non-biologic material (e.g., orthopedic hardware) removed in a single collection procedure (e.g., surgical operation/event, biopsy, scrape, aspiration etc.). A case is usually called an "Accession" and is given a single accession number in the Laboratory Information System.

During an operation, the surgeon may label and send one or more discrete collections of material (specimens) to pathology for analysis. By sending discrete, labeled collections of tissue in separate containers, the surgeon is requesting that each discrete labeled collection (specimen) be analyzed and reported independently – as a separate "Part" of the overall case. Therefore, each Part is an important, logical component of the laboratory workflow. Within each Accession, each Part is managed separately from the others and is identified uniquely in the workflow and in the Laboratory Information System.

During the initial gross (or "eyeball") examination of a Part, the pathologist may determine that some or all of the tissue in a Part should be analyzed further (usually through histology). The pathologist will place all or selected sub-samples of the material that makes up the Part into labeled containers (cassettes). After some processing, all the tissue in each cassette is embedded in a paraffin block (or epoxy resin for electron microscopy); at the end of the process, the block is physically attached to the cassette and has the same label. Therefore, each "Block" is an important, logical component of the laboratory workflow, which corresponds to physical material in a container for handling, separating and identifying material managed in the workflow. Within the workflow and Laboratory Information System, each Block is identified uniquely and managed separately from all others.

From a Block, technicians can slice very thin sections. One or more of these sections is placed on one or more slides. (Note, material from a Part can also be placed directly on a slide bypassing the block). A slide can be stained and then examined by the pathologists. Each "Slide", therefore, is an important, logical component of the laboratory workflow, which corresponds to physical material in a container for handling, separating and identifying material managed in the workflow. Within the workflow and within the Laboratory Information Systems, each Slide is identified uniquely and managed separately from all others.

While "Parts" to "Blocks" to "Slides" is by far the most common workflow in pathology, it is important to note that there can be numerous variations on this basic theme. In particular, laser capture microdissection and other slide sampling approaches for molecular pathology are in increasing use. Such new workflows require a generic approach in the Standard to identifying and managing specimen identification and processing, not one limited only to "Parts", "Blocks", and "Slides". Therefore, the Standard adopts a generic approach of describing uniquely identified Specimens in Containers.

SS.2 BASIC CONCEPTS AND DEFINITIONS

SS.2.1 Specimen

A physical object (or a collection of objects) is a specimen when the laboratory considers it a single discrete, uniquely identified unit that is the subject of one or more steps in the laboratory (diagnostic) workflow.

To say the same thing in a slightly different way: "Specimen" is defined as a role played by a physical entity (one or more physical objects considered as single unit) when the entity is identified uniquely by the laboratory and is the direct subject of more steps in a laboratory (diagnostic) workflow.

It is worthwhile to expand on this very basic, high level definition because it contains implications that are important to the development and implementation of the DICOM Specimen Module. In particular:

1. A single discrete physical object or a collection of several physical objects can act as a single specimen as long as the collection is ***considered a unit*** during the laboratory (diagnostic) process step involved. In other words, a specimen may include multiple physical pieces, as long as they are considered a single unit in the workflow. For example, when multiple fragments of tissue are placed in a cassette, most laboratories would consider that collection of fragments as one specimen (one "block").

2. A specimen must be ***identified***. It must have an ID that identifies it as a unique subject in the laboratory workflow. An entity that does not have an identifier is not a specimen.

3. Specimens are ***sampled and processed*** during a laboratory's (diagnostic) workflow. Sampling can create new (child) specimens. These child specimens are full specimens in their own right (they have unique identifiers and are direct subjects in one or more steps in the laboratory's (diagnostic) workflow. This property of specimens (that can be created from existing specimens by sampling) extends a common defintion of specimen which limits the word to the original object received for examination (e.g., from surgery).

4. However, child specimens can and do carry some attributes from ***ancestors***. For example, a tissue section cut from a formalin fixed block remains formalin fixed, and a tissue section cut from a block dissected from the proximal margin of a colon resection is still made up of tissue from the proximal margin. A description of a specimen therefore, may require descripton of its parent specimens.

5. A specimen is defined by decisions in the laboratory workflow. For example, in a typical laboratory, multiple tissue sections cut from a single block and placed on the same slide are considered a single specimen (as single unit identified by the slide number). However, if the histotechs had placed each tissue section on its own slide (and given each slide a unique number), each tissue section would be a specimen in its own right**.**

SS.2.2 Container

Specimen containers (or just "containers") play an important role in laboratory (diagnostic) processes. In most, but not all, process steps, specimens are held in containers, and a container often carries its specimen's ID. Sometimes the container becomes intimately involved with the specimen (e.g., a paraffin block), and in some situations (such as examining tissue under the microscope) the container (the slide and coverslip) become part of the optical path.

Containers have identifiers that are important in laboratory operations and in some imaging processes (such as whole slide imaging). The DICOM Specimen Module distinguishes the Container ID and the Specimen ID, making them different data elements. In many laboratories where there is one specimen per container, the value of the specimen ID and container ID will be same. However, there are use cases in which there are more than one specimen in a container. In those situations, the value of the container ID and the specimen IDs will be different (see Section SS.3.5).

Containers are often made up of components. For example, a "slide" is container that is made up of the glass slide, the cover slip and the "glue" the binds them together. The Module allows each component to be described in detail.

SS.3 SPECIMEN MODULE

SS.3.1 Scope

The Specimen Module (see PS3.3) defines formal DICOM attributes for the identification and description of laboratory specimens when said specimens are the subject of a DICOM image. The Module is focused on the specimen and laboratory attributes necessary to ***understand and interpret*** the image. These include:

1. Attributes that identify (specify) the specimen (within a given institution and across institutions).

2. Attributes that identify and describe the container in which the specimen resides. Containers are intimately associated with specimens in laboratory processes, often "carry" a specimen's identity, and sometimes are intimately part of the imaging process, as when a glass slide and cover slip are in the optical path in microscope imaging.

3. Attributes that describe specimen collection, sampling and processing. Knowing how a specimen was collected, sampled, processed and stained is vital in interpreting an image of a specimen. One can make a strong case that those laboratory steps are part of the imaging process.

4. Attributes that describe the specimen or its ancestors (see Section SS.2.1, above) when these descriptions help with the interpretation of the image.

Attributes that convey diagnostic opinions or interpretations are not within the scope of the Specimen Module. The DICOM Specimen Module does not seek to replace or mirror the pathologist's report.

SS.3.2 Relationship with the Laboratory Information System

The Laboratory Information System (LIS) is critical to management of workflow and processes in the pathology lab. It is ultimately the source of the identifiers applied to specimens and containers, and is responsible for recording the processes that were applied to specimens.

An important purpose of the Specimen Module is to store specimen information necessary to understand and interpret an image within the image information object, as images may be displayed in contexts where the Laboratory Information System is not available. Implementation of the Specimen Module therefore requires close, dynamic integration between the LIS and imaging systems in the laboratory workflow.

It is expected that the Laboratory Information Systems will participate in the population of the Specimen Module by passing the appropriate information to a DICOM compliant imaging system in the Modality Worklist, or by processing the image objects itself and populating the Specimen Module attributes.

The nature of the LIS processing for imaging in the workflow will vary by product implementation. For example, an image of a gross specimen may be taken before a gross description is transcribed. A LIS might provide short term storage for images and update the description attributes in the module after a particular event (such as sign out). The DICOM Standard is silent on such implementation issues, and only discusses the attributes defined for the information objects exchanged between systems.

SS.3.3 Case Level Information and the Accession Number

A pathology "case" is a unit of work resulting in a report with associated codified, billable acts. Case Level attributes are generally ***outside*** the scope of the Specimen Module. However, a case is equivalent to a DICOM Requested Procedure, for which attributes are specified in the DICOM Study level modules.

DICOM has existing methods to handle most "case level" issues, including accepting cases referred for other institutions, clinical history, status codes, etc. These methods are considered sufficient to support DICOM imaging in Pathology.

The concept of an "Accession Number" in Pathology has been determined to be sufficiently equivalent to an "Accession Number" in Radiology that the DICOM data element "Accession Number" at the Study level at the DICOM information model may be used for the Pathology Accession Number with essentially the existing definition.

It is understood that the value of the laboratory accession number is often incorporated as part of a Specimen ID. However, there is no presumption that this is always true, and the Specimen ID should not be parsed to determine an accession number. The accession number will always be sent in its own discrete attribute.

SS.3.4 Laboratory Workflows and Specimen Types

While created with anatomic pathology in mind, the DICOM Specimen Module is designed to support specimen identification, collection, sampling and processing attributes for a wide range of laboratory

workflows. The Module is designed in a general way so not to limit the nature, scope, scale or complexity of laboratory (diagnostic) workflow that may generate DICOM images.

To provide specificity on the general process, the Module provides extendable lists of Container Types, Container Component Types, Specimen Types, Specimen Collection Types, Specimen Process Types and Staining Types. It is expected that the value sets for these "types" can be specialized to describe a wide range of laboratory procedures.

In typical anatomic pathology practice, and in Laboratory Information Systems, there are conventionally three identified levels of specimen preparation – part, block, and slide. These terms are actually conflations of the concepts of specimen and container. Not all processing can be described by only these three levels.

A part is the uniquely identified tissue or material collected from the patient and delivered to the pathology department for examination. Examples of parts would include a lung resection, colon biopsy at 20 cm, colon biopsy at 30 cm, peripheral blood sample, cervical cells obtained via scraping or brush, etc. A part can be delivered in a wide range of containers, usually labeled with the patients name, medical record number, and a short description of the specimen such as "colon biopsy at 20 cm". At accession, the lab creates a part identifier and writes it on the container. The container therefore conveys the part's identifier in the lab.

A block is a uniquely identified container, typically a cassette, containing one or more pieces of tissue dissected from the part (tissue dice). The tissue pieces may be considered, by some laboratories, as separate specimens. However in most labs, all the tissue pieces in a block are considered a single specimen.

A slide is a uniquely identified container, typically a glass microscope slide, containing tissue or other material. Common slide preparations include:

- "Tissue sections" created from tissue embedded in blocks. (1 slide typically contains one or more tissue sections coming from one block)
- "Touch preps" prepared by placing a slide into contact with unprocessed tissue.
- "Liquid preparations" are a thin layer of cells created from a suspension.

SS.3.5 Relationship Between Specimens and Containers

Virtually all specimens in a clinical laboratory are associated with a container, and specimens and containers are both important in imaging (see "Definitions", above). In most clinical laboratory situations there is a one to one relationship between specimens and containers. In fact, pathologists and LIS systems routinely consider a specimen and its container as single entity; e.g. the slide (a container) and the tissue sections (the specimen) are considered a single unit.

However, there are legitimate use cases in which a laboratory may place two or more specimens in the same container (see Section SS.4 for examples). Therefore, the DICOM Specimen Module distinguishes between a Specimen ID and a Container ID. However, in situations where there is only one specimen per container, the value of the Specimen ID and Container ID may be the same (as assigned by the LIS).

Some Laboratory Information System may, in fact, not support multiple specimens in a container, i.e., they manage only a single identifier used for the combination of specimen and container. This is not contrary to the DICOM Standard; images produced under such a system will simply always assert that there is only one specimen in each container. However, a pathology image display application that shows images from a variety of sources must be able to distinguish between container and specimen IDs, and handle the 1:N relationship.

In allowing for one container to have multiple specimens, the Specimen Module asserts that it is the Container, not the Specimen, that is the unique target of the image. In other words, one Container ID is required in the Specimen Module, and multiple Specimen IDs are allowed in the Specimen Sequence. See Figure SS.3-1.

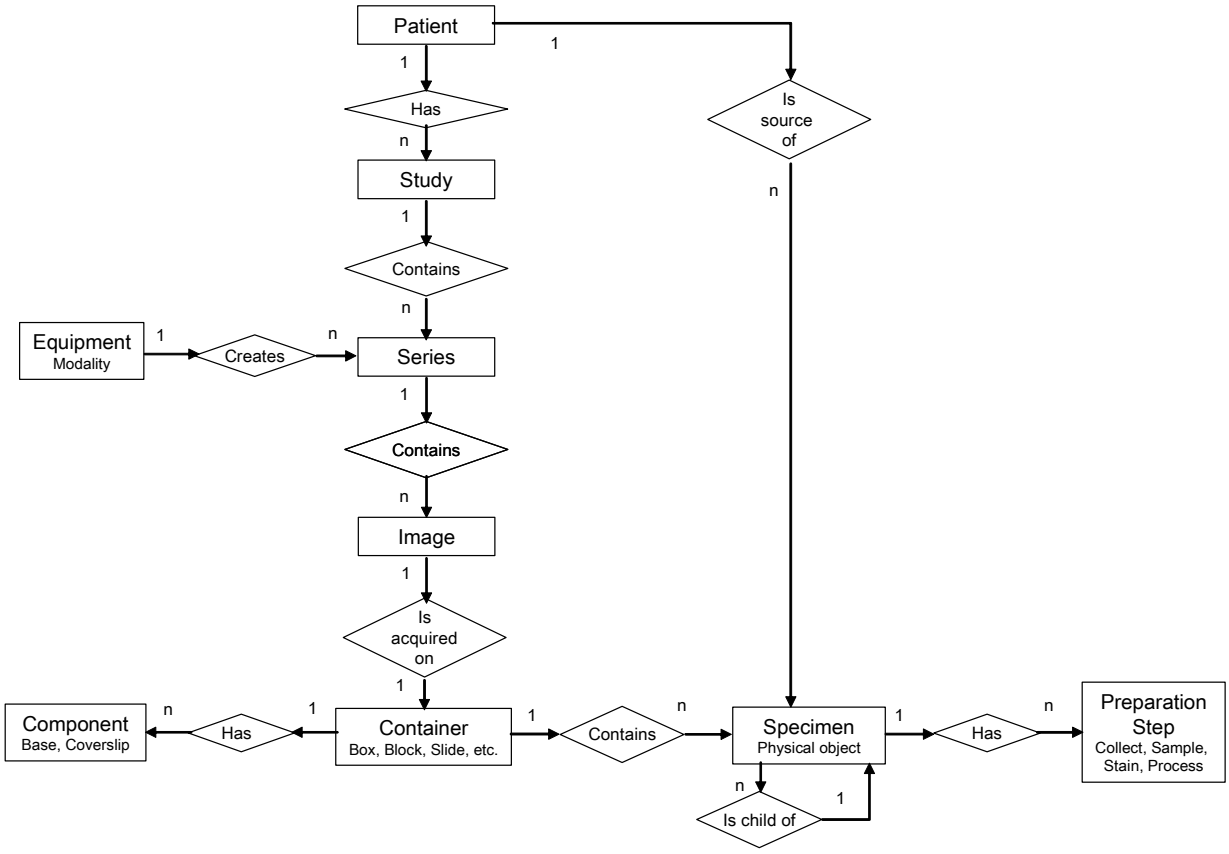

Figure SS.3-1 Extension of DICOM E-R Model for Specimens

If there is more than one specimen in a container, there must be a mechanism to identify and locate each specimen. When there is more than one specimen in a container, the Module allows various approaches to specify their locations. The Specimen Localization Content Item Sequence (0040,0620), through its associated Template 8004, allows the specimen to be localized by a distance in three dimensions from a reference point on the container, by a textual description of a location or physical attribute such as a colored ink, or by its location as shown in a referenced image of the container. The referenced image may use an overlay, burned-in annotation, or an associated Presentation State SOP Instance to specify the location of the specimen.

SS.3.6 Relationship Between Specimens and Images

Because the Module supports one container with multiple specimens, the Module can be used with an image of:

- A single specimen associated with a container
- One or more specimens out of several in the same container
- All specimens in the same container

However the Module is **not** designed for use with an image of:

- Multiple specimens that are not associated with the same container, e.g., two gross specimens (two Parts) on a photography table, each with a little plastic label with their specimen number.

- Multiple containers that hold specimens (e.g., eight cassettes containing breast tissue being x-rayed for calcium).

Such images may be included in the Study, but would not use the Specimen Module; they would, for instance, be general Visible Light Photographic images. Note, however, that the LIS might identify a "virtual container" that contains such multiple real containers, and manage that virtual container in the laboratory workflow.

SS.4 SPECIMEN IDENTIFICATION EXAMPLES

SS.4.1 One Specimen Per Container

In normal clinical practice, when there is one specimen per container, the value of the specimen identifier and the value of the container identifier will be the same. In Figure SS.4-1, each slide is prepared from a single tissue sample from a single block (cassette).

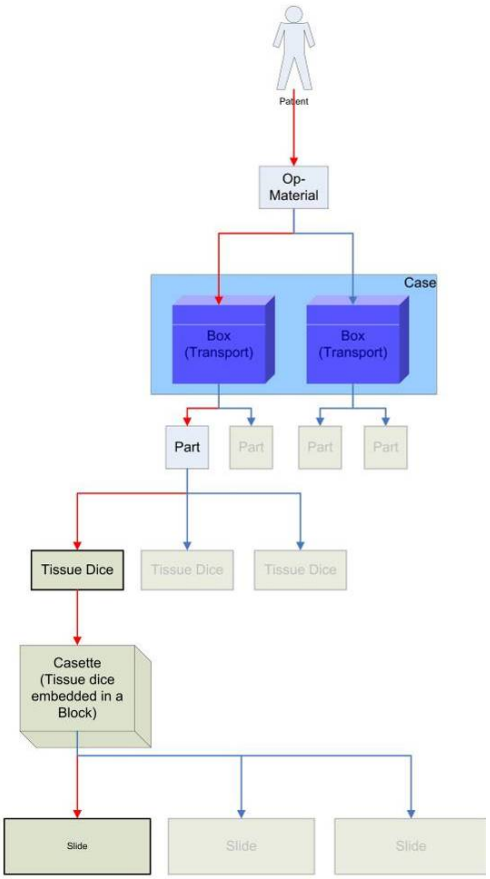

Figure SS.4-1 Sampling for one specimen per container

SS.4.2 Multiple Items From Same Block

Figure SS.4-2 shows more than one tissue item on the same slide coming from the same block (but cut from different levels). The laboratory information system considers two tissue sections (on the same slide) to be separate specimens.

Two Specimen IDs will be assigned, different from the Container (Slide) ID. The specimens may be localized, for example, by descriptive text "Left" and "Right".

If the slide is imaged, a single image with more than one specimen may be created. In this case, both specimens must be identified in the Specimen Sequence of the Specimen Module. If only one specimen is imaged, only its Specimen ID must be included in the Specimen Sequence; however, both IDs may be included (e.g., if the image acquisition system cannot determine which specimens in/on the container are in the field of view).

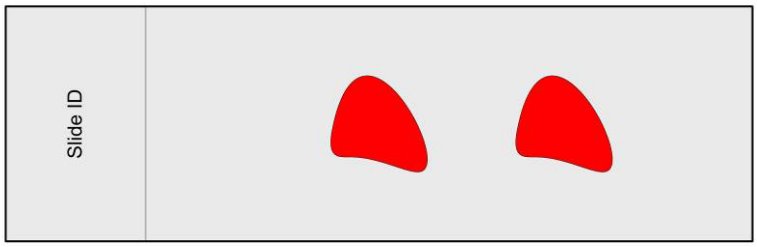

Figure SS.4-2 Container with two specimens from same parent

SS.4.3 Items From Different Parts in the Same Block

Figure SS.4-3 shows processing where more than one tissue item is embedded in the same block within the same Cassette, but coming from different clinical specimens (parts). This may represent different lymph nodes embedded into one cassette, or different tissue dice coming from different parts in a frozen section examination, or tissue from the proximal margin and from the distal margin, and both were placed in the same cassette. Because the laboratory wanted to maintain the sample as separate specimens (to maintain their identity), the LIS gave them different IDs and the tissue from Part A was inked blue and the tissue from Part B was inked red.

The specimen IDs must be different from each other and from the container (cassette) ID. The specimens may be localized, for example, by descriptive text “Red” and “Blue” for Visual Coding of Specimen.

If a section is made from the block, each tissue section will include fragments from two specimens (red and blue). The slide (container) ID will be different from the section id (which will be different form each other).

If the slide is imaged, a single image with more than one specimen may be created but the different specimens must be identified and unambiguously localized within the container.

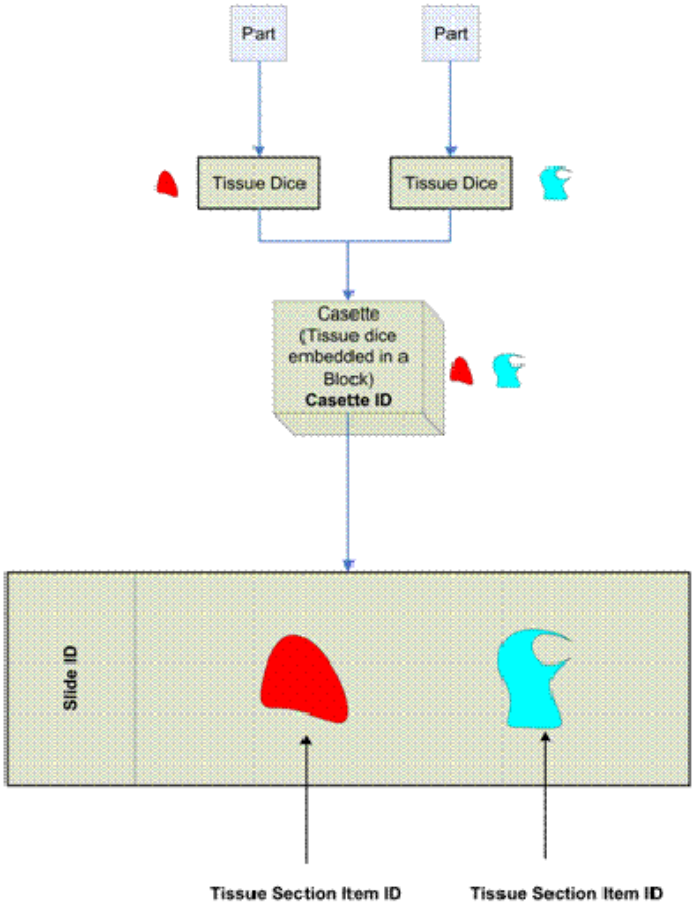

Figure SS.4-3 Sampling for two specimens from different ancestors

SS.4.4 Items From Different Parts on the Same Slide

Figure SS.4-4 shows the result of two tissue collections placed on the same slide by the surgeon. E.g., in gynecological smears the different directions of smears might represent different parts (portio, cervix).

The specimen IDs must be different from each other and from the container (slide) ID. The specimens may be localized, for example, by descriptive text “Short direction smear” and “Long direction smear”.

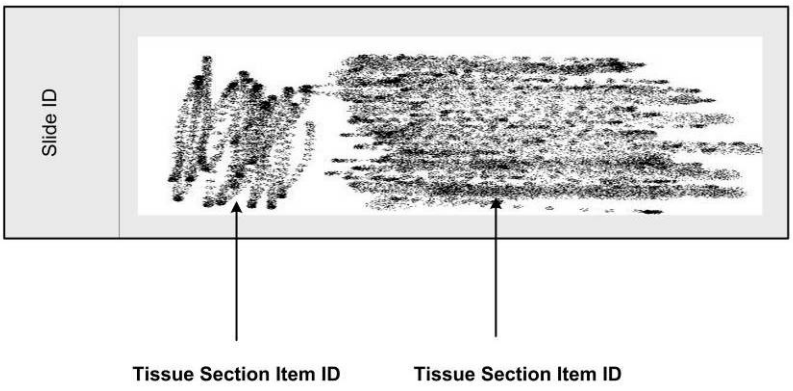

Figure SS.4-4 Two specimens smears on one slide

SS.4.5 Tissue Micro Array

Slides created from a TMA block have small fragments of many different tissues coming from different patients, all of which may be processed at the same time, under the same conditions by a desired technique. These are typically utilized in research. See Figure SS.4-5. Tissue items (spots) on the TMA slide come from different tissue items (cores) in TMA blocks (from different donor blocks, different parts and different patients).

Each Specimen (spot) must have its own ID. The specimens may be localized, for example, by X-Y coordinates, or by a textual column-row identifier for the spot (e.g., “E3” for fifth column, third row).

If the TMA slide is imaged as a whole, e.g., at low resolution as an index, it must be given a “pseudo-patient” identifier (since it does not relate to a single patient). Images created for each spot should be assigned to the real patients.

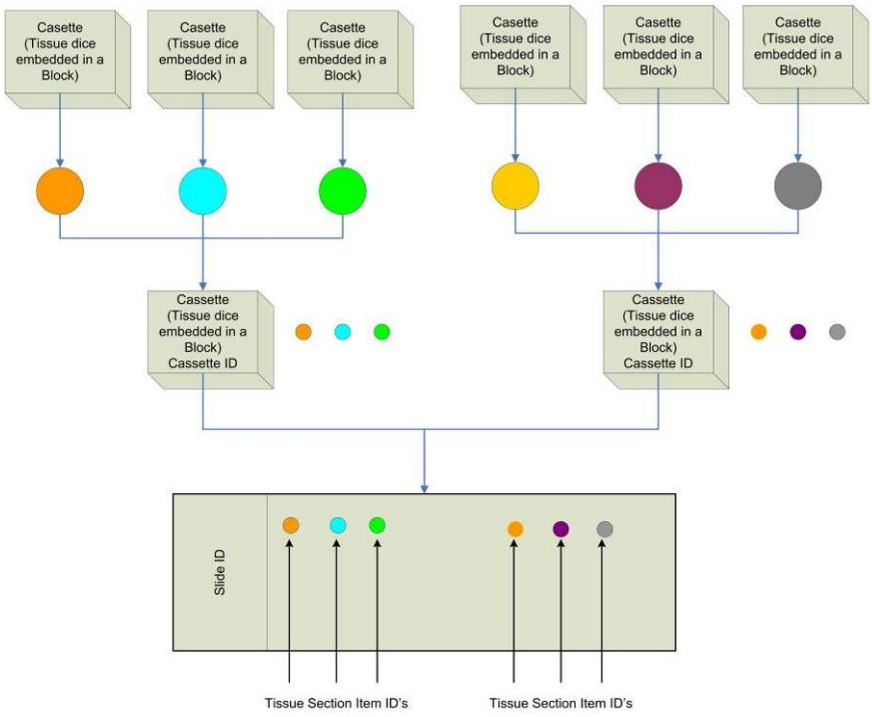

Figure SS.4-5 Sampling for TMA Slide

SS.5 STRUCTURE OF THE SPECIMEN MODULE

The Specimen Module content is specified as a Macro as an editorial convention to facilitate its use in both Composite IODs and in the Modality Worklist Information Model.

The Module has two main sections. The first deals with the specimen container. The second deals with the specimens within that container. Because more than one specimen may reside in single container, the specimen section is set up as a sequence.

The Container section is divided two “sub-sections”:

- One deals with the Specimen Container ID and the Container Type. Note that the “Container Identifier” is a required field.
- One deals with Container Components. Because there may be more than one component, this section is set up as a sequence.

The Specimen Description Sequence contains five “sub-sections”

- One deals with the Specimen ID
- One deals with descriptions of the specimen
- One deals with preparation of the specimen and its ancestor specimens (including sampling, processing and staining). Because of its importance in interpreting slide images, staining is distinguished from other processing. Specimen preparation is set up as sequence of process steps (multiple steps are possible); each step is in turn a sequence of content items (attributes using coded vocabularies). This is the most complex part of the module.
- One deals with the original anatomic location of the specimen in the patient.
- One deals with specimen localization within a container. This is used to identify specimens when there is more than one in a container. It is set up as sequence.

SS.6 EXAMPLES OF SPECIMEN MODULE USE

This section includes examples of the use of the Specimen Module. Each example has two tables.

The first table contains the majority of the container and specimen elements of the Specimen Module. The second includes the Specimen Preparation Sequence (which documents the sampling, processing and staining steps).

In the first table, invocations of Macros have been expanded to their constituent attributes. The Table does not include Type 3 (optional) attributes that are not used for the example case.

The second table shows the Items of the Specimen Preparation Sequence and its subsidiary Specimen Preparation Step Content Item Sequence. That latter sequence itself has subsidiary Code Sequence Items, but these are shown in the canonical DICOM “triplet” format (see PS3.16), e.g., (T-28600, SRT, “Left Upper Lobe of Lung”). In the table, inclusions of subsidiary templates have been expanded to their constituent Content Items. The Table does not include Type U (optional) Content Items that are not used for the example case.

Values in the colored columns of the two tables actually appear in the image object.

SS.6.1 Gross Specimen

This is an example of how the Specimen Module can be populated for a gross specimen (a lung lobe resection received from surgery). The associated image would be a gross image taken in gross room.

Table SS.6-1 Specimen Module for Gross Specimen

Attribute Name	Tag	Attribute Description	Example Value	Comments
Container Identifier	(0040,0512)	The identifier for the container that contains the specimen(s) being imaged.	S07-100 A	Note that the container ID is required, even though the container itself does not figure in the image.
Issuer of the Container Identifier Sequence	(0040,0513)	Organization that assigned the Container Identifier		
>Local Namespace Entity ID	(0040,0031)	Identifies an entity within the local namespace or domain.	Case Medical Center	
Container Type Code Sequence	(0040,0518)	Type of container that contains the specimen(s) being imaged. Zero or one items shall be permitted in this sequence		This would likely be a default container value for all gross specimens. The LIS does not keep information on the gross container type, so this is an empty sequence.
Specimen Description Sequence	(0040,0550)	Sequence of identifiers and detailed description of the specimen(s) being imaged. Zero or more Items may be included in this Sequence.		
>Specimen Identifier	(0040,0551)	A departmental information system identifier for the Specimen.	S07-100 A	Specimen and Container have same ID
>Issuer of the Specimen Identifier Sequence	(0040,0562)	The name or code for the institution that has assigned the Specimen Identifier.		
>> Local Namespace Entity ID	(0040,0031)	Identifies an entity within the local namespace or domain.	Case Medical Center	
>Specimen UID	(0040,0554)	Unique Identifier for Specimen	1.2.840.99790.986.33.1677.1.1.17.1	
>Specimen Short Description	(0040,0600)	Short textual specimen description	Part A: LEFT UPPER LOBE	The LIS "Specimen Received" field is mapped to this DICOM field
>Specimen Detailed Description	(0040,0602)	Detailed textual specimen description	A: Received fresh for intraoperative consultation, labeled with the patient's name, number and "left upper lobe," is a pink-tan, wedge-shaped segment of soft tissue, 6.9 x 4.2 x 1.0 cm. The pleural surface is pink-tan and glistening with a stapled line measuring 12.0 cm. in length. The pleural surface shows a 0.5 cm. area of puckering. The pleural surface is inked black. The cut surface reveals a 1.2 x 1.1 cm, white-gray, irregular mass abutting the pleural surface and deep to the puckered area. The remainder of the cut surface is red-brown and congested. No other lesions are identified. Representative sections are submitted.	This is a mapping from the LIS “Gross Description” field. Note that in Case S07-100 there were six parts. This means the LIS gross description field will have six sections (A - F). We would have to parse the gross description field into those parts (A-F) and then only incorporate section "A" into this attribute. NOTE: One could consider listing all the Blocks associated with Part A. It would be easy to do and might give useful information.

>Specimen Preparation Sequence	(0040,0610)	Sequence of Items identifying the process steps used to prepare the specimen for image acquisition. One or more Items may be present. This Sequence includes description of the specimen sampling step from a parent specimen, potentially back to the original part collection.	(see Table SS.6-2)	
>>Specimen Preparation Step Content Item Sequence	(0040,0612)	Sequence of Content Items identifying the processes used in one preparation step to prepare the specimen for image acquisition. One or more Items may be present.		
>Primary Anatomic Structure Sequence	(0008,2228)	Original anatomic location in patient of specimen. This location may be inherited from the parent specimen, or further refined by modifiers depending on the sampling procedure for this specimen.		
>>Code Value	(0008,0100)		T-28600	This is a code sequence item
>>Coding Scheme Designator	(0008,0102)		SRT	
>>Code Meaning	(0008,0104)		Left Upper Lobe of Lung	

585

Table SS.6-2 Specimen Preparation Sequence for Gross Specimen

Specimen Preparation Sequence - Item #	Specimen Prep. Step Content Item Sequence - Item #	Template / Row	Value Type (0040,A040)	Concept Name Code Sequence (0040,A043)	Example Value	Comments
1	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A	Collection in OR
	2	8001 / 2	TEXT	(111724, DCM, "Issuer of Specimen Identifier")	Case Medical Center	
	1	8001 / 3	CODE	(111701, DCM, "Processing type")	(P3-02000, SRT, "Specimen collection")	
	2	8001 / 4	DATETIME	(111702, DCM, "Datetime of processing")	200703230827	
	3	8001 / 5	TEXT	(111703, DCM, "Processing step description")	Taken	
	4	8001 / 8 8002 / 1	CODE	(111704, DCM, "Sampling Method")	(P1-03000, SRT, "Excision")	
2	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A	Specimen received in Pathology department
	2	8001 / 2	TEXT	(111724, DCM, "Issuer of Specimen Identifier")	Case Medical Center	
	1	8001 / 3	CODE	(111701, DCM, "Processing type")	(P3-05013, SRT, "Specimen Receiving")	
	2	8001 / 4	DATETIME	(111702, DCM, "Datetime of processing")	200703230943	

SS.6.2 Slide

This is an example of how the Specimen Module can be populated for a slide (from a lung lobe resection received from surgery). The associated image would be a whole slide image.

Table SS.6-3 Specimen Module for a Slide

Attribute Name	Tag	Attribute Description	Example Value	Comments
Container Identifier	(0040,0512)	The identifier for the container that contains the specimen(s) being imaged.	S07-100 A 5 1	
Issuer of the Container Identifier Sequence	(0040,0513)	Organization that assigned the Container Identifier		
>Local Namespace Entity ID	(0040,0031)	Identifies an entity within the local namespace or domain.	Case Medical Center	
Container Type Code Sequence	(0040,0518)	Type of container that contains the specimen(s) being imaged. Only a single item shall be permitted in this sequence		This would likely be a default container value for all slide specimens.
>Code Value	(0008,0100)		G-81EA	This is a code sequence item
>Coding Scheme Designator	(0008,0102)		SRT	
>Code Meaning	(0008,0104)		Slide	
Container Component Sequence	(0040,0520)	Description of one or more components of the container (e.g., description of the slide and of the coverslip). One or more Items may be included in this Sequence.		
>Container Component Type Code Sequence	(0050,0012)	Type of container component. One Item shall be included in this Sequence.		
>>Code Value	(0008,0100)		A-0101D	This is a code sequence item
>>Coding Scheme Designator	(0008,0102)		SRT	
>>Code Meaning	(0008,0104)		Microscope slide cover slip	
>Container Component Material	(0050,001A)	Material of container component.	GLASS	
Specimen Description Sequence	(0040,0550)	Sequence of identifiers and detailed description of the specimen(s) being imaged. Zero or more Items may be included in this Sequence.		
>Specimen Identifier	(0040,0551)	A departmental information system identifier for the Specimen.	S07-100 A 5 1	Specimen and Container have same ID
>Issuer of the Specimen Identifier Sequence	(0040,0562)	The name or code for the institution that has assigned the Specimen Identifier.		
>>Local Namespace Entity ID	(0040,0031)	Identifies an entity within the local namespace or domain.	Case Medical Center	
>Specimen UID	(0040,0554)	Unique Identifier for Specimen	1.2.840.99790.986.33.1677.1.1.19.5	

>Specimen Short Description	(0040,0600)	Short textual specimen description	Part A: LEFT UPPER LOBE, Block 5: Mass (2 pc), Slide 1: H&E	This attribute concatenates four LIS fields: 1. Specimen Received, 2. Cassette Summary, 3. Number of Pieces in Block, 4. Staining. This does not always work this nicely. Often one or more of fields is empty or confusing. Note this field is limited to 64 characters
>Specimen Detailed Description	(0040,0602)	Detailed textual specimen description	A: Received fresh for intraoperative consultation, labeled with the patient's name, number and "left upper lobe," is a pink-tan, wedge-shaped segment of soft tissue, 6.9 x 4.2 x 1.0 cm. The pleural surface is pink-tan and glistening with a stapled line measuring 12.0 cm. in length. The pleural surface shows a 0.5 cm. area of puckering. The pleural surface is inked black. The cut surface reveals a 1.2 x 1.1 cm, white-gray, irregular mass abutting the pleural surface and deep to the puckered area. The remainder of the cut surface is red-brown and congested. No other lesions are identified. Representative sections are submitted. Block 5: "Mass" (2 pieces)	This is a mapping from the LIS Gross Description Field and the Block Summary. Note that in Case S07-100, there were six parts. This means the LIS gross description field will have six sections (A - F). We would have to parse the gross description field into those parts (A-F) and then only incorporate section "A" into this attribute. The same would be true of the Blocks. NOTE: One could consider listing all the Blocks associated with Part A. It would be easy to do and might give useful information.
>Specimen Preparation Sequence	(0040,0610)	Sequence of Items identifying the process steps used to prepare the specimen for image acquisition. One or more Items may be present. This Sequence includes description of the specimen sampling step from a parent specimen, potentially back to the original part collection.	(see Table SS.6-4)	
>>Specimen Preparation Step Content Item Sequence	(0040,0612)	Sequence of Content Items identifying the processes used in one preparation step to prepare the specimen for image acquisition. One or more Items may be present.		
>Primary Anatomic Structure Sequence	(0008,2228)	Original anatomic location in patient of specimen. This location may be inherited from the parent specimen, or further refined by modifiers depending on the sampling procedure for this specimen.		
>>Code Value	(0008,0100)		T-28600	This is a code sequence item
>>Coding Scheme Designator	(0008,0102)		SRT	
>>Code Meaning	(0008,0104)		Left Upper Lobe of Lung	

The example Specimen Preparation Sequence first describes the most recent processing of the slide (staining), then goes back to show its provenance. Notice that there is no sampling process for the slide described here; the LIS did not record the step of slicing of blocks into slides.

Table SS.6-4 Specimen Preparation Sequence for Slide

Specimen Preparation Sequence - Item #	Specimen Prep. Step Content Item Sequence - Item #	Template / Row	Value Type (0040,A040)	Concept Name Code Sequence (0040,A043)	Example Value	Comments
1	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A	Part Collection in OR.
	2	8001 / 2	TEXT	(111724, DCM, "Issuer of Specimen Identifier")	Case Medical Center	
	3	8001 / 3	CODE	(111701, DCM, "Processing type")	(P3-02000, SRT, "Specimen collection")	
	4	8001 / 4	DATETIME	(111702, DCM, "Datetime of processing")	200703230827	
	5	8001 / 5	TEXT	(111703, DCM, "Processing step description")	Taken	
	6	8001 / 8 8002 / 1	CODE	(111704, DCM, "Sampling Method")	(P1-03000, SRT, "Excision")	
2	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A	Specimen received in Pathology department
	2	8001 / 2	TEXT	(111724, DCM, "Issuer of Specimen Identifier")	Case Medical Center	
	3	8001 / 3	CODE	(111701, DCM, "Processing type")	(P3-05013, SRT, "Specimen Receiving")	
	4	8001 / 4	DATETIME	(111702, DCM, "Datetime of processing")	200703230943	
3	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A 5	Sampling to block
	2	8001 / 2	TEXT	(111724, DCM, "Issuer of Specimen Identifier")	Case Medical Center	
	3	8001 / 3	CODE	(111701, DCM, "Processing type")	(P3-4000A, SRT, "Sampling of tissue specimen")	
	4	8001 / 5	TEXT	(111703, DCM, "Processing step description")	Block Creation	
	5	8001 / 8 8002 / 1	CODE	(111704, DCM, "Sampling Method")	(P1-01003, SRT, "Dissection")	
	6	8001 / 8 8002 / 2	TEXT	(111705, DCM, "Parent Specimen Identifier")	S07-100 A	
	7	8001 / 8 8002 / 3	TEXT	(111706, DCM, "Issuer of Parent Specimen Identifier")	Case Medical Center	
	8	8001 / 8 8002 / 4	CODE	(111707, DCM, "Parent specimen type")	(T-D0011, SRT, "Anatomic part")	
	9	8001 / 8 8002 / 6	TEXT	(111709, DCM, "Location of sampling site")	Mass	This is coming from the summary of blocks field in the LIS
4	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier")	S07-100 A 5	Block Processing

	2	8001 / 2	TEXT	(111724, DCM, “Issuer of Specimen Identifier”)	Case Medical Center	
	3	8001 / 3	CODE	(111701, DCM, “Processing type”)	(P3-05000, SRT, “Specimen Processing”)	
	4	8001 / 4	DATETIME	(111702, DCM, “Datetime of processing”)	200703231900	
	5	8001 / 5	TEXT	(111703, DCM, “Processing step description”)	Standard Block Processing (Formalin)	
	6	8001 / 10	CODE	(111715, DCM, “Specimen Fixative”)	(C-21402, SRT, “Formalin”)	
5	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier”)	S07-100 A 5	Block embedding
	2	8001 / 2	TEXT	(111724, DCM, “Issuer of Specimen Identifier”)	Case Medical Center	
	3	8001 / 3	CODE	(111701, DCM, “Processing type”)	(P3-05000, SRT, “Specimen Processing”)	
	4	8001 / 4	DATETIME	(111702, DCM, “Datetime of processing”)	200703240500	
	5	8001 / 5	TEXT	(111703, DCM, “Processing step description”)	Embedding (paraffin)	
	6	8001 / 11	CODE	(F-6221A, SRT, “Embedding medium”)	(F-61118, SRT, “Paraffin”)	
6	1	8001 / 1	TEXT	(121041, DCM, "Specimen Identifier”)	S07-100 A 5 1	Slide Staining
	2	8001 / 3	CODE	(111701, DCM, “Processing type”)	(P3-00003, SRT, “Staining”)	
	3	8001 / 4	DATETIME	(111702, DCM, “Datetime of processing”)	200703240700	
	4	8001 / 9 8003 / 2	TEXT	(F-61D98, SRT, “Stain”)	H&E (1)	

600

605

Changes to NEMA Standards Publication PS 3.3-2008

Digital Imaging and Communications in Medicine (DICOM)

Part 3: Information Object Definitions

In PS 3.3, Section 7, add Extension of DICOM Real-World Model for the Specimens.

7.X EXTENSION OF THE DICOM MODEL OF THE REAL WORLD FOR SPECIMENS

The DICOM Model of the Real World is extended for Specimens with the addition of several objects whose relationships to each other and existing DICOM Real World objects are shown in Figure 7.X-1.

Attributes of the Specimen, Container, Component and Preparation Step objects are represented in the Specimen Module within the Image IODs.

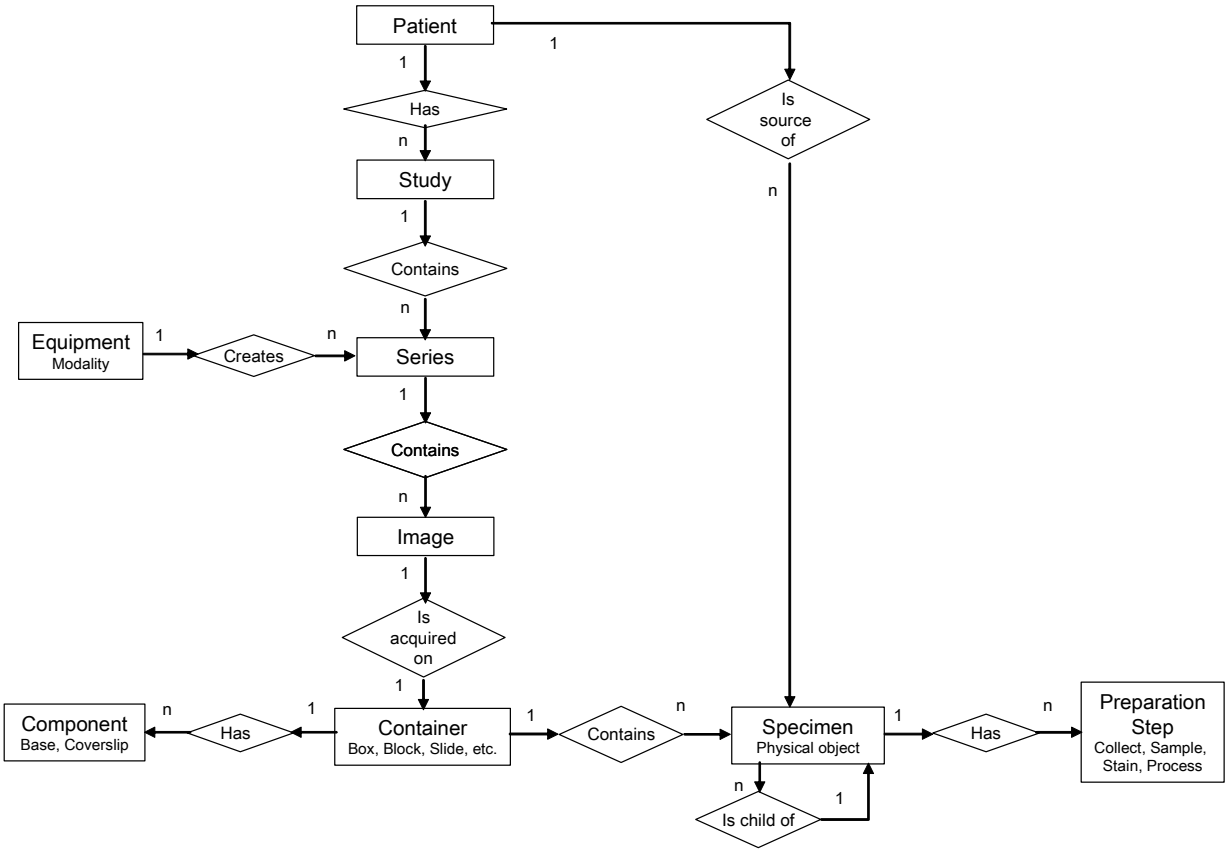

Figure 7.X-1 – DICOM MODEL OF THE REAL WORLD – SPECIMENS

7.X.1 Specimen

A physical object (or a collection of objects) is a specimen when the laboratory considers it a single discrete, uniquely identified unit that is the subject of one or more steps in the laboratory (diagnostic) workflow.

7.X.2 Container

Specimen containers (or just “containers”) play an important role in laboratory (diagnostic) processes. In most, but not all, process steps, specimens are held in containers, and a container often carries its specimen’s ID. Sometimes the container becomes intimately involved with the specimen (e.g., a paraffin block), and in some situations (such as examining tissue under the microscope) the container (the slide and coverslip) become part of the optical path.

7.X.3 Container Component

Containers are often made up of components. For example, a “slide” is container that is made up of the glass slide, the cover slip and the “glue” the binds them together.

7.X.4 Preparation Step

Before a slide is imaged, the preparation of the specimen (including sampling, processing and staining) will take place. Specimen preparation is described as a sequence of time-stamped process steps. Mulitple steps are possible, and may include sampling from ancestor specimens.

In PS 3.3, Section 10, add Macro for HL7 Hierarchic Designator. ***Note this change is already final text in CP800.***

10.X HL7v2 HIERARCHIC DESIGNATOR MACRO

Table 10-x describes the attributes for identifying an entity (system, organization, agency, or department) that has responsibility for managing or assigning a defined set of instance identifiers (such as placer or filler number, patient identifiers, provider identifiers, etc.). This entity could be a particular health care application such as a registration system that assigns patient identifiers, a governmental entity such as a licensing authority that assigns professional identifiers or drivers' license numbers, or a facility where such identifiers are assigned.

Note: This definition is identical to HL7 v2.5.1, Section 2.A.33, with only minor changes for editorial style.

These attributes are equivalent to the components of the HL7 v2 Hierarchic Designator and Entity Identifier data types (see HL7 v2 Chapter 2.A).

If both Local Namespace Entity ID (0040,0031) and Universal Entity ID (0040,0032) are present, they shall refer to the same entity.

Table 10-x
HL7v2 HIERARCHIC DESIGNATOR MACRO

Attribute Name	Tag	Type	Attribute Description
Local Namespace Entity ID	(0040,0031)	1C	Identifies an entity within the local namespace or domain. Required if Universal Entity ID (0040,0032) is not present; may be present otherwise.
Universal Entity ID	(0040,0032)	1C	Universal or unique identifier for an entity. Required if Local Namespace Entity ID (0040,0031) is not present; may be present otherwise.
Universal Entity ID Type	(0040,0033)	1C	Standard defining the format of the Universal Entity ID. Required if Universal Entity ID (0040,0032) is present. Defined Terms: DNS An Internet Domain Name System name EUI64 An IEEE Extended Unique Identifier ISO An International Standards Organization Object Identifier URI Uniform Resource Identifier UUID The DCE Universal Unique Identifier X400 An X.400 MHS identifier X500 An X.500 directory name Note: The defined terms correspond to the values of HL7 v2 Table 0301

In PS 3.3, Annex A, make the changes to Table A.1-1and Table A.1-2 in accordance with the changes to the IODs

A.1.4 OVERVIEW OF THE COMPOSITE IOD MODULE CONTENT

Table A.1-1
COMPOSITE INFORMATION OBJECT MODULES OVERVIEW - IMAGES

Editor to make appropriate changes based on the IOD Tables below.

Table A.1-2
COMPOSITE INFORMATION OBJECT MODULES OVERVIEW – NON-IMAGES

Editor to make appropriate changes based on the IOD Tables below.

In PS 3.3, remove the Specimen Identification Module C.7.1.2 from all of the IODs that currently reference it and add Specimen Identification Module C.7.6.2x where appropriate

A.2.3 CR Image IOD Module Table

Table A.2-1
CR IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	CR Image	C.8.1.2	M
	…		

A.3.3 CT Image IOD Module Table

Table A.3-1
CT IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	CT Image	C.8.2.1	M
	…		

A.4.3 MR Image IOD Module Table

Table A.4-1
MR IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	MR Image	C.8.3.1	M
	…		

A.5.4 NM Image IOD Module Table

Table A.5-1
NM IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	NM Image Pixel	C.8.4.7	M
	…		

A.6.4 US Image IOD Module Table

Table A.6-1
US IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	US Region Calibration	C.8.5.5	U
	…		

A.7.4 US Multi-Frame Image IOD Module Table

Table A.7-1
US MULTI-FRAME IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	US Region Calibration	C.8.5.5	U
	…		

A.8.1.3 SC Image IOD Module Table

Table A.8-1
SC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	SC Image	C.8.6.2	M
	…		

A.8.2.3 Multi-frame Single Bit SC Image IOD Module Table

Table A.8-2
MULTI-FRAME SINGLE BIT SC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Multi-frame Dimension	C.7.6.17	U
	Specimen	**C.7.6.2x**	**U**
	SC Image	C.8.6.2	M
	…		

A.8.3.3 Multi-frame Grayscale Byte SC Image IOD Module Table

Table A.8-3
MULTI-FRAME GRAYSCALE BYTE SC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Multi-frame Dimension	C.7.6.17	U
	Specimen	**C.7.6.2x**	**U**
	SC Image	C.8.6.2	M
	…		

A.8.4.3 Multi-frame Grayscale Word SC Image IOD Module Table

Table A.8-4
MULTI-FRAME GRAYSCALE WORD SC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Multi-frame Dimension	C.7.6.17	U
	Specimen	**C.7.6.2x**	**U**
	SC Image	C.8.6.2	M
	…		

A.8.5.3 Multi-frame True Color SC Image IOD Module Table

Table A.8-5
MULTI-FRAME TRUE COLOR SC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Multi-frame Dimension	C.7.6.17	U
	Specimen	**C.7.6.2x**	**U**
	SC Image	C.8.6.2	M
	…		

A.14.3 XA Image IOD Module Table

Table A.14-1
X-RAY ANGIOGRAPHIC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Intervention	C.7.6.13	U
	Specimen	**C.7.6.2x**	**U**
	X-Ray Image	C.8.7.1	M
	…		

A.16.3 XRF Image IOD Module Table

Table A.16-1 - XRF IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Intervention	C.7.6.13	U
	Specimen	**C.7.6.2x**	**U**
	X-Ray Image	C.8.7.1	M
	…		

A.21.3 PET Image IOD Module Table

Table A.21.3-1 - PET IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	PET Image	C.8.9.4	M
	…		

A.26.3 DX Image IOD Module Table

Table A.26-1
DIGITAL X-RAY IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	SOP Common	C.12.1	M

Notes: ...

7. The Specimen Identification Module ~~**is User optional, because although its Attributes may be helpful for identification and correlation with Pathology Information Systems, much specimen radiography, including forensic radiography, is performed with conventional clinical X-Ray equipment that is not likely to support specific specimen identification features**~~ **was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008**.

A.27.2 Digital Mammography X-Ray Image IOD Module Table

Table A.27-1
DIGITAL MAMMOGRAPHY X-RAY IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	SOP Common	C.12.1	M

…

Note**s**: **1.** The Curve Module was previously included in this IOD but has been retired. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.28.2 Digital Intra-oral X-Ray Image IOD Module Table

Table A.28-1
DIGITAL INTRA-ORAL X-RAY IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	SOP Common	C.12.1	M

…

Note**s**: **1.** The Curve Module was previously included in this IOD but has been retired. See PS 3.3 2004.
2. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.32.1.2 VL Endoscopic Image IOD Entity-Relationship Model

…

Table A.32.1-1
VL ENDOSCOPIC IMAGE IOD MODULES

IE	Module	Reference	Usage
	…		
	Device	C.7.6.12	U
	Specimen	**C.7.6.2x**	**U**
	VL Image	C.8.12.1	M
	…		

A.32.2.1 VL Microscopic Image IOD Description

The VL Microscopic Image IOD specifies the Attributes of Single-frame VL Microscopic Images**, including both imaging of specimens and direct microscopic imaging of the patient (e.g., perioperative microscopy)**. **Microscopic Images with** Slide Coordinates shall not be encoded with this IOD.

A.32.2.2 VL Microscopic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the VL Microscopic Image IOD, with exception of the VOI LUT, Frame of Reference and Modality LUT entities, which are not used. Additionally, Image in figure A.1.2 of PS3.3 represents a Single Frame image. A frame denotes a two-dimensional organization of pixels recorded as a single exposure. Table A.32.1-2 specifies the Modules of the VL Microscopic Image IOD.

Notes**:** ~~**1. A microscopy procedure might include multiple series of single frame VL Microscopic Images as well as one or more additional series of related diagnostic images. The procedure might involve multiple Performed Procedure Steps, multiple microscopes, and multiple anatomic regions and might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during a single procedure. For example: Histologic staining of the same section with multiple special stains.**~~

~~**3**~~**1**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.1-2
VL MICROSCOPIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C – Required if Imaging Subject is a specimen**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**C – Required if Imaging Subject is a specimen**
	VL Image	C.8.12.1	M
	,,,		

A.32.3.2 VL Slide-Coordinates Microscopic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the VL Slide-Coordinates Microscopic Image IOD, with exception of the VOI LUT, Frame of Reference and Modality LUT entities, which are not used. Additionally, Image in figure A.1.2 of PS3.3 represents a Single Frame image. A frame denotes a two-dimensional organization of pixels recorded as a single exposure. Table A.32.1-3 specifies the Modules of the VL Slide-Coordinates Microscopic Image IOD.

Notes**:** ~~**1. A microscopic imaging procedure might include multiple series of single frame Microscopic Images as well as one or more additional series of related diagnostic images and might involve multiple Performed Procedure Steps, multiple Microscopes, and multiple anatomic regions. The procedure might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during a single procedure. For example: Histologic staining of the same section with multiple special stains.**~~

~~**3**~~**1**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.1-3
VL SLIDE-COORDINATES MICROSCOPIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**M**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**M**
	VL Image	C.8.12.1	M
	…		

A.32.4.2 VL Photographic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the VL Photographic Image IOD, with exception of the VOI LUT, Frame of Reference and Modality LUT entities, which are not used. Additionally, Image in figure A.1.2 of PS3.3 represents a Single Frame image. A frame denotes a two-dimensional organization of pixels recorded as a single exposure. Table A.32.4-1 specifies the Modules of the VL Photographic Image IOD.

Notes: ~~**1. A VL photographic imaging procedure might include multiple series of single frame VL Photographic images as well as one or more additional series of related diagnostic images. The procedure might involve multiple Performed Procedure Steps, multiple cameras, and multiple anatomic regions and might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during a single procedure.**~~

~~**3**~~**1**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.4-1
VL PHOTOGRAPHIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**C - Required if the Imaging Subject is a Specimen**
	VL Image	C.8.12.1	M
	…		

A.32.5.2 Video Endoscopic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the Video Endoscopic Image IOD, with exception of the VOI LUT, and Modality LUT entities, which are not used. Table A.32.5-1 specifies the Modules of the Video Endoscopic Image IOD.

Notes**:** ~~**1. An endoscopic procedure might include multiple series of video Endoscopic images as well as one or more additional series of: single frame VL Endoscopic images, Key Object Selection documents (for selecting clips from the video) and/or of related diagnostic images. The procedure might involve multiple Performed Procedure Steps, multiple endoscopes, and multiple anatomic regions and might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during an endoscopic procedure. For example: Endoscopic examination of duodenal mucosa, biopsy, lavage, or biliary stone removal.**~~

~~**3**~~**1**. The video may include audio channel for acquiring patient voice or physiological sounds, healthcare professionals comment, or environment sounds.

~~**4**~~**2**. The Frame Pointers Module has not been included because the selection of relevant sub-sequence(s) is usually made in a second step and stored into separate Key Object Selection Documents.

~~**5**~~**3**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

4. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.5-1
VIDEO ENDOSCOPIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Device	C.7.6.12	U
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**C - Required if the Imaging Subject is a Specimen**
	VL Image	C.8.12.1	M
	…		

A.32.6.1 Video Microscopic Image IOD Description

The Video Microscopic Image IOD specifies the Attributes of Video Microscopic Images**, including both imaging of specimens and direct microscopic imaging of the patient (e.g., perioperative microscopy)**. **Microscopic Images with** Slide Coordinates shall not be encoded with this IOD.

A.32.6.2 Video Microscopic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the Video Microscopic Image IOD, with exception of the VOI LUT, and Modality LUT entities, which are not used. Table A.32.6-1 specifies the Modules of the Video Microscopic Image IOD.

Notes: ~~**1. A microscopy procedure might include multiple series of video Microscopic images as well as one or more additional series of: single frame VL Microscopic images, Key Object Selection documents (for selecting clips from the video) and/or of related diagnostic images. The procedure might involve multiple Performed Procedure Steps, multiple microscopes, and multiple anatomic regions and might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during a single procedure. For example: Histologic staining of the same section with multiple special stains.**~~

~~**3**~~**1**. The video may include audio channel for acquiring patient voice or physiological sounds, healthcare professionals comment, or environment sounds.

~~**4**~~**2**. The Frame Pointers Module has not been included because the selection of relevant sub-sequence(s) is usually made in a second step and stored into separate Key Object Selection Documents.

~~**5**~~**3**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

4. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.6-1
VIDEO MICROSCOPIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Device	C.7.6.12	U
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**C - Required if the Imaging Subject is a Specimen**
	VL Image	C.8.12.1	M
	…		

A.32.7.2 Video Photographic Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the Video Photographic Image IOD, with exception of the VOI LUT and Modality LUT entities, which are not used. Table A.32.7-1 specifies the Modules of the Video Photographic Image IOD.

Notes: ~~**1. A VL photographic imaging procedure might include multiple series of video Photographic images as well as one or more additional series of: single frame VL Photographic images, Key Object Selection documents (for selecting clips from the video) and/or of related diagnostic images. The procedure might involve multiple Performed Procedure Steps, multiple cameras, and multiple anatomic regions and might be supervised, performed, and/or interpreted by one or more individuals.**~~

~~**2. Several distinct diagnostic or therapeutic processes might occur during a single procedure.**~~

~~**3**~~**1**. The video may include audio channel for acquiring patient voice or physiological sounds, healthcare professionals comment, or environment sounds.

~~**4**~~**2**. The Frame Pointers Module has not been included because the selection of relevant sub-sequence(s) is usually made in a second step and stored into separate Key Object Selection Documents.

~~5~~**3**. The Curve entity was previously include**d** in the list of entities that are not used, but has been retired from DICOM. It is still not used in this IOD. See PS 3.3 2004.

4. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Table A.32.7-1
VIDEO PHOTOGRAPHIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Device	C.7.6.12	U
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**C - Required if the Imaging Subject is a Specimen**
	VL Image	C.8.12.1	M
	…		

A.35.1.3 Basic Text SR IOD Module Table

Table A.35.1-1
BASIC TEXT SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.35.2.3 Enhanced SR IOD Module Table

Table A.35.2-1
ENHANCED SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.35.3.3 Comprehensive SR IOD Module Table

Table A.35.3-1
COMPREHENSIVE SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.35.4.3 Key Object Selection Document IOD Module Table

Table A.35.4-1
KEY OBJECT SELECTION DOCUMENT IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.35.5.3 Mammography CAD SR IOD Module Table

Table A.35.5-1
MAMMOGRAPHY CAD SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.35.6.3 Chest CAD SR IOD Module Table

Table A.35.6-1
CHEST CAD SR IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Observation Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.36.2.3 Enhanced MR Image IOD Module Table

Table A.36-1
ENHANCED MR IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Device	C.7.6.12	U
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	Enhanced MR Image	C.8.13.1	M
	…		

A.36.2.3.1 Enhanced MR Image IOD Content Constraints

The General Image Module, Overlay Plane Module and VOI LUT Module shall not be used in a Standard Extended SOP Class of the Enhanced MR Image.

Notes: 1. ...

2. The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

3. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

…

A.36.3.3 MR Spectroscopy IOD Module Table

Table A.36-3
MR SPECTROSCOPY IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M

	Specimen	**C.7.6.2x**	**U**
	MR Spectroscopy	C.8.14.1	M
	…		

Note: The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.37.3 Raw Data IOD Module Table

Table A.37-1
RAW DATA IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	Raw Data	C.19.1	M
	…		

Note: The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.38.1.3 Enhanced CT Image IOD Module Table

Table A.38-1
ENHANCED CT IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Device	C.7.6.12	U
	Acquisition Context	C.7.6.14	M
	Specimen	**C.7.6.2x**	**U**
	Enhanced CT Image	C.8.15.2	M
	…		

A.38.1.3.1 Enhanced CT Image IOD Content Constraints

The General Image Module, Overlay Plane Module and VOI LUT Module shall not be used in a Standard Extended SOP Class of the Enhanced CT Image.

Notes: 1. ...

2. The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

3. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.39.1.3 Spatial Registration IOD Module Table

Table A.39-1 SPATIAL REGISTRATION IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.39.2.1.2 Deformable Spatial Registration IOD Module Table

Table A.39-2 SPATIAL REGISTRATION IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.40.3 Spatial Fiducials IOD Module Table

Table A.40-1 SPATIAL FIDUCIALS IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

…

A.41.2 Ophthalmic Photography 8 Bit Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the Ophthalmic Photography 8-Bit Image IOD, with exception of the VOI LUT, and Modality LUT entities, which are not used. Table A.41-1 specifies the Modules of the Ophthalmic Photography 8 Bit Image IOD.

Note**s**: **1.** The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.41.3 Ophthalmic Photography 8 Bit Image IOD Modules

Table A.41-1
OPHTHALMIC PHOTOGRAPHY 8 BIT IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

A.42.2 Ophthalmic Photography 16 Bit Image IOD Entity-Relationship Model

The E-R Model in Section A.1.2 of this Part depicts those components of the DICOM Information Model that directly reference the Ophthalmic Photography 16-Bit Image IOD, with exception of the VOI LUT, Frame of Reference and Modality LUT entities, which are not used. Table A.42-1 specifies the Modules of the Ophthalmic Photography 16 Bit Image IOD.

Note**s**: **1.** The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

2. The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.42.3 Ophthalmic Photography 16 Bit Image IOD Modules

Table A.42-1
OPHTHALMIC PHOTOGRAPHY 16 BIT IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

A.43.2 Stereometric Relationship IOD Modules

Table A.43-2
STEREOMETRIC RELATIONSHIP IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**C - Required if the Imaging Subject is a Specimen**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.45.1.3 Encapsulated PDF IOD Module Table

Table A.45.1-1
ENCAPSULATED PDF IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.46.2 Real World Value Mapping IOD Module Table

Table A.46-1 REAL WORLD VALUE MAPPING IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…

Note: The Specimen Identification Module was previously included in this IOD but has been retired. See PS 3.3-2008.

A.47.3 Enhanced XA Image IOD Module Table

Table A.47-1
ENHANCED X-RAY ANGIOGRAPHIC IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
…	…	…	…
	Respiratory Synchronization	C.7.6.18.2	C – Required if respiratory synchronization was applied.
	Specimen	**C.7.6.2x**	**U**
	X-Ray Filtration	C.8.7.10	U
	…		

A.47.3.1.2 Overlay Plane ~~Module~~, Curve ~~Module and VOI~~, LUT and Specimen Identification Module**s**

The Overlay Plane Module, VOI LUT Module and Softcopy Presentation LUT Module shall not be used in a Standard Extended SOP Class of the Enhanced XA Image.

Notes: 1. The VOI LUT function is provided by a Frame VOI LUT Functional Group.

2. The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

3. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

…

A.48.3 Enhanced XRF Image IOD Module Table

Table A.48.-1
ENHANCED X-RAY RF IMAGE IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…	…	…
	Respiratory Synchronization	C.7.6.18.2	C - Required if respiratory synchronization was applied.
	Specimen	**C.7.6.2x**	**U**
	X-Ray Tomography Acquisition	C.8.7.7	U
	…		

A.48.3.1.2 Overlay Plane ~~Module~~, Curve ~~Module and VOI~~, LUT and Specimen Identification Module**s**

The Overlay Plane Module, VOI LUT Module and Softcopy Presentation LUT Module shall not be used in a Standard Extended SOP Class of the Enhanced XA Image.

Notes: 1. The VOI LUT function is provided by a Frame VOI LUT Functional Group.

2. The Curve Module was previously include**d** in the list of Modules that shall not be present, but has been retired from DICOM. It is still not permitted to be present. See PS 3.3 2004.

3. The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

A.51.3 Segmentation IOD Module Table

Table A.51-1
SEGMENTATION IOD MODULES

IE	Module	Reference	Usage
Patient	Patient	C.7.1.1	M
	~~**Specimen Identification**~~	~~**C.7.1.2**~~	~~**U**~~
	Clinical Trial Subject	C.7.1.3	U
	…		
	Multi-frame Dimension	C.7.6.17	M
	Specimen	**C.7.6.2x**	**U**
	Segmentation Image	C.8.20.2	M
	…		

Note: The Specimen Identification Module was previously included in this IOD but has been retired, and its functionality replaced by the Specimen Module. See PS 3.3-2008.

Make the following change to Section C.4.10

C.4.10 Scheduled Procedure Step Module

Table C.4-10
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
Scheduled Procedure Step Sequence	(0040,0100)	One or more Scheduled Procedure Steps for one Requested Procedure.
…		
Scheduled Specimen Sequence	**(0040,0500)**	**Sequence of Items identifying specimens to be imaged in the identified Scheduled Procedure Step(s), with their characteristics.**
>Include 'Specimen Macro' Table C.7.6.2x-2		

Make the following change to Section C.4.15

C.4.15 Image Acquisition Results

Table C.4-15 specifies attributes that describe the acquisition of images during the performance of the Procedure Step and that provide references to the Series, Images and other Composite SOP Instances associated with this Modality Performed Procedure Step.

Table C.4-15
IMAGE ACQUISITION RESULTS MODULE ATTRIBUTES

Attribute Name	Tag	Attribute Description
…		
Performed Series Sequence	(0040,0340)	Attributes of the Series that comprise this Modality Performed Procedure Step. The Sequence may have zero or more Items.
>Performing Physician's Name	(0008,1050)	Name of the physician(s) administering this Series.
…		
>Referenced Image Sequence	(0008,1140)	A Sequence that provides reference to one or more sets of Image SOP Class/SOP Instance pairs created during the acquisition of the procedure step. The sequence may have zero or more Items.
>>Referenced SOP Class UID	(0008,1150)	Uniquely identifies the referenced SOP Class.
>>Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the referenced SOP Instance.
>>Container Identifier	**(0040,0512)**	**The identifier for the container that contains the specimen(s) imaged.**
>>Specimen Description Sequence	**(0040,0560)**	**Sequence of identifiers of the specimen(s) imaged. One or more Items shall be included in this Sequence.**
>>>Specimen Identifier	**(0040,0551)**	**A departmental information system identifier for the Specimen.**
>>>Specimen UID	**(0040,0554)**	**Unique identifier for the Specimen.**
…		

Make the following changes in Section C.7.1.2, and remove the remainder of the section

C.7.1.2 Specimen Identification Module

Retired. See PS 3.3-2008.

Note: The functionality of the Specimen Identification Module has been replaced by the Specimen Module. See C.7.6.2x.

~~**Table C.7-2a specifies the Attributes that identify a Specimen.**~~

~~**Table C.7-2a**~~
~~**SPECIMEN IDENTIFICATION MODULE ATTRIBUTES**~~

~~Attribute Name~~	~~Tag~~	~~Type~~	~~Attribute Description~~
~~Specimen Accession Number~~	~~(0040,050A)~~	~~1~~	~~A departmental Information System identifier that identifies the Accession. See Section C.7.1.2.1.1 for further explanation.~~
~~Specimen Sequence~~	~~(0040,0550)~~	~~2~~	~~Detailed description of one or more specimens. Zero or more Items may be included in this Sequence.~~
~~>Specimen Identifier~~	~~(0040,0551)~~	~~2C~~	~~A departmental information system identifier for the Specimen. See Section C.7.1.2.1.2 for further explanation.~~ ~~Required if a sequence item is present.~~
~~>Specimen Type Code Sequence~~	~~(0040,059A)~~	~~2C~~	~~Specimen Type. Only a single Item shall be permitted in this Sequence. Required if a sequence item is present and Specimen Identifier (0040,0551) is sent.~~
~~>>Include 'Code Sequence Macro' Table 8.8-1~~		~~No Baseline Context IDs are defined~~	
~~>Slide Identifier~~	~~(0040,06FA)~~	~~2C~~	~~Identifier of the Slide.~~ ~~Required if a sequence item is present and the Specimen is a Slide.~~

~~**C.7.1.2.1 Specimen Module Attributes**~~

~~**C.7.1.2.1.1 Specimen Accession Number**~~

~~**Specimen Accession Number (0040,06CA) is the primary identifier of the Specimen.**~~

~~**Note: Specimen Accession Number (0040,050A) identifies tissue or fluid obtained from a Patient in a Specimen-harvest procedure. This Attribute was created to differentiate Accession Numbers, as used in Anatomic Pathology to identify specimens, from other uses of the term "Accession Number" in Information Systems. The Specimen Accession Number (0040,050A) is typically unique within the scope of the institution in which the Accession is performed. An Accession may contain multiple Specimens. Typically, an Accession contains the Specimens obtained in one Specimen-harvest procedure and submitted by one Requesting Physician. However, multiple Specimen-harvest procedures may be involved.**~~

~~**C.7.1.2.1.2 Specimen Identifier**~~

~~**Specimen Identifier (0040,050A) may be used to convey a slide number, a block number, or other secondary identifier of the Specimen.**~~

~~**Note: The Specimen Identifier (0040,0551) is typically unique within the scope of the institution in which the related Accession is performed. However, a value of Specimen Identifier (0040,0551) does not always exist. For example, it is common practice in some Anatomic Pathology departments to use a Specimen Identifier (0040,0551) to identify specimen-containers or blocks only if multiple containers or blocks are submitted for a single Accession. Therefore, Specimen Identifier (0040,0551) is modeled as a Type 2 Attribute.**~~

Make the following changes in Section C.7.2.1

Table C.7-3
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
…			
Accession Number	(0008,0050)	2	A**n** ~~**RIS generated number that**~~ identifier**s** ~~**of**~~ the order for the Study. **See C.7.2.1.1.2.**
…			

C.7.2.1.1 General Study Attribute Descriptions

…

C.7.2.1.1.2 Accession Number

Accession Number (0008,0050) may be used by department information systems to link a Study to a broader managed process. For radiology, the Accession Number may correspond to the Order Filler Number as specified in HL7 v2. For anatomic pathology, the Accession Number identifies a "Pathology Case", usually associated with a surgical event and including all specimens collected during that event.

Note: In previous editions of the Standard (see PS3.3-2008), a separate Specimen Accession Number attribute was defined, but that has been retired in favor of a single Accession Number in the Study IE.

Define a new Image IE Specimen Module:

C.7.6.2x Specimen Module

Table C.7.6.2x-1 specifies the Attributes that identify one or more Specimens being imaged.

Table C.7.6.2x-1
SPECIMEN MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Include 'Specimen Macro' Table C.7.6.2x-2			

Table C.7.6.2x-2
SPECIMEN MACRO

Attribute Name	Tag	Type	Attribute Description
Container Identifier	(0040,0512)	1	The identifier for the container that contains the specimen(s) being imaged. See Section C.7.6.2x.1.1.
Issuer of the Container Identifier Sequence	(0040,0513)	2	Organization that assigned the Container Identifier. Zero or one Item shall be present.
>Include 'HL7v2 Hierarchic Designator' Macro Table 10-x			
Alternate Container Identifier Sequence	(0040,0515)	3	Sequence of alternate identifiers for the container that contains the specimen(s) being imaged. These may have been assigned, e.g., by the manufacturer, or by another institution that collected the specimen. One or more Items may be present.
>Container Identifier	(0040,0512)	1	The identifier for the container that contains the specimen(s) being imaged.
>Issuer of the Container Identifier Sequence	(0040,0513)	2	Organization that assigned the Container Identifier. Zero or one Item shall be present.
>>Include 'HL7v2 Hierarchic Designator Macro' Table 10-x			
Container Type Code Sequence	(0040,0518)	2	Type of container that contains the specimen(s) being imaged. Zero or one item shall be present.
>Include 'Code Sequence Macro' Table 8.8-1			*Baseline Context ID is 8101*
Container Description	(0040,051A)	3	Description of the container.
Container Component Sequence	(0040,0520)	3	Description of one or more components of the container (e.g., description of the slide and of the coverslip). One or more Items may be present.
>Container Component Type Code Sequence	(0050,0012)	1	Type of container component. One Item shall be present.
>>Include 'Code Sequence Macro' Table 8.8-1			*Baseline Context ID is 8102*
>Manufacturer	(0008,0070)	3	Manufacturer of the container component.
>Manufacturer's Model Name	(0008,1090)	3	Manufacturer's model name of the container component.

>Container Component ID	(0050,001B)	3	Manufacturer's identifier of the container component, e.g., Lot Number and/or Version.
>Container Component Length	(0050,001C)	3	Length in mm of container component.
>Container Component Width	(0050,0015)	3	Width in mm of container component.
>Container Component Diameter	(0050,001D)	3	Diameter in mm of container component for cylindrical or circular components.
>Container Component Thickness	(0050,0013)	3	Thickness in mm of container component
>Container Component Material	(0050,001A)	3	Material of container component. Defined Terms: GLASS PLASTIC METAL
>Container Component Description	(0050,001E)	3	Container component text description.
Specimen Description Sequence	(0040,0560)	1	Sequence of identifiers and detailed description of the specimen(s) being imaged. One or more Items shall be present. Each specimen imaged in the Pixel Data shall be identified by an Item in this Sequence. Other specimens in/on the container, but not imaged in the Pixel Data, may also be identified by Items in this Sequence.
>Specimen Identifier	(0040,0551)	1	A departmental information system identifier for the Specimen. See Sections C.7.6.2x.1.1 and C.7.6.2x.1.2. If a single specimen is present in a container, the value of the Specimen Identifier and the value of the Container Identifier are typically the same.
>Issuer of the Specimen Identifier Sequence	(0040,0562)	2	The name or code for the institution that has assigned the Specimen Identifier. Zero or one Item shall be present.
>>Include 'HL7v2 Hierarchic Designator Macro' Table 10-x			
>Specimen UID	(0040,0554)	1	Unique Identifier for Specimen. See Section C.7.6.2x.1.2.
>Specimen Type Code Sequence	(0040,059A)	3	Specimen Type. Only one Item shall be present.
>>Include 'Code Sequence Macro' Table 8.8-1			*Baseline Context ID is 8103*
>Specimen Short Description	(0040,0600)	3	Short textual specimen description (may include ancestor specimen descriptions).
>Specimen Detailed Description	(0040,0602)	3	Detailed textual specimen description (may include ancestor specimen descriptions).

>Specimen Preparation Sequence	(0040,0610)	2	Sequence of Items identifying the process steps used to prepare the specimen for image acquisition. This includes description of all processing necessary to interpret the image. Zero or more Items shall be present. This Sequence includes description of the specimen sampling step from an ancestor specimen, potentially back to the original part collection. See Section C.7.6.2x.1.3.
>>Specimen Preparation Step Content Item Sequence	(0040,0612)	1	Sequence of Content Items identifying the processes used in one preparation step to prepare the specimen for image acquisition. One or more Items may be present.
>>>Include 'Content Item Macro' Table 10-2			*Baseline Template ID is 8101 Specimen Preparation*
>Include 'Primary Anatomic Structure Macro' Table 10-8			Original anatomic location in patient of specimen. This location may be identical to that of the parent specimen, may be further refined by modifiers depending on the sampling procedure for this specimen, or may be a distinct concept.
>Specimen Localization Content Item Sequence	(0040,0620)	1C	Sequence of Content Items identifying the location of the specimen in the container and/or in the image. See Section C.7.6.2x.1.4. Required if multiple specimens present in the image; may be present otherwise. One or more Items shall be present.
>>Include 'Content Item Macro' Table 10-2			*Defined Template ID is 8104 Specimen Localization*

C.7.6.2x.1 Specimen Module Attributes

C.7.6.2x.1.1 Container Identifier and Specimen Identifier

"Specimen" is the role played by a discrete physical object (or a collection of objects that are considered as a unit) that is the subject of pathology examination.

A specimen is a physical object (or a collection of objects) when the laboratory considers it a single discrete, uniquely identified unit that is the subject of one or more steps in the laboratory (diagnostic) workflow. This includes objects at all levels of processing, including fresh tissue, dissected organs, tissue embedded in paraffin, sections made from embedded tissue, and liquid preparations.

Specimens are physically managed by being placed in or on a container. The concept of container includes buckets, cassettes, vials, and slides. While there is usually one specimen per container, it is possible, in some laboratory workflows, for multiple specimens to be in/on a container.

Both specimens and specimen containers have logical identifiers for workflow management. The logical identifier of a container is usually conveyed on a label on the container. The specimen itself will typically not be physically labeled with its identifier. For the usual case of a single specimen in/on a container, the logical identifiers may be identical. However, when there are multiple specimens in/on a container, each specimen receives a distinct logical identifier. These identifiers are encoded in the SOP Instance using attributes Container Identifier (0040,0512) and Specimen Identifier (0040,0551).

Notes: 1. This definition of "specimen" extends the common definition beyond the part or parts that were submitted for examination (e.g., from surgery) to include any derivative piece that may be separately analyzed or examined, such as a block or slide preparation.

2. Although many Pathology Information Systems use a hierarchical system for identifying parts, blocks and slides, there should be no assumption made that this will be the case and in particular, there should be no attempt to parse a given Specimen Identifier to retrieve an accession number or other higher level identifier.

C.7.6.2x.1.2 Specimen Identifier and Specimen UID

The Specimen Identifier (0040,0551) must be unique at least within the Study; the actual scope of uniqueness is determined by the departmental information system that assigns the IDs. Each specimen shall also be assigned a globally unique Specimen UID (0040,0554) that allows referencing beyond the scope of a Study. This UID may be used, for instance, if a specimen is sent to another institution for further analysis.

C.7.6.2x.1.3 Specimen Preparation Sequence and Specimen Preparation Step Content Item Sequence

Interpretation of specimen images requires information about the source of the specimen and its preparation (e.g., sampling, fixation, staining). The processing steps used to prepare a specimen are recorded in the Specimen Preparation Sequence (0040,0610). This sequence may include one Item for each processing step (as defined in the laboratory workflow) in the history of the specimen, and those Items are composed of a set of Content Items in the Specimen Preparation Step Content Item Sequence (0040,0612).

The Specimen Preparation Sequence may include description of the original part collected from the patient, the processing of that part, the sampling of tissue from the part and the preparation of that sample, and the further sub-sampling and processing of the tissue. In other words, the description of a specfic specimen may include descriptions of the specimen's ancestors.

The Specimen Preparation Sequence Items shall be in ascending chronological order.

C.7.6.2x.1.4 Specimen Localization Content Item Sequence

When there are multiple specimens in/on a container, the Specimen Localization Content Item Sequence (0040,0620) is used to identify the location of the specimen in the container, as there is no physical label with the Specimen Identifier. This Content Item Sequence, in accordance with TID 8004, allows the specimen to be localized by a distance in one to three dimensions from a reference point on the container, by an identified physical description such as a colored ink, or by its location as shown in a referenced image of the container. The referenced image may use an overlay, burned-in annotation, or an associated Presentation State SOP Instance to specify the location of the specimen.

Change attribute used to identify images with the Specimen Module (which uses the Primary Anatomic Structure Sequence within the Specimen Description Sequence for anatomic location)

C.8.12.1 VL Image Module

Table C.8-77 specifies the Attributes that describe a VL Image produced by Endoscopy (ES), General Microscopy (GM), Slide Microscopy (SM), External-camera Photography (XC), or other VL imaging Modalities.

Table C.8-77
VL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
…	…	…	…
Anatomic Region Sequence	(0008,2218)	1C	Sequence that identifies the anatomic region of interest in this image (i.e. external anatomy, surface anatomy, or general region of the body). Only a single Item shall be permitted in this sequence. Required if Number of Frames (0028,0008) is present and **~~Specimen Accession Number (0040,050A)~~ Specimen Description Sequence (0040,0560)** is absent. May be present otherwise.
…			
*Include 'Primary Anatomic Structure Macro' Table 10~~.x 4~~ **8***			*No Context ID is defined.* ***These Type 3 Attributes are not appropriate when Specimen Description Sequence (0040,0560) is present, as it includes the Primary Anatomic Structure Macro for each specimen in the image.***
…			

1250

1255

Changes to NEMA Standards Publication PS 3.4-2008

Digital Imaging and Communications in Medicine (DICOM)

Part 4: Service Class Specifications

Modify PS3.4 Section C.6.1.1.5

C.6.1.1.5 Composite Object Instance Level

Table C.6-4 defines the keys at the Composite object instance Information level of the Patient Root Query/Retrieve Information Model.

Table C.6-4
COMPOSITE OBJECT INSTANCE LEVEL KEYS FOR THE PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL

Description	Tag	Type
Instance Number	(0020,0013)	R
SOP Instance UID	(0008,0018)	U
…		
Content Template Sequence	(0040,A504)	O
>Template Identifier	(0040,DB00)	O
>Mapping Resource	(0008,0105)	O
Container Identifier	**(0040,0512)**	**O**
Specimen Description Sequence	**(0040,0560)**	**O**
>Specimen Identifier	**(0040,0551)**	**O**
>Specimen UID	**(0040,0554)**	**O**
All Other Attributes at composite object instance Level		O

Notes: 1. SOP Class UID (0008,0016) is an optional key, but it is strongly recommended that it always be returned by all SCPs, if matching is requested.

2. The Concept Name Code Sequence (0040,A043) and Content Template Sequence (0040,A504) are optional keys that are useful for identifying instances of various Structured Reporting Storage SOP Classes. It is strongly recommended that these keys be supported by the SCP for query against such instances.

3. Container Identifier (0040,0512) and Specimen Description Sequence (0040,0560) are optional keys that are useful for identifying instances of Image SOP Classes that include the Specimen Module. It is strongly recommended that these keys be supported by an SCP operating in a pathology laboratory context for query against such instances.

Modify PS3.4 Section F.7.2.1.1

F.7.2.1.1 Modality Performed Procedure Step Subset Specification

The Application Entity which claims conformance to this SOP Class as an SCU must provide all Required Attributes as specified in Table F.7.2-1. Optional Attributes maintained by the SCP may be provided as well. The Application Entity which claims conformance as an SCP to this SOP Class shall support the subset of the Modality Performed Procedure Step Attributes specified in Table F.7.2-1.

Table F.7.2-1
MODALITY PERFORMED PROCEDURE STEP SOP CLASS N-CREATE, N-SET AND FINAL STATE ATTRIBUTES

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Requirement Type Final State (See Note 1)
…				
Performed Series Sequence	(0040,0340)	2/2	3/1	1 (See note 2)
…				
>Referenced Image Sequence	(0008,1140)	2/2	2/2	See F.7.2.2.2.
>>Referenced SOP Class UID	(0008,1150)	1/1	1/1	
>>Referenced SOP Instance UID	(0008,1155)	1/1	1/1	
>>Container Identifier	**(0040,0512)**	**3/3**	**3/3**	
>>Specimen Description Sequence	**(0040,0560)**	**3/3**	**3/3**	
>>>Specimen Identifier	**(0040,0551)**	**1/1**	**1/1**	
>>>Specimen UID	**(0040,0554)**	**1/1**	**1/1**	
…				

Modify PS3.4 Section K.6

1295 **K.6.1.2.2 Modality Worklist Attributes**

Table K.6-1
ATTRIBUTES FOR THE MODALITY WORKLIST INFORMATION MODEL

Description / Module	Tag	Matching Key Type	Return Key Type	Remark/Matching Type
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)	R	1	The Attributes of the Scheduled Procedure Step shall only be retrieved with Sequence Matching. The Scheduled Procedure Step Sequence shall contain only a single Item.
> …				
>All other Attributes from the Scheduled Procedure Step **Sequence**		O	3	
Scheduled Specimen Sequence	**(0040,0500)**	**O**	**3**	**One or more Items may be returned in this Sequence.**
>Container Identifier	**(0040,0512)**	**O**	**1**	
>Container Type Code Sequence	**(0040,0518)**	**-**	**2**	**Zero or one Item shall be returned in this Sequence.**
>>Code Value	**(0008,0100)**	**-**	**1**	
>>Coding Scheme Designator	**(0008,0102)**	**-**	**1**	
>>Coding Scheme Version	**(0008,0103)**	**-**	**3**	
>>Code Meaning	**(0008,0104)**	**-**	**1**	
>Specimen Description Sequence	**(0040,0550)**	**O**	**1**	**One or more Items may be returned in this Sequence.**
>>Specimen Identifier	**(0040,0551)**	**O**	**1**	
>>Specimen UID	**(0040,0554)**	**O**	**1**	
>>All other Attributes from the Specimen Description Sequence		**O**	**3**	**Specimen Preparation Sequence (0040,0610), if present, describes preparation steps already performed, not scheduled procedure steps**
>All other Attributes from the Scheduled Specimen Sequence		**O**	**3**	
Requested Procedure				
…				

1300

1305

Changes to NEMA Standards Publication PS 3.6-2008

Digital Imaging and Communications in Medicine (DICOM)

Part 6: Data Dictionary

In PS 3.6, retire existing data elements and add new data elements:

(0040,050A)	*Specimen Accession Number*	*LO*	*1*	***RET***
(0040,0550)	*Specimen Sequence*	*SQ*	*1*	***RET***
(0040,0551)	Specimen Identifier	LO	1	
(0040,059A)	Specimen Type Code Sequence	SQ	1	
(0040,06FA)	*Slide Identifier*	*LO*	*1*	***RET***
(0040,0500)	**Scheduled Specimen Sequence**	**SQ**	**1**	
(0040,0512)	**Container Identifier**	**LO**	**1**	
(0040,0513)	**Issuer of the Container Identifier Sequence**	**SQ**	**1**	
(0040,0515)	**Alternate Container Identifier Sequence**	**SQ**	**1**	
(0040,0518)	**Container Type Code Sequence**	**SQ**	**1**	
(0040,051A)	**Container Description**	**LO**	**1**	
(0040,0520)	**Container Component Sequence**	**SQ**	**1**	
(0040,0560)	**Specimen Description Sequence**	**SQ**	**1**	
(0040,0562)	**Issuer of the Specimen Identifier Sequence**	**SQ**	**1**	
(0040,0554)	**Specimen UID**	**UI**	**1**	
(0040,0600)	**Specimen Short Description**	**LO**	**1**	
(0040,0602)	**Specimen Detailed Description**	**UT**	**1**	
(0040,0610)	**Specimen Preparation Sequence**	**SQ**	**1**	
(0040,0612)	**Specimen Preparation Step Content Item Sequence**	**SQ**	**1**	
(0040,0620)	**Specimen Localization Content Item Sequence**	**SQ**	**1**	
(0050,0012)	**Container Component Type Code Sequence**	**SQ**	**1**	
(0050,0015)	**Container Component Width**	**FD**	**1**	
(0050,0013)	**Container Component Thickness**	**FD**	**1**	
(0050,001A)	**Container Component Material**	**CS**	**1**	
(0050,001B)	**Container Component ID**	**LO**	**1**	
(0050,001C)	**Container Component Length**	**FD**	**1**	
(0050,001D)	**Container Component Diameter**	**FD**	**1**	
(0050,001E)	**Container Component Description**	**LO**	**1**	

1315

1320

Changes to NEMA Standards Publication PS 3.16-2008

Digital Imaging and Communications in Medicine (DICOM)

Part 16: Content Mapping Resource

In PS 3.16, add normative reference to HL7

2 Normative references

ANSI/HL7 V2.6-2007 HL7 Standard Version 2.6 – An Application Protocol for Electronic Data Exchange in Healthcare Environments

In PS 3.16, make specimen subject context consistent with new Specimen Module:

TID 1009 Subject Context, Specimen

Identifies (and optionally describes) a specimen that is the subject.

TID 1009
SUBJECT CONTEXT, SPECIMEN
Type: Extensible

	NL	Rel with Parent	VT	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			UIDREF	EV (121039, DCM, "Specimen UID")	1	U		
~~2~~			~~TEXT~~	~~EV (121040,DCM, "Specimen Accession Number")~~	~~1~~	~~U~~		~~Defaults to value of Specimen Accession Number (0040,050A) in Specimen Identification Module~~
~~3~~2			INCLUDE	DTID (1007) Patient Subject Context	1	UC	IFF the source of the specimen is a human or animal patient	
~~4~~3			TEXT	EV (121041, DCM, "Specimen Identifier")	1	U		~~Defaults to value of Specimen Identifier (0040,0551) if a single item of Specimen Sequence (0040,0550) is present in Specimen Identification Module~~
4			TEXT	EV (111724, DCM, "Issuer of Specimen Identifier")	1	U		See note
5			CODE	EV (~~121042,DCM~~ R-00254, SRT, "Specimen Type")	1	U		~~Defaults to value of Specimen Type Code Sequence (0040,059A) if a single item of Specimen Sequence (0040,0550) is present in Specimen Identification Module~~ DCID (8103) Anatomic Pathology Specimen Types
6			TEXT	EV (~~121043~~111700, DCM, "~~Slide~~ Specimen Container Identifier")	1	U		~~Defaults to value of Slide Identifier (0040,06FA) if a single item of Specimen Sequence (0040,0550) is present in Specimen Identification Module~~
~~7~~			~~UIDREF~~	~~EV (121044,DCM, "Slide UID")~~	~~1~~	~~U~~		

Content Item Descriptions

Row 4	The Issuer of Specimen Identifier shall be formatted in accordance with the HL7 v2 Hierarchic Designator data type (see HL7 v2.6 Section 2.A.33), i.e., [*Namespace ID*]^[*Universal ID^Universal ID Type*]

In PS 3.16, replace other uses of DCM with SNOMED specimen type:

TID 3112 Specimen Obtained

The Specimen Obtained Template allows recording of obtaining a specimen, and the identifiers for that specimen. This is particularly designed for blood samples that will be analyzed for blood oxygen-related measurements. The analysis of the sample may be recorded in one or more log entries using TID 3109 Measurements Template, or in a separate Structured Report SOP Instance referenced by a log entry using TID 3103 Referenced Object Template.

TID 3112
Specimen Obtained
Type: Extensible

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CODE	EV (121123, DCM, "Patient Status or Event")	1	M		DCID (3515) Specimen Collection
2	>	HAS ACQ CONTEXT	CODE	EV (~~**121042,DCM**~~ **R-00254, SRT**, "Specimen Type")	1	UC	IFF specimen is blood sample	DCID (3520) Blood Source Type
3	>	HAS ACQ CONTEXT	CODE	EV (G-C0E9, SRT, "Procedure site")	1	U		BCID (3630) Cardiovascular Anatomic locations
4	>	HAS PROPERTIES	INCLUDE	DTID (1009) Subject Context, Specimen	1	U		

…

TID 3516 Blood Lab Measurements

The Blood Lab Measurements template provides for the recording of measurements made on blood samples obtained during a catheterization procedure. The type and anatomic source of the blood is recorded as acquisition context. The results from the blood chemistry measurement system are quoted; the measurement names may be pre-coordinated with the type or source of the blood, or generic measurement names may be reported. In the latter case, the full measurement concept name may be effectively post-coordinated using the recorded acquisition context.

TID 3516
Blood Lab Measurements
Type: Extensible

	NL	Relation with Parent	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1			CONTAINER	EV (122125, DCM, "Blood lab measurements")	1	M		
2	>	HAS ACQ CONTEXT	CODE	EV (~~**121042,DCM**~~ **R-00254, SRT**, "Specimen Type")	1	M		DCID (3520) Blood Source Type
3	>	HAS ACQ CONTEXT	CODE	EV (G-C0E9, SRT, "Procedure site")	1	M		BCID (3630) Cardiovascular Anatomic Locations
…	…	…	…	…	…	…	…	…

In PS 3.16, add context groups for generic and Anatomical Pathology Specimen Types:

CID 8101 Container Types

Context ID 8101
Container Types

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	A-0101E	Tissue cassette
SRT	A-01022A-01022	Tissue microarray cassette
SRT	A-01024	Specimen vial
SRT	A-0101B	Microscope slide
SRT	A-01023	Specimen container
SRT	A-01021	Electron microscopy grid
SRT	A-01025	Specimen well

CID 8102 Container Component Types

Context ID 8102
Container Component Types

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
Include CID 8101 Container Types		
SRT	A-0101D	Microscope slide cover slip
SRT	F-62219	Microscope slide mounting media
SRT	A-0101F	Specimen container lid

CID 8103 Anatomic Pathology Specimen Types

Context ID 8103
Anatomic Pathology Specimen Types

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	T-D0010	Entire body
SRT	G-80A5	Body substance sample
SRT	G-80A6	Body fluid sample
SRT	G-8300	Tissue specimen
SRT	G-843A	Gross specimen
SRT	G-8439	Tissue section
SRT	G-843B	Core sample of tissue block
SRT	G-843C	Tissue spot
SRT	G-81EA	Slide

SRT	G-803C	Smear sample
SRT	T-1A404	Touch preparation cytologic material
SRT	T-1A403	Liquid based cytologic material
SRT	G-8003	Aspirate
SRT	G-81A0	Genetic sample
Include CID 8104 Breast Tissue Specimen Types		

CID 8104 Breast Tissue Specimen Types

Context ID 8104
Breast Tissue Specimen Types

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	G-8346	breast duct sample
SRT	G-8339	frozen section breast sample
SRT	G-833D	lumpectomy breast sample
SRT	G-8430	specimen from breast obtained by excision
SRT	G-8311	specimen from breast obtained by total mastectomy
SRT	G-833F	segmentectomy breast sample
SRT	G-832D	breast tru-cut biopsy sample
SRT	G-8318	specimen from breast obtained by core needle biopsy
SRT	G-8319	specimen from breast, stereotactically guided core needle biopsy
SRT	G-831B	specimen from breast by incisional biopsy of breast mass
SRT	R-003AC	specimen from breast obtained by image guided core biopsy

CID 8109 Specimen Collection Procedure

Context ID 8109
Specimen Collection Procedure

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	P1-03130	Aspiration
SRT	P1-03100	Biopsy
SRT	P1-03000	Excision
SRT	P1-03000	Resection
SRT	P1-0D300	Harvesting of tissue
SRT	P1-03021	Removal of device

SRT	P1-38200	Venipuncture
SRT	P0-00593	Taking of swab
SRT	P3-02000	Specimen collection
SRT	P1-03154	Scraping

CID 8110 Specimen Sampling Procedure

Context ID 8110
Specimen Sampling Procedure

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	P1-01003	Dissection
DCM	111726	Dissection with entire specimen submission
DCM	111727	Dissection with representative sections submission
SRT	P3-40011	Core sampling
SRT	P3-4000D	Block sectioning
SRT	P3-40004	Laser microdissection
SRT	P3-4000E	Block surface recut
SRT	P3-4000F	Block step sectioning
SRT	P3-4500A	Touch preparation (procedure)
SRT	P3-00048	Smear procedure

CID 8111 Specimen Preparation Procedure

Context ID 8111
Specimen Preparation Procedure

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning	HL7 v3 ActClass equivalent
SRT	P3-02000	Specimen collection	SPECCOLLECT
SRT	P3-05013	Specimen receiving	CONTREG
SRT	P3-4000A	Sampling of tissue specimen	PROC
SRT	P3-00003	Staining	SPCTRT
SRT	P3-05000	Specimen processing	SPCTRT
DCM	111729	Specimen storage	STORE

1405 **CID 8112 Specimen Stains**

Context ID 8112
Specimen Stains

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	C-22860	acid fast stain
SRT	C-2280A	acid phosphatase stain
SRT	C-2280B	Albert's stain
SRT	C-22963	alcian blue 8GX stain
SRT	C-2288B	alcian blue stain
SRT	C-22932	alcohol soluble nigrosine stain
SRT	C-2286D	aldehyde fuchsin stain
SRT	C-22961	alizarin blue S stain
SRT	C-22959	alizarin cyanine green stain
SRT	C-22953	alizarin red S stain
SRT	C-22813	alizarin yellow GG stain
SRT	C-22814	alizarin yellow R stain
SRT	C-2285B	alkaline phosphatase stain
SRT	C-2287E	aniline blue stain
SRT	C-2280C	auramine stain
SRT	C-22873	azo black stain
SRT	C-22929	azocarmine G (GX) stain
SRT	C-22842	azophloxin stain
SRT	C-22831	azorubin S stain
SRT	C-22945	azure A stain
SRT	C-22946	azure B stain
SRT	C-22944	azure C stain
SRT	C-2286E	bauer's chromic acid leucofuchsin stain
SRT	C-22872	benzo fast scarlet stain
SRT	C-2280D	beta-glucuronidase stain
SRT	C-22866	biebrich scarlet stain
SRT	C-22848	bismark brown R stain
SRT	C-22848	bismark brown Y stain
SRT	C-22921	blue shade eosin stain
SRT	C-22965	brazilin stain
SRT	C-22934	brilliant cresyl blue stain
SRT	C-22869	brilliant crocein stain
SRT	C-22865	brilliant orange stain
SRT	C-22857	brilliant yellow stain
SRT	C-2283C	butyrate esterase stain
SRT	C-2286B	carbol fuchsin stain
SRT	C-22971	carmine stain

SRT	C-22972	carminic acid stain
SRT	C-22822	carmoisine A stain
SRT	C-22936	celestine blue B stain
SRT	C-2280E	chloroacetate esterase stain
SRT	C-2287B	chromic acid stain
SRT	C-22838	chromotrope 2R stain
SRT	C-22806	chrysoidine R stain
SRT	C-22805	chrysoidine Y stain
SRT	C-22973	cochineal stain
SRT	C-22837	colloidal iron stain
SRT	C-22851	Congo red stain
SRT	C-22847	cresyl echt violet stain
SRT	C-22840	cresyl violet stain
SRT	C-22833	crystal ponceau stain
SRT	C-2283D	crystal violet stain
SRT	C-22966	curcumin stain
SRT	C-22826	diamond black stain
SRT	C-22871	durazol red stain
SRT	C-22852	erie garnet stain
SRT	C-22839	eriochrome blue black SE stain
SRT	C-22924	erythrosin B stain
SRT	C-22923	erythrosin Y stain
SRT	C-22854	Evans blue stain
SRT	C-22883	fast blue B salt stain
SRT	C-22881	fast blue BB salt stain
SRT	C-22878	fast blue RR salt stain
SRT	C-22882	fast garnet GBC salt stain
SRT	C-22886	fast green FCF stain
SRT	C-22876	fast red B salt stain
SRT	C-22877	fast red ITR stain
SRT	C-22875	fast red TR salt stain
SRT	C-22867	fast sulfon black F stain
SRT	C-22879	fast violet B salt stain
SRT	C-22859	fat red 7B stain
SRT	C-2280F	Feulgen reaction stain
SRT	C-22810	field's stain
SRT	C-22816	Flagellar stain
SRT	C-22A00	fluorescent stain
SRT	C-2286C	fouchet stain
SRT	C-22902	fuchsin acid stain
SRT	C-22889	fuchsin basic stain
SRT	C-22935	gallocyanine stain
SRT	F-61968	giemsa stain

SRT	C-22830	gram stain
SRT	C-2286F	hansel stain
SRT	C-22967	hematein stain
SRT	C-22968	hematoxylin stain
SRT	C-22817	immunofluorescent stain
SRT	C-2285C	India ink stain
SRT	C-22962	indigo carmine stain
SRT	C-22927	indophenol from naphthol stain
SRT	C-22974	insoluble berlin blue stain
SRT	C-22804	janus green B stain
SRT	C-22818	Jenner-Giemsa stain
SRT	C-22899	kenacid blue R stain
SRT	C-22942	lacmoid stain
SRT	C-22819	Leishman stain
SRT	C-22887	light green SF stain
SRT	C-22841	lissamine fast red B stain
SRT	C-22843	lissamine fast yellow stain
SRT	C-22914	lissamine green B stain
SRT	C-22917	lissamine rhodamine stain
SRT	C-2283F	luxol fast blue stain
SRT	C-22890	malachite green stain
SRT	C-2283A	Mallory bleach stain
SRT	C-22802	martius yellow stain
SRT	C-2281A	may-Grunwald giemsa stain
SRT	C-22937	meldola blue stain
SRT	C-22811	metanil yellow stain
SRT	C-22907	methyl blue stain
SRT	C-2281B	methyl green pyronin stain
SRT	C-22809	methyl orange stain
SRT	C-22808	methyl red stain
SRT	C-2287C	methyl violet stain
SRT	C-22947	methylene blue stain
SRT	C-2284A	methylene violet stain
SRT	C-22952	methylene violet stain (Bernthsen)
SRT	C-2287F	modified trichrome stain
SRT	C-2284B	mucicarmine stain
SRT	C-2281C	myeloperoxidase stain
SRT	C-22846	naphthalene black 12B stain
SRT	C-22801	naphthol green B stain
SRT	C-22803	naphthol yellow S stain
SRT	C-2285D	naphthol-AS-D-chloracetate esterase stain
SRT	C-22928	neutral red stain
SRT	C-2281D	neutrophil alkaline phosphatase stain

SRT	C-22891	new fuchsin stain
SRT	C-2284C	night blue stain
SRT	C-22941	nile blue stain
SRT	C-22823	nitrazine yellow stain
SRT	C-2281E	nonspecific esterase stain
SRT	C-22955	nuclear fast red stain
SRT	C-22863	oil red O stain
SRT	C-22832	orange G stain
SRT	C-22824	orange II stain
SRT	C-2284D	orcein stain
SRT	C-22901	page blue 83 stain
SRT	C-22989	page blue G-90 stain
SRT	C-22885	patent blue V sodium salt stain
SRT	C-2281F	periodic acid Schiff stain
SRT	R-F748A	permethrin stain
SRT	C-2285E	peroxidase stain
SRT	C-22922	phloxin B stain
SRT	C-2284E	phosphotungstic acid-hematoxylin stain
SRT	C-22829	ponceau 3R stain
SRT	C-22868	ponceau S stain
SRT	C-22828	ponceau xylidine stain
SRT	C-22855	pontamine sky blue 5BX stain
SRT	C-22856	pontamine sky blue 6BX stain
SRT	C-22870	potassium hydroxide stain
SRT	C-22956	procion brilliant blue MRS stain
SRT	C-2288A	protargol S stain
SRT	C-22820	Prussian blue stain
SRT	C-2284F	quinacrine fluorescent stain
SRT	C-2286A	rhodamine stain
SRT	C-2282A	Romanowsky stain
SRT	C-22925	rose bengal stain
SRT	C-22908	rosolic acid sodium salt stain
SRT	C-22964	saffron stain
SRT	F-61DA5	safranin stain
SRT	C-22931	safranine O stain
SRT	C-2287A	silver nitrate stain
SRT	C-22836	silver stain
SRT	C-22874	sirius red F3B stain
SRT	C-22912	solochrome azurine (BS) stain
SRT	C-22821	solochrome black 6B stain
SRT	C-22909	solochrome cyanine R stain
SRT	C-22825	solochrome dark blue stain
SRT	C-22975	soluble berlin blue stain

SRT	C-22906	spirit soluble aniline blue stain
SRT	C-22920	spirit soluble eosin stain
SRT	C-2282B	spore stain
SRT	C-2282D	Sudan stain
SRT	C-22827	sunset yellow FCF stain
SRT	C-2285A	tartrate resistant acid phosphatase
SRT	C-22844	tartrazine stain
SRT	C-2285F	terminal deoxynucleotidyl transferase stain
SRT	C-2288D	thioflavine S stain
SRT	C-22926	thioflavine T stain
SRT	C-22850	thionin stain
SRT	C-22943	thionine stain
SRT	C-22845	titan yellow stain
SRT	C-2287D	trichrome stain
SRT	C-22815	tropaeolin O stain
SRT	C-22812	tropaeolin OO stain
SRT	C-22853	trypan blue stain
SRT	C-2283E	Van Gieson stain
SRT	C-22880	verhoeff's hematoxylin stain
SRT	C-22858	vital new red stain
SRT	C-22904	water soluble aniline blue stain
SRT	C-22954	water soluble anthracene brown stain
SRT	C-22933	water soluble nigrosine stain
SRT	C-22957	waxoline blue stain
SRT	F-61E5A	wayson stain
SRT	F-619B7	wright stain
SRT	C-22888	xylene cyanol FF stain
SRT	C-2282C	Ziehl-Neelsen stain
SRT	C-22A08	acridine orange stain
SRT	C-22A07	acriflavine stain
SRT	C-22A03	atebrin FS stain
SRT	C-22A02	auramine G stain
SRT	C-22A01	auramine O stain
SRT	C-22A11	coriphosphine stain
SRT	C-22A05	fluorescein stain
SRT	C-22AA1	fluorexon stain
SRT	C-22A04	rhodamine B stain
SRT	C-22A06	Fluorescein sodium stain
SRT	C-22864	Sudan black B stain
SRT	C-2282E	Sudan black stain
SRT	C-22958	Sudan blue stain
SRT	C-22807	Sudan II stain
SRT	C-22861	Sudan III stain

SRT	C-22862	Sudan IV stain
SRT	C-22903	alkali blue 5B (4B) stain
SRT	C-22905	alkali blue 6B stain
SRT	C-22911	chrome azurol S stain
SRT	C-22918	dibromofluorescein stain
SRT	C-22897	ethyl violet stain
SRT	C-22896	methyl green stain
SRT	C-22892	methyl violet 2B stain
SRT	C-22894	methyl violet 6B stain
SRT	C-22916	pyronine B stain
SRT	C-22915	pyronine G stain
SRT	C-22951	toluidine blue stain
SRT	C-22895	victoria blue 4R stain
SRT	C-22913	victoria blue B stain
SRT	C-22919	water soluble eosin stain

CID 8113 Specimen Preparation Steps

Context ID 8113
Specimen Preparation Steps

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	P3-40005	Specimen microwave heating
SRT	P3-40009	Specimen steam heating
SRT	P3-40006	Protease digestion of tissue specimen
SRT	P3-4000B	Specimen dehydration
SRT	P3-05050	Specimen freezing
SRT	P3-40003	Specimen clearing

CID 8114 Specimen Fixatives

Context ID 8114
Specimen Fixatives

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	C-2141C	Neutral Buffered Formalin
SRT	F-62235	Bouin's fluid
SRT	C-2141B	Formalin aqueous solution of formaldehyde
SRT	F-62231	Carnoy's fluid

SRT	F-62238	Formol sublimate
SRT	F-62233	Helly's fluid
SRT	F-6220F	Michel's medium
SRT	F-62234	Zenker's fluid
SRT	C-21403	Paraformaldehyde
SRT	C-21624	Acetic acid
SRT	C-20830	Chloroform
SRT	C-12916	Chromium trioxide
SRT	C-21047	Ethanol
SRT	C-21402	Formaldehyde
SRT	C-13321	Mercuric chloride
SRT	C-2102B	Methanol
SRT	C-15211	Osmium tetroxide
SRT	C-21919	Picric acid
SRT	C-13518	Potassium dichromate

CID 8115 Specimen Embedding Media

Context ID 8115
Specimen Embedding Media

Type: Extensible Version: 20080626

Coding Scheme Designator	Code Value	Code Meaning
SRT	F-616D8	Paraffin wax
SRT	F-62232	Tissue freezing medium
SRT	C-2A000	Plastic
SRT	C-84085	Agar
SRT	C-2A400	Epoxy resin
SRT	C-100EA	Acrylic resin

In PS 3.16 Annex B, modify CID 4014

CID 4014 View for Mammography

Context ID 4014
View for Mammography

Type: Non-Extensible Version: ~~20040322~~20080626

Coding Scheme Designator (0008,0102)	Code Value (0008,0100)	Code Meaning (0008,0104)	ACR MQCM 1999 Equivalent
…			
SRT	R-1024B	cranio-caudal exaggerated medially	XCCM
SRT	**G-8310**	**tissue specimen from breast**	

In PS 3.16 Annex C, add acquisition context templates:

TID 8001 Specimen Preparation

This template describes a single specimen preparation step.

TID 8001
Specimen Preparation
Type: Extensible

	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	TEXT	EV (121041, DCM, "Specimen Identifier")	1	M		
2	TEXT	EV (111724, DCM, "Issuer of Specimen Identifier")	1	U		
3	CODE	EV (111701, DCM, "Processing type")	1	M		DCID (8111) Specimen Preparation Procedure
4	DATETIME	DT (111702, DCM, "Datetime of processing")	1	U		
5	TEXT	DT (111703, DCM, "Processing step description")	1	U		
6	CODE	DT (111703, DCM, "Processing step description")	1	U		DCID (8113) Specimen Preparation Steps
7	CODE	DT (P3-02000, SRT, "Specimen Collection")	1	MC	IFF Row 3 Processing Type value is (P3-02000, SRT, "Specimen Collection")	BCID (8109) Specimen Collection Procedure
8	INCLUDE	DTID (8002) Specimen Sampling	1	MC	IFF Row 3 Processing Type value is (P3-4000A, SRT, "Specimen Sampling")	
9	INCLUDE	DTID (8003) Specimen Staining	1	MC	IFF Row 3 Processing type value is (P3-00003, SRT, Staining	
10	CODE	DT (F-6221B, SRT, "Tissue Fixative")	1	U		BCID (8114) Specimen Fixatives
11	CODE	DT (F-6221A, SRT, "Embedding medium")	1	U		BCID (8115) Specimen Embedding Media

Content Item Descriptions

Row 1	For sampling steps (which create a child specimen from a parent), the ID is that of the child specimen. For other preparation steps, the ID of a specimen does not change during the processing.
Row 2	The issuer shall be formatted in accordance with the HL7v2 Hierarchic Designator Data Type. That format is [*Namespace ID*]^[*Universal ID^Universal ID Type*], where *Namespace ID* identifies an entity within the local namespace or domain, *Universal ID* is a universal or unique identifier for an entity, and *Universal ID Type* specifies the standard format of the Universal ID (see HL7 v2 Section 2.A.33).

TID 8002 Specimen Sampling

1445

TID 8002
Specimen Sampling
Type: Extensible

	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	CODE	DT (111704, DCM, "Sampling Method")	1	M		BCID (8110) Specimen Sampling Procedure
2	TEXT	DT (111705, DCM, "Parent Specimen Identifier")	1	M		
3	TEXT	DT (111706, DCM, "Issuer of Parent Specimen Identifier")	1	U		
4	CODE	DT (111707, DCM, "Parent specimen type")	1	M		BCID (8103) Anatomic Pathology Specimen Types
5	TEXT	DT (111708, DCM, "Position Frame of Reference")	1	U		
6	TEXT	DT (111709, DCM, "Location of sampling site")	1	U		
7	NUM	DT (111710, DCM, "Location of sampling site X offset")	1	U		
8	NUM	DT (111711, DCM, "Location of sampling site Y offset")	1	U		
9	NUM	DT (111712, DCM, "Location of sampling site Z offset")	1	U		
10	IMAGE	DT (111709, DCM, "Location of sampling site")	1	U		

Content Item Descriptions

Row 3	**The Issuer of Specimen Identifier shall be formatted in accordance with the HL7 v2 Hierarchic Designator data type (see HL7 v2.6 Section 2.A.33), i.e., [*Namespace ID*]^[*Universal ID^Universal ID Type*]**
Row 5	Description of coordinate system and origin reference point on parent specimen or parent specimen container used for localizing the sampling site
Rows 7-9	The X, Y and Z locations are used as needed to describe the sampling site; not all may be needed. E.g., resection from 10 cm along the colon may be described as only a Y dimension location.
Row 10	Reference to image of parent specimen localizing the sampling site; may include referenced Presentation State object

1450

TID 8003 Specimen Staining

TID 8003
Specimen Staining
Type: Extensible

	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	CODE	DT (F-61D98, SRT, “Stain”)	1	MC	IF Row 2 not present	DCID (8112) Specimen Stains
2	TEXT	DT (F-61D98, SRT, “Stain”)	1	MC	IF Row 1 not present	

TID 8004 Specimen Localization

TID 8004
Specimen Localization
Type: Extensible

	Value Type	Concept Name	VM	Req Type	Condition	Value Set Constraint
1	TEXT	DT (111708, DCM, “Position Frame of Reference”)	1	U		
2	TEXT	DT (111718, DCM, “Location of Specimen”)	1	U		
3	NUM	DT (111719, DCM, “Location of Specimen X offset”)	1	U		
4	NUM	DT (111720, DCM, “Location of Specimen Y offset”)	1	U		
5	NUM	DT (111721, DCM, “Location of Specimen Z offset”)	1	U		
6	IMAGE	DT (111718, DCM, “Location of Specimen”)	1	U		
7	COMPOSITE	DT (111718, DCM, “Location of Specimen”)	1	U		Presentation State SOP Instance reference
8	TEXT	DT (111723, DCM, “Visual Marking of Specimen“)	1	U		

Content Item Descriptions

Row 1	Description of coordinate system and origin reference point used for localizing the Specimen. The value “CURRENT IMAGE ” identifies the frame of reference as the pixel space of the Image SOP Instance in which this Content Item occurs.
Row 2	Description of specimen location, either in absolute terms or relative to the Position Frame Reference of Row 1
Rows 3-5	Location of specimen (nominal center) relative to the Position Frame Reference of Row 1. The Content Items include the units of measurement (e.g., mm). If Row 1 value is “CURRENT IMAGE ”, measurement shall be from the top left hand corner of the Pixel Data of the SOP Instance, using units of ({pixel}, UCUM, “Pixels”).
Row 6	Reference to image of container localizing the specimen; may include referenced Presentation State object

Row 7	Reference to Presentation State object for this SOP Instance, with annotations localizing the specimen
Row 8	Description of visual distinguishing idenitifiers, e.g., ink, or a particular shape of the specimen

In PS 3.16 Annex D, add and revise definitions for specimen-related identifiers. The temporary codes (beginning with xx) will be replaced by SNOMED or DICOM Controlled Terminology codes prior to Final Text. Those terms with SNOMED codes will be removed from this table.

DICOM Code Definitions (Coding Scheme Designator "DCM" Coding Scheme Version "01")

Code Value	Code Meaning	Definition	Notes
…	…	…	…
121039	Specimen UID	Unique Identifier of specimen which is the subject of observations	
121040	***Specimen Accession Number***	***Accession Number of specimen which is the subject of observations***	***Retired.***
121041	Specimen Identifier	Identifier of specimen which is the subject of observations	
121042	***Specimen Type***	***Coded category of specimen which is the subject of observations***	***Retired. Replaced with (R-00254, SRT, "Specimen Type")***
121043	***Slide Identifier***	***Identifier of specimen microscope slide which is the subject of observations***	***Retired. Replaced with (111700, DCM, Specimen Container Identifier)***
121044	***Slide UID***	***Unique Identifier of specimen microscope slide which is the subject of observations***	***Retired.***
…	…	…	…
111700	Specimen Container Identifier	Identifier of container (box, block, microscope slide, etc.) for the specimen under observation	
111701	Processing type	Type of processing that tissue specimen underwent	
111702	Datetime of processing	Date and time of processing step	
111703	Processing step description	Description of the individual step in the tissue processing sequence	
111704	Sampling Method	Method of sampling used to derive specimen from its parent	
111705	Parent Specimen Identifier	Identifier of the parent specimen which gave rise to the current specimen	
111706	Issuer of Parent Specimen Identifier	Assigning authority for parent specimen's identifier	
111707	Parent specimen type	Parent specimen type which gave rise to current specimen	
111708	Position Frame of Reference	Description of coordinate system and origin reference point on parent specimen, or parent specimen container, or image used for localizing the sampling site or location within container or image	

111709	Location of sampling site	Reference to image of parent specimen localizing the sampling site; may include referenced Presentation State object	
111710	Location of sampling site X offset	Location of sampling site of specimen (nominal center) relative to the Position Frame of Reference.	
111711	Location of sampling site Y offset	Location of sampling site of specimen (nominal center) relative to the Position Frame of Reference.	
111712	Location of sampling site Z offset	Location of sampling site of specimen (nominal center) relative to the Position Frame of Reference.	
111718	Location of Specimen	Description of specimen location, either in absolute terms or relative to the Position Frame of Reference	
111719	Location of Specimen X offset	Location of specimen (nominal center) relative to the Position Frame of Reference in the X dimension	
111720	Location of Specimen Y offset	Location of specimen (nominal center) relative to the Position Frame of Reference in the Y dimension	
111721	Location of Specimen Z offset	Location of specimen (nominal center) relative to the Position Frame of Reference in the Z dimension	
111723	Visual Marking of Specimen	Description of visual distinguishing idenitifiers, e.g., ink, or a particular shape of the specimen	
111724	Issuer of Specimen Identifier	Assigning authority for specimen identifier	
111726	Dissection with entire specimen submission	Dissection of specimen with submission of all its sections for further processing or examination	
111727	Dissection with representative sections submission	Dissection of specimen with submission of representative sections for further processing or examination	
111729	Specimen storage	A workflow step, during which tissue specimens are stored in a climate-controlled environment	

1470