10. Scheduling

Chapter Chair/Editor:	Joe Peterson Wismer Martin, Inc.
Editor:	Robert M. Burkhead Oacis Healthcare Systems, Inc.

10.1 PURPOSE

This chapter defines abstract messages for the purpose of communicating various events related to the scheduling of appointments for services or for the use of resources. There are three basic types of messages defined in this transaction set: *request transactions* and their responses, *query transactions* and their responses, and *unsolicited transactions* and their responses. Request transactions communicate requests for the scheduling of appointments for services or for the use of resources. These transactions occur between *placer* (requesting) applications and *filler* (processing) applications. The query and unsolicited transaction sets provide for the exchange of scheduling information between systems. The exchange of this information is achieved either actively or passively. The active gathering of scheduling information is performed by issuing query transactions to a filler application from a querying application. The passive gathering of this information is performed by accepting unsolicited transactions issued by a filler application.

This chapter describes various roles under which applications might operate. The roles discussed in this chapter illustrate the underlying model used to develop this specification. They do not imply the need for a particular application model or method of implementation.

This chapter defines the transactions at the seventh level, that is, the abstract message. Various schemes are used to generate the actual characters that comprise the messages according to the communication environment. The HL7 Encoding Rules will be used where there is not a complete Presentation Layer. This is described in Chapter 1, "Relationship to Other Protocols." The examples included in this chapter were constructed using the HL7 Encoding Rules.

10.1.1 Schedules, appointments, and services and resources

The goal of this specification is to facilitate the communication of scheduling requests and information between applications. Such communication involves three main subjects: *schedules*, *appointments*, and *services and resources*. Schedules control the occurrence of certain services and the use of particular resources. They consist of a set of open, booked and blocked slots for one particular service or resource. *Open slots* are periods of time on a schedule during which a service may occur, and/or a resource is available for use. *Booked slots* are periods of time on a schedule that have already been reserved. *Appointments* occupy sets of one or more booked slots on a schedule. They describe the nature of the service and/or the use of the resource, the person or persons responsible for the appointment's booking, and other information

relevant to the booking and execution of an appointment. *Blocked slots* on a schedule are periods of time during which a service or resource is unavailable for reasons other than booked appointments (for example, a piece of equipment might be unavailable for maintenance reasons).

In the context of this chapter, services and resources are those things that are controlled by schedules. *Services* are real-world events, such as clinic appointments, the performance of which is controlled by a schedule. Often, these kinds of activities relate to the care of a patient. In other words, appointments for services often schedule a service for one or more patients. *Resources* are tangible items whose use is controlled by a schedule. These "items" are often people, locations, or things low in supply but high in demand.

10.1.1.1 Schedules

A *schedule* controls the dates and times available for the performance of a service and/or the use of a resource. One schedule applies to one service or resource, since each service or resource can be reserved independently of the others. (If two or more services, people, locations, or things cannot be reserved independently of one another, they are considered to be one activity or resource.) A schedule consists of slots of time during which the controlled service or resource is potentially available for performance or use. Slots are categorized as open, booked, or blocked. An open slot on a schedule indicates that the service or resource is available for performance or use during that period of time. A booked slot indicates that the service or resource is not available during the time period, because an appointment has been scheduled. A blocked slot indicates that a service or resource is unavailable for reasons other than a scheduled appointment.

The real-world, non-automated analog of the schedule described above is a standard appointment book. These books are generally organized with rows of time slots, during which a service or resource is available. The following figure illustrates an excerpt from such an appointment book.

Figure 10-1. An example excerpt from an appointment book

Date: May 17, 1994

	Room A	**Room B**	**Room C**	**Room D**
8:00 am	Pat: B Smith			
:15	Dr.: Peters		Closed for	
:30	Physical	Pat: N Drew	remodeling	
:45	Exam	Dr.: Collins		
9:00 am	Pat: J Adams	Allergy		Pat: A Jones
:15	Dr.: Anders	Scratch Test		Dr.: Peters
:30	Follow-up			

Each cell in the figure above represents a slot on a schedule. Different shading patterns represent booked and blocked slots. Information identifying the appointments scheduled in booked slots is written in the

appointment book. Similarly, explanations are written into the book when resources are blocked. Those cells with no shading and comments represent open slots.

As in the figure above, appointment books commonly contain more than one column. This format allows the scheduling of more than one resource or activity within the same book. This chapter defines a schedule as an entity controlling the availability of only one resource or service for a given period of time. Given that definition, each column in the above excerpt from the appointment book represents a separate schedule for a separate resource.

10.1.1.2 Services and resources

Services and resources are the "what" in any communication of scheduling transactions, that is, they are things—either tangible or intangible—that the transaction is attempting to affect or describe. The services and resources that are controlled by schedules are typically in high demand. In any case, their use or performance is managed through the process of reserving blocks of time.

Services are typically activities that occur in a certain location, where specific people and equipment exist to carry out the activity. The activity must be scheduled prior to its occurrence. The schedule that controls the activity may not be the same schedule that controls the location, people, and equipment. For example, patient visits to a clinic are typically controlled through scheduling. Patients receive an appointment at the clinic, and at the appointed time are seen by a member of the clinic staff. From the point of view of the person or application requesting the appointment for the patient, the "thing" being scheduled is a service (e.g., a doctor's consult, an X-ray, etc.). The assignment of an exam room and (in this example) a physician, nurse practitioner, or other staff member is incidental to the actual appointment.

Resources are tangible things that must be reserved prior to their use. Examples might include MRI equipment, portable X-ray machines, or rooms. People are also tangible resources that are often scheduled. Typically these people controlled by schedules have special roles, perform special activities, and are in high demand.

The following are the primary attributes that describe a resource:

- A unique identification code

  The unique identification code for a service or resource describes a specific instance of that service or resource. For tangible resources, this may be a serial number, a location, an employee number, or another unique designation. For services, the identification of a slot on the schedule is usually sufficient for unique identification.

- A code describing the type of class of service or resource

  This code describes a type or class of service, or resource groups like services or resources together. For services, this is typically a universal service identifier similar to the field used in the OBR segment defined in the Order Entry chapter (Chapter 4). This universal service identifier uniquely identifies clinical services performed in a healthcare provider organization.

  For tangible resources, this code may be a model number, a staff classification (such as physician, nurse, physical therapist, etc.), or a kind of room. This kind of information can be used to request a resource from a pool, where a specific instance of the resource scheduled is unknown and unimportant (as long as it is of the specified type or class).

- A name or text description of the resource

The name or text description of the resource provides a human-readable identification of the service or resource.

When a resource is associated with an appointment, or is requested for an appointment, the following attributes describe the relationship (or requested relationship):

- The start date and time the service or resource is required for the appointment

  The start date and time the service or resource is required for the appointment describes the point at which the service or resource should be made available to the activity. In this specification, this is represented as a positive or negative time offset from the start date and time of the appointment.

- The duration for which the service or resource is needed for the appointment

  The duration for which the service or resource is required for the appointment describes how long the service or resource is needed to complete the appointment. By adding the duration to the start date and time, the end date and time can be calculated for the required resource or service within the activity.

Other attributes further describe services and resources. These attributes are communicated, as necessary, in transactions between applications.

10.1.1.3 Appointments

Appointments are instances of the performance of a service or the use of a resource. They describe the "why," the "who," and the "when" in any communication of scheduling transactions. These appointments occupy one or more slots on a service or resource schedule, causing those slots to become unavailable or "booked." Appointments can describe scheduled activities related to patients in a healthcare setting, or they can describe scheduled activities wholly unrelated to patients.

In its simplest form, an appointment consists of one service or resource reserved for a period of time, for a specific reason. More complex activities involve multiple services or resources, or parent-child relationships to other appointments.

The primary attributes for the appointment which describes a scheduled activity include the following:

- a unique placer appointment identification code

  The placer appointment identification code uniquely describes an instance of an appointment. It is used in communications between placer and filler applications to identify a particular appointment (or a request for an appointment booking) on the placer application. Except in special circumstances, the code is assigned by the placer application upon making an initial scheduling request. This concept is similar in practice to the placer order number found in Chapter 4, Order Entry.

- a unique filler appointment identification code

  The filler appointment identification code uniquely describes an instance of an appointment. It is the filler application's counter-part to the placer appointment identification code. It is used in communications between placer and filler applications to identify a particular appointment (or request for an appointment booking) on the filler application. Except under special circumstances, it is assigned by the filler application when an appointment (or a request for an appointment

booking) is created by the filler application. This concept is similar in practice to the filler order number found in Chapter 4, Order Entry.

- an appointment start date and time

  The appointment start date and time describe the beginning of the appointment. In request transactions, the appointment start date and time are expressed as a preference or list of preferences. The filler application uses this expression of preference to book the appointment. Once an appointment has been booked, the start date and time are expressed in the actual scheduled start date and time.

- an appointment duration

  The appointment duration describes how long the appointment will last, and consequently, the end date and time of the appointment.

Supporting information about service and resource activities includes the following:

- reason codes to describe the reason that the service is occurring or the resource is being used;
- patient information to describe for whom the appointment is taking place, whether the appointment or scheduled activity is for, or related to, a patient;
- requestor information to describe the person responsible for initiating and executing the appointment;
- location information to describe where the appointment is scheduled to occur.

Other attributes further describe appointments. These attributes are communicated as necessary in transactions between applications.

10.1.1.4 Parent and child appointments

Parent appointments are those appointments that embody one or more child appointments. For example, a request for a repeating appointment results in a logical parent (the original scheduled appointment request), and one or more children (each individual occurrence of the appointment). This specification provides no information about how individual applications store or handle parent and child appointments, but it does provide a mechanism for identifying individual occurrences (children) within transactions.

Either the placing application or the filling application can specify child appointments--and in one of two ways. If each individual child appointment is assigned a separate and unique Placer Appointment ID and/or Filler Appointment ID, then that unique identifier may be used in transactions to specify an individual child. If, however, neither the placer nor filler application assigns a unique identifier separately, an occurrence number can be used. Both the ARQ and SCH segments allow for an occurrence number, which is a unique serial number assigned to each child within a parent appointment.

10.1.2 Application roles

In this specification, there are four roles that an application can assume: a filler application role, a placer application role, a querying application role, and an auxiliary application role. These application roles define the interaction that an application will have with other applications in the messaging environment. In many environments, any one application may take on more than one application role.

In this specification, the definition of application roles is not intended to define or limit the functionality of specific products developed by vendors of such applications. Instead, this information is provided to help define the model used to develop this specification, and to provide an unambiguous way for applications to communicate with each other.

10.1.2.1 The filler application role

The filler application role in the scheduling model is very similar to the filler application concept presented in Chapter 4, Order Entry. A filler application, in the scheduling model, is one that "owns" one or more schedules for one or more services or resources. In other words, a filler application exerts control over a certain set of services or resources and the schedules that define the availability of those services or resources. Because of this control, no other application has the ability to reserve, or to otherwise modify, the schedules controlled by a particular filler application.

Other applications can, on the other hand, make requests to modify the schedules owned by the filler application. The filler application either fulfills or denies requests to book slots, or to otherwise modify the schedules for the services and resources over which it exerts control.

Finally, the filler application also provides information about scheduled activities to other applications. The reasons that an application may be interested in receiving such information are varied. An application may have previously requested bookings or modifications on the schedule, or may simply be interested in the information for its own reporting or statistical purposes. There are two methods whereby filler applications disseminate this information: by issuing unsolicited information messages, or by responding to queries.

The analog of a filler application in a non-automated environment might be an appointment book and the person in charge of maintaining that book. The appointment book describes when the resources are available and when they are booked. This appointment book is the only official record of this information, and controls the availability of the resources to any user. The person in charge of this appointment book takes requests to book the resources, and decides whether to accept or reject the requests based on the information recorded in the appointment book. Anyone needing information from the appointment book either consults the book directly, or contacts the person in charge of the book.

10.1.2.2 The placer application role

The placer application role in the scheduling model is also very similar to its counterpart in the Order Entry chapter. A placer application requests the booking, modification, cancellation, etc., of a scheduled activity for a service or resource. Because it cannot exert any control over the schedule for that resource, it must send its requests to modify the schedule to the filler application. In requesting that these appointments be booked or modified in some way, the placer application is asking the filler application to exert its control over the schedule on the placer application's behalf.

The analog of a placer application in a non-automated environment might be any person needing a particular resource or appointment for a service. A person needing to book an appointment would contact the person in charge of the appointment book for that resource or service, and request a reservation. Often, there is negotiation between the person requesting the reservation or appointment and the person who maintains the appointment book. The requesting person will indicate requirements and preferences, and the person controlling the appointment book will indicate whether the request can be fulfilled as specified.

10.1.2.3 The querying application role

A querying application neither exerts control over, nor requests changes to a schedule. Rather than accepting unsolicited information about schedules, as does an auxiliary application, the querying application actively solicits this information using a query mechanism. It will, in general, be driven by a person wanting information about schedules, and may be part of an application filling the placer application

role as defined in this chapter. The information that the querying application receives is valid only at the exact time that the query results are generated by the filler application. Changes made to the schedule after the query results have been returned are not communicated to the querying application until it issues another query transaction.

The analog of a querying application in a non-automated environment might be any person needing information about a specific portion of a schedule. For example, a facilities manager may need to know whether a specific room has been scheduled during a specific period of time. This person might ask the person controlling the appointment book about the specific room and period of time in question.

Often, a placer application will also act as a querying application. The ability to send queries and receive lists of open slots are built in to some implementations of placer applications. These placer applications use this information to select open slots for subsequent booking requests. The current specification does not imply that placer applications should or should not also be able to fulfill the role of a querying application. Instead, the model defines these roles separately. Applications that support this functionality may take advantage of this application role in the model. Applications that do not support the querying application role are not limited in their support of the placer application role.

10.1.2.4 The auxiliary application role

Like querying applications, an auxiliary application neither exerts control over, nor requests changes to a schedule. It, too, is only concerned with gathering information about a particular schedule. It is considered an "interested third-party," in that it is interested in any changes to a particular schedule, but has no interest in changing it or controlling it in any way. An auxiliary application passively collects information by receiving unsolicited updates from a filler application.

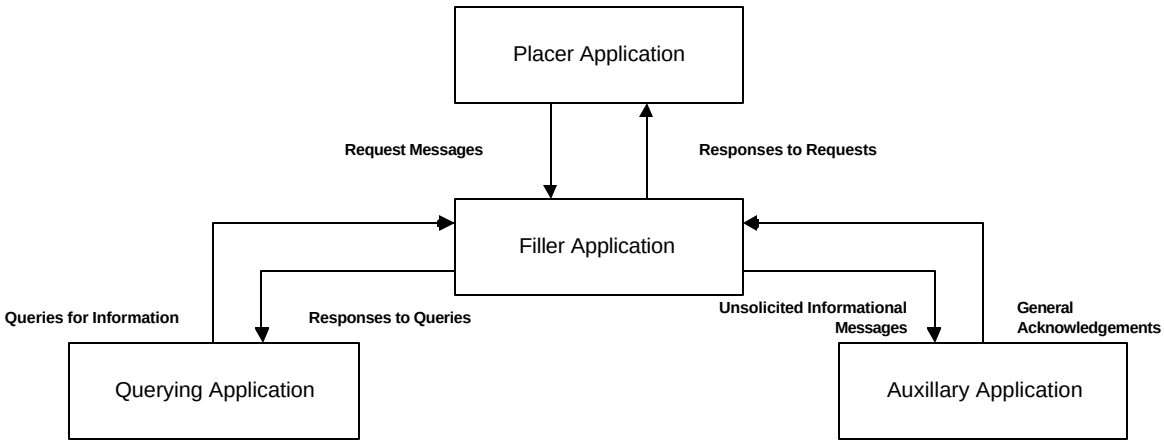
The analog of an auxiliary application in a non-automated environment might be any person receiving reports containing schedule information. For example, a facilities manager may need to know what rooms are booked for activity during specific periods of time. This person might ask the person controlling the appointment book for a periodic listing of activity, which may be something as simple as copies of pages from the appointment book.

Often, a placer application will also act as an auxiliary application. A placer application may have the capacity to store information about the scheduled activity that it requested. In such cases, the placer application is also an "interested" application in that it wishes to receive any messages describing changes to the content or status of the scheduled activity it initiated.

10.1.2.5 Application roles in a messaging environment

In a messaging environment, these four application roles communicate using specific types of messages and trigger events. The following figure illustrates the relationships between these application roles in a messaging environment:

Figure 10-2. Application role messaging relationships



The relationship between placer and filler applications revolves around request messages and response messages to those requests. Placer applications trigger request messages to filler applications, which respond to those requests with request response messages.

The relationship between querying and filler applications focuses on query messages and responses. Querying applications trigger query messages to filler applications, which respond with query response messages.

The relationship between auxiliary and filler applications centers on unsolicited informational messages. Filler applications trigger unsolicited informational messages to auxiliary applications whenever changes in the schedule occur. Auxiliary applications do not respond with any messages other than general acknowledgments. Filler applications triggering unsolicited informational messages do not expect further information from auxiliary applications.

10.1.3 Trigger events, statuses, reasons, and types

This chapter defines several trigger events used to communicate scheduling information between applications. In addition, it also defines, suggests, or allows for several statuses that scheduled activities may hold, several reasons a scheduled activity may occur, and several types of scheduled activities. The distinction between these four concepts is important for understanding the information in this chapter.

10.1.3.1 Trigger events

The trigger events for this chapter are defined in Section 10.2, “PLACER APPLICATION REQUESTS AND TRIGGER EVENTS, ” 10.3, “FILLER APPLICATION MESSAGES AND TRIGGER EVENTS UNSOLICITED,” and 10.4, “QUERY TRANSACTIONS A ND TRIGGER EVENTS.” Traditionally, trigger events define the transition of some entity from one state to another.[1] Typical trigger events may be listed as follows: new, cancel, modify, discontinue, reschedule, and delete.

1 HL7 trigger events are not strictly limited to this definition; however, most trigger events do define state transitions.

10.1.3.2 Statuses

The status of a scheduled activity describes where that activity is in its life cycle. A status differs from a trigger event in an important way: a status describes the current condition of an entity, whereas a trigger event is generated to "move" the entity from one state to another. All status fields in this chapter are defined with respect to the application acting in the role of a filler, unless otherwise (and specifically) indicated. Therefore, a status in a scheduling interface transaction is only truly meaningful if the transaction was generated by the application assigning or maintaining that status.

Typical statuses for a schedule transaction might include the following: pending, wait-listed, confirmed, canceled, discontinued, deleted, started, completed, overbooked (booked for a resource along with another conflicting appointment), blocked, etc.

10.1.3.3 Reasons

This chapter defines two kinds of reasons used with transactions. The first is an appointment reason that indicates why the appointment is being booked—and ultimately why the activity is going to occur. The second is an event reason that describes why a particular trigger event has been generated. Reasons tend to be static, whereas statuses tend to change. In contrast, trigger events describe an action to be performed.

Appointment reasons tend to be relatively static for the life of the scheduled activity. Typical examples of appointment reasons include the following: routine, walk-in, check-up, follow-up, emergency, etc.

Event reasons are static as well, but only for the life of a particular trigger event. Typical examples of event reasons include the following: no-show (e.g., when an appointment is canceled), at patient request, at caregiver request, etc.

10.1.3.4 Types

Rather than describing why an appointment has been scheduled—as the appointment reason does—the appointment type describes the kind of appointment recorded in the schedule. This information tends to be administrative in nature. Typical appointment types might include: normal, tentative (or "penciled in"), STAT, etc.

10.1.4 Appointments, orders, and referrals

A schedule request or appointment should not be confused, in any way, with orders for services, or for patient referrals. The trigger events and messages defined in this chapter are meant to operate within the realm of scheduling activities, and not to imply that any other trigger event or real-world event has or should occur. It should not be construed from this chapter that any schedule request transaction can be used instead of an order transaction, in which a service or other activity must be specifically ordered. In such cases, a specific order transaction should occur (either electronically or otherwise). If subsequent scheduling transactions are then required to carry out the order, the trigger events and messages defined in this chapter may be used.

10.1.5 Glossary

10.1.5.1 Appointment

An appointment represents a booked slot or group of slots on a schedule, relating to one or more services or resources. Two examples might include a patient visit scheduled at a clinic, and a reservation for a piece of equipment.

10.1.5.2 Auxiliary application

An auxiliary application neither exerts control over, nor requests changes to a schedule. It is only concerned with gathering information about a particular schedule. It can be considered an "interested third-party," in that it is interested in any changes to a particular schedule, but has no interest in changing it or controlling it in any way. It may gather information passively or actively. An auxiliary application passively collects information by receiving unsolicited updates from a filler application.

10.1.5.3 Block

An indication that a slot or a set of slots is unavailable for reasons other than booking an appointment.

10.1.5.4 Book

The act of reserving a slot or set of slots on a schedule for a service or resource.

10.1.5.5 Child appointment

A child appointment is an appointment subordinate to another appointment (called a parent appointment). For example, a single instance of an appointment in a group of recurring appointments is a child to the group. Child appointments can themselves be parent appointments. For example, if a battery of appointments is scheduled, then the atomic units of the battery are children to the battery request. If the battery is scheduled as a repeating appointment, then each instance of the battery of appointments (parent to each of the atomic units) is a child to the original repeating request.

10.1.5.6 Filler application

The filler application role in the scheduling model is very similar to the filler application concept presented in Chapter 4, Order Entry. A filler application, in the scheduling model, is one that "owns" one or more schedules for one or more services or resources. It fulfills requests to book slots for the services or resources over which it exerts control. It also notifies other applications of activity related to appointments, such as new bookings, modifications, cancellations, etc.

10.1.5.7 Parent appointment

A parent appointment is an appointment that consists of one or more subordinate appointments (called child appointments). A parent appointment is used to relate or group multiple appointments together in various ways. Examples of kinds of parent scheduled activities include, but are not limited to, the following.

- Recurring (repeating) appointments. For example, a physical therapy appointment may be scheduled every Tuesday at 4:00 PM for three months.
- Batteries of appointments. For example, an activity consisting of an appointment with Radiology, an appointment with a specialist, and an appointment with a primary care physician might be scheduled.
- Complex appointments. For example, recurring batteries of appointments, or batteries of battery appointments.

Parent appointments can themselves be children to other appointments.

10.1.5.8 Placer application

The role of the placer application in the scheduling model is also very similar to its counterpart in the Order Entry chapter. A placer application must request the booking, modification, cancellation, etc., of an

appointment for a service or resource because it cannot exert any control over that service or resource on the schedule. In requesting that these appointments be booked or modified in some way, the placer application is asking the filler application to exert its control over the schedule on the placer application's behalf.

10.1.5.9 Querying application

A querying application neither exerts control over, nor requests changes to a schedule. Rather than accepting unsolicited information about schedules, as does an auxiliary application, the querying application actively solicits this information using a query mechanism. It will be driven by a person wanting information about schedules, and may be part of an application filling the placer application role as defined in this chapter. The information that the querying application receives is valid only at the exact time that the query results are generated by the filler application. Changes made to the schedule after the query results have been returned are not communicated to the querying application until it issues another query transaction.

10.1.5.10 Resource

A resource is any person, place or thing that must be reserved prior to its use.

10.1.5.11 Schedule

A schedule is the sum of all of the slots related to a service or resource.

10.1.5.12 Service

A service is any activity that must be scheduled prior to its performance.

10.1.5.13 Slot

A slot is one unit on a schedule. A slot represents the smallest unit of time or quantity that a service or resource may be booked. Depending on the nature of the service or resource, there may be more than one defined slot at a given instant of time. For example, if a service is an open group therapy session with twelve available seats, then there are twelve slots for the given block of time.

10.1.6 Organization of this chapter: trigger events and message definitions

This specification contains three functional groupings of trigger events and message definitions. The trigger events within each of the three functional groupings share the same or similar message definitions. For clarity, message definitions shared by multiple trigger events are presented only once.

The first functional grouping of trigger events and message definitions describes *placer request transactions.* This grouping defines the trigger events and message definitions for transactions from applications acting in a placer application role, and also defines the related filler application response messages. These messages are described in Section 10.2, "PLACER APPLICATION REQUESTS AND TRIGGER EVENTS."

The second functional grouping describes trigger events and message definitions for *unsolicited transactions* from applications acting in the filler application role. This grouping describes the unsolicited messages originating from an application fulfilling the filler role, and the response messages sent back by applications fulfilling the auxiliary role. These messages are described in Section 10.3, "FILLER APPLICATION MESSAGES AND TRIGGER EVENTS UNSOLICITED."

The final grouping describes *query transactions* from applications acting in the querying application role, and also defines the *related filler application messages* used to respond to these queries. These messages are described in section 10.4, "QUERY TRANSACTIONS AND TRIGGER EVENTS."

The notation used to describe the sequence, optionality, and repetition of segments is described in Chapter 2, "Format for defining abstract messages."

10.1.6.1 Update mode

This chapter uses the "Action code/unique identifier" mode for updating via repeating segments. For more information on updating via repeating segments. For more information on updating via repeating segments, please see Section 2.23.4, "Modes for updating via repeating segment," in Chapter 2. The definition of the "Action code/unique identifier" update mode can be found in Chapter 2, Section 2.23.4.2, "Action code/unique identifier mode update definition."

10.2 PLACER APPLICATION REQUESTS AND TRIGGER EVENTS

Placer request and filler response transactions are the messages and trigger events used between placer applications and filler applications. The placer application initiates transactions using the **SRM** message, requesting that the filler application modify its schedule(s) with the given trigger event and information. The filler application responds to these requests, using the **SRR** message, to either grant or deny the requests from the placer application.

When initiating a request, the placer application will generate and send an **SRM** message containing all of the information necessary to communicate the desired action to the filler application. All required segments and fields (both explicitly required and conditionally required) should be provided to the filler application, as defined in this chapter. When the filler application receives the transaction, it acknowledges it with the appropriate accept acknowledgment using an **ACK** message (assuming that the enhanced acknowledgment mode is in use). After processing the request at the application level, the filler acknowledges the transaction with the appropriate application acknowledgment in an **SRM** message (again assuming that an application acknowledgment was requested under the enhanced acknowledgment mode, or that the original acknowledgment mode is in use). Applying the explanations of the various application acknowledgment codes in the context of this chapter, an application accept from the filler means that the request was processed and accepted by the filler. An application error from the filler means that the request was processed and denied. An application reject from the filler means that the request was not, and could not, be processed due to one or more reasons unrelated to its content (for example: it fails the basic application protocol validation, the filler system is down, or there was an internal error). When appropriate, an **SRM** message with an application accept acknowledgment will contain further information on the request that was processed.

There are no unsolicited messages initiated from a filler application defined in this set of trigger events. Those messages and trigger events are defined below, in Section 10.3, "FILLER APPLICATION MESSAGES AND TRIGGER EVENTS UNSOLICITED."

All of the trigger events associated with placer request and filler response transactions use a common message definition, that follows:

SRM	Schedule Request Message	Chapter
MSH	Message Header	2
ARQ	Appointment Request Information	10
[APR]	Appointment Preferences	10
[{ NTE }]	Notes and Comments	2
[{ PID	Patient Identification	3
[PV1]	Patient Visit	3
[PV2]	Patient Visit - Additional Info	3
[{ OBX }]	Observation/Result	4
[{ DG1 }]	Diagnosis	6
}		
]		
{ RGS	Resource Group Segment	10
[{ AIS	Appointment Information - Service	10
[APR]	Appointment Preferences	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIG	Appointment Information - General Resource	10
[APR]	Appointment Preferences	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIL	Appointment Information - Location Resource	10
[APR]	Appointment Preferences	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIP	Appointment Information - Personnel Resource	10
[APR]	Appointment Preferences	10
[{ NTE }]	Notes and Comments	2
}		
]		
}		

SRR	Scheduled Request Response	Chapter
MSH	Message Header	2
MSA	Message Acknowledgment	2
[ERR]	Error Information	2
[SCH	Schedule Activity Information	10
[{ NTE }]	Notes and Comments	2
[{ PID	Patient Identification	3
[PV1]	Patient Visit	3
[PV2]	Patient Visit - Additional Info	3
[{ DG1 }]	Diagnosis	6
}		
]		
{ RGS	Resource Group Segment	10
[{ AIS	Appointment Information - Service	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIG	Appointment Information - General Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIL	Appointment Information - Location Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIP	Appointment Information - Personnel Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
}		
]		

Note that in the abstract message definitions for both the SRM and SRR, the patient information segments (segments PID through DG1) are both optional as a group, and repeating as a group. The optionality allows for transactions that relate to a patient, and for those that do not. The ability to repeat the patient information allows for those transactions in which one activity must be scheduled for multiple patients (e.g., for family or group therapy).

In contrast, a transaction may specify no more than (and no less than) one activity. Note that neither the ARQ segment (in the SRM message) nor the SCH segment (in the SRR message) are allowed to repeat, and that they are required. Neither the optionality nor the ability to repeat patient information allows a transaction to specify more than one activity.

The trigger events that use this message definition are listed below.

10.2.1 Request new appointment booking (event S01)

A placer application sends a transaction with this trigger event to a filler application to request that a new appointment be booked. If it is successful, the filler application returns an application acknowledgment (if requested under the enhanced acknowledgment mode, or if the original acknowledgment mode is in use). The acknowledgment may optionally contain an SCH segment and related detail segments describing the actual appointment that was booked.

10.2.2 Request appointment rescheduling (event S02)

A placer application uses this trigger event to request that an existing appointment be rescheduled. The new Requested Start Date and Time, Appointment Duration, Repeating Interval, Repeating Interval Duration, and/or Priority are provided in the ARQ segment, along with the existing placer and filler identification numbers. If it is successful, an application acknowledgment is returned, optionally containing

an SCH segment and related detail segments describing the new information for the rescheduled appointment.

This transaction should not be used to reschedule an appointment that has begun but has not been completed. In such cases, and only if it is logical to do so, the appointment should be discontinued and a new schedule request should be submitted. Likewise, this transaction should not be used to reschedule a parent appointment, in which one or more children have begun or have already occurred. Again, the parent appointment should be discontinued, and a new schedule request should be made. This procedure removes any ambiguity between applications that may arise with an attempt to modify an appointment that is in progress.

10.2.3 Request appointment modification (event S03)

This message transmits a request for modification of an existing appointment to a filler application. This trigger event is used to request the modification of information on an existing appointment, outside of the need to reschedule, cancel, discontinue or delete the appointment, or to add, modify, cancel, discontinue, or delete services and/or resources on the appointment. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the new information for the modified appointment.

10.2.4 Request appointment cancellation (event S04)

The request appointment cancellation trigger event is sent by the placer application to the filler application to request that an existing appointment be canceled. A cancel event is used to stop a valid appointment from occurring. For example, if a patient scheduled for an exam cancels his/her appointment, then a request to cancel the appointment is sent. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the canceled appointment.

This trigger event can be used to cancel a parent appointment, in which none of the children of the appointment have either begun or have been completed. Any child appointments that exist on the filler and placer applications should be considered canceled. If one or more child appointments have begun or have been completed, then this trigger event should not be used. Instead, the S05 (request appointment discontinuation) event should be used.

10.2.5 Request appointment discontinuation (event S05)

The request appointment discontinuation is sent by the placer application to the filler application to request that an appointment in progress be stopped, or that the remaining occurrences of a parent appointment not occur as scheduled. If none of the child appointments of a parent appointment have occurred, then a cancel trigger event should be sent instead. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the discontinued appointment.

10.2.6 Request appointment deletion (event S06)

A request appointment deletion is sent by the placer application to the filler application to request that an appointment that had been entered in error be removed from the system. A delete trigger event should only be used when an appointment has been erroneously requested, and must be removed from the schedule so that it does not affect any statistical processing. A delete trigger event differs from a cancel trigger event in that a delete acts to remove an error, whereas a cancel acts to prevent a valid request from occurring. This

trigger event should not be used for any appointment that has already begun, or has already been completed. Likewise, it should not be used on any parent appointment if any child appointments have either begun or been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the deleted appointment.

The delete trigger event should be implemented with careful forethought, as it typically has different effects and repercussions in various applications. In some applications, a delete event cannot be undone. This means that if a delete transaction was sent erroneously, recovery will be difficult or impossible. In other applications, a delete transaction will not result in the physical deletion of the record(s), but will set a status or a flag. In these cases, the filler and/or placer appointment identifiers (the numbers or codes that uniquely identify the scheduled appointment or request to the placer and filler applications) probably cannot be reused. Since these applications maintain a record of deleted appointments, the reuse of an identifier will likely cause a conflict in the applications' processing of transactions.

10.2.7 Request addition of service/resource on appointment (event S07)

The request addition of service/resource is triggered by the placer application to request that a new service or resource be added to an existing appointment. Services and resources are represented by the AIS, AIG, AIL, and AIP segments on an HL7 scheduling interface transaction. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the modified appointment.

10.2.8 Request modification of service/resource on appointment (event S08)

The request modification of service/resource is triggered on the placer application to request that information pertaining to an existing service or resource be changed for an existing appointment. Services and resources are represented by the AIS, AIG, AIL, and AIP segments on an HL7 scheduling interface transaction. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the modified appointment.

This trigger event should not be used when an existing resource or service must be replaced or rescheduled for an existing appointment. The following fields on the indicated segments should not be changed by this trigger event: the first three fields of the AIS, the first four fields of the AIG, the first four fields of the AIL, and the first four fields of the AIP. Instead, use two trigger events to accomplish the replacement or rescheduling of a service or resource: S09 (request cancellation of service/resource), as well as S07 (request addition of service/resource).

10.2.9 Request cancellation of service/resource on appointment (event S09)

This trigger event requests that a service or resource be removed from an existing scheduled appointment that has not yet begun. A cancel event is used to stop a valid service or resource from participating in the appointment. For example, if a portable X-ray machine scheduled for an exam is no longer needed, then the placer application requests that the resource be canceled on the filler application. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the modified appointment.

10.2.10 Request discontinuation of service/resource on appointment (event S10)

A request discontinuation of service/resource is sent by the placer application to the filler application when the remaining occurrences of a recurring appointment no longer require a particular service or resource. In other words, this trigger event is sent to request that the performance of a service or resource in a recurring appointment that has already begun be stopped. If the first appointment in a set of recurring appointments has not yet occurred, then a cancel trigger event should be sent instead. This trigger event should only be used on appointments that have not been completed, or on parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the modified appointment.

10.2.11 Request deletion of service/resource on appointment (event S11)

A request deletion of service/resource is sent by the placer application to the filler application to request that a scheduled appointment requiring a service or resource entered in error be removed from the system. A delete trigger event should only be used when a service or resource has been erroneously attached to an appointment, and must be removed from the schedule so that it does not affect any statistical processing. A delete trigger event differs from a cancel trigger event in that a delete acts to remove an error, whereas a cancel acts to prevent a valid request from occurring. This trigger event should only be used on appointments that have not been completed, or on parent appointments whose children have not been completed. If it is successful, an application acknowledgment is returned, optionally containing an SCH segment and related detail segments describing the modified appointment.

10.3 FILLER APPLICATION MESSAGES AND TRIGGER EVENTS UNSOLICITED

Unsolicited transactions from filler applications are the messages and trigger events used between filler applications and auxiliary applications. Transactions are initiated by the filler application, using the **SIU** message to notify auxiliary applications of modifications in a filler application's schedule(s). The auxiliary application responds to these notifications, using the **ACK** message, either to acknowledge receipt of the transaction, or to signal that an interfacing error of some kind has occurred.

This set of trigger events is also used to notify applications fulfilling the placer application role of changes in the filler application's schedule(s), if the application is configured to accept these messages and trigger events as an auxiliary application would. As the discussion of application roles has indicated above, any one application can have more than one application role. If it is important that the application acting in the placer application role in your messaging environment be notified of unsolicited changes to a filler application's schedule(s), then it must also support the role of an auxiliary application.

When initiating a notification transaction, the filler application will generate and send an **SIU** message containing all of the information necessary to communicate the desired information to the auxiliary application. All required segments and fields (both explicitly required and conditionally required) should be provided by the filler application, as defined in this chapter. When the auxiliary application receives the transaction, it acknowledges with the appropriate accept acknowledgment using an **ACK** message (assuming that the enhanced acknowledgment mode is in use). After processing the notification at the application level, the auxiliary application acknowledges the transaction with the appropriate application acknowledgment in an **ACK** message (assuming that an application acknowledgment was requested under the enhanced acknowledgment mode, or that the original acknowledgment mode is in use). Applying the explanations of the various application acknowledgment codes (detailed in Chapter 2) in the context of this chapter, an application accept from the auxiliary application means that the notification was processed and accepted. An application error from the auxiliary application means that the auxiliary application was unable to process the notification at the application level. An application reject from the auxiliary application means

that the request was not, and could not, be processed due to one or more reasons unrelated to its content (for example: it fails the basic application protocol validation, the system is down, or there was an internal error).

All of the trigger events associated with unsolicited transactions from filler applications use a common message definition, that follows:

SIU	Schedule Information Unsolicited	Chapter
MSH	Message Header	2
SCH	Schedule Activity Information	10
[{ NTE }]	Notes and Comments	2
[{ PID	Patient Identification	3
[PV1]	Patient Visit	3
[PV2]	Patient Visit - Additional Info	3
[{ OBX }]	Observation/Result	4
[{ DG1 }]	Diagnosis	6
}		
]		
{ RGS	Resource Group Segment	10
[{ AIS	Appointment Information - Service	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIG	Appointment Information - General Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIL	Appointment Information - Location Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
[{ AIP	Appointment Information - Personnel Resource	10
[{ NTE }]	Notes and Comments	2
}		
]		
}		

ACK	General Acknowledgment	Chapter
MSH	Message Header	2
MSA	Message Acknowledgment	2
[ERR]	Error Information	2

The trigger events that use this message definition are listed below.

10.3.1 Notification of new appointment booking (event S12)

This message is sent from a filler application to notify other applications that a new appointment has been booked. The information provided in the SCH segment and the other detail segments as appropriate describe the appointment that has been booked by the filler application.

10.3.2 Notification of appointment rescheduling (event S13)

This message is sent from a filler application to notify other applications that an existing appointment has been rescheduled. The information in the SCH segment and the other detail segments as appropriate describe the new date(s) and time(s) to which the previously booked appointment has been moved. Additionally, it describes the unchanged information in the previously booked appointment.

This transaction should not be used to reschedule an appointment that has begun but has not been completed. In such cases, and only if it logical to do so, the appointment should be discontinued and a new

schedule request should be submitted. Likewise, this transaction should not be used to reschedule a parent appointment, in which one or more children have begun or have already taken place. Again, the parent appointment should be discontinued, and a new schedule request should be made. This procedure removes any ambiguity between applications that may arise with an attempt to modify an appointment that is in progress.

10.3.3 Notification of appointment modification (event S14)

This message notifies other applications that an existing appointment has been modified on the filler application. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed.

10.3.4 Notification of appointment cancellation (event S15)

A notification of appointment cancellation is sent by the filler application to other applications when an existing appointment has been canceled. A cancel event is used to stop a valid appointment from taking place. For example, if a patient scheduled for an exam cancels his/her appointment, then the appointment is canceled on the filler application.

This trigger event can be used to cancel a parent appointment, in which none of the children of the appointment have either begun or been completed. Any child appointments that exist on the filler and placer applications should be considered canceled. If one or more child appointments have begun or have been completed, then this trigger event should not be used. Instead, the S16 (notification of appointment discontinuation) event should be used.

10.3.5 Notification of appointment discontinuation (event S16)

A notification of appointment discontinuation is sent by the filler application to notify other applications that an appointment in progress has been stopped, or that the remaining occurrences of a parent appointment will not occur. If none of the child appointments of a parent appointment have taken place, then a cancel trigger event should be sent instead.

10.3.6 Notification of appointment deletion (event S17)

A notification of appointment deletion is sent by the filler application to other applications when an appointment that had been entered in error has been removed from the system. A delete trigger event should only be used when an appointment has been erroneously scheduled. It must be removed from the schedule so that it does not affect any statistical processing. A delete trigger event differs from a cancel trigger event in that a delete acts to remove an error, whereas a cancel acts to prevent a valid request from occurring. This trigger event should not be used for any appointment that has already begun, or that has already been completed. Likewise, it should not be used for any parent appointment if any child appointments have either begun or been completed.

The delete trigger event should be implemented with careful forethought, as it typically has different effects and repercussions in various applications. In some applications, a delete event cannot be undone. This means that if a delete transaction was sent erroneously, recovery will be difficult or impossible. In other applications, a delete transaction will not result in the physical deletion of the record(s), but will set a status or a flag. In these cases, the filler and/or placer appointment identifiers (the numbers or codes that uniquely identify the scheduled appointment or request to the placer and filler applications) probably cannot be reused. Since these applications maintain a record of deleted appointments, the reuse of an identifier will likely cause a conflict in the applications' processing of transactions.

10.3.7 Notification of addition of service/resource on appointment (event S18)

The notification of addition of service/resource is triggered on the filler application when a new service or resource has been added to an existing appointment. Services and resources are represented by the AIS, AIG, AIL, and AIP segments on an HL7 scheduling interface transaction. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed.

10.3.8 Notification of modification of service/resource on appointment (event S19)

The notification of modification of service/resource is triggered on the filler application when the information pertaining to an existing service or resource has been changed for an existing appointment. Services and resources are represented by the AIS, AIG, AIL, and AIP segments on an HL7 scheduling interface transaction. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed.

This trigger event should not be used when an existing resource or service has been replaced in relation to an existing appointment. Instead, use two other trigger events: S20 (notification of cancellation of service resource), as well as S18 (notification of addition of service/resource).

10.3.9 Notification of cancellation of service/resource on appointment (event S20)

This trigger event notifies other applications that a service or resource has been removed from an existing scheduled appointment that has not yet begun. A cancel event is used to stop a valid service or resource from participating in the appointment. For example, if a portable X-ray machine scheduled for an exam is no longer needed, then the resource is canceled on the filler application. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed.

10.3.10 Notification of discontinuation of service/resource on appointment (event S21)

A notification of discontinuation of service/resource is sent by the filler application to other applications when the remaining children of a parent appointment no longer require a particular service or resource. In other words, this trigger event is sent to discontinue the performance of a service or resource in a parent appointment that has already begun. If the first appointment in a set of recurring appointments has not yet taken place, then a cancel trigger event should be sent instead. This trigger event should only be used for appointments that have not been completed, or for parent appointments whose children have not been completed.

10.3.11 Notification of deletion of service/resource on appointment (event S22)

A notification of deletion of service/resource is sent by the filler application to other applications when a scheduled appointment requiring a service or resource entered in error has been removed from the system. A delete trigger event should only be used in those circumstances when a service or resource has been erroneously attached to an appointment, and must be removed from the schedule so that it does not affect any statistical processing. A delete trigger event differs from a cancel trigger event in that a delete acts to remove an error, whereas a cancel acts to prevent a valid request from taking place.

10.3.12 Notification of blocked schedule time slot(s) (event S23)

A notification of blocked schedule time slots is sent by the filler application to other applications when a schedule has had one or more time slots blocked and made unavailable for reasons other than the scheduling of an appointment. For example, if an exam room is unavailable for several hours because of maintenance needs or contamination, a user may block off those several hours on the exam room's schedule. Similarly, if a physician is unavailable because he or she has taken vacation time, his or her schedule may be blocked off for the duration of the vacation. When these types of conditions exist, the filler application may use this transaction to notify other applications that the resources controlled by schedules are unavailable.

10.3.13 Notification of opened ("un-blocked") schedule time slot(s) (event S24)

A notification of blocked schedule time slots is sent by the filler application to other applications when a schedule has one or more time slots open up ("un-blocked") and become available for use. Typically, the blocked period of time on a schedule is simply allowed to expire, because the blocked amount of time is generally used for non-appointment activities. This transaction can be used either to discontinue the blocked status on the schedule, or to reverse a previous block made in error. For the purposes of this transaction, discontinuing a block currently in progress (the blocked period has started, but not yet completed) and canceling a blocked period in the future are not significantly different. Therefore, a separate discontinue block transaction is not necessary. If this transaction is received prior to the inception of a blocked period, then the entire block period is simply canceled according to the data provided in the transaction. If the transaction is received after the blocked period has begun, but prior to the end of the blocked period, then the blocked period is discontinued according to the data provided in the transactions. Applications may decide how to handle transactions that attempt to open a blocked period that has both started and ended in the past; however, these transactions can generally be ignored.

For example, if an exam room has been blocked for several hours because of maintenance activities or contamination, and if the work has been completed ahead of schedule, a user may open those several hours on the exam room's schedule. When such a situation occurs, the filler application may use this transaction to notify other applications that the room is available.

10.3.14 Notification that patient did not show up for scheduled appointment (event S26)

A notification that a patient did not show up for an appointment. For example, if a patient was scheduled for a clinic visit, and never arrived for that appointment, this trigger event can be used to set a status on the appointment record for statistical purposes, as well as to free resources assigned to the appointment (or any other application level actions that must be taken in the event a patient does not appear for an appointment).

Patient Administration events defined in Chapter 3 can be used to indicate that a patient has arrived for an appointment, e.g., A01 (admit/visit notification), A04 (register a patient), A05 (preadmit a patient), or A10 (patient arriving - tracking) as possible examples. Similarly, Patient Administration transactions can be used to identify the end of an appointment, e.g., A02 (discharge/end visit) or A09 (patient departing - tracking) as possible examples.

10.4 QUERY TRANSACTIONS AND TRIGGER EVENTS

Query transactions are the messages and trigger events used between querying applications and filler applications. In Version 2.3 of the Standard, there are several types of queries available. Original mode display-oriented and record-oriented queries are compatible with the queries defined in previous versions of the Standard. New enhanced

mode queries include an Embedded Query Language (EQQ), a Virtual Table Query (VQQ), a Stored Procedure Request (SPQ), and an Event Replay Query. Original mode display-oriented queries now have an Enhanced Display Response (EDR) available in Version 2.3. Descriptions and definitions of these query types are found in Chapter 2, Section 2.16, "Query Trigger Events and Message Definitions."

As the discussion of application roles has indicated above, any one application can have more than one application role. If it is important that applications in your messaging environment that fulfill either the placer or auxiliary application roles be able to query information actively from a filler application's schedule(s), then they must also support the role of a querying application.

10.4.1 Original mode queries - display oriented

Original mode display-oriented queries are defined in Chapter 2, Sections 2.17, "Original Mode Queries," and 2.18, "Original Mode Deferred Access." Querying applications use the **QRY** message to initiate a query. Specifying a trigger event of Q01 (query sent for immediate response) in the query transaction yields a request for an immediate response, whereas the use of trigger event Q02 (query send for deferred response) requests a deferred response. In the immediate mode, the responding application initiates a message using the **DSR** message type. In the deferred response mode, the responding application first acknowledges the query with a general acknowledgment, and then later fulfills the query request with a DSR message, using trigger event Q03 (deferred response to a query). Refer to Chapter 2, Section 2.16, "Query Trigger Events and Message Definitions," for a full discussion of query messages, types, definitions, triggers, and variants.

As indicated in item (a) under Section 2.16.1 in Chapter 2, the allowable values for the filters in the QRD and QRF segments are determined among the coordinating applications during implementation. In general, applications responding to query transactions should define the valid filter codes for the queries they are able to support. Applications initiating query transactions should coordinate with these values at the time of implementation. Section 10.4.3, "SQM/SQR - schedule query message and response (event S25)," suggests a representative set of values that might be used in querying applications for schedule information.

Likewise, information contained in the DSP segment(s) is formatted according to the standards and requirements laid out at the time of implementation. Data contained in these lines of displayable information should be understood to have lost their semantic value, and should be treated only as text.

If both the querying and responding applications support the QAK segment introduced in Version 2.3, then the Enhanced Display Response message (message type EDR) may be used to respond to the QRY message.

10.4.2 Original mode queries - record oriented

As stated in Chapter 2, Section 2.16, "Query Trigger Events and Message Definitions," original mode record-oriented query and response messages are defined in the individual chapters. This section defines the messages used in Original Mode record-oriented queries and responses for schedule information. Refer to Chapter 2, Section 2.16, "Query Trigger Events and Message Definitions," for a full discussion of query messages.

This section also defines the format of the response message for SQL queries, Virtual Table Queries (VQQ) and Stored Procedure Request (SPQ)queries, when the Enhanced Response Format Code field of their respective defining segments contains the code **R**. This code indicates that the response should be given in the record-oriented format. When using any of these three enhanced mode queries with a record-oriented

response indicator, use only the response message definition from this section. The remainder of this section pertains only to original mode record-oriented queries.

10.4.3 SQM/SQR - schedule query message and response (event S25)

Original Mode record-oriented query transactions are initiated from the querying application using the Schedule Query (SQM) to request information about a filler application's schedule(s). The filler application responds to these requests, using the Schedule Query Response (SQR) message to either return the requested information, or to signal that an interfacing error of some kind has occurred. The definitions for the SQM message and the SQR response are listed below.

SQM	Schedule Query	Chapter
MSH	Message Header	2
QRD	Query Definition	2
[QRF]	Query Filter	2
[ARQ	Appointment Request	10
[APR]	Appointment Preferences	10
[PID]	Patient Identification	3
{ RGS	Resource Group Segment	10
[{ AIS	Appointment Information - Service	10
[APR]	Appointment Preferences	10
}		
]		
[{ AIG	Appointment Information - General Resource	10
[APR]	Appointment Preferences	10
}		
]		
[{ AIP	Appointment Information - Personnel Resource	10
[APR]	Appointment Preferences	10
}		
]		
[{ AIL	Appointment Information - Location Resource	10
[APR]	Appointment Preferences	10
}		
]		
}		
]		
[DSC]	Continuation Pointer	2

SQR	Schedule Query Response	Chapter
MSH	Message Header	2
MSA	Message Acknowledgment	2
[ERR]	Error	2
QAK	Query Acknowledgment	2
[{ SCH	Schedule Activity Information	10
[{ NTE }]	Notes and Comments	2
[PID	Patient Identification	3
[PV1]	Patient Visit	3
[PV2]	Patient Visit - Additional Info	3
[DG1]	Diagnosis	6
]		
{ RGS	Resource Group Segment	10
[{ AIS	Appointment Information - Service	10
[{NTE}]	Notes and Comments	2
}		
]		
[{ AIG	Appointment Information - General Resource	10
[{NTE}]	Notes and Comments	2
}		
]		
[{ AIP	Appointment Information - Personnel Resource	10
[{NTE}]	Notes and Comments	2
}		
]		
[{ AIL	Appointment Information - Location Resource	10
[{NTE}]	Notes and Comments	2
}		
]		
}		
}		
]		
[DSC]	Continuation Pointer	2

If the deferred response mode (as defined in Chapter 2, Section 2.18, “Original Mode Deferred Access”) is required, then modify the above message definition as follows:

- A code of **D** for “deferred” appears in the third field of the QRD segment, “Query Priority.”
- The acknowledgment of the initial SQM message is a general acknowledgment (ACK).
- The SQR message is sent as if it were an unsolicited message. The original querying application responds with a general acknowledgment message (ACK).

There is only one trigger event defined for schedule information queries. This trigger event is used for all original mode record-oriented schedule information queries. The specification of information to return in the query response is defined by the values provided in certain fields of the QRD and QRF segments.

QRD-2-query format code is assumed to hold the value **R**, indicating that the response should be in a record-oriented format. A value of **D** is invalid in *QRD-2-query format*, in conjunction with this trigger event, and should generate an error.

QRD-9-what subject filter defines the kind of information that the query is requesting. The following codes are suggested as possible candidates for this field, defining the different kinds of scheduling information requests that might be required by querying applications. Refer to *HL7 table 0048 - What subject filter* for valid values.

Scheduling additions to HL7 Table 0048 - What subject filter

Value	Description
SAL	All schedule related information, including open slots, booked slots, blocked slots
SOP	Open slots on the identified schedule
SBK	Booked slots on the identified schedule
SBL	Blocked slots on the identified schedule
SSA	Time slots available for a single appointment
SSR	Time slots available for a recurring appointment

QRF-1-where subject filter allows the query to specify the department, the system, or the subsystem.

Any remaining definition and filtering of the query should be achieved by supplying information in the chapter-specific segments that fall between the QRF segment and DSC segment in the message definition.

10.4.4 Enhanced mode queries

The new enhanced mode queries, introduced in Version 2.3, use the message definitions and responses defined in Chapter 2. Refer to Section 2.20, “Enhanced Query Mode Response Messages,” for more information on those query transactions.

10.5 MESSAGE SEGMENTS

10.5.1 ARQ - appointment request segment

The ARQ segment defines a request for the booking of an appointment. It is used in transactions sent from an application acting in the role of a placer.

Figure 10-3. ARQ attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	75	EI	R			00860	Placer Appointment ID
2	75	EI	C			00861	Filler Appointment ID
3	5	NM	C			00862	Occurrence Number
4	75	EI	O			00218	Placer Group Number
5	200	CE	O			00864	Schedule ID
6	200	CE	O			00865	Request Event Reason
7	200	CE	O		0276	00866	Appointment Reason
8	200	CE	O		0277	00867	Appointment Type
9	20	NM	O			00868	Appointment Duration
10	200	CE	O			00869	Appointment Duration Units
11	53	DR	O	Y		00870	Requested Start Date/Time Range
12	5	ST	O			00871	Priority
13	100	RI	O			00872	Repeating Interval
14	5	ST	O			00873	Repeating Interval Duration
15	48	XCN	R			00874	Placer Contact Person
16	40	XTN	O	Y		00875	Placer Contact Phone Number
17	106	XAD	O			00876	Placer Contact Address
18	80	PL	O			00877	Placer Contact Location
19	48	XCN	R			00878	Entered By Person
20	40	XTN	O	Y		00879	Entered By Phone Number
21	80	PL	O			00880	Entered By Location
22	75	EI	O			00881	Parent Placer Appointment ID
23	75	EI	O			00882	Parent Filler Appointment ID

10.5.1.0 ARQ field definitions

10.5.1.1 Placer appointment ID (EI) 00860

```
Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field contains placer application's permanent identifier for the appointment request (and the scheduled appointment itself, when confirmed as booked by the filler application). This is a composite field. Refer to Chapter 2, Section 2.8.15, "EI - entity identifier," for a description of the EI data type and its components and subcomponents.

The first component is a string that identifies an individual appointment request, or booked appointment. It is assigned by the placer application, and it identifies an appointment request, and the subsequent scheduled appointment, uniquely among all such requests and/or booked appointments from a particular requesting application. If the placer appointment ID identifies a parent of a repeating schedule request, then the individual scheduled child appointments can be uniquely identified either by a new placer appointment ID or the parent's placer appointment ID plus an occurrence number, specified in *ARQ-3-occurrence number*.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.1.2 Filler appointment ID (EI) 00861

```
Components:  <entity identifier (ST)> ^ <namespace ID (ST)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field contains the filler application's permanent identifier for the appointment request (and the scheduled appointment itself, when confirmed as a booked slot by the filler application). This is a composite field. Refer to Chapter 2, Section 2.8.15, "EI - entity identifier," for a description of the EI data type and its components and subcomponents.

The first component is a string that identifies an individual appointment request, or booked appointment. It is assigned by the filler application, and it identifies a appointment request, and the subsequent scheduled appointment, uniquely among all such requests and/or booked appointments from a particular processing application. If the filler appointment ID identifies a parent of a repeating schedule request, then the individual scheduled child appointments can be uniquely identified either by a new filler appointment ID or the parent's filler appointment ID plus an occurrence number, specified in *ARQ-3-occurrence number*.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

This is a conditionally required field. On initial request messages and other messages where a filler has not yet assigned a filler appointment ID, this field should not contain a value. In all other subsequent messages, where a filler application has assigned a filler appointment ID and communicated it to other applications, this field is required.

10.5.1.3 Occurrence number (NM) 00862

Definition: This field is used in conjunction with the placer appointment ID and/or the filler appointment ID to uniquely identify an individual occurrence (a child) of a parent repeating schedule appointment.

This field is conditionally required. If the transaction using this segment is meant to apply only to one occurrence of a repeating appointment, and an occurrence number is required to uniquely identify the child appointment (that is, the child does not have a separate and unique placer appointment ID or filler appointment ID), then this field is required.

10.5.1.4 Placer group number (EI) 00218

```
Components: <entity Identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field allows a placer application to group sets of appointment requests together, and subsequently to identify the group.

The first component is a string that identifies a group of appointment requests. It is assigned by the placer application, and it identifies an appointment group uniquely among all such groups of requests from a particular requesting application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.1.5 Schedule ID (CE) 00864

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code for the schedule in which this appointment should be (or is) booked. This field is provided for situations in which filler applications maintain multiple schedules, and in which a particular resource or set of resources is controlled by more than one of those schedules.

If a new appointment must be booked, it may be necessary to provide a schedule ID to uniquely identify the intended slot(s) being requested in the transaction. After the request has been assigned to one or more slots, however, the filler application should assign a unique filler appointment ID (see Sections 10.5.1.1, "Placer appointment ID (EI) 00860," and 10.5.1.2, "Filler appointment ID (EI) 00861)." This filler appointment ID, as its definition indicates, should uniquely identify the appointment among all such requests and appointments within the filler application. This means that, once assigned, the filler appointment ID should uniquely identify the appointment (either as a request or as a booked appointment) without a need to provide the schedule ID too. As a cautionary note regarding implementation, if the filler appointment ID would not otherwise be unique, it may be necessary to include the schedule ID as part of the filler appointment ID. This can be done either by prefixing the appointment ID with the schedule ID, or by appending the schedule ID to the appointment ID.

10.5.1.6 Request event reason (CE) 00865

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains the identifier code for the reason that the request event is being triggered. This field may contain a code describing the cancel reason, the delete reason, the discontinue reason, the add reason, or any other code describing the reason that a specific event is occurring.

10.5.1.7 Appointment reason (CE) 00866

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains the identifier code for the reason that the appointment is to take place. This field may contain a Universal Service Identifier describing the observation/test/battery/procedure or other activity that is to be performed during the requested appointment, similar to the Universal Service Identifier defined for the OBR segment in Chapter 4 on Order Entry. It may also contain a site-specific code describing a pre-defined set of reasons that an appointment may be set to occur. This code can be based on local and/or universal codes. The use of universal codes is recommended. Refer to *user-defined table 0276 - Appointment reason codes*, below, for suggested codes.

User-defined Table 0276 - Appointment reason codes

Value	Description
ROUTINE	Routine appointment - default if not valued
WALKIN	A previously unscheduled walk-in visit
CHECKUP	A routine check-up, such as an annual physical
FOLLOWUP	A follow up visit from a previous appointment
EMERGENCY	Emergency appointment

10.5.1.8 Appointment type (CE) 00867

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code for the type of appointment being requested. Refer to *user-defined table 0277 - Appointment type codes* for suggested codes.

User-defined Table 0277 - Appointment type codes

Value	Description

NORMAL	Routine schedule request type - default if not valued
TENTATIVE	A request for a tentative (e.g., "penciled in") appointment
COMPLETE	A request to add a completed appointment, used to maintain records of completed appointments that did not appear in the schedule (e.g., STAT, walk-in, etc.)

10.5.1.9 Appointment duration (NM) 00868

Definition: This field contains the amount of time being requested for the appointment. In cases of requests for repeating appointments, this field describes the duration of one instance of the appointment. If this field is unvalued, then the institution's standard duration for the type of appointment requested will be assumed.

The appointment duration field must contain a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.1.10 Appointment duration units (CE) 00869

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used in expressing *the ARP-9-appointment duration* field. This field should be valued according to the recommendations in Chapters 2 and 7. If this component is not valued, the ISO base unit of seconds (code **s**) will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.1.11 Requested start date/time range (DR) 00870

```
Components:  <range start date/time (TS)> ^ <range end date/time (TS)>
```

Definition: This field contains the date and time that the appointment is requested to begin, in the form of a date/time range. The first component contains the earliest date and time that the appointment may be scheduled to begin. The second component contains the latest date and time that the appointment may be scheduled to begin.

The TS (time stamp) data type allows for two components: the time stamp, and a degree of precision. If used, the degree of precision should be separated from the time stamp by a subcomponent delimiter.

If only the range start date/time has been provided, then the range end date/time is assumed to be infinity. Using this scenario is equivalent to requesting the next available slot on/after a particular date and time. If only the range end date/time has been provided, then the range start date/time is assumed to be immediate. Using this scenario is equivalent to requesting the appointment start some time between the current date and time, and the specified range end date/time. Requesting an appointment when the range start and range end date/time are the same is equivalent to requesting a specific slot on a schedule. If this field is unvalued, then the filler application will assume that the next available slot should be scheduled, using the institution's processing rules for scheduling appointments.

This field may repeat. Repetitions of this field are used to construct a list of acceptable ranges. Repetitions of this field are connected with a logical OR to construct this list. This procedure allows applications to provide multiple preferences for the scheduling of appointments. Applications should take steps to ensure that nonsensical ranges are not indicated in this field (for example, redundant ranges).

Examples:

Schedule the appointment to begin at some time between 8:00AM on Tuesday, May 17th, 1994 and 12:00PM on Friday, May 20th, 1994 local time:

```
...|199405170800^199405201200|...
```

Schedule the appointment in the next available slot on/after 6:00AM on Monday, April 25th, 1994 local time:

```
...|199405250600^|...
```

> **Note**: The field value ...|199405250600|... is equivalent to making the above request, according to the HL7 rules for processing fields.

Schedule the appointment in the next available slot on/**before** 6:00AM on Monday, April 25th, 1994 local time:

```
...|^199405250600|...
```

Schedule the appointment in the next available slot:

```
...||...
```

Schedule the appointment to begin on any weekday during the two weeks beginning Monday, April 4th 1994. In this example, the degree of precision (sub)component of the time stamp is used to indicate that the date/time ranges refer to the institution's standard operating day:

```
...|199404040000&D^199404080000&D~199404110000&D^199404150000&D|...
```

Schedule the appointment in the next available slot that does not occur during the May, 1994 HL7 Working Group Meeting:

```
...|^199405161600~199405230800^|...
```

Schedule the appointment to begin on/before 4:00PM on Thursday, December 23rd, 1993, or any weekday between Monday, December 27th and Thursday, December 30th, or on/after 8:00AM on Monday, January 3rd, 1994:

```
...|^199312231600~199312270000&D^199312300000&D~199401030800^|...
```

10.5.1.12 Priority (ST) 00871

Definition: This field contains the urgency of the request. The definition of this field is equivalent to the definition of the priority component of the Quantity/Timing data type given in the Order Entry chapter (Chapter 4), Section 4.4.6, "Priority component."

10.5.1.13 Repeating interval (RI) 00872

```
Components:  <repeat pattern (IS)> ^ <explicit time interval (ST)>
```

Definition: This field contains the interval between repeating appointments. The default setting indicates that the appointment should occur once, if the component is not valued. The definition of this field is equivalent to the definition of the interval component of the Quantity/Timing data type given in the Order Entry chapter (Chapter 4), Section 4.4.2, "Interval component."

If an explicit time interval is specified for the repeat pattern, then it specifies the actual time(s) at which the appointment should be scheduled. The *ARQ-11-requested start date/time range* ought to indicate the first repetition that should occur.

Note:	The subcomponent delimiter defined for the Interval component of the Quantity/Timing field definition has been replaced by a component delimiter for this field.

10.5.1.14 Repeating interval duration (ST) 00873

Definition: This field indicates how long the appointment repetitions should continue, once they have begun. The default setting indicates that the appointment should occur once. If the Interval Duration is defined as indefinitely repeating, the repetition of this appointment can only be stopped by using a discontinue event. The definition of this field is equivalent to the definition of the Interval component of the Quantity/Timing field given in the Order Entry chapter (Chapter 4), Section 4.4.3, "Duration component," with the exc eption of the default value.

10.5.1.15 Placer contact person (XCN) 00874

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
              <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
              table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
              <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
              <assigning facility ID (HD)>

Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field identifies the person responsible for requesting the scheduling of a requested appointment. This person could be the same person responsible for executing the actual appointment, or it could be the provider requesting that an appointment be made on behalf of the patient, with another provider.

10.5.1.16 Placer contact phone number (XTN) 00875

```
Components:  [NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^
              <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^
              <area/city code (NM)> ^ phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>
```

Definition: This field contains the phone number used to contact the placer contact person.

10.5.1.17 Placer contact address (XAD) 00876

```
Components:  <street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip
              or postal code(ST)> ^ <country (ID)> ^ <address type (ID)> ^ <other geographic designation (ST)>
              ^ <county/parish code (IS)> ^ <census tract (IS)>
```

Definition: This field contains the address used to contact the placer contact person.

10.5.1.18 Placer contact location (PL) 00877

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
              <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ < location description (ST)>

Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a code that identifies the location of the placer contact person.

10.5.1.19 Entered by person (XCN) 00878

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
              <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
              table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
              <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
              <assigning facility ID (HD)>

Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field identifies the person responsible for entering the request for the scheduling of an appointment. It is included to provide an audit trail of persons responsible for the request. This person may be someone other than the placer contact person, who is responsible for entering orders and requests.

10.5.1.20 Entered by phone number (XTN) 00879

```
Components:  [NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^
              <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^
              <area/city code (NM)> ^ phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>
```

Definition: This field contains the phone number used to contact the *ARQ-19-entered by person*.

10.5.1.21 Entered by location (PL) 00880

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
              <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>

Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a code that identifies the location of the entered by person.

10.5.1.22 Parent placer appointment ID (EI) 00881

```
Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field relates a child to its parent, when a parent-child relationship exists. It contains the placer application's permanent identifier for the parent of the appointment request. This is a composite field.

The first component is a string that identifies the parent appointment request. It is assigned by the placer application, and identifies an appointment request uniquely among all such requests from a particular requesting application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.1.23 Parent filler appointment ID (EI) 00882

```
Components:  <entity identifier (ST)> ^ <namespace ID (ID)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field relates a child to its parent, when a parent-child relationship exists. It contains the filler application's permanent identifier for the parent of the appointment request. This is a composite field.

The first component is a string that identifies the parent appointment request. It is assigned by the filler application, and identifies an appointment request uniquely among all such requests on a particular processing application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.2 SCH - schedule activity information segment

The SCH segment contains general information about the scheduled appointment.

Figure 10-4. SCH attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	75	EI	R			00860	Placer Appointment ID
2	75	EI	C			00861	Filler Appointment ID
3	5	NM	C			00862	Occurrence Number
4	75	EI	O			00863	Placer Group Number
5	200	CE	O			00864	Schedule ID
6	200	CE	R			00883	Event Reason
7	200	CE	O		0276	00866	Appointment Reason
8	200	CE	O		0277	00867	Appointment Type
9	20	NM	O			00868	Appointment Duration
10	200	CE	O			01304	Appointment Duration Units
11	200	TQ	R	Y		00884	Appointment Timing Quantity
12	48	XCN	O			00874	Placer Contact Person
13	40	XTN	O			00875	Placer Contact Phone Number
14	106	XAD	O			00876	Placer Contact Address
15	80	PL	O			00877	Placer Contact Location
16	38	XCN	R			00885	Filler Contact Person
17	40	XTN	O			00886	Filler Contact Phone Number
18	106	XAD	O			00887	Filler Contact Address
19	80	PL	O			00888	Filler Contact Location
20	48	XCN	R			00878	Entered by Person
21	40	XTN	O	Y		00879	Entered by Phone Number
22	80	PL	O			00880	Entered by Location
23	75	EI	O			00881	Parent Placer Appointment ID
24	75	EI	O			00882	Parent Filler Appointment ID
25	200	CE	O		0278	00889	Filler Status Code

10.5.2.0 SCH field definitions

10.5.2.1 Placer appointment ID (EI) 00860

```
Components: <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field contains the placer application's permanent identifier for the appointment request (and the scheduled appointment itself, when it has been confirmed as a booked slot by the filler application). This is a composite field.

The first component is a string that identifies an individual appointment request, or a booked appointment. It is assigned by the placer application, and identifies an appointment request, and the subsequent scheduled appointment, uniquely among all such requests and/or booked appointments from a particular requesting application. If *SCH-1-placer appointment ID* identifies a parent of a repeating schedule request, then the individual child scheduled appointments can be uniquely identified either by a new *SCH-1-placer appointment ID* or by *SCH-20-parent's placer appointment ID* plus an *SCH-3-occurrence number*.

The second component contains the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.2.2 Filler appointment ID (EI) 00861

```
Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field contains the filler application's permanent identifier for the appointment request (and the scheduled appointment itself, when it has been confirmed as a booked slot by the filler application). This is a composite field.

The first component is a string of up to fifteen characters that identifies an individual appointment request, or a booked appointment. It is assigned by the filler application, and identifies an appointment request, and the subsequent scheduled appointment, uniquely among all such requests and/or booked appointments from a particular processing application. If *SCH-2-filler appointment ID* identifies a parent of a repeating schedule request, then the individual child scheduled appointments can be uniquely identified either by a new *SCH-2-filler appointment ID* or by *SCH-21-parent's filler appointment ID* plus an *SCH-3-occurrence number*.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.2.3 Occurrence number (NM) 00862

Definition: This field is used in conjunction with *SCH-1-placer appointment ID* and/or *SCH-2-filler appointment ID* to uniquely identify an individual occurrence (a child) of a parent repeating schedule appointment.

This field is conditionally required. If the transaction using this segment is intended to apply only to one occurrence of a repeating appointment, and an occurrence number is required to uniquely identify the child appointment (that is, the child does not have a separate and unique *SCH-1-placer appointment ID* or *SCH-2-filler appointment ID*), then this field is required.

10.5.2.4 Placer group number (EI) 00863

```
Components: <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field allows a placer application to group sets of appointment requests together, and subsequently to identify the group.

The first component is a string that identifies a group of appointment requests. It is assigned by the placer application, and it identifies an appointment group uniquely among all such groups of requests from a particular requesting application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data.

10.5.2.5 Schedule ID (CE) 00864

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```


Definition: This field contains an identifier code for the schedule in which this appointment is (or will be) booked. This field is provided for instances in which filler applications maintain multiple schedules, and when a particular resource or set of resources is controlled by more than one of those schedules.

This field is provided on the SCH segment for informational purposes to applications fulfilling the placer, querying and auxiliary roles.

10.5.2.6 Event reason (CE) 00863

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code for the reason that the notification event was triggered. This field may contain a code describing the cancel reason, the delete reason, the discontinue reason, the add reason, the block reason or any other code describing the reason that a specific event will occur.

10.5.2.7 Appointment reason (CE) 00866

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code for the reason that the appointment is to take place. This field may contain a Universal Service Identifier describing the observation/test/battery/procedure or other activity that is to take place during the requested appointment, similar to the Universal Service Identifier defined for the OBR segment in the Order Entry chapter (Chapter 4). It may also contain a site-specific code describing a pre-defined set of reasons that an appointment may be set to occur. This code can be based on local and/or universal codes. The use of universal codes is recommended. Refer to *user-defined table 0276 - Appointment reason codes* for suggested codes.

10.5.2.8 Appointment type (CE) 00867

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains the identifier code for the type of appointment. Refer to *user-defined table 0277 - Appointment type codes* for suggested codes.

10.5.2.9 Appointment duration (NM) 00868

Definition: This field contains amount of time requested and allotted for the appointment. In cases of repeating appointments, this field describes the duration of one instance of the appointment. If this field is unvalued, then the institution's standard duration for the type of appointment requested will be assumed.

The appointment duration field must contain a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.2.10 Appointment duration units (CE) 01304

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing the *ARP-9-appointment duration* field. This field should be valued according to the recommendations in Chapters 2 and 7. If this component is not valued, the ISO base unit of seconds (code "**s**") is assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.2.11 Appointment timing quantity (TQ) 00884

```
Components:  <quantity (CQ)> ^ <interval (CM)> ^<duration (CM)> ^ <start date/time (TS)> ^ <end date/time
             (TS)> ^ <priority (ID)> ^ <condition (ST)> ^ <text (TX)> ^ <conjunction (ID)> ^ <order
             sequencing (CM)>
```

Definition: This field contains the scheduled appointment's timing and quantity, as scheduled by the filler application. Chapter 4, Section 4.4, ""Quantity/Timing (TQ) Definition," fully describes the components and the appropriate data values for the components of this field.

10.5.2.12 Placer contact person (XCN) 00874

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
             <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
             table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
             <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
             <assigning facility ID (HD)>

Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field identifies the person responsible for requesting the scheduling of a requested appointment. Most often, this person will be the same person responsible for executing the appointment.

10.5.2.13 Placer contact phone number (XTN) 00875

```
Components:  [NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^
             <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^
             <area/city code (NM)> ^ phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>
```

Definition: This field contains the phone number used to contact the *SCH-12-placer contact person*.

10.5.2.14 Placer contact address (XAD) 00876

```
Components:  <street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip
             or postal code(ST)> ^ <country (ID)> ^ <address type (ID)> ^ <other geographic designation (ST)>
             ^ <county/parish code (IS)> ^ <census tract (IS)>
```

Definition: This field contains the address used to contact the *SCH-12-placer contact person*.

10.5.2.15 Placer contact location (PL) 00877

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
             <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>

Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a code that identifies the location of the *SCH-12-placer contact person*.

10.5.2.16 Filler contact person (XCN) 00885

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
             <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
             table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
             <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
             <assigning facility ID (HD)>

Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field identifies the person responsible for the scheduling of the requested appointment. Most often, this person will be the same person responsible for maintaining the schedule and for reviewing appointment requests.

10.5.2.17 Filler contact phone number (XTN) 00886

```
Components:  [NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^
              <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^
              <area/city code (NM)> ^ phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>
```

Definition: This field contains the phone number used to contact the *SCH-16-filler contact person*.

10.5.2.18 Filler contact address (XAD) 00887

```
Components:  <street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip
              or postal code(ST)> ^ <country (ID)> ^ <address type (ID)> ^ <other geographic designation (ST)>
              ^ <county/parish code (IS)> ^ <census tract (IS)>
```

Definition: This field contains the address used to contact the *SCH-16-filler contact person*..

10.5.2.19 Filler contact location (PL) 00888

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
              <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>


Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a code that identifies the location of the *SCH-16-filler contact person*.

10.5.2.20 Entered by person (XCN) 00878

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
              <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
              table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
              <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
              <assigning facility ID (HD)>


Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>


Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field identifies the person responsible for entering the request for the scheduling of an appointment. It is included to provide an audit trail of persons responsible for the request. This person may be someone other than the placer contact person, who is responsible for entering orders and requests.

10.5.2.21 Entered by phone number (XTN) 00879

```
Components:  [NNN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^
              <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^
              <area/city code (NM)> ^ phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>
```

Definition: This field contains the phone number used to contact the *ARQ-19-entered by person*.

10.5.2.22 Entered by location (PL) 00880

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
              <patient location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>


Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a code that identifies the location of the entered by person.

10.5.2.23 Parent placer appointment ID (EI) 00881

```
Components:  <entity identifier (ST)> ^ <namespace ID (IS)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field relates a child to its parent, when a parent-child relationship exists. It contains the placer application's permanent identifier for the parent of the appointment request. This is a composite field.

The first component is a string that identifies the parent appointment request. It is assigned by the placer application, and identifies an appointment request uniquely among all such requests from a particular requesting application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

10.5.2.24 Filler appointment ID (EI) 00882

```
Components:  <entity identifier (ST)> ^ <namespace ID (ID)> ^ <universal ID (ST)> ^ <universal ID type (ID)>
```

Definition: This field relates a child to its parent, when a parent-child relationship exists. It contains the filler application's permanent identifier for the parent of the appointment request. This is a composite field.

The first component is a string that identifies the parent appointment request. It is assigned by the filler application, and it identifies an appointment request uniquely among all such requests on a particular processing application.

The second through fourth components contain the assigning authority identifying information. Section 2.8.15, "EI - entity identifier," in Chapter 2 describes the structure and content of these components with respect to the EI data type.

This is a conditionally required field. On initial messages where a filler has not yet assigned a filler appointment ID, this field should not contain a value. In all other subsequent messages, where a filler application has assigned a filler appointment ID, this field is required.

10.5.2.25 Filler status code (CE) 00889

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the status of the appointment with respect to the filler application. Refer to *user-defined table 0278 - Filler status codes* for suggested codes.

User-defined Table 0278 - Filler status codes

Value	Description
PENDING	Appointment has not yet been confirmed
WAITLIST	Appointment has been placed on a waiting list for a particular slot, or set of slots
BOOKED	The indicated appointment is booked
STARTED	The indicated appointment has begun and is currently in progress
COMPLETE	The indicated appointment has completed normally (was not discontinued, canceled, or deleted)

CANCELLED	The indicated appointment was stopped from occurring (canceled prior to starting)
DC	The indicated appointment was discontinued (DC'ed while in progress, discontinued parent appointment, or discontinued child appointment)
DELETED	The indicated appointment was deleted from the filler application
BLOCKED	The indicated time slot(s) is(are) blocked
OVERBOOK	The appointment has been confirmed; however it is confirmed in an overbooked state

10.5.3 RGS - resource group segment

The RGS segment is used to identify relationships between resources identified for a scheduled event. This segment can be used, on a site specified basis, to identify groups of resources that are used together within a scheduled event, or to describe some other relationship between resources. To specify related groups of resources within a message, begin each group with an RGS segment, and then follow that RGS with one or more of the Appointment Information segments (AIG, AIL, AIS, or AIP).

If a message does not require any grouping of resources, then specify a single RGS in the message, and follow it with all of the Appointment Information segments for the scheduled event. (At least one RGS segment is required in each message — even if no grouping of resources is required — to allow parsers to properly understand the message.)

Figure 10-5. RGS attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			01203	Set ID - RGS
2	3	ID	C			00763	Segment Action Code
3	200	CE	O			01204	Resource Group ID

10.5.3.0 RGS field definitions

10.5.3.1 Set ID - RGS (SI) 01203

Definition: This field contains a number that uniquely identifies the information represented by this segment in this transaction for the purposes of addition, change or deletion.

10.5.3.2 Segment action code (ID) 00763

Definition: This field contains the action to be taken when updating or modifying information in this segment from previously sent interface transactions. Refer to *HL7 table 0206 - Segment action code* in Chapter 2, Section 2.23.4.2, "Action code/unique identifier mode update definition," for valid values.

This field is conditionally required. It is required for all updating or modifying trigger events.

10.5.3.3 Resource group ID (CE) 01204

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code describing the group of resources following this RGS segment.

10.5.4 AIS - appointment information - service segment

The AIS segment contains information about various kinds of services that can be scheduled. Services included in a transaction using this segment are assumed to be controlled by a schedule on a schedule filler application. Services not controlled by a schedule are not identified on a schedule request using this segment.

Figure 10-6. AIS attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00890	Set ID - AIS
2	3	ID	C		0206	00763	Segment Action Code
3	200	CE	R			00238	Universal Service Identifier
4	26	TS	C			01202	Start Date/Time
5	20	NM	C			00891	Start Date/Time Offset
6	200	CE	C			00892	Start Date/Time Offset Units
7	20	NM	O			00893	Duration
8	200	CE	O			00894	Duration Units
9	10	IS	C		0279	00895	Allow Substitution Code
10	200	CE	C		0278	00889	Filler Status Code

10.5.4.0 AIS field definitions

10.5.4.1 Set ID - AIS (SI) 00890

Definition: This field contains a number that uniquely identifies the information represented by this segment in this transaction for the purposes of addition, change or deletion.

10.5.4.2 Segment action code (ID) 00763

Definition: This field contains the action to be taken when updating or modifying information in this segment from previously sent interface transactions. Refer to *HL7 table 0206 - Segment action code* in Chapter 2, Section 2.23.4.2, "Action code/unique identifier mode update definition," for valid values.

This field is conditionally required. It is required for all updating or modifying trigger events.

10.5.4.3 Universal service identifier (CE) 00238

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains an identifier code for a service to be scheduled. This field may contain a Universal Service Identifier describing the observation/test/battery/procedure or other activity that is to be performed during the requested appointment, similar to the Universal Service Identifier defined for the OBR segment in the Order Entry chapter (Chapter 4). This code can be based on local and/or universal codes. The use of universal codes is recommended.

10.5.4.4 Start date/time (TS) 01202

Definition: This field contains the date and time this service needs for the appointment. This field allows the application to identify that the service is required for the appointment at a different time than the appointment's start date/time

This field is conditionally required. If a value for *AIS-4-start date/time offset* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and

the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIS-4-start date/time offset* and any valid time unit code in *AIS-5-start date/time offset units*.

10.5.4.5 Start date/time offset (NM) 00891

Definition: This field contains the offset this service needs for the appointment, expressed in units of time relative to the scheduled start date/time. This field allows the application to identify that the service is required for the appointment at a different time than the appointment's start date/time. The first component contains the offset amount. An offset of zero (0), or an unvalued field indicates that the service is required at the start date/time of the appointment.

A positive offset (an unsigned or positive number) indicates that the service is required after the appointment's start date/time. Specifying a negative offset indicates that the service is required prior to the specified start date/time of the appointment. Negative offsets are allowed, and sites should clearly define the effect of a negative offset on the appointment's start date/time.

This field is conditionally required. If a value for *AIS-4-start date/time offset* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIS-4-start date/time offset* and any valid time unit code in *AIS-5-start date/time offset units*.

10.5.4.6 Start date/time offset units (CE) 00892

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing the start date/time offset. This field should be valued according to the recommendations in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code **s**) will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

This field is conditionally required. If a value for *AIS-4-start date/time offset* is provided, then a value is required for this field.

10.5.4.7 Duration (NM) 00893

Definition: This field contains the duration for which the resource is requested/scheduled for this appointment, if different from the overall duration of the requested/scheduled appointment. This field indicates to the application that a resource is required for a different amount of time than the appointment's overall duration. An unvalued duration indicates that the resource is required from its start date/time offset (specified in the previous two fields) until the end of the appointment. If no start date/time offset is specified, then the resource is required for the full duration of the appointment.

This field must be a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.4.8 Duration units (CE) 00894

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing the duration. This field should be valued according to the recommendations in Chapters 2 and 7. If this field is not valued, the

ISO base unit of seconds (code **s**) will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.4.9 Allow substitutions code (IS) 00895

Definition: This field contains a code indicating whether the identified resource can be substituted with an equivalent resource by the filler application. Refer to *user-defined table 0279 - Allow substitution codes* for suggested codes.

User-defined Table 0279 - Allow substitution codes

Value	Description
NO	Substitution of this resource is not allowed
CONFIRM	Contact the Placer Contact Person prior to making any substitutions of this resource
NOTIFY	Notify the Placer Contact Person, through normal institutional procedures, that a substitution of this resource has been made
YES	Substitution of this resource is allowed

This field is conditionally required. It is required for all request messages. It is optional for all unsolicited transactions, and for all query messages.

10.5.4.10 Filler status code (CE) 00889

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code that describes the requested/scheduled status of the resource or activity, from the point of view of the filler application. Refer to *user-defined table 0278 - Filler status codes* for suggested codes.

This is a conditionally required field. Because the information contained in this field is only appropriate in transactions originating from a filler application, it is required for those messages. This includes all unsolicited transactions originating from a filler application, as well as all response messages originating from a filler application. This field is optional for all transactions originating from placer, querying and auxiliary applications. It is recommended that this field be left unvalued in transactions originating from applications other than the filler application.

10.5.5 AIG - appointment information - general resource segment

The AIG segment contains information about various kinds of resources (other than those with specifically defined segments in this chapter) that can be scheduled. Resources included in a transaction using this segment are assumed to be controlled by a schedule on a schedule filler application. Resources not controlled by a schedule are not identified on a schedule request using this segment. Resources described by this segment are general kinds of resources, such as equipment, that are identified with a simple identification code.

Figure 10-7. AIG attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00896	Set ID - AIG
2	3	ID			0206	00763	Segment Action Code
3	200	CE	C			00897	Resource ID
4	200	CE	R			00898	Resource Type
5	200	CE	O	Y		00899	Resource Group
6	5	NM	O			00900	Resource Quantity
7	200	CE	O			00901	Resource Quantity Units
8	26	TS	C			01202	Start Date/Time
9	20	NM	C			00891	Start Date/Time Offset
10	200	CE	C			00892	Start Date/Time Offset Units
11	20	NM	O			00893	Duration
12	200	CE	O			00894	Duration Units
13	10	IS	C		0279	00895	Allow Substitution Code
14	200	CE	C		0278	00889	Filler Status Code

10.5.5.0 AIG field definitions

10.5.5.1 Set ID - AIG (SI) 00896

Definition: This field contains a number that uniquely identifies the information represented by this segment in this transaction for the purposes of addition, change or deletion.

10.5.5.2 Segment action code (ID) 00763

Definition: This field contains the action to be taken when updating or modifying information in this segment from previously sent interface transactions. Refer to *HL7 table 0206 - Segment action code* in Chapter 2, Section 2.23.4.2, "Action code/unique identifier mode update definition," for valid values.

This field is conditionally required. It is required for all updating or modifying trigger events.

10.5.5.3 Resource ID (CE) 00897

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains the ID number and name of the resource being requested or scheduled for an appointment. This field is used to identify a specific resource being requested, or a specific resource that has been scheduled for an appointment. If the specific resource is not known but the type of resource is, *AIG-3-resource type* is used to identify the type of resource required or scheduled.

At a minimum, the ID number component should be supplied to identify either the specific resource being requested or the specific resource that has been scheduled. For inter-enterprise communications, for which a shared ID number may not be available, the minimum components required to uniquely identify a resource may be defined by site-specific negotiations.

This field is conditionally required for this segment. In new schedule request messages, it is required if the request asks that a specific resource be scheduled. For all other request messages, the specific resource should be identified if the information is available (either because a specific resource was initially requested, or because the filler application returned the ID of the specific resource that has been scheduled).

This field is required for all unsolicited transactions from the filler application.

This field is optional for all query transactions.

10.5.5.4 Resource type (CE) 00898

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the role of the resource requested/scheduled for this appointment. For requests, if a specific resource is not identified in *AIG-2-resource ID*, then this field identifies the type of resource that should be scheduled by the filler application. At a minimum, the type of the identifier component should be valued.

10.5.5.5 Resource group (CE) 00899

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the requested resource as a member of the indicated group. If, in a Schedule Request Message (SRM), no specific resource is requested, but a resource type is requested, this field can be used to further qualify the type of resource being requested.

10.5.5.6 Resource quantity (NM) 00900

Definition: This field contains the quantity of the specified resource or resource type identified in either or both of the preceding two fields. If it is not valued, this field defaults to a value of one (1).

10.5.5.7 Resource quantity units (CE) 00901

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains the units of the resource requested, whose quantity is given in the preceding field. This field should be valued according to the recommendations in Chapters 2 and 7. If this field is not valued, the unit of each (code "ea") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.5.8 Start date/time (TS) 01202

Definition: This field contains the date and time this service needs for the appointment. This field allows the application to identify that the service is required for the appointment at a different time than the appointment's start date/time

This field is conditionally required. If a value for *AIG-8-start date/time offset* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIG-8-start date/time offset* and any valid time unit code in *AIG-9-start date/time offset units*.

10.5.5.9 Start date/time offset (NM) 00891

Definition: This field contains the offset that this resource needs for the appointment, expressed in units of time relative to the scheduled start date/time. This field indicates to the application that the resource is required for the appointment at a different time than the appointment's start date/time. The first component indicates the offset amount. An offset of zero (0), or an unvalued field, indicates that the resource is required at the start date/time of the appointment.

A positive offset (an unsigned or positive number) indicates that the resource is required after the appointment's start date/time. Specifying a negative offset indicates that the resource is required prior to

the specified start date/time of the appointment. Negative offsets are allowed, and sites should clearly define the effect of a negative offset on the appointment's start date/time.

This field is conditionally required. If a value for *AIG-7-start date/time* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIG-8-start date/time offset* and any valid time unit code in *AIG-9-start date/time offset units*.

10.5.5.10 Start date/time offset units (CE) 00892

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing *AIG-8-start date/time offset*. This field should be valued according to the recommendations made in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

This field is conditionally required. If a value for *AIG-8-start date/time offset* is provided, then a value is required for this field.

10.5.5.11 Duration (NM) 00893

Definition: This field contains the duration for which the resource is requested/scheduled for this appointment, if it is different than the overall duration of the requested/scheduled appointment. This field indicates to the application that a resource is required for a different amount of time than the appointment's overall duration. An unvalued duration indicates that the resource is required from its start date/time offset (specified in the previous two fields) until the end of the appointment. If no start date/time offset is specified, then the resource is required for the full duration of the appointment.

This field must be a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.5.12 Duration units (CE) 00894

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing the *AIG-11-duration* field. This field should be valued according to the recommendations in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.5.13 Allow substitutions code (IS) 00895

Definition: This field contains a code indicating whether the identified resource can be substituted with an equivalent resource by the filler application. Refer to *user-defined table 0279 - Allow substitution codes* for suggested codes.

This field is conditionally required. It is required for all request messages. It is optional for all unsolicited transactions, and for all query messages.

10.5.5.14 Filler status code (CE) 00889

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code that describes the requested/scheduled status of scheduling resource or activity, from the point of view of the filler application. Refer to *user-defined table 0278 - Filler status codes* for suggested codes.

This is a conditionally required field. Because the information contained in this field is only appropriate in transactions originating from a filler application, it is required for those messages. This includes all unsolicited transactions originating from a filler application, as well as all response messages originating from a filler application. This field is optional for all transactions originating from placer, querying and auxiliary applications. It is recommended that this field be left unvalued in transactions originating from applications other than the filler application.

10.5.6 AIL - appointment information - location resource segment

The AIL segment contains information about location resources (meeting rooms, operating rooms, examination rooms, or other locations) that can be scheduled. Resources included in a transaction using this segment are assumed to be controlled by a schedule on a schedule filler application. Resources not controlled by a schedule are not identified on a schedule request using this segment. Location resources are identified with this specific segment because of the specific encoding of locations used by the HL7 specification.

Figure 10-8. AIL attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00902	Set ID - AIL
2	1	ID	C		0206	00763	Segment Action Code
3	80	PL	C			00903	Location Resource ID
4	200	CE	R			00904	Location Type
5	200	CE	O			00905	Location Group
6	26	TS	C			01202	Start Date/Time
7	20	NM	C			00891	Start Date/Time Offset
8	200	CE	C			00892	Start Date/Time Offset Units
9	20	NM	O			00893	Duration
10	200	CE	O			00894	Duration Units
11	10	IS	C		0279	00895	Allow Substitution Code
12	200	CE	C		0278	00889	Filler Status Code

10.5.6.0 AIL field definitions

10.5.6.1 Set ID - AIL (SI) 00902

Definition: This field contains a number that uniquely identifies the information represented by this segment in this transaction for the purposes of addition, change or deletion.

10.5.6.2 Segment action code (ID) 00763

Definition: This field contains the action to be taken when updating or modifying information in this segment from previously sent interface transactions. Refer to *HL7 table 0206 - Segment action code* in Chapter 2, Section 2.23.4.2, "Action code/unique identifier mode update definition," for valid values

This field is conditionally required. It is required for all updating or modifying trigger events.

10.5.6.3 Location resource ID (PL) 00903

```
Components:  <point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status  (IS)> ^
              <person location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ <location description (ST)>
```

```
Subcomponents of facility:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains a coded identification of the location being requested or scheduled for an appointment. This field is used to identify a specific location being requested, or a specific location which has been scheduled for an appointment. If the specific location is not known but the type of location is, *AIL-3-location type* is used to identify the type of location required or scheduled. Please see Section 2.8.26, "PL - person location," in Chapter 2 for a description of each component.

This field is conditionally required for this segment. In new schedule request messages, it is required if the request asks that a specific location be scheduled. For all other request messages, the specific location should be identified if the information is available (either because a specific location was initially requested, or because the filler application returned the coded identification of the specific location that has been scheduled).

This field is required for all unsolicited transactions from the filler application. It is optional for all query transactions.

10.5.6.4 Location type (CE) 00904

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the role of the location requested/scheduled for this appointment. For requests, if a specific location is not identified in *AIL-2-location resource ID*, then this field identifies the type of location that should be scheduled by the filler application. At a minimum, the type identifier component should be valued.

10.5.6.5 Location group (CE) 00905

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the requested resource as a member of the indicated group. If, in a Schedule Request Message (SRM), no specific location is requested, but a location type is requested, *AIL-4-location group* can be used to further qualify the type of resource being requested.

10.5.6.6 Start date/time (TS) 01202

Definition: This field contains the date and time this service needs for the appointment. This field allows the application to identify that the service is required for the appointment at a different time than the appointment's start date/time

This field is conditionally required. If a value for *AIL-6-start date/time offset* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIL-6-start date/time offset* and any valid time unit code in *AIL-7-start date/time offset units*.

10.5.6.7 Start date/time offset (NM) 00891

Definition: This field contains the offset this resource needs for the appointment, expressed in units of time relative to the scheduled start date/time. This field indicates to the application that the resource is required for the appointment at a different time than the appointment's start date/time. The first component contains the offset amount. An offset of zero (0), or an unvalued field, indicates that the resource is required at the start date/time of the appointment.

A positive offset (an unsigned or positive number) indicates that the resource is required after the appointment's start date/time. Specifying a negative offset indicates that the resource is required prior to the specified start date/time of the appointment. Negative offsets are allowed, and sites should clearly define the effect of a negative offset on the appointment's start date/time.

This field is conditionally required. If a value for *AIL-5-start date/time* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIL-6-start date/time offset* and any valid time unit code in *AIL-7-start date/time offset units*.

10.5.6.8 Start date/time offset units (CE) 00892

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing the Start Date/Time Offset field. This field should be valued according to the recommendations made in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

This field is conditionally required. If a value for *AIL-6-start date/time offset* is provided, then a value is required for this field.

10.5.6.9 Duration (NM) 00893

Definition: This field contains the duration for which the resource is requested/scheduled for this appointment, if it is different than the overall duration of the requested/scheduled appointment. This field indicates to the application that a resource is required for a different amount of time than the appointment's overall duration. An unvalued duration indicates that the resource is required from its start date/time offset (specified in the previous two fields) until the end of the appointment. If no start date/time offset is specified, then the resource is required for the full duration of the appointment.

This field must be a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.6.10 Duration units (CE) 00894

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used associated with *AIL-9-duration*. This field should be valued according to the recommendations made in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.6.11 Allow substitutions code (IS) 00895

Definition: This field contains a code indicating whether the identified location can be replace with an equivalent substitute location by the filler application. Refer to *user-defined table 0279 - Allow substitution codes* for suggested codes.

This field is conditionally required. It is required for all request messages. It is optional for all unsolicited transactions, and for all query messages.

10.5.6.12 Filler status code (CE) 00889

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code that describes the requested/scheduled status of the location, from the point of view of the filler application. Refer to *user-defined table 0278 - Filler status codes* for suggested codes.

This is a conditionally required field. Because the information contained in this field is only appropriate in transactions originating from a filler application, it is required for those messages. This includes all unsolicited transactions originating from a filler application, as well as all response messages originating from a filler application. This field is optional for all transactions originating from placer, querying and auxiliary applications. It is recommended that this field be left unvalued in transactions originating from applications other than the filler application.

10.5.7 AIP - appointment information - personnel resource segment

The AIP segment contains information about the personnel types that can be scheduled. Personnel included in a transaction using this segment are assumed to be controlled by a schedule on a schedule filler application. Personnel not controlled by a schedule are not identified on a schedule request using this segment. The kinds of personnel described on this segment include any healthcare provider in the institution controlled by a schedule (for example: technicians, physicians, nurses, surgeons, anesthesiologists, or CRNAs).

Figure 10-9. AIP attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	4	SI	R			00906	Set ID - AIP
2	3	ID	C		0206	00763	Segment Action code
3	80	XCN	C			00913	Personnel Resource ID
4	200	CE	R			00907	Resource Role
5	200	CE	O			00899	Resource Group
6	26	TS	C			01202	Start Date/Time
7	20	NM	C			00891	Start Date/Time Offset
8	200	CE	C			00892	Start Date/Time Offset Units
9	20	NM	O			00893	Duration
10	200	CE	O			00894	Duration Units
11	10	IS	C		0279	00895	Allow Substitution Code
12	200	CE	C		0278	00889	Filler Status Code

10.5.7.0 AIP field definitions

10.5.7.1 Set ID - AIP (SI) 00906

Definition: This field contains a number that uniquely identifies the information represented by this segment in this transaction for the purposes of addition, change or deletion.

10.5.7.2 Segment action code (ID) 00763

Definition: This field contains the action to be taken when updating or modifying information in this segment from previously sent interface transactions. Refer to *HL7 table 0206 - Segment action code* in Chapter 2, Section 2.23.4.2, “Action code/unique identifier mode update definition,” for valid values.

This field is conditionally required. It is required for all updating or modifying trigger events.

10.5.7.3 Personnel resource ID (XCN) 00913

```
Components:  <ID number (ST)> ^ <family name (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^
              <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <source
              table (IS)> ^ <assigning authority (HD)> ^ <name type (ID)> ^ <identifier check digit (ST)> ^
              <code identifying the check digit scheme employed (ID)> ^ <identifier type code (IS)> ^
              <assigning facility ID (HD)>

Subcomponents of assigning authority:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>

Subcomponents of assigning facility ID:  <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
```

Definition: This field contains the ID number and name of the person being requested or scheduled for an appointment. This field is used to identify a specific person being requested, or a specific person who has been scheduled as a resource for an appointment. If the specific person is not known, but the type of resource is, *AIP-3-resource role* is used to identify the type of personnel resource required or scheduled. Refer to Chapter 2, Section 2.8.46, "XCN - extended composite ID number and name for persons," for a description of the components contained in the XCN data type.

At a minimum, the ID number component should be supplied to identify either the specific person being requested or the specific person who has been scheduled. For inter-enterprise communications, for which a shared ID number may not be available, the minimum components needed to uniquely identify a person may be defined by site-specific negotiations.

This field is conditionally required for this segment. In new schedule request messages, it is required if the request asks that a specific person be scheduled. For all other request messages, the specific person should be identified if the information is available (either because a specific person was initially requested, or because the filler application returned the ID of the specific person who has been scheduled).

This field is required for all unsolicited transactions from the filler application.

This field is optional for all query transactions.

10.5.7.4 Resource role (CE) 00907

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the role of the personnel requested/scheduled for an appointment. For requests, if a specific person is not identified in the *AIP-3-personnel resource ID* field, then this field identifies the type of person that should be scheduled by the filler application. At a minimum, the *AIP-4-resource role identifier* component should be valued.

10.5.7.5 Resource group (CE) 00899

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field identifies the requested resource as a member of the indicated group. If, in a Schedule Request Message (SRM), no specific resource is requested, but an *AIP-4-resource role* is requested, *the AIP-5-resource group* field can be used to further qualify the type of resource being requested.

10.5.7.6 Start date/time (TS) 01202

Definition: This field contains the date and time this service needs for the appointment. This field allows the application to identify that the service is required for the appointment at a different time than the appointment's start date/time.

This field is conditionally required. If a value for *AIP-7-start date/time offset* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIP-6-start date/time offset* and any valid time unit code in *AIP-8-start date/time offset units*.

10.5.7.7 Start date/time offset (NM) 00891

Definition: This field contains the offset this resource needs for the appointment, expressed in units of time relative to the scheduled start date/time. This field indicates to the application that the resource is required for the appointment at a different time than the appointment's start date/time. The first component contains the offset amount. An offset of zero (0), or an unvalued field, indicates that the resource is required at the start date/time of the appointment.

A positive offset (an unsigned or positive number) indicates that the resource is required after the appointment's start date/time. Specifying a negative offset indicates that the resource is required prior to the specified start date/time of the appointment. Negative offsets are allowed, and sites should clearly define the effect of a negative offset on the appointment's start date/time.

This field is conditionally required. If a value for *AIP-6-start date/time* is not provided, then a value is required for this field. To specify that there is no difference between the appointment's start date/time and the resource's start date/time either replicate the appointment's start date/time into this field, or specify an offset of zero (0) in *AIP-7-start date/time offset* and any valid time unit code in *AIP-8-start date/time offset units*.

10.5.7.8 Start date/time offset units (CE)

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used for expressing *AIP-7-start date/time offset*. This field should be valued according to the recommendations made in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") is assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

This field is conditionally required. If a value for *AIP-7-start date/time offset* is provided, then a value is required for this field.

10.5.7.9 Duration (NM) 00893

Definition: This field contains the duration for which the resource is requested/scheduled for an appointment, if different from the overall duration of the requested/scheduled appointment. This field indicates to the application that a resource is required for a different amount of time than the appointment's overall duration. An unvalued duration indicates that the resource is required from its start date/time offset (specified in the previous two fields) until the end of the appointment. If no start date/time offset is specified, then the resource is required for the full duration of the appointment.

This field must be a positive, non-zero number. A negative number or zero (0) is nonsensical in the context of a duration.

10.5.7.10 Duration units (CE) 00894

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code describing the units of time used associated with *AIP-9-duration*. This field should be valued according to the recommendations made in Chapters 2 and 7. If this field is not valued, the ISO base unit of seconds (code "**s**") will be assumed. Refer to Chapter 7, *Figures 7-10* through *7-13*, for a list of ISO and ANSI+ unit codes.

10.5.7.11 Allow substitutions code (IS) 00895

Definition: This field contains a code indicating whether the identified personnel resource can be replaced with an equivalent substitute personnel resource by the filler application. Refer to *user-defined table 0279 - Allow substitution codes* for suggested codes.

This field is conditionally required. It is required for all request messages. It is optional for all unsolicited transactions, and for all query messages.

10.5.7.12 Filler status code (CE) 00889

```
Components:  <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^
              <alternate text (ST)> ^ <name of alternate coding system (ST)>
```

Definition: This field contains a code that describes the requested/scheduled status of the personnel resource, from the point of view of the filler application. Refer to *user-defined table 0278 - Filler status codes* for suggested codes.

This field is conditionally required. It should not be valued in any request transactions from the placer application to the filler application. It is required for all transactions from the filler application. It is optional for query transactions.

This is a conditionally required field. Because the information contained in this field is only appropriate in transactions originating from a filler application, it is required for those messages. This includes all unsolicited transactions originating from a filler application, as well as all response messages originating from a filler application. This field is optional for all transactions originating from placer, querying and auxiliary applications. It is recommended that this field be left unvalued in transactions originating from applications other than the filler application.

10.5.8 APR - appointment preferences segment

The APR segment contains parameters and preference specifications used for requesting appointments in the SRM message. It allows placer applications to provide coded parameters and preference indicators to the filler application, to help determine when a requested appointment should be scheduled. An APR segment can be provided in conjunction with either the ARQ segment or any of the service and resource segments (AIG, AIS, AIP, and AIL). If an APR segment appears in conjunction with an ARQ segment, its parameters and preference indicators pertain to the schedule request as a whole. If the APR segment appears with any of the service and resource segments, then its parameters and preferences apply only to the immediately preceding service or resource.

Figure 10-10. APR attributes

SEQ	LEN	DT	R/O/C	RP/#	TBL#	ITEM#	ELEMENT NAME
1	80	SVC	O	Y	0294	00908	Time Selection Criteria
2	80	SVC	O	Y		00909	Resource Selection Criteria
3	80	SVC	O	Y		00910	Location Selection Criteria
4	5	NM	O			00911	Slot Spacing Criteria
5	80	SVC	O	Y		00912	Filler Override Criteria

10.5.8.0 APR field definitions

10.5.8.1 Time selection criteria (SVC) 00908

```
Components:  <parameter class (IS)> ^ <parameter value (ST)>
```

Definition: This field is used to communicate parameters and preferences to the filler application regarding the selection of an appropriate time slot for an appointment. The first component of this field is a code identifying the parameter or preference being passed to the filler application. The second component is the actual data value for that parameter.

For example, if a filler application allows preference parameters to be passed to specify a preferred start time, a preferred end time, and preferred days of the week for the appointment, it may define the following parameter class codes and valid data sets.

User-defined Table 0294 - Time selection criteria parameter class codes

Parameter Class	**Description: Valid Values**
PREFSTART	The preferred start time for the appointment request, service or resource. Any legal time specification in the format HHMM, using 24-hour clock notation
PREFEND	The preferred end time for the appointment request, service or resource. Any legal time specification in the format HHMM, using 24-hour clock notation
MON	An indicator that Monday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
TUE	An indicator that Tuesday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
WED	An indicator that Wednesday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
THU	An indicator that Thursday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
FRI	An indicator that Friday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
SAT	An indicator that Saturday is or is not preferred for the day on which the appointment will occur. OK = Preferred appointment day NO = Day is not preferred
SUN	An indicator that Sunday is or is not preferred for the day on which the

appointment will occur. OK = Preferred appointment day
NO = Day is not preferred

Given this set of parameter class codes and valid value sets, a placer may indicate a preferred start time of 8:00 AM on Monday, Wednesday or Friday by specifying the following in *APR-1-time selection criteria*:

```
...|PREFSTART^0800~MON^OK~WED^OK~FRI^OK~TUE^NO~THU^NO~SAT^NO~SUN^NO|...
```

The valid set of preferences should be determined by the placer and filler applications during implementation of the interface.

10.5.8.2 Resource selection criteria (SVC) 00909

```
Components: <parameter class (IS)> ^ <parameter value (ST)>
```

Definition: This field is used to communicate parameters and preferences to the filler application regarding the selection of an appropriate resource for an appointment. The first component of this field is a code identifying the parameter or preference being passed to the filler application. The second component is the actual data value for that parameter.

Refer to Section 10.5.8.1, "Time selection criteria (SVC) 00908," for an example illustrating how this mechanism works within an interface.

The valid set of preferences should be determined by the placer and filler applications during implementation of the interface. Refer to *user-defined table 0294 - Time selection criteria parameter class codes* for suggested examples.

10.5.8.3 Location selection criteria (SVC) 00910

```
Components: <parameter class (IS)> ^ <parameter value (ST)>
```

Definition: This field is used to communicate parameters and preferences to the filler application regarding the selection of an appropriate location for the appointment. The first component of this field is a code identifying the parameter or preference being passed to the filler application. The second component is the actual data value for that parameter.

Refer to Section 10.5.8.1, "Time selection criteria (SVC) 00908," for an example of how this mechanism works within an interface.

The valid set of preferences should be determined by the placer and filler applications during implementation of the interface. Refer to *user-defined table 0294 - Time selection criteria parameter class codes* for suggested examples.

10.5.8.4 Slot spacing criteria (NM) 00911

Definition: This field is used in queries returning lists of possible appointment slots, or other lists of slots. If the filler application allows it, the querying application may indicate the spacing of the slots returned to the querying application, in relation to the requested start date/time in the ARQ segment. The value in this field should be a positive integer, representing the number of minutes between slot starting times that is returned in the query.

For example, if there is a request that an appointment with a duration of 1.5 hours be scheduled some time between 9:00 AM and 11:30 AM, and the *APR-4-slot spacing criteria* field contains a value of 1.5, then the list of slots returned should read as follows:

9:00 - 10:30
9:15 - 10:45
9:30 - 11:00
9:45 - 11:15
10:00 - 11:30

10.5.8.5 Filler override criteria (SVC) 00912

```
Components:  <parameter class (IS)> ^ <parameter value (ST)>
```

Definition: This field is used to communicate override parameters to the filler application. These override parameters allow placer applications to override specific features of filler applications such as conflict checking. It is assumed that the placer and filler applications will pass enough information to determine whether the requestor is allowed to override such features. This chapter does not provide any security or permission information.

The first component of this field is a code identifying the parameter being passed to the filler application. The second component is the actual data value for that parameter.

Refer to Section 10.5.8.1, "Time selection criteria (SVC) 00908," for an example illustrating how this mechanism works within an interface.

The valid set of parameters should be determined by the placer and filler applications during implementation of the interface.

10.6 EXAMPLE TRANSACTIONS

10.6.1 Request and receive new appointment - event S01

The patient has been seen by his primary care physician, Dr. Jones, and requires treatment by a cardiologist. The PCP requests a new appointment with Dr. Jensen at the North Office. The patient has requested that the appointment be scheduled for a time between January 2nd and January 10th, 1994, and between 8:00 AM and 5:00 PM . Dr. Jensen's office responds to the request with an appointment at the North Office at 9:30 AM on January 6, 1994.

```
MSH|^~\&|JONES|EWHIN|SPOCARD|EWHIN|199401010800||SRM^S01|090849JONES|P|
2.3|||AL|AL|||<cr>

ARQ|19940047^SCH001|||||047^Referral||NORMAL|||199401020800^19940110170
0||||0045^Jones^Harold^S^^^MD||||3372^Effenbach^Thomas||||<cr>

PID||4875439|484848||Peterson^Joseph^^Jerome^SR|Brown|19401121|M|Jayjay
||N 1234 Newport Highway^Mead^WA^99021||555-4685|||M|||999-99-
4413||||||||||<cr>

DG1|001|I9|786.5|CHEST PAINS|199401010730|W||||||||||||<cr>

DG1|002|I9|412|OLD MYOCARDIAL
INFARCTION|199401010730|W||||||||||||<cr>

RGS|001|<cr>

AIP|001|032^JENSEN^HELEN|002^CARDIOLOGIST|||||||NO|<cr>

AIL|001|^NORTH OFFICE|002^CLINIC|||||||YES|<cr>



MSH|^~\&|SPOCARD|EWHIN|JONES|EWHIN|199401010802||ACK|021244SPOCARD|P|2.
```

```
3||||||<cr>

MSA|CA|090849JONES||||<cr>



MSH|^~\&|SPOCARD|EWHIN|JONES|EWHIN|199401010810||SRR^S01|0934849SPOCARD
|P|2.3|||||||<cr>

MSA|AA|090849JONES||||<cr>

SCH|1994047^SCH001|1994567^SCH100|||||047^Referral|NORMAL|30|min|^^^199
401060930^199401061000^^^^|0045^Jones^Harold^S^^^MD|555-
4685|||087^Jensen^Helen^M^^^MD|555-9255||||BOOKED<cr>

PID||4875439|484848||Peterson^Joseph^^Jerome^SR|Brown|19401121|M|Jayjay
||N 1234 Newport Highway^Mead^WA^99021||555-4685|||M|||999-99-
4413||||||||||<cr>

RGS|001|<cr>

AIP|001|032^JENSEN^HELEN|002^CARDIOLOGIST|||||||NO|BOOKED<cr>

AIL|001|103^NORTH OFFICE|002^CLINIC|||||||NO|BOOKED<cr>



MSH|^~\&|JONES|EWHIN|SPOCARD|EWHIN|199401010812||ACK|434532JONES|P|2.3|
|||||<cr>

MSA|CA|0934849SPOCARD||||<cr>
```

10.6.2 Unsolicited notification of rescheduled appointment - event S13

The patient has asked Dr. Jensen to reschedule his January 6th appointment. Dr. Jensen's scheduling application (the filler application) sends the PCP, Dr. Jones, a notification that the original appointment has been rescheduled, followed by a notification of the new appointment on January 9th at 1:00 PM.

```
MSH|^~\&|SPOCARD|EWHIN|JONES|EWHIN|199401040800||SIU^S13|021244SPOCARD|
P|2.3|||AL|ER||<cr>

SCH|1994047^SCH001|1994567^SCH100|||||047^Referral|NORMAL|30|min|^^^199
401091300^199401091330^^^^|0045^Jones^Harold^S^^^MD|555-
4685|||087^Jensen^Helen^M^^^MD|555-9255||||BOOKED<cr>

NTE||The patient is going to be on vacation so cannot make previous
appointmentscheduled on January 6.<cr>

PID||4875439|484848||Peterson^Joseph^^Jerome^SR|Brown|19401121|M|Jayjay
||N 1234 Newport Highway^Mead^WA^99021||555-4685|||M|||999-99-
4413||||||||||<cr>

RGS|001|<cr>

AIP|001|032^JENSEN^HELEN|002^CARDIOLOGIST|||||||NO|BOOKED<cr>

AIL|001|103^NORTH OFFICE|002^CLINIC|||||||NO|BOOKED<cr>


MSH|^~\&|JONES|EWHIN|SPOCARD|EWHIN|199401010802||ACK|035324JONES|P|2.3|
|||||<cr>

MSA|CA|021244SPOCARD||||<cr>
```

10.6.3 Request and receive new appointment with repeating interval - event S01

The patient has been seen by his specialist, Dr. Smith, and requires treatment by a physical therapist, Helen Morgan. Dr. Smith’s office requests a one hour appointment each day for the next five days. Ms Morgan’s office responds to the request with an appointment at 9:30 AM on June 20th through June 24th, 1994.

The patient has been seen by his specialist, Dr. Smith, and requires treatment by a physical therapist, Helen Morgan. Dr. Smith's office requests a one-hour appointment each day for the next five days. Ms Morgan's office responds to the request with an appointment at 9:30 AM on June 20th through June 24th, 1994.

```
MSH|^~\&|SMITH|EWHIN|MORGAN|EWHIN|199406190800||SRM^S01|03432SMITH|P|2.
3|||AL|AL||<cr>

ARQ|19940347^SCH001|||||047^Referral||NORMAL|060|min|199406200930||Q1D|
D5|00335^Smith^Harry^A^^^MD||||A3423^Jones^Fred||||<cr>

PID||4875439|484848||Peterson^Joseph^^Jerome^SR|Brown|19401121|M|Jayjay
||N 1234 Newport Highway^Mead^WA^99021||555-4685|||M||999-99-
4413||||||||||<cr>

DG1|001|I9|833.00|Closed dislocation
wrist|199406190700||||||||||||<cr>

RGS|001|<cr>

AIP|001|064^MORGAN^HELEN|097^PHYSICAL THERAPIST|||||||NO|<cr>

AIL|001|103^NORTH OFFICE|002^CLINIC|||||||NO|<cr>



MSH|^~\&|MORGAN|EWHIN|SMITH|EWHIN|199406190802||ACK|546644MORGAN|P|2.3|
|||||<cr>

MSA|CA|03432SMITH||||<cr>



MSH|^~\&|MORGAN|EWHIN|SMITH|EWHIN|199406190810||SRR^S01|0654544JONES|P|
2.3||||||<cr>

MSA|AA|03432SMITH||||<cr>

SCH|1994037^SCH001|1994297^SCH100|||||047^Referral|NORMAL|60|min|^Q1D^D
5^199406200930^199406240930^^^^|0335^Smith^Harry^A^^^MD||||064^Morgan^H
elen|||||BOOKED<cr>

PID||4875439|484848||Peterson^Joseph^^Jerome^SR|Brown|19401121|M|Jayjay
||N 1234 Newport Highway^Mead^WA^99021||555-4685|||M||999-99-
4413||||||||||<cr>

RGS|001|<cr>

AIP|001|064^MORGAN^HELEN|097^PHYSICAL THERAPIST|||||||NO|BOOKED<cr>

AIL|001|103^NORTH OFFICE|002^CLINIC|||||||NO|BOOKED<cr>



MSH|^~\&|SMITH|EWHIN|MORGAN|EWHIN|199406190800||ACK|045742SMITH|P|2.3||
||||<cr>

MSA|CA|0654544JONES||||<cr>
```

10.7 IMPLEMENTATION CONSIDERATIONS

10.7.1 Logical relationship of resource and service segments

This chapter implies that the relationship of the repeating resource and service specific segments has a logical “and” relationship. In other words, if more than one AIP segment is sent in a transaction, it is logical to assume that both specified personnel resources are required for the appointment. Currently, there is no way to specify an “or” relationship between the resource and service segments. It is possible to specify a resource type and achieve a similar (but not equivalent) effect. See Section 10.8.1 under “Issues” for a further discussion.

10.7.2 Multiple placer applications

When implementing the transactions defined in this chapter with multiple placer applications, one must consider the implications of a situation when more than one placer application asks to book, hold, lock, or otherwise reserve the same slot or set of slots on a particular schedule.

This chapter makes no attempt to define attribute ownership (e.g., based on application roles). Ownership is the right to create or update attribute content. If two or more applications attempt simultaneously to update the same attribute(s), deadly update collisions may occur, causing data corruption, unless robust mechanisms for bidding and locking such attributes are in place between applications. This chapter makes no attempt to address data ownership issues or to define attribute bidding and locking mechanisms.

This chapter assumes that the placer and filler applications have put such mechanisms into place, therefore resolving any contention or collision issues at the application level. Further, if such mechanisms have not been implemented by the applications, then this chapter assumes that procedural solutions have been implemented by the healthcare provider organization to resolve contention and collision issues.

10.8 ISSUES

10.8.1 Logical relationship of resource and service segments

An implementor of a ballot draft specification of this chapter realized the need to logically AND and OR multiple resources for a single appointment. For example, they wished to specify the following condition:

((Resource-1 and Resource-2) or (Resource-3 and (Resource-4 or Resource-5)))

The current message structure for any kind of transaction does not address the need for any of the service or resource detail segments (AIS, AIG, AIL, or AIP).

They have proposed an extension to the Standard that would allow Lisp-like logical syntax within messages such as the Schedule Request message. This syntax makes use of a BEGIN and an END segment to logically group segments, and an AND and an OR segment to logically connect segments. To achieve a request as in the example above, the implementation of these logical grouping and connecting segments would read as follows:

```
BEGIN|<cr>
BEGIN|<cr>
AIG|Resource-1...<cr>
AIG|Resource-2...<cr>
AND|<cr>
END|<cr>
BEGIN|<cr>
AIG|Resource-3...<cr>
BEGIN|<cr>
AIG|Resource-4...<cr>
AIG|Resource-5...<cr>
OR|<cr>
END|<cr>
AND|<cr>
END|<cr>
OR|<cr>
END|<cr>
```

This would translate to:

((Resource-1 Resource-2 AND) (Resource-3 (Resource-4 Resource-5 OR) AND) OR)

This is the RPN or Lisp-like logical notation for the example in the first paragraph. This syntax could encompass and support groupings of several different resource and service types.

This proposal was presented to the Control/Query Technical Committee. Their initial response was that this proposal is outside of the scope of Control/Query for the current Standard 2.3 ballot and response cycle. If necessary, this proposal will be resubmitted to the Control/Query Technical Committee by the implementing organization for future versions of the Standard.