Digital Imaging and Communications
in Medicine
(MEDICOM/DICOM)

Supplement 10

Basic Worklist Management
(Modality Worklist Management SOP Class)

Status: **Final Text - February 1, 1996**

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FOREWORD

2 ACR (the American College of Radiology) and NEMA (the National Electrical Manufacturers Association) formed a joint committee to develop a Standard for Digital Imaging and Communications in Medicine. This

4 DICOM Standard was developed according to the NEMA Procedures.

6 This Supplement to the Standard is developed by CEN TC251/WG4/PT020 in cooperation with ACR-NEMA/WG VI and CEN TC251/WG3/PT022.

8

This DICOM standard is structured as a multi-part document using the guidelines established in the following

10 document:

- ISO/IEC Directives, 1989 Part 3 - Drafting and Presentation of International Standards.

12

This document is a Supplement to the DICOM Standard. It is an extension to Parts 3, 4 and 6 of the published

14 DICOM Standard which consists of the following parts:

PS 3.1—   Introduction and Overview

16 PS 3.2—   Conformance

PS 3.3—   Information Object Definitions

18 PS 3.4—   Service Class Specifications

PS 3.5—   Data Structures and Encoding

20 PS 3.6—   Data Dictionary

PS 3.7—   Message Exchange

22 PS 3.8—   Network Communication Support for Message Exchange

PS 3.9—   Point-to-Point Communication Support for Message Exchange

24 PS 3.10   —   Media Storage and File Format

PS 3.11   —   Media Storage Application Profiles

26 PS 3.12   —   Media Format and Physical Medial for Media Interchange

PS 3.13   —   Print Management Point-to-Point Communication Support

28

These Parts are independent but related documents.

30

Note: This Supplement is influenced by the ISIS (Information System - Imaging System) Model. The ISIS

32   Model is being developed by the American College of Radiology, National Electrical Manufacturers Association, ACR-NEMA DICOM Committee, the College of American Pathologists Image

34   Exchange Committee (CAP-IEC), CEN/TC251/WG4/PT4-020: Modality-Information System Interface Project Team, and Health Level Seven (HL7) as the Real World Model for the domain of

36   the Information System - Imaging System interface. The ISIS model is a common mapping of CEN/TC251/WG3/PT-022, CEN/TC251/WG4/PT-020, HL7, CAP-IEC, and ACR-NEMA DICOM

38   Real-World-Models. The semantics of the objects and their attributes in this Standard are described in the ISIS model. This supplement uses only the subset of the ISIS Model that contains objects

40   relevant to Modality Worklist Management. The ISIS Model ensures consistency with PT3-022, CAP-IEC, and HL7.

42

Scope and Field of Application

44 This Supplement to the DICOM Standard specifies the Basic Worklist Management Service Class, which supports the exchange of any type of worklist from one AE to another AE. The Basic Worklist Management Service Class

contains the Modality Worklist SOP Class, which supports the transfer of the Modality Worklist from the Information System (IS) to the Modality.

Basic Worklist Management Service Class

This Supplement to the DICOM Standard specifies a DICOM Basic Worklist Management Service Class, which defines an application-level class-of-service which facilitates the transfer of worklists.

A worklist is the structure to present information related to a particular set of tasks. It specifies particular details for each task. The information may support the selection of the task to be performed first and may support the performance of that task. One example is the worklist used to present information about scheduled imaging procedures at an imaging modality and to the operator of that modality.

This supplement defines a service for communicating such worklists. The following are characteristics for this service class:

− The worklist has to be queried by the Application Entity (AE) associated to the equipment on which, or by which, the tasks included in the worklist have to be performed. In this query, a number of search keys can be used, defined for each particular worklist SOP class.

− The worklist consists of worklist items, each item is related to one task. A worklist item contains attributes from different objects related to the task.

Note: The Basic Worklist Management Service Class is used as a mechanism to pass the worklist from the IS to the AE associated with the application where the task is to be performed. If that application wants to send information to the IS about a task that has or has not been performed, it uses another mechanism implemented in a different Service Class.

The Basic Worklist Management Service Class is generic to support exchange of different kind of worklists. Currently there is only one SOP class defined in the Basic Worklist Management Service Class: The Modality Worklist SOP Class.

Modality Worklist SOP Class

The Modality Worklist SOP Class facilitates the transfer of worklists from the IS to the Modality comprising attributes from the real-world objects: Scheduled Procedure Step, Requested Procedure, Imaging Service Request, Service Episode, and Patient. The Modality Worklist SOP Class covers the most important requirements for interoperability between an Imaging Acquisition Device, i.e. Modality (MOD), and the Information System (IS). These Requirements are:

− Verify patient (e.g. download patient demographic information from IS to Modality, to verify that the person to be examined is the intended subject).

− Select a procedure step from the IS (e.g. download Procedure Step information from the IS to the Modality).

− Select Imaging Procedure.

− Prepare the Imaging Procedure (Step).

− Couple DICOM images with related information from the IS (e.g. patient demographics, procedure description, ID data structure from the IS, contextual IS information).

− Capture all the attributes from the IS, that are mandatory to be inserted into the DICOM Image Object

The Modality Worklist SOP Class is not intended to provide access to all IS information and services which may be of interest to a Modality operator or attending physician. It's primary focus is the efficient operation of the image acquisition equipment. DICOM SOP Classes and non-DICOM Services which fall beyond the scope of the Modality Worklist SOP Class may be needed.

2   This Supplement includes a number of Addenda to existing Parts of DICOM:

4   1.   Part 3 Addenda (Addition of Section 7 and Annex C)
     2.   Part 4 Addenda (Addition to a new Annex Z)
6   3.   Part 6 Addenda (Addition of Section 6 and Annex A)

Digital Imaging and Communications

in Medicine

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Part 3 Addendum

Basic Worklist Management

(Modality Worklist Modules)

2 | **Item #1**
Add to Part 3 the following Section 7.3 "Extension of the DICOM model of the real-world":

4

7.3 Extension of the DICOM model of the real-world

6 For the purpose of the Modality Worklist SOP Class in the Basic Worklist Management Service Class an enhancement of the original DICOM Model of the Real-World is made, as depicted in Figure 7.3.

8

Annex X discusses the relationship of this extension to the original DICOM model of the real world.

10

This subset of the real-world model covers the requirements for the Modality Worklist SOP Class in the Basic

12 Worklist Management Service Class.

14 Figure 7.3 is an abstract description of the real world objects invoked in the Modality-IS Interface. It is not to be seen as a database scheme for an implementation.

16   Note: The real world model depicted in Figure 7.3 is influenced by the ISIS (Information System - Imaging System) Model. The ISIS Model is being developed by the American College of Radiology, National

18   Electrical Manufacturers Association, ACR-NEMA DICOM Committee, the College of American Pathologists Image Exchange Committee (CAP-IEC), CEN/TC251/WG4/PT4-020: Modality-

20   Information System Interface Project Team, and Health Level Seven (HL7) as the Real World Model for the domain of the Information System - Imaging System interface. The ISIS model is a common

22   mapping of CEN/TC251/WG3/PT-022, CEN/TC251/WG4/PT-020, HL7, CAP-IEC, and ACR-NEMA DICOM Real-World-Models. The semantics of the objects and their attributes in this

24   Standard are described in the ISIS model. This supplement uses only the subset of the ISIS Model that contains objects relevant to the Worklist. The ISIS Model ensures consistency with PT3-022,

26   CAP-IEC, and HL7.

28
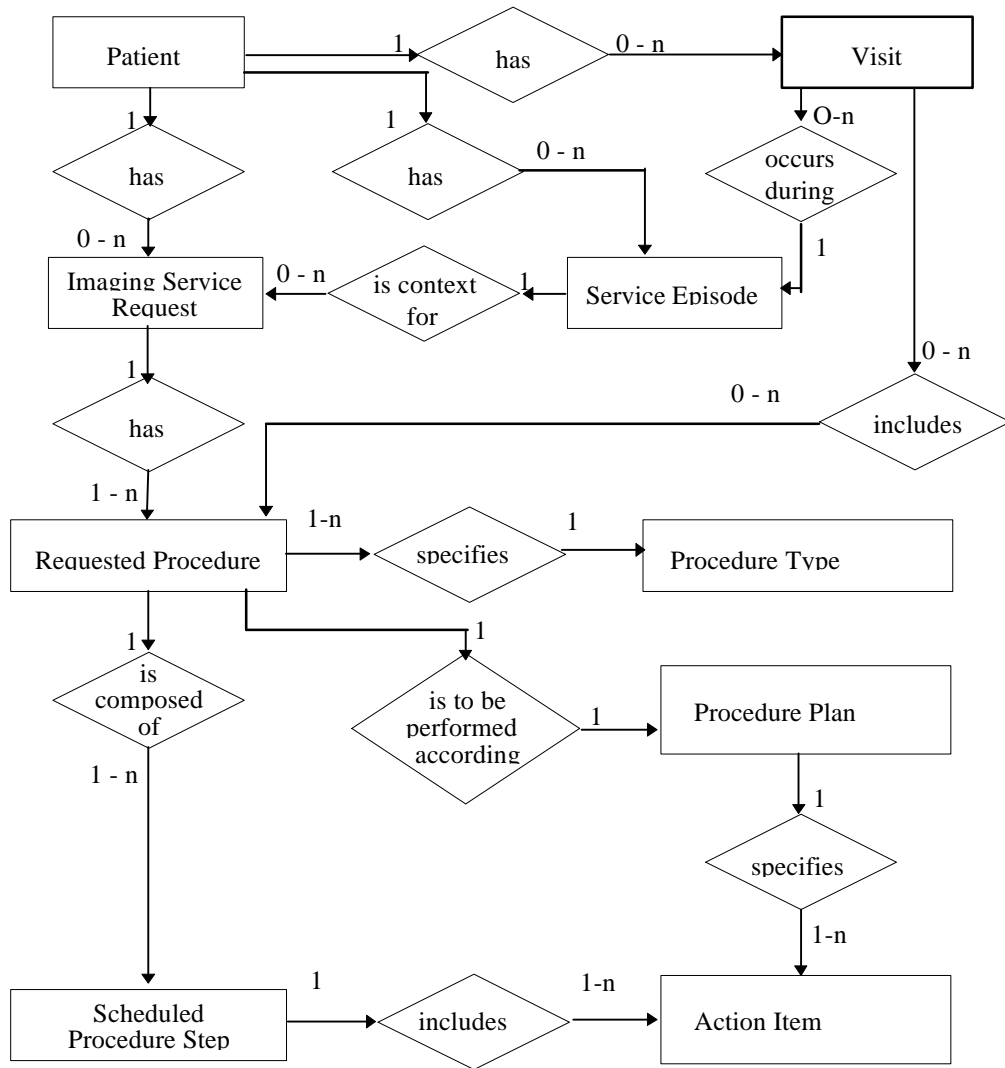
Figure 7.3. Model of the real world for the purpose of Modality-IS Interface

7.3.1. Definition of the Extensions of the DICOM Real-World Model

7.3.1.1 PATIENT

A Patient is a person receiving, or registered to receive, healthcare services.

7.3.1.2 SERVICE EPISODE

A Service Episode is a collection of events, aggregated during an interval bounded by start and stop times (e.g. an outpatient visit or a hospitalization). The definition of the start time, stop time, and included events of a Service Episode is entirely arbitrary. A Service Episode is the context in which the treatment or management of an arbitrary subset of a Patient's medical conditions occurs. In the context of imaging services, a Service Episode may involve one or more Healthcare Organizations (administrative entities that authorize Healthcare Providers to provide services within their legal administrative domain, e.g. hospitals, private physician's offices, multispecialty clinics, nursing homes). A subset of Service Episode, the Facility Episode, is the collection of events that fall

under the accountability of a particular Healthcare Organization. A Service Episode identifies the Certified Health
Care Providers who have been delegated responsibility by one or more Healthcare Organizations to provide
healthcare services to the Patient. One or more Certified Healthcare Providers (Organizations or individual
persons, e.g. physician group practices, individual physicians, technologists, nurses) may be accountable for the
healthcare services provided in a Service Episode. The Certified Health Care Providers are accountable to one or
more Healthcare Organizations and to the Patient for the outcomes of the services provided. A Service Episode
may be associated with one or more physical locations (e.g. different rooms, departments, buildings, or cities).
One or more DICOM Visits may be associated with a Service Episode.

Notes:

1. The Service Episode is defined both in the ISIS model and in this extension of the DICOM model of the real
    world, to ensure consistency with PT3-022, CAP-IEC and HL7. The DICOM Visit is a part of the Service
    Episode. The Service Episode describes several administrative aspects of healthcare, while the DICOM
    Visit is limited to the description of one visit of a Patient to a facility.

2. In the context of the Modality Worklist SOP Class, only the DICOM Visit is of relevance, the Service
    Episode Modules are not defined.

7.3.1.3 IMAGING SERVICE REQUEST

An Imaging Service Request is a set of one or more Requested Procedures selected from a list of Procedure Types.
An Imaging Service Request is submitted by one authorized imaging service requester to one authorized imaging
service provider in the context of one Service Episode. An Imaging Service Request includes pertinent specific
and general information. Each instance of an Imaging Service Request carries the information common to one or
more Requested Procedures requested at the same moment. An Imaging Service Request may be associated with
one or more DICOM Visits. The existence of an Imaging Service Request will typically result in the creation of
one or more Imaging Service Reports and the distribution of Imaging Service Reports to one or more destinations.

7.3.1.4 PROCEDURE TYPE

A Procedure Type identifies a class of procedures. In the context of imaging services, a Procedure Type is an item
in a catalog of imaging procedures that can be requested and reported upon in an imaging service facility. An
instance of a Procedure Type typically has a name and one or more other identifiers. A Procedure Type is
associated with one or more Procedure Plans.

Note: The information content of this entity relates to the general identification of a Procedure Type rather
          than to its decomposition into the action items required to perform a specific instance of a Requested
          Procedure for a particular Patient.

7.3.1.5 REQUESTED PROCEDURE

A Requested Procedure is an instance of a Procedure of a given Procedure Type. An instance of a Requested
Procedure includes all of the items of information that are specified by an instance of a Procedure Plan that is
selected for the Requested Procedure by the imaging service provider. This Procedure Plan is defined by the
imaging service provider on the basis of the Procedure Plan templates associated with the considered Procedure
Type. An Imaging Service Request may include requests for several different Requested Procedures. The purpose
of this entity is to establish the association between Imaging Service Requests and Procedure Types, to convey the
information that belongs to this association and to establish the relationships between Requested Procedures and
the other entities that are needed to describe them. A single Requested Procedure of one Procedure Type is the
smallest unit of service that can be requested, reported, coded and billed. Performance of one instance of a
Requested Procedure is specified by exactly one Procedure Plan. A Requested Procedure leads to one or more
Scheduled Procedure Steps involving Action Items as specified by a Procedure Plan. A Requested Procedure may
be associated with one or more DICOM Visits. A Requested Procedure may involve one or more pieces of
equipment.

7.3.1.6 SCHEDULED PROCEDURE STEP

A Scheduled Procedure Step is an arbitrarily defined scheduled unit of service, that is specified by the Procedure Plan for a Requested Procedure. A Scheduled Procedure Step prescribes one or more Action Items (events). A Scheduled Procedure Step involves equipment (e.g. imaging Modality equipment, anesthesia equipment, surgical equipment, transportation equipment), human resources, consumable supplies, location, and time (e.g. start time, stop time, duration). While in the context of imaging services the scheduling of a Procedure Step might include only a general designation of imaging Modality that could be satisfied by multiple pieces of the same equipment type, the performance of one instance of a Scheduled Procedure Step involves one and only one piece of imaging Modality equipment.

Notes:

1. The Procedure Step entity is provided to support management of the logistical aspects of procedures (e.g. materials management, human resources, scheduling). The full definition of the contents of Procedure Steps and their constituent action items (events) is implementation dependent and is beyond the scope of this Standard. A single Action Item (event) contained within a given Scheduled Procedure Step might or might not be schedulable in a given facility.

2. A Scheduled Procedure Step may contribute to more than one Requested Procedure (e.g. a Scheduled Procedure Step requiring an intravenous iodine contrast injection might be shared by an intravenous pyelogram and a CT examination). However, for billing purposes an instance of a Scheduled Procedure Step is typically considered to be a part of only one Requested Procedure.

3. Typically each Scheduled Procedure Step contains at least one Action Item (event) of a magnitude that would justify an entry in the medical record.

7.3.1.7 PROCEDURE PLAN

A Procedure Plan is a protocol or specification that defines the ordered set of Action Items that must be done in order to perform the Scheduled Procedure Steps of a Requested Procedure. The distribution of Action Items over the set of Scheduled Procedure Steps that constitute a single Requested Procedure is assumed to be performed by the IS, and is not specified by this Standard. The Action Items actually performed during a Procedure Step may differ from those prescribed in the related Procedure Plan. Audit of actually performed Action Items versus the prescribed Procedure Plan is an important element of quality control, but is not specified by this Standard.

Note: The fact that Action Items are in a given order in a Procedure Plan is not evident in Figure 7.3. However, the order of Action Items is represented at the syntax level (i.e. as the sequence of items present in the Action Item Code Sequence (0040,0008)).

7.3.1.8 ACTION ITEM

2   An Action Item is one of the ordered set of actions prescribed by a Procedure Plan to perform an instance of a Requested Procedure. Action Items are simple (atomic) events. A Scheduled Procedure Step contains at least one

4   Action Item. Typically, the code identifying an Action Item instance would be selected from a catalog of action types. Multiple Action Items of the same action type may exist in one Scheduled Procedure Step. The distribution

6   of Action Items over the set of Scheduled Procedure Steps of a Single Requested Procedure is not specified by this Standard.

8

2

4 > *Item #2*
> *Add to Part 3, Section C.4 the following Sections C.4... "Module Definitions":*

6

8 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 Station AE Title	(0040,0001)	The AE title of the modality on which the Scheduled Procedure Step is scheduled to be performed.
>Scheduled Station Name	(0040,0010)	An institution defined name for the modality on which the Scheduled Procedure Step is scheduled to be performed.
>Scheduled Procedure Step Location	(0040,0011)	The location at which the Procedure Step is scheduled to be performed.
>Scheduled Procedure Step Start Date	(0040,0002)	Date on which the Scheduled Procedure Step is scheduled to start.
>Scheduled Procedure Step Start Time	(0040,0003)	Time at which the Scheduled Procedure Step is scheduled to start.
>Scheduled Procedure Step End Date	(0040,0004)	Date on which the Scheduled Procedure Step is scheduled to end.
>Scheduled Procedure Step End Time	(0040,0005)	Time at which the Scheduled Procedure Step is scheduled to end.
>Scheduled Performing Physician's Name	(0040,0006)	Name of the physician scheduled to administer the Scheduled Procedure Step.
>Scheduled Procedure Step Description	(0040,0007)	Institution-generated description or classification of the Scheduled Procedure Step to be performed. Note: The purpose of this attribute is to store a description or classification that is used at a local level (e.g., a hospital or a managed care network), and this description need not comply to an accepted standard.
>Scheduled Action Item Code Sequence	(0040,0008)	Sequence describing the Scheduled Action Item(s) following a specified coding scheme. This sequence contains one or more Action Items.
>>Code Value	(0008,0100)	The code value (defined by the coding scheme) that represents the type of Scheduled Action Item

>>Coding Scheme Designator	(0008,0102)	The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)
>>Code Meaning	(0008,0104)	The Scheduled Procedure Step that is represented by the Code Value (0008,0100)
>Scheduled Procedure Step ID	(0040,0009)	Identifier which identifies the Scheduled Procedure Step.
>Comments on the Scheduled Procedure Step	(0040,0400)	User-defined comments on the Scheduled Procedure Step. Note: The Comments attribute is intended to transmit non-structured information, which can be displayed to the operator of the Modality.
>Modality	(0008,0060)	Source equipment for the image. See PS 3.3 for Enumerated Values
>Requested Contrast Agent	(0032,1070)	Contrast agent requested for use in the Scheduled Procedure Step
>Pre-Medication	(0040,0012)	Medication to be administered at the beginning of the Scheduled Procedure Step, e.g. Nuclear Medicine radiopharmaceutical.

2 C.4.11 Requested Procedure Module

Table C.4-11 Requested Procedure Module Attributes

4

Attribute Name	Tag	Attribute Description
Requested Procedure ID	(0040,1001)	Identifier which identifies the Requested Procedure in the Imaging Service Request.
Reason for the Requested Procedure	(0040,1002)	Reason for requesting this imaging procedure. Note: this reason is more specific to the requested procedure than the reason mentioned in the imaging service request (0040,2001).
Requested Procedure Comments	(0040,1400)	User-defined comments on the Requested Procedure. Note: The Comments attribute is intended to transmit non-structured information, which can be displayed to the operator of the equipment (e.g. Modality).
Requested Procedure Code Sequence	(0032,1064)	A sequence that conveys the Requested Procedure of one Procedure Type.
>Code Value	(0008,0100)	The code value (defined by the coding scheme) that represents the type of Requested Procedure.

>Coding Scheme Designator	(0008,0102)	The code from table D-2 designating the coding scheme which maps the Code Value (0008,0100) onto the Code Meaning (0008,0104)
>Code Meaning	(0008,0104)	The requested procedure that is represented by the Code Value (0008,0100)
Study Instance UID	(0020,000D)	Unique identifier to be used to identify the Study
Referenced Study Sequence	(0008,1110)	Uniquely identifies the Study SOP Instances associated with this SOP Instance.
>Referenced SOP Class UID	(0008,1150)	Uniquely identifies the SOP Class.
>Referenced SOP Instance UID	(0008,1155)	Uniquely identifies the SOP Instance.
Requested Procedure Description	(0032,1060)	Institution-generated administrative description or classification of Requested Procedure
Requested Procedure Priority	(0040,1003)	Requested Procedure Type Urgency. Defined Terms are: STAT, HIGH, ROUTINE, MEDIUM, LOW
Patient Transport Arrangements	(0040,1004)	Mode of transportation of the patient to the location of examination.
Requested Procedure Location	(0040,1005)	Physical location at which the Requested Procedure is to be performed.
Placer Order Number / Procedure	(0040,1006)	The order number assigned to the Requested Procedure by the party placing the order.
Filler Order Number / Procedure	(0040,1007)	The order number assigned to the Requested Procedure by the party filling the order.
Confidentiality Code	(0040,1008)	Confidentiality Constraints on the Requested Procedure by the party filling the order.
Reporting Priority	(0040,1009)	Requested Reporting Priority. Defined Terms are: HIGH, ROUTINE, MEDIUM, LOW
Names of Intended Recipients of results	(0040,1010)	Names of the physicians, who are intended recipients of results.

2

C.4.12 Imaging Service Request Module

4   **Table C.4-12 Imaging Service Request Module Attributes**

Attribute Name	Tag	Attribute Description

Reason for the Imaging Service Request	(0040,2001)	Reason for the Imaging Service Request. Note: this reason is less specific to the requested procedure than the reason mentioned in the Requested Procedure (0040,1002).
Imaging Service Request Comments	(0040,2400)	User-defined comments on the Imaging Service Request. Note: The Comments attribute is intended to transmit non-structured information, which can be displayed to the operator of the equipment (e.g. Modality).
Requesting Physician	(0032,1032)	Physician who requested the Imaging Service Request.
Referring Physician's Name	(0008,0090)	Patient's primary physician for this Imaging Service Request.
Requesting Service	(0032,1033)	Institutional department where the request initiated.
Accession Number	(0008,0050)	A departmental IS generated number which identifies the order for the Imaging Service Request.
Issuing Date of Imaging Service Request	(0040,2004)	Date on which the Imaging Service Request was issued by the requester.
Issuing Time of Imaging Service Request	(0040,2005)	Time at which the Imaging Service Request was issued by the requester.
Placer Order Number / Imaging Service Request	(0040,2006)	The order number assigned to the Imaging Service Request by the party placing the order.
Filler Order Number / Imaging Service Request	(0040,2007)	The order number assigned to the Imaging Service Request by the party filling the order.
Order entered by ...	(0040,2008)	The person who entered the Imaging Service Request into an Information System.
Order Enterer's Location	(0040,2009)	The location at which the Imaging Service Request was entered.
Order Callback Phone Number	(0040,2010)	Telephone Number at which additional information can be retrieved.

2

2

> **Item #3**
>
> 4 **Add to Part 3, Section C.2 Table C.2-3 the following Attributes:**

6

Attribute Name	Tag	Attribute Description
Patient's Age	(0010,1010)	Age of the Patient.
Occupation	(0010,2180)	Occupation of the Patient.
Patient Data Confidentiality Constraint Description	(0040,3001)	Special indication to the modality operator about confidentiality of patient information (e.g., that he should not use the patients name where other patients are present).

2

| Item #4 |
| Add an informative Annex X to Part 3: |

6   **ANNEX X (Informative) Integration of Modality Worklist in the Original DICOM Standard**

8

10

DICOM was published in 1993 and effectively addresses image communication for a number of modalities and
12   Image Management functions for a significant part of the field of medical imaging. Since then, many additional
medical imaging specialties have contributed to the extension of the DICOM Standard and developed additional
14   Image Object Definitions. Furthermore, there have been discussions about the harmonization of the DICOM Real-
World domain model with other standardization bodies. This effort has resulted in a number of extensions to the
16   DICOM Standard. The integration of the Modality Worklist addresses an important part of the domain area that
was not included initially in the DICOM Standard. At the same time, the Modality Worklist integration makes a
18   step in the direction of harmonization with other standardization bodies (CEN TC 251, HL7, etc.).

20   The purpose of this ANNEX is to show how the original DICOM Standard relates to the extension for Modality
Worklist Management. The two included figures outline the void filled by the Modality Worklist Management
22   specification and the relationship between the original DICOM Data Model and the extended model.

24

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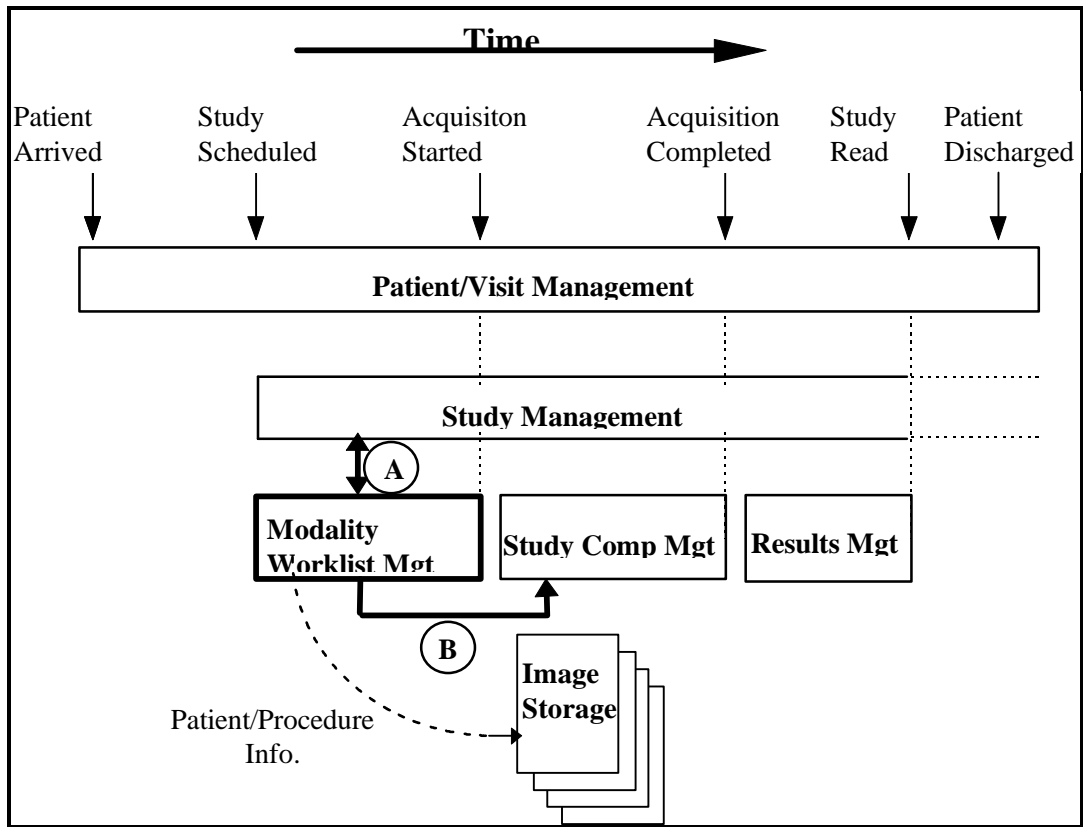
4

Figure X-1: Functional View - Modality Worklist Management in the Context of DICOM Service
6   **Classes**

8

The management of a patient starts when the patient enters a physical facility (e.g. a hospital, a clinic, a imaging
10   center) or even before that time. The DICOM Patient Management SOP Class provides many of the functions that
are of interest to imaging departments. Figure X-1 is an example where one presumes that an order for a
12   procedure has been issued for a patient. The order for an imaging procedure results in the creation of a Study
Instance within the DICOM Study Management SOP Class. At the same time (A) the Modality Worklist
14   Management SOP Class enables a modality operator to request the scheduling information for the ordered
procedures. A worklist can be constructed based on the scheduling information. The handling of the requested
16   imaging procedure in DICOM Study Management and in DICOM Worklist Management are closely related. The
worklist also conveys patient/study demographic information that can be incorporated into the images.

18

Worklist Management is completed once the scheduled imaging procedure has started (B). However, Study
20   Management continues throughout all stages of the Study, including interpretation. The actual procedure
performed (based on the request) and information about the images produced are conveyed by the DICOM Study
22   Component SOP Class.

2

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6

8

*Original DICOM
Real World Model*

*Modality Worklist
Real World Model
Extension*
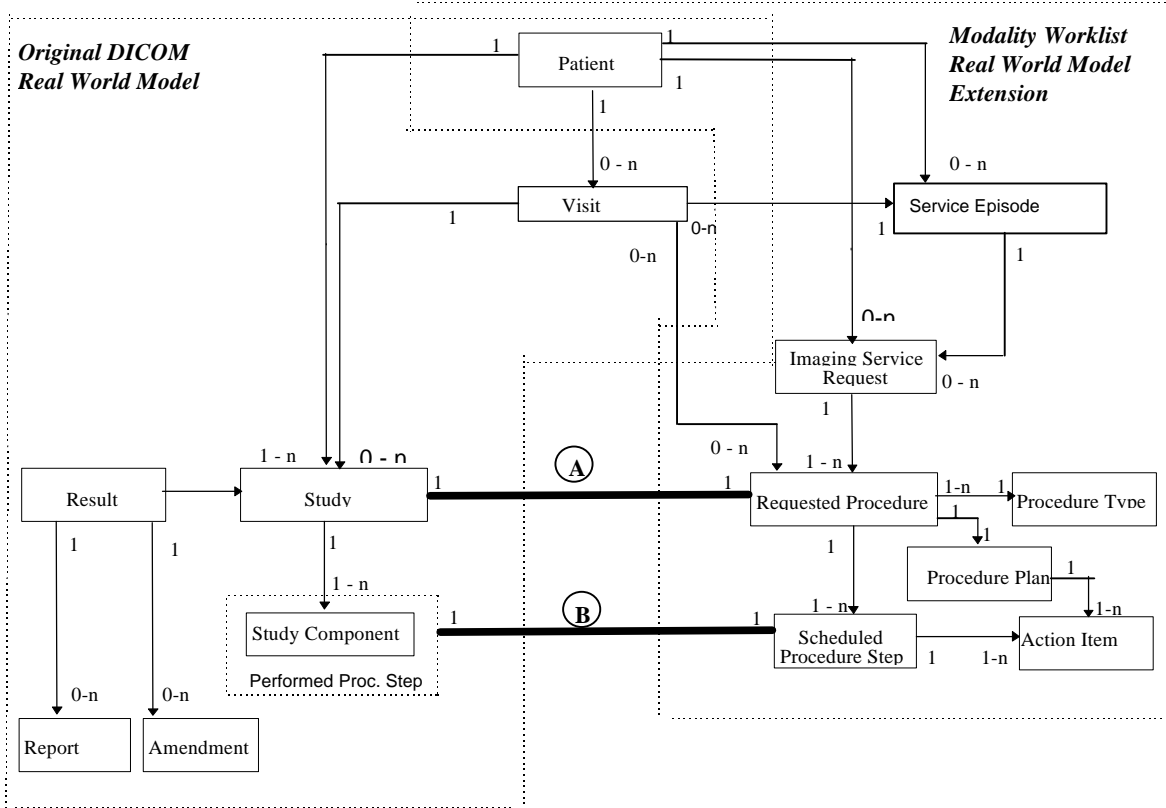
10

Figure X-2: Relationship of the Original Model and the Extensions for Modality Worklist
12   **Management**

14

Figure X-2 shows the relationship between the original DICOM Real-World model and the extensions of this
16   Real-World model required to support the Modality Worklist. The new parts of the model add entities that are
needed to request and to schedule imaging procedures, a concept that is not supported in the original model. The
18   entities required for representing the Worklist form a natural extension of the original DICOM Real-World model.

20   Common to both the original model and the extended model is the Patient entity. The Service Episode is an
administrative concept that has been shown in the extended model in order to pave the way for future adaptation
22   to a common model supported by other standardization groups including HL7, CEN TC 251 WG 3, CAP-IEC, etc.
The Visit is in the original model but not shown in the extended model because it is a part of the Service Episode.
24

There is a 1 to 1 relationship between a Requested Procedure and the DICOM Study (A). A DICOM Study is the
26   result of a single Requested Procedure. A Requested Procedure can result in only one Study.

28   A 1 to 1 relationship exists between a Scheduled Procedure Step and a Performed Procedure Step (B). The concept
of a Performed Procedure Step is a superset of the Study Component concept contained in the original DICOM

model. There is no means to relate previously Scheduled Procedure Steps using Study Component information. This may be a candidate for future extensions of the Study Component into the more general concept of Performed Procedure Step.

2

4

Digital Imaging and Communications in Medicine

(MEDICOM/DICOM)

Part 4 Addendum

Basic Worklist Management Service Class

(Modality Worklist SOP Class)

2

4

> **Item #1**
> **Add to Part 4 the following Annex Z "Basic Worklist Management Service Class":**

6

8   **Annex Z (Normative) Basic Worklist Management Service Class**

Z.1 Overview

10   ## Z.1.1 Scope

The Basic Worklist Management Service Class defines an application-level class-of-service which facilitates the
12   access to worklists.

14   A worklist is the structure to present information related to a particular set of tasks. It specifies particular details
for each task. The information supports the selection of the task to be performed first, and supports the
16   performance of that task.

    Note: One example is the worklist used to present information about scheduled imaging procedures at an
18   imaging modality and to the operator of that modality. Another example is the worklist presented at
               a radiological reporting station to indicate which studies have been performed and are waiting to be
20   reported.

22   This supplement defines a service for communicating such worklists. The following are characteristics for this
service class:

24   –   The worklist has to be queried by the Application Entity (AE) associated with the application on which, or by
        which, the tasks included in the worklist have to be performed. In this query, a number of search keys can be
26   used, defined for each particular worklist SOP class.

    –   The worklist consists of worklist items, each item is related to one task. A worklist item contains attributes
28   from different objects related to the task.

    Notes:

30   1. This service class is not intended to provide a comprehensive generalized database query mechanism such as
        SQL. Instead, the Basic Worklist Management Service Class is focused towards basic queries using a small
32   set of common Key Attributes used as Matching Keys or Return Attributes. Basic Worklist Information
        Models are not hierarchical.

34   2. Basic Worklist Information Models always consist of one query level, which may consist of one or more
        entities. There is no distinction between hierarchical and relational use of C-Find in the Basic Worklist
36   Management Service Class.

Z.1.2 Conventions

2 Key Attributes serve two purposes, they may be used as : Matching Key Attributes and Return Key Attributes. Matching Key Attributes may be used for matching (criteria to be used in the C-FIND request to determine
4 whether an entity matches the query). Return Key Attributes may be used to specify desired return attributes (what elements in addition to the Matching Key Attributes have to be returned in the C-FIND response).

6   Note: Matching Keys are typically used in an SQL 'where' clause. Return Keys are typically used in an SQL 'select' clause to convey the attribute values.
8
Matching Key Attributes may be of Type "required" (R) or "optional" (O). Return Key Attributes may be of Type
10 1, 1C, 2, 2C, 3 as defined in PS 3.5.

Z.1.3 Worklist Information Model

12 In order to serve as a Service Class Provider (SCP) of the Basic Worklist Service Class, a DICOM Application Entity (AE) possesses information about the Attributes of a number of managed worklist entries. This information
14 is organized into Worklist Information Models.

16 Worklists are implemented against well defined Information Models. A specific SOP Class of the Basic Worklist Service Class consists of an informative Overview, an Information Model Definition and a DIMSE-C Service
18 Group. In this service class, the Information Model plays a role similar to an Information Object Definition (IOD) of most other DICOM service classes.

20 ## Z.1.4 Service Definition

Two peer DICOM AEs implement a SOP Class of the Basic Worklist Service Class with one serving in the SCU
22 role and one serving in the SCP role. SOP Classes of the Basic Worklist Service Class are implemented using the DIMSE-C C-FIND service as defined in PS 3.7.
24
Only a baseline behavior of the DIMSE-C C-FIND is used in the Service Class.
26
The following description of the DIMSE-C C-FIND service provides a brief overview of the SCU/SCP semantics:
28
A C-FIND service conveys the following semantics:

30   -   The SCU requests that the SCP perform a match for the Matching Keys and return values for the Return Keys which have been specified in the Identifier of the request, against the information that the SCP
32   possesses, to the objects specified in the SOP Class.

     Note: In this Annex, the term "Identifier" refers to the Identifier service parameter of the C-FIND service
34   as defined in PS 3.7.

     -    The SCP generates a C-FIND response for each match with an Identifier containing the values of all
36   Matching Key Attributes and all known Return Key Attributes requested. Each response contains one worklist item. All such responses will contain a status of Pending. A status of Pending indicates that the
38   process of matching is not complete.

     -    When the process of matching is complete a C-FIND response is sent with a status of Success and no
40   Identifier.

     -    A Refused or Failed response to a C-FIND request indicates that the SCP is unable to process the request.

42   -   The SCU may cancel the C-FIND service by issuing a C-CANCEL-FIND request at any time during the processing of the C-FIND service. The SCP will interrupt all matching and return a status of Canceled.

Note: The SCU needs to be prepared to receive C-FIND responses sent by the SCP until the SCP finally
2   processed the C-CANCEL-FIND request.

4   **Z.2 Worklist Information Model Definition**

The Worklist Information Model is identified by the SOP Class negotiated at association establishment time. The
6   SOP Class is composed of both an Information Model and a DIMSE-C Service Group.

8   Information Model Definitions for standard SOP Classes of the Worklist Service Class are defined in this Annex.
A Worklist Information Model Definition contains:

10   -   an Entity/Relationship Model Definition;

            -    a Key Attributes Definition;

12   **Z.2.1 Entity/Relationship Model Definition**

Basic Worklist Information Models consist of a single level, that includes all Matching Key Attributes and all
14   Return Key Attributes, which may be sent from the SCU to the SCP in the request and whose values are expected
to be returned from the SCP to the SCU in each of the responses (or worklist items). The Matching Key Attribute
16   values in the request specify the worklist items that are to be returned in the responses. All Key Attributes (the
Matching Key Attributes and the Return Key Attributes) in the request determine which attribute values are
18   returned in the responses for that worklist.

20   A Worklist Item has a one-to-one relationship with the real-world object defining the root for the Basic Worklist
Information Model. In addition the Worklist Item is related to a number of other objects from the real-world
22   model. Each of these real-world objects is represented by a hierarchy of entities organized in an (internal)
Entity/Relationship Model.

24   **Z.2.2 Attributes Definition**

Attributes are defined for each entity in the internal Entity/Relationship Model. An Identifier in a C-FIND request
26   shall contain values to be matched against the Attributes of the Entities in a Worklist Information Model. For any
worklist request, the set of entities for which Attributes are returned, shall be determined by the set of Matching
28   and Return Key Attributes specified in the Identifier.

Z.2.2.1 Attribute Types

2 All Attributes of entities in a Worklist Information Model shall be specified both as a Matching Key Attribute (either required or optional) and as a Return Key Attribute.

4 *Z.2.2.1.1 Matching Key Attributes*

The Matching Key Attributes are Keys, which select Worklist-Items to be included in a requested Worklist.

6 *Z.2.2.1.1.1 Required Matching Key Attributes*

A Basic Worklist Management SCP shall support matching based on values of all Required Matching Key
8 Attributes of the C-FIND request. Multiple entities may match a given value for a Required Key.

10 If an SCP manages an entity with an unknown attribute value (i.e. zero length), the unknown value shall fail to match any Matching Key value.

12   Notes:

       1. Even though there is no means to perform matching on such entities, they may be queried as a Return Key
14   Attribute using a C-FIND request with a zero length value (universal match) or by a single wildcard
          (wildcard match).

16   2. An SCU may choose to supply any subset of Required Matching Key Attributes.

Z.2.2.1.1.2 Optional Matching Key Attributes

18 In the Worklist Information Model, a set of Attributes may be defined as Optional Matching Key Attributes. Optional Matching Key Attributes contained in the Identifier of a C-FIND request may induce two different types
20 of behavior depending on support for matching by the SCP. If the SCP

       - does not support matching on the Optional Matching Key Attribute, then the Optional Matching Key
22   Attribute shall be ignored for matching but shall be processed in the same manner as a Return Key
          Attribute.

24   - supports matching of the Optional Matching Key Attribute, then the Optional Matching Key Attribute shall
          be processed in the same manner as a Required Matching Key.

26   Notes:

       1. The Conformance Statement of the SCP lists the Optional Matching Key Attributes which are supported for
28   matching.

       2. An SCU can not expect the SCP to support a match on an Optional Matching Key.

Z.2.2.1.2 Return Key Attributes

2 The values of Return Key Attributes to be retrieved with the Worklist are specified with zero-length (universal matching) in the C-FIND request. SCPs shall support Return Key Attributes defined by a Worklist Information
4 Model according to the Data Element Type (1, 1C, 2, 2C, 3) as defined in PS 3.5.

6 Every Matching Key Attribute shall also be considered as a Return Key Attribute. Therefore the C-FIND response shall contain in addition to the values of the requested Return Key Attributes the values of the requested Matching
8 Key Attributes.

   Notes:

10 1. The Conformance Statement of the SCP lists the Return Key Attributes of Type 3, which are supported.

    2. An SCU may choose to supply any subset of Return Key Attributes.

12 3. An SCU can not expect to receive any Type 3 Return Key Attributes.

Z.2.2.2 Attribute Matching

14 The following types of matching, which are defined by the Query/Retrieve Service Class in PS 3.4 may be performed on Matching Key Attributes in the Basic Worklist Service Class. Different Matching Key Attributes
16 may be subject for different matching types. The Worklist Information Model defines the type of matching for each Required Matching Key Attribute. The Conformance Statement of the SCP shall define the type of matching
18 for each Optional Matching Key Attribute.

       -   Single Value Matching;

20   -   List of UID Matching;

       -   Wild Card Matching;

22   -   Range Matching;

       -   Sequence Matching.
24
    The following type of matching, which is defined by the Query/Retrieve Service Class in PS 3.4 shall be
26 performed on Return Key Attributes in the Basic Worklist Service Class.

       -   Universal Matching;

Z.2.2.3 Matching Multiple Values
28

    When matching an Attribute which has a value multiplicity of greater than one, if any of the values match, then
30 all values are returned.

Z.3 Worklist Information Model

2 Each Worklist Information Model is associated with one SOP Class. The following Worklist Information Model is defined:

4   o   Modality Worklist Information Model

Z.4 DIMSE-C Service Group

6

One DIMSE-C Service is used in the construction of SOP Classes of the Basic Worklist Management Service
8 Class. The following DIMSE-C operation is used:

-    C-FIND;

Z.4.1 C-FIND Operation

10

SCPs of some SOP Classes of the Basic Worklist Management Service Class are capable of processing queries
12 using the C-FIND operation as described in PS 3.7. The C-FIND operation is the mechanism by which queries are performed. Matches against the keys present in the Identifier are returned in C-FIND responses.

Z.4.1.1 C-FIND Service Parameters

14

Z.4.1.1.1 SOP Class UID

16 The SOP Class UID identifies the Worklist Information Model against which the C-FIND is to be performed.
Support for the SOP Class UID is implied by the Abstract Syntax UID of the Presentation Context used by this C-
18 FIND operation.

Z.4.1.1.2 Priority

20 The Priority Attribute defines the requested priority of the C-FIND operation with respect to other DIMSE operations being performed by the same SCP.
22

Processing of priority requests is not required of SCPs. Whether or not an SCP supports priority processing and the
24 meaning of the different priority levels shall be stated in the Conformance Statement of the SCP.

Z.4.1.1.3 Identifier

26 Both the C-FIND request and response contain an Identifier encoded as a Data Set (see PS 3.5).

Z.4.1.1.3.1 Request Identifier Structure

28 An Identifier in a C-FIND request shall contain

-    Key Attributes values to be matched against the values of attributes specified in that SOP Class.
30

The Key Attributes and values allowable for the query shall be defined in the SOP Class definition for the
32 corresponding Worklist Information Model.

Z.4.1.1.3.2 Response Identifier Structure

34 An Identifier in a C-FIND response shall contain

-    Key Attributes with values corresponding to Key Attributes contained in the Identifier of the request
36   (Key Attributes as defined in Z.2.2.1.)

Z.4.1.1.4 Status

2 Table Z.4.-1 defines the status code values which might be returned in a C-FIND response. Fields related to status code values are defined in PS 3.7.

4   **Table Z.4 -1 C-FIND Response Status Values**

Service Status	Further Meaning	Status Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier Does Not Match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied.	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence for this Identifier.	FF01	Identifier

Note: Status Codes are returned in DIMSE response messages (See PS 3.7). The code values stated in
6   column "Status Codes" are returned in Status Command Element (0000,0900).

Z.4.1.2 C-FIND SCU Behavior

8 All C-FIND SCUs shall be capable of generating query requests which meet the requirements of the "Worklist" Search Method (see Z.4.1.3.1).
10
Required Keys, and Optional Keys associated with the Worklist may be contained in the Identifier.
12

14
An SCU conveys the following semantics using the C-FIND requests and responses:

16   -   The SCU requests that the SCP perform a match of all keys specified in the Identifier of the request against the information it possesses of the Worklist specified in the request.

18   -   The SCU shall interpret Pending responses to convey the Attributes of a match of an Entity.

      -    The SCU shall interpret a response with a status equal to Success, Failed, Refused or Cancel to convey
20   the end of Pending responses.

      -    The SCU shall interpret a Refused or Failed response to a C-FIND request as an indication that the SCP
22   is unable to process the request.

      -    The SCU may cancel the C-FIND service by issuing a C-FIND-CANCEL request at any time during the
24   processing of the C-FIND. The SCU shall recognize a status of Cancel to indicate that the C-FIND-CANCEL was successful.

26 ## Z.4.1.3 C-FIND SCP Behavior

All C-FIND SCPs shall be capable of processing queries which meet the requirements of the "Worklist" Search
2 (see Z.4.1.3.1).

4 An SCP conveys the following semantics using the C-FIND requests and responses:

- The SCP is requested to perform a match of all the keys specified in the Identifier of the request, against
6   the information it possesses. Attribute matching is performed using the key values specified in the
      Identifier of the C-FIND request as defined in Section Z.2.

8 - The SCP generates a C-FIND response for each match using the "Worklist" Search method. All such
      responses shall contain an Identifier whose Attributes contain values from a single match. All such
10   responses shall contain a status of Pending.

■ When all matches have been sent, the SCP generates a C-FIND response which contains a status of
12   Success. A status of Success shall indicate that a response has been sent for each match known to the
      SCP.

14   Note: No ID is contained in a response with a status of Success. For a complete definition, see
          PS3.7.

16 - The SCP shall generate a response with a status of Refused or Failed if it is unable to process the request.
      A Refused or Failed response shall contain no Identifier.

18 - If the SCP receives C-FIND-CANCEL indication before it has completed the processing of the matches it
      shall interrupt the matching process and return a status of Cancel.

20 **Z.4.1.3.1. "Worklist" Search Method**

The following procedure is used to generate matches:

22   The key match strings contained in the Identifier of the C-FIND request are matched against the values of
      the Key Attributes for each worklist entity. For each entity for which the Attributes match all of the
24   specified match strings, construct an Identifier. This Identifier shall contain all of the values of the
      Attributes for this entity which match those in the C-FIND request. Return a response for each such
26   Identifier. If there are no matching keys, then there are no matches, return a response with a status equal
      to Success and with no Identifier.

28 **Z.5 Association Negotiation**

Association establishment is the first phase of any instance of communication between peer DICOM AEs. The
30 association negotiation procedure specified in PS 3.7 shall be used to negotiate the supported SOP Classes or Meta
   SOP Classes.
32
Support for the SCP/SCU role selection negotiation is optional. The SOP Class Extended Negotiation shall not be
34 supported.

Z.6 SOP Class Definitions

36 **Z.6.1 Modality Worklist SOP Class**

Z.6.1.1 Modality Worklist SOP Class Overview

38 The Modality Worklist SOP class defined within the Basic Worklist Management Service Class defines an
   application-level class of service which facilitates the communication of information to the imaging modality
40 about Scheduled Procedure Steps, and entities related to the Scheduled Procedure Steps. As will be detailed
   below, part of the information carried by the worklist mechanism is intended to be used by the imaging modality
42 itself, but much of the information is intended to be presented to the modality operator.

2 This worklist is structured according to Scheduled Procedure Steps. A procedure step is a unit of service in the context of a requested imaging procedure.

4

The Modality Worklist SOP class supports the following requirements:

6 − Verify patient (e.g. download patient demographic information from IS to Modality, to verify that the person to be examined is the intended subject).

8 − Select a Procedure Step from the IS (e.g. download procedure step information from the IS to the Modality). There are two alternatives for the realization of this requirement, supporting different organization methods of
10   the department: The Modality may obtain the list of Procedure Steps from the IS. Display of the list and   selecion from the list is done at the Modality.
12   The list is displayed and selection is performed on the IS. This implies, that the   information is obtained by the Modality just before the Scheduled Procedure Step starts.
14   The Modality Worklist SOP class supports both of the organization methods.

   − Select Imaging Procedure.

16 − Prepare the Imaging Procedure (Step).

   − Couple DICOM images unambiguously with related information from the IS (e.g. patient demographics,
18   procedure description, ID data structure from the IS, contextual IS information).

   − Capture all the attributes from the IS, that are mandatory to be inserted into the DICOM Image Object

20

The Modality Worklist SOP Class is not intended to provide access to all IS information and services which may
22 be of interest to a Modality operator or attending physician. It's primary focus is the efficient operation of the image acquisition equipment. DICOM SOP Classes such as the existing Detached Patient Management SOP Class
24 and non-DICOM Services which fall beyond the scope of the Modality Worklist SOP Class may be needed.

26 The Modality Worklist SOP Class does not support the transmission of information from the Modality to the information system.

28

Z.6.1.2 Modality Worklist Information Model

30 ### Z.6.1.2.1 E/R Model

In response to a given C-FIND request, the SCP might have to send several C-FIND responses, (i.e. one C-FIND
32 response per matching worklist item). Each worklist item focuses on one Scheduled Procedure Step and the related information. The E-R diagram presented in Figure Z.6-1 depicts the content of one C-FIND request, that
34 is:

   - the matching Scheduled Procedure Step, the Requested Procedure to which the Scheduled Procedure Step
36   contributes, the Imaging Service Request in which the associated Requested Procedure is ordered, any associated Visit, and the Patient who is to be the subject of the Procedure.

38

Therefore, for a given C-FIND request, a given Scheduled Procedure Step will appear in only one of the resulting
40 C-FIND responses. Obviously, information about the Requested Procedure, Imaging Service Request, Visit and Patient may be mentioned in several of these C-FIND responses.

42

The Modality Worklist Information Model is represented by the Entity Relationship diagram shown in figure Z.6 -
44 1.

Note: The entities appearing in messages related to the Modality Worklist SOP Class are required to comply to the Modality Worklist model. However, DICOM does not define the internal structure of the database.

The entry point of the Modality Worklist is the Scheduled Procedure Step entity.

The attributes of a Scheduled Procedure Step Worklist can be found in

− PS 3.3 "Patient Relationship Module"

− PS 3.3 "Patient Identification Module"

− PS 3.3 "Patient Demographic Module"

− PS 3.3 "Patient Medical Module"

− PS 3.3 "Visit Relationship Module"

− PS 3.3 "Visit Identification Module"

− PS 3.3 "Visit Status Module"

− PS 3.3 "Visit Admission Module"

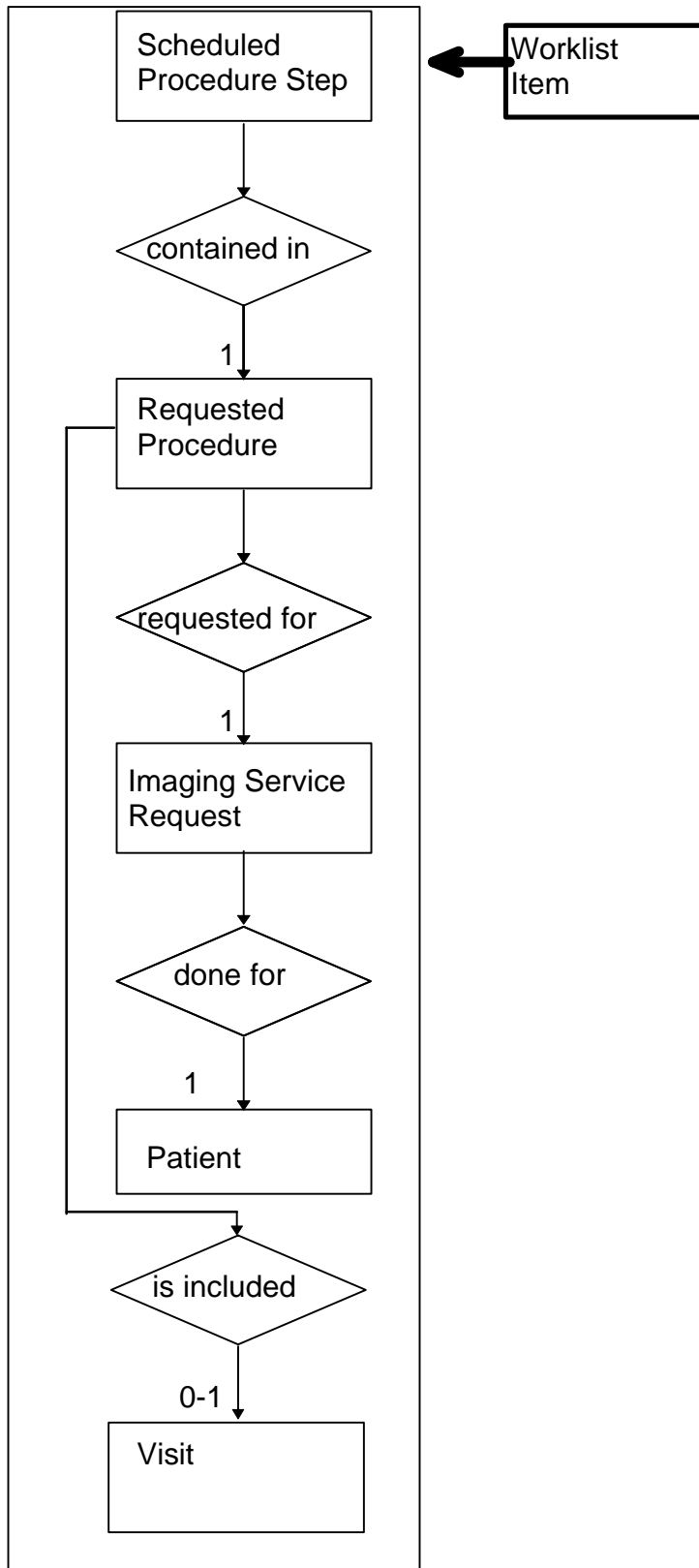− Supplement 10, Part 3 Addendum, Section C.4.10 "Scheduled Procedure Step Module"

− Supplement 10, Part 3 Addendum, Section C.4.11 "Requested Procedure Module"

− Supplement 10, Part 3 Addendum, Section C.4.12 "Imaging Service Request Module"

2   Figure Z.6-1 -- Modality Worklist information model E/R diagram

Z.6.1.2.2 Modality Worklist Attributes

2   Table Z.6-2 defines the Attributes of the Modality Worklist Information Model:

4   **Table Z.6-2 Attributes for the Modality Worklist Information Model**

Description / Module	Tag	Match-ing Key Type	Return Key Type	Remark / Matching Type
SOP Common				
Specific Character Set	(0008,0005)	O	1C	This attribute is required if expanded or replacement character sets are used.
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.
>Scheduled station AE title	(0040,0001)	R	1	The Scheduled station AE title shall be retrieved with Single Value Matching only.
>Scheduled Procedure Step Start Date	(0040,0002)	R	1	Scheduled Step Start Date shall be retrieved with Single Value Matching or Range Matching. see remark under Scheduled Procedure Step Start Time (0040,0003).
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	Scheduled Step Start Time shall be retrieved with Single Value Matching or Range Matching. Scheduled Step Start Date and Scheduled Step Start Time are subject to Range Matching. If both keys are specified for Range Matching, e.g. the date range "July 5\July 7" and the time range "10am\6pm" specifies the time period starting on July 5, 10am until July 7, 6pm. Note: If the Information System does not provide scheduling for individual Procedure Steps, it is allowed to use the closest scheduling information it possesses (e.g. Procedures are subject to scheduling instead of Procedure Steps).
>Modality	(0008,0060)	R	1	The Modality shall be retrieved with Single Value Matching.

>Scheduled Performing Physician's Name	(0040,0006)	R	2	Scheduled Performing Physician's Name shall be retrieved with Single Value Matching or Wild Card Matching.
>Scheduled Procedure Step Description	(0040,0005)	O	1C	Either the Scheduled Procedure Step Description (0040,0005) or the Scheduled Action Item Code Sequence (0040,0008) or both shall be supported by the SCP.
>Scheduled Station Name	(0040,0010)	O	2	
>Scheduled Procedure Step Location	(0040,0011)	O	2	
>Scheduled Action Item Code Sequence	(0040,0008)	O	1C	Either the Scheduled Procedure Step Description (0040,0005) or the Scheduled Action Item Code Sequence (0040,0008) or both shall be supported by the SCP. The Scheduled Action Item Code Sequence contains one or more Action Items.
>>Code Value	(0008,0100)	O	1C	Required if a Sequence Item is present.
>>Coding Scheme Designator	(0008,0102)	O	1C	Required if a Sequence Item is present.
>>Code Meaning	(0008,0104)	O	3	
>Pre-Medication	(0040,0012)	O	2C	The value of the Pre-Medication Attribute is to be returned, when Pre-Medication is to be applied to that Scheduled Procedure Step.
>Scheduled Procedure Step ID	(0040,0009)	O	1	
>Requested Contrast Agent	(0032,1070)	O	2C	The value of the Requested Contrast Agent Attribute is to be returned, when Contrast Media is to be applied to that Scheduled Procedure Step.
>All other Attributes from the Scheduled Procedure Step Module		O	3	
Requested Procedure				
Requested Procedure ID	(0040,1001)	O	1	
Requested Procedure Description	(0032,1060)	O	1C	The Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both shall be supported by the SCP.
Requested Procedure Code Sequence	(0032,1064)	O	1C	The Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both shall be supported by the SCP. The Requested Procedure Code Sequence shall contain only a single Item.
>Code Value	(0008,0100)	O	1C	Required if a Sequence Item is present.

>Coding Scheme Designator	(0008,0102)	O	1C	Required if a Sequence Item is present.
>Code Meaning	(0008,0104)	O	3	
Study Instance UID	(0020,000D)	O	1	
Referenced Study Sequence	(0008,1110)	O	2	
>Referenced SOP Class UID	(0008,1150)	O	1C	Required if a Sequence Item is present.
>Referenced SOP Instance UID	(0008,1155)	O	1C	Required if a Sequence Item is present.
Requested Procedure Priority	(0040,1003)	O	2	
Patient Transport Arrangements	(0040,1004)	O	2	
All other Attributes from the Requested Procedure Module		O	3	
Imaging Service Request				
Accession Number	(0008,0050)	O	2	
Requesting Physician	(0032,1032)	O	2	
Referring Physician's Name	(0008,0090)	O	2	
All other Attributes from the Scheduled Procedure Step Module		O	3	
Visit Identification				
Admission ID	(0038,0010)	O	2	
All other Attributes from the Visit Identification Module		O	3	
Visit Status				
Current Patient Location	(0038,0300)	O	2	
All other Attributes from the Visit Status Module		O	3	
Visit Relationship				
Referenced Patient Sequence	(0008,1120)	O	2	
>Referenced SOP Class UID	(0008,1150)	O	2	
>Referenced SOP Instance UID	(0008,1155)	O	2	
All other Attributes from the Visit Relationship Module		O	3	
Visit Admission				
All Attributes from the Visit Admission Module		O	3	
Patient Relationship				
All Attributes from the Patient Relationship Module		O	3	
Patient Identification				
Patient's Name	(0010,0010)	R	1	Patient Name shall be retrieved with Single Value Matching or Wild Card Matching.

Patient ID	(0010,0020)	R	1	Patient ID shall be retrieved with Single Value Matching.
All other Attributes from the Patient Identification Module		O	3	
Patient Demographic				
Patients Birth Date	(0010,0030)	O	2	
Patient's Sex	(0010,0040)	O	2	
Patient's Weight	(0010,1030)	O	2	
Confidentiality constraint on patient data	(0040,3001)	O	2	
All other Attributes from the Patient Demographic Module		O	3	
Patient Medical				
Patient State	(0038,0500)	O	2	
Pregnancy Status	(0010,21C0)	O	2	
Medical Alerts	(0010,2000)	O	2	
Contrast Allergies	(0010,2110)	O	2	
Special Needs	(0038,0050)	O	2	
All other Attributes from the Patient Medical Module		O	3	

Notes:

1. Just like Series and Image Entities specified in the Query/Retrieve Service Class either an SCU or an SCP may support optional Matching Key Attributes and/or Type 3 Return Key Attributes which are not included in the Worklist Information Model (i.e. standard or private attributes). This is considered a Standard Extended SOP Class (see PS 3.2).

2. Each Module contains a Comment Attribute. This may be used to transmit non-structured information, which may be displayed to the operator of the Modality.

Z.6.1.3 Conformance Requirements

An implementation may conform to the Modality Worklist SOP Class as an SCU or an SCP. The Conformance Statement shall be in the format defined in Annex A of PS 3.2.

Z.6.1.3.1 SCU Conformance

An implementation which conforms to the Modality Worklist SOP Class shall support queries against the Worklist Information Model described in Section Z.6.1.2 of this Annex using the baseline C-FIND SCU Behavior described in Section Z.4.1.2 of this Annex.

An implementation which conforms to the Modality Worklist SOP Class as an SCU shall state in its Conformance Statement whether it requests matching on Optional Matching Key Attributes. If it requests Type 3 Return Key Attributes, then it shall list these Optional Return Key Attributes.

Z.6.1.3.2 SCP Conformance

2 An implementation which conforms to the Modality Worklist SOP Class shall support queries against the Worklist Information Model described in Section Z.6.2.1 of this Annex using the C-FIND SCP Behavior described in Section Z.4.1.3 of this Annex.

4

6 An implementation which conforms to the Modality Worklist SOP Class as an SCP shall state in its Conformance Statement whether it supports matching on Optional Matching Key Attributes. If it supports Type 3 Return Key Attributes, then it shall list the Optional Return Key Attributes which it supports.

8 **Z.6.1.4 SOP Classes**

The Modality Worklist SOP Class in the Basic Worklist Service Class identify the Modality Worklist Information
10 Model, and the DIMSE-C operations supported. The following Standard SOP Class is identified:

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

12

2

Item #2
4 | *Add an informative Annex Y to Part 4:*

---

6   **ANNEX Y (Informative)** **Examples for the Usage of the Modality Worklist**

8

These are a few typical examples of Modality Worklists:

10   A Worklist consisting of Scheduled Procedure Step entities that have been scheduled for a certain time
           period (e.g. "August 9, 1995"), and for a certain Scheduled Station AE title (namely the modality, where
12   the Scheduled Procedure Step is going to be performed). See Figure A2-1.

           A Worklist consisting of the Scheduled Procedure Step entities that have been scheduled for a certain
14   time period (e.g. "August 9, 1995"), and for a certain Modality type (e.g. CT machines). This is a
           scenario, where scheduling is related to a pool of modality resources, and not for a single resource.

16   A Worklist consisting of the Scheduled Procedure Step entities that have been scheduled for a certain
           time period (e.g. "August 9, 1995"), and for a certain Scheduled Performing Physician. This is a scenario,
18   where scheduling is related to human resources and not for equipment resources.

           A Worklist consisting of a single Scheduled Procedure Step entity that has been scheduled for a specific
20   Patient. In this scenario, the selection of the Scheduled Procedure Step was done beforehand at the
           modality. The rationale to retrieve this specific worklist is to convey the most accurate and up-to-date
22   information from the IS, right before the Procedure Step is performed.

24

The Modality Worklist SOP Class User may retrieve additional attributes. This may be achieved by Services
26 outside the scope of the Modality Worklist SOP Class.

   Note: Additional attributes may be retrieved using N-GET services on the appropriate Service Class
28   Providers, e.g. on the Detached Patient Management Service Class to retrieve additional patient
           attributes.
30

32

Worklist Request:
The Modality queries the IS for the Scheduled Procedure Step entities that have been scheduled for a *specific time period* (e.g. August 9, 1995), and *for a particular Station AE Title* (namely the modality, where the Step is to be performed).

Modality

Network Boundary

Information System

Worklist Response:

Scheduled Proc. Step: 1

Requested Procedure: 123

Imaging Service Request: 5578

Patient: "Jones"

Visit: 95081234

Worklist Response:

Scheduled Proc. Step: n

Requested Procedure: 345

Imaging Service Request: 3422

Patient: "Miller"

Visit: 95080476

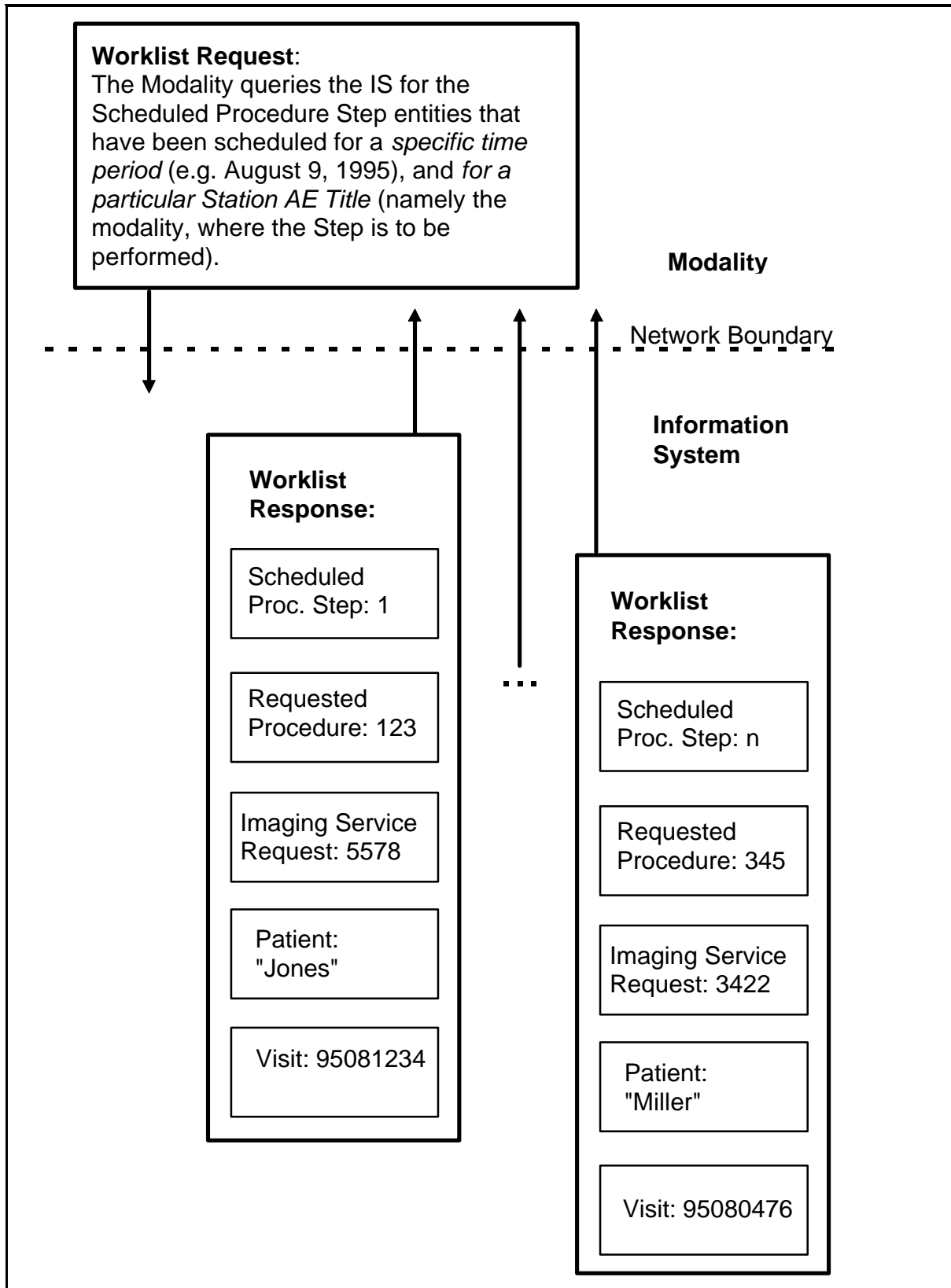2   **Figure A2-1 - Modality Worklist message flow example**

4

Digital Imaging and Communications

in Medicine

(MEDICOM/DICOM)

Part 6 Addendum

Basic Worklist Management

Item #1
Add the following Data Elements to Part 6 Section 6:

Tag	Name	VR	VM
(0040,0001)	Scheduled Station AE Title	AE	1-n
(0040,0002)	Scheduled Procedure Step Start Date	DA	1
(0040,0003)	Scheduled Procedure Step Start Time	TM	1
(0040,0004)	Scheduled Procedure Step End Date	DA	1
(0040,0005)	Scheduled Procedure Step End Time	TM	1
(0040,0006)	Scheduled Performing Physician's Name	PN	1
(0040,0007)	Scheduled Procedure Step Description	LO	1
(0040,0008)	Scheduled Action Item Code Sequence	SQ	1
(0040,0009)	Scheduled Procedure Step ID	SH	1
(0040,0010)	Scheduled Station Name	SH	1-n
(0040,0011)	Scheduled Procedure Step Location	SH	1
(0040,0012)	Pre-Medication	LO	1
(0040,0100)	Scheduled Procedure Step Sequence	SQ	1
(0040,0400)	Comments on the Scheduled Procedure Step	LT	1
(0040,1001)	Requested Procedure ID	SH	1
(0040,1002)	Reason for the Requested Procedure	LO	1
(0040,1003)	Requested Procedure Priority	SH	1
(0040,1004)	Patient Transport Arrangements	LO	1
(0040,1005)	Requested Procedure Location	LO	1
(0040,1006)	Placer Order Number / Procedure	SH	1
(0040,1007)	Filler Order Number / Procedure	SH	1
(0040,1008)	Confidentiality Code	LO	1
(0040,1009)	Reporting Priority	SH	1
(0040,1010)	Names of Intended Recipients of results	PN	1-n
(0040,1400)	Requested Procedure Comments	LT	1
(0040,2001)	Reason for the Imaging Service Request	LO	1
(0040,2004)	Issuing Date of Imaging Service Request	DA	1
(0040,2005)	Issuing Time of Imaging Service Request	TM	1
(0040,2006)	Placer Order Number / Imaging Service Request	SH	1
(0040,2007)	Filler Order Number / Imaging Service Request	SH	1
(0040,2008)	Order entered by ...	PN	1
(0040,2009)	Order Enterer's Location	SH	1
(0040,2010)	Order Callback Phone Number	SH	1
(0040,2400)	Imaging Service Request Comments	LT	1
(0040,3001)	Patient Data Confidentiality Constraint Description	LO	1

Item #2
Add the following UID to Part 6 Annex A:

UID Value	UID Name	UID Type	Part
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	SOP Class	Part 4