U.S. Department of Health and Human Services

Office of the National Coordinator for Health Information Technology

Scheduling

AHIC Extension/Gap

December 31, 2008

Table of Contents

1.0   Preface and Introduction

1.1   Background

In April and June of 2008, the American Health Information Community (AHIC) approved a recommendation to develop documents that address extensions/gaps from the use cases published between 2006 and 2008. One of the extensions/gaps prioritized for subsequent processing in the national health agenda activities in 2009 was Scheduling. The 2009 Scheduling Extension/Gap addresses the electronic exchange of standardized patient appointment scheduling information between Electronic Health Record systems (EHRs), Personal Health Record systems (PHRs), and other systems that support scheduling.

This extension/gap document is being developed by Office of the National Coordinator for Health Information Technology (ONC) to represent the AHIC priorities and provide context for the national health agenda activities, beginning with the selection of harmonized standards by the Healthcare Information Technology Standards Panel (HITSP). Components that need to be considered during the standards identification and harmonization activities include standardized vocabularies, data elements, datasets, and technical standards that support the information needs and scheduling processes of consumers, clinicians, healthcare entities, and scheduling support staff. This is the Final AHIC 2009 Scheduling Extension/Gap Document. Feedback received on the Draft AHIC Extension/Gap has been considered and incorporated where applicable. HITSP has the opportunity to reuse standards, where applicable, from those previously recognized by the Secretary of Health and Human Services, to specify and constrain how they are to be used to advance interoperability and to work with standards development organizations to see that gaps in standards are filled.

1.2   Progress to Date

To date, the national health agenda, including the activities of AHIC and HITSP, has not formally addressed all of the interoperability considerations for the communication of scheduling information.

Previously published AHIC use cases incorporate several concepts that have been evaluated by HITSP and could be leveraged during standards harmonization for this extension/gap.

- The 2008 Patient-Provider Secure Messaging Use Case includes the need for communicating information between patients and providers, including health reminders for patients. This use case also describes the need for access to a

web portal and/or information exchange for the purposes of communication and/or exchange of relevant healthcare supporting information (e.g., scheduling information); and

- The 2008 Consultations and Transfers of Care Use Case includes the need for communicating a core set of patient information to support consultations and transfers of care. This use case also acknowledges the need for communicating eligibility information that may be relevant to the scheduling process and exchange of scheduling information.

2.0   Overview and Scope

2.1   Document/Request Overview

This extension/gap document is focused on information needs to facilitate the electronic exchange of scheduling information. The 2009 Scheduling Extension/Gap Document is divided into the following sections:

- Section 1.0, Preface and Introduction, describes the progress to date, the additional priorities identified by the AHIC, the resulting extensions/gaps, and their purpose;

- Section 2.0, Overview and Scope, describes the sections of an extension/gap document, the request being made to HITSP, and the scope of that request;

- Section 3.0, Functional Needs, describes the combination of end-user needs and system behaviors that support interoperability and information exchange;

- Section 4.0, Stakeholder Communities, describes individuals and organizations that participate in activities described in this extension/gap;

- Section 5.0, Issues and Obstacles, describes issues and obstacles that may need to be planned for, addressed, or resolved to achieve the capabilities described in the extension/gap;

- Section 6.0, Use Case Perspectives, describes how the extension/gap combines similar roles and functions to illustrate common needs and activities. The roles are intended to depict functional roles rather than organizations or physical entities;

- Section 7.0, Use Case Scenarios, describes how perspectives interact and exchange information within the context of a workflow. The information exchanges illustrate the communication of scheduling information. Use case scenarios provide a context for understanding role-based information needs and are not meant to be prescriptive;

- Section 8.0, Scheduling Scenario, describes various situations and information exchanges that assist in the communication of information. Situations may be re-used from previously published 2006 – 2008 Use Cases and/or new scenarios may be described;

- Section 9.0, Information Exchange, describes information exchange capabilities that are needed to support the scenarios and the high-level role of information exchange;

- Section 10.0, Dataset Considerations, identifies specific information opportunities relevant to this extension/gap document that may support future identification, development, and harmonization of standards;

- Appendix A, Glossary, provides contextual descriptions of key concepts and terms introduced in this extension/gap document; and

- Appendix B, Analysis and Examples, identifies specific data types, datasets, data elements, vocabularies, naming conventions, capabilities, and technical standards that may support future industry efforts in the identification, development, and harmonization of standards.

2.2   Scope

Scheduling can be described as information associated with processes and information exchanges needed to communicate healthcare appointment information. Scheduling information exchanges may occur between provider systems (such as EHRs and/or scheduling systems), as well as between provider systems and consumer systems (such as PHRs). Prior-Authorization and eligibility for appointment scheduling will be covered in the 2009 Prior-Authorization Extension/Gap.

The requirements for scheduling may include:

- The ability for provider and consumer systems to electronically access appointment availability, and exchange selection, confirmation and related information.

- The ability for appointment providers to exchange appointment availability, selection, confirmation and related information to consumer and provider systems.

- The ability for provider and consumer systems to exchange patients' scheduling-related clinical and/or administrative information.

Workflow processes internal to scheduling activities and the business rules an organization uses to assign clinicians, staff, or resources to appointment slots may be needed to exchange scheduling information.

Identification, development, and harmonization of standards to support the interoperability associated with scheduling has been preliminarily addressed. However, additional work with standards and professional organizations, care delivery organizations, and organizations providing information technology services and products to the healthcare industry is needed to support the interoperability needs associated with scheduling. As mentioned in Section 1.0, the needs expressed

here have not yet been fully addressed by the national health agenda's standardization efforts. Examples of gaps in industry standards are outlined in the upcoming sections of this extension/gap document.

3.0   Functional Needs

This section describes a combination of user needs and system behaviors to support users during the exchange of scheduling information. Support for this exchange includes the development of interoperability standards for vocabularies, data elements, datasets, and other technical components that are implicit in these functional needs. Rather than an all-inclusive list of functional requirements, key capabilities are outlined below. The descriptions in this section are not intended to prescribe policy nor propose architectures required to implement capabilities.

A. The ability to communicate an appointment request for one or more appointments between an appointment requestor and an appointment provider.

   i. The appointment request is communicated from a clinician, organization, consumer, or a clinician acting on a consumer's behalf, to the appointment provider.

   ii. Information that may be required of the appointment requestor during scheduling activities includes reason for visit, location for the appointment, type of appointment, clinician, specialty, and prerequisites for scheduling a requested appointment.

   iii. An appointment requestor may need to provide additional information such as a specific department, clinician, or facility to meet a patient's unique care needs. For example, a patient with fear of enclosed spaces may require a specific location or organization with an open style imaging device to complete requested testing.

B. The ability to communicate appointment sequencing and intervals, appointment types, standardized units of time, and other information pertinent to the activities of scheduling sequenced appointments.

   i. Information of this nature may come from an appointment requestor, appointment provider, or other source.

   ii. Information about the correct sequencing of a series of appointments may be made available by an appointment provider and/or included in an appointment request.

   iii. Information related to a series of appointments for repetitive treatment or therapy may be communicated by appointment requestors and/or providers during the communication of appointment requests. Examples of this type of information exchange may include requests for a series of physical therapy

treatments, or a series of laboratory tests, or administration of medications at pre-determined intervals.

C. The ability to view and/or process potential/available appointment slots.

   i. Information about appointment slots such as time, date, durations, locations, and types of appointments may need to be communicated to an appointment requestor.

   ii. The ability to process appointment information into a calendaring system or appointment tracking tool.

D. The ability to access availability of multiple resources among or between appointment providers to fulfill appointment requests.

   i. The appointment provider may need to request and receive availability information from multiple resources before making a specific appointment slot accessible to appointment requestors. For example, an appointment for a bone marrow biopsy may require that an oncologist, or other specialty clinician, laboratory personnel, and/or other support staff are available at the time of the appointment for the biopsy.

E. The ability to uniquely identify and associate appointments.

   i. The appointment information exchanged may include patient identification and demographic information, reason for visit, type of appointment, calendaring information such as date, time, and duration of appointment information. (See the Dataset Considerations section for additional details).

   ii. The ability to associate appointments with related information.

   iii. The ability to associate a selected appointment with a specific patient.

   iv. The ability to associate a selected appointment with a specific provider.

F. The ability to select or decline an available appointment.

   i. The appointment requestor may have the ability to select from a listing of available appointments.

   ii. The appointment requestor may select one or more appointment slot(s).

   iii. Appointment slots may be temporarily held while waiting for the appointment requestor's selection, to ensure that it is not also simultaneously offered to another appointment requestor.

G. The ability to receive and/or acknowledge the appointment selection and the ability to exchange appointment confirmation information.

H. The ability to communicate and/or exchange a request for an appointment change.

   i. The appointment requestor and/or provider may communicate a change for an appointment such as the time, date, or location of a previously scheduled appointment.

   ii. Appointment changes are not limited to elements of time or location. An appointment change may also include modification to any information in the confirmed/scheduled appointment.

   iii. An appointment requestor and/or an appointment provider may make changes to a confirmed/scheduled appointment request.

I. The ability to manage cancellations or reschedules.

J. The ability to schedule or request an appointment for more than one patient to an appointment slot, such as, for health education classes, a family psychotherapy appointment, or concurrent physical therapy treatments.

K. The ability to communicate appointment reminders and notifications from appointment providers to appointment requestors.

   i. Reminders may be initiated by a provider, clinician, organization, consumer, and/or their systems. Therefore a reminder may be generated by an EHR, PHR, scheduling system, or other system with scheduling capabilities and be communicated through health information exchange activities, secure messaging and/or web portal.

      a. An appointment reminder may be needed to alert a patient of an upcoming scheduled appointment.

      b. An appointment reminder may include instructions for the patient to follow before or upon arriving for their appointment.

      c. Clinical reminders often contain sensitive information and should be communicated using exchanges outlined in the 2008 Patient-Provider Secure Messaging Use Case.

4.0 Stakeholder Communities

Examples of stakeholders who may be directly or indirectly involved in the exchange of scheduling information have been listed below. Specific descriptions of each type of stakeholder can be found in the previous 2006 – 2008 AHIC Use Cases.

Stakeholders that may be directly involved in the exchange of scheduling information may include: Patients, Consumers, Clinicians, and Clinical Support Staff.

Stakeholders that may assist in scheduling information communication may include: EHR and PHR System Suppliers, and Scheduling System Suppliers.

Stakeholders that may be sources or recipients of scheduling information and/or scheduling requirements may include: Knowledge Suppliers, Healthcare Payors, EHR and PHR System Suppliers, Laboratory Organizations, Diagnostic Imaging Organizations, Public Health, and Government Agencies.

5.0   Issues and Obstacles

A number of issues in today's health information technology environment are obstacles to achieving the healthcare data standardization and interoperability to promote patient safety, reduce healthcare costs, and increase the value of electronic health information exchange. Some general issues were described within the 2006 – 2008 AHIC Use Cases. Examples of specific issues and obstacles related to scheduling are outlined below.

A. Appointment Types and Slots:

i.   To effectively exchange scheduling information, standard appointment types and other standardized appointment details may be needed.

a.   It may be difficult to effectively exchange scheduling information without standard appointment types and increments of time.

b.   The methods for incorporating or configuring standardized appointment types and appointment slots may vary.

c.   Without a common vocabulary for describing resources such as staff roles, supplies, and equipment, the exchange of appointment requests may at times be difficult.

d.   The methods used to assign clinicians, staff, and resources to appointment slots in an organization's scheduling system and create an entity-specific calendar may vary based on business rules, guidelines, or processes.

B. Appointment Identification:

i.   To effectively exchange scheduling information, systems may need to be able to associate appointments with a patient.

a.   When a patient cannot be uniquely identified across systems, it may be difficult to accurately associate a patient with an appointment.

ii. To effectively exchange scheduling information, systems may need the ability to uniquely identify a request for appointment, confirmed appointment, updated appointment, and/or complete appointment.

a.   When systems do not have capabilities to uniquely identify appointments, it may be difficult to effectively exchange information about a specific appointment.

iii. To effectively exchange scheduling information, systems may need to be able to associate appointments with a provider.

    a. When a provider cannot be uniquely identified across systems, it may be difficult to accurately associate a provider with an appointment.

C. General Appointment Management:

i. There may be a need to resolve appointment conflicts such as overlapping assignments or out-of-order appointments.

    a. It may be difficult to coordinate multiple and/or related appointments without access to appointment information or enterprise-wide registration.

ii. There may be a need to communicate a confirmation that all prerequisites for an appointment have been met.

    a. It may be difficult to provide the requested and/or scheduled service when pre-appointment requirements such as incomplete pre-registration information or fasting before blood work that did not occur.

iii. Business rules that govern the communication of appointment reminders, notifications, and alerts are typically specific to organizations.

6.0   Use Case Perspectives

The 2009 Scheduling Extension/Gap describes the flow of information between appointment requestors and appointment providers who are scheduling appointments. This extension/gap includes three perspectives that are intended to indicate roles and functions, rather than organizations or physical locations. Each perspective describes the need for the exchange of scheduling information from a particular viewpoint. Each perspective is described below:

- **Appointment Requestor**

   An appointment requestor may be a patient, consumer, proxy, surrogate, clinician, clinical support staff, scheduling support staff, or any healthcare provider organization. An appointment requestor may need to exchange appointment request information with an appointment provider. Examples of appointment types may include follow-up visits, new patient visits, physical examinations, procedures, therapies, and/or tests. The appointment requestor may be acting independently, having a desire or need for an appointment, or in response to a notification or reminder about an examination, procedure, or laboratory testing appointment availability. An appointment requestor may exchange information with one or more appointment providers simultaneously.

- **Appointment Provider**

   An appointment provider is a healthcare entity that supplies appointments and may include a clinician, clinical support staff, scheduling support staff, and/or any provider of healthcare. An appointment provider may exchange information with one or more appointment requestors about available appointments such as times and dates, length of appointments, types of appointments, locations for appointments, provider information such as specialty, pre-requisites for appointments, and/or other details about appointments.

- **Information Exchange**

   The information exchange perspective may include health information exchange organizations, integrated care delivery networks, provider organizations, health record banks, public health networks, specialty networks, and others. These entities may support specific functional capabilities that assist in facilitating health information exchange activities.

7.0 Use Case Scenarios

The 2009 Scheduling Extension/Gap focuses on the exchange of information needed to schedule consumer appointments with healthcare providers. This section contains several examples intended to provide context to the scheduling scenario presented in Section 8.0.

An appointment requestor may need to view or exchange information about available appointment slots, make a specific request, select, modify, cancel, and/or receive confirmation for an appointment. An appointment provider may need to exchange appointment information such as available appointment slot information, appointment requests and selections, and/or appointment confirmations, instructions, and reminders with an appointment requestor. An appointment provider may also need to exchange appointment information with additional resources in order to coordinate complex appointments. This general scenario can be applied to a variety of situations. Some examples of these situations are as follows:

Provider-to-Provider Scheduling

Providers will require the ability to schedule appointments on patients' behalf (potentially for either individual patients or groups of patients) using EHRs or other systems. Example scenarios include:

- Clinician-to-clinician scheduling for consultation, referral, or transfer

- Clinician-to-other-healthcare-provider scheduling for items such as laboratory testing or diagnostic imaging

Other provider to provider scheduling needs may include scenarios in which patients have complex needs requiring more extensive coordination. Examples include:

- Clinician-to-healthcare-entity scheduling for procedures requiring pre-operative care such as diagnostic imaging, electro-cardiogram (EKG), laboratory testing, and/or post-operative care such as observation, follow-up examinations, or rehabilitative services

- Scheduling for procedures involving sequential appointments and pre-determined intervals such as cancer therapy

Consumer-to-Provider Scheduling

Consumers will require the ability to schedule appointments with healthcare providers using systems such as PHRs and/or other tools. Example scenarios include:

- Scheduling an appointment with a provider where the patient is already known to the provider. Information exchange in this case would primarily have to do with appointment availability and information associated with the appointment request and confirmation.

- Scheduling an appointment with a new provider. In addition to appointment availability and other associated information, information exchanged between a PHR and scheduling system may also include patient-specific information such as demographic information.

8.0   Scheduling Scenario

Figure 8-1. Scenario: Appointment Requestor to and from the Appointment Provider
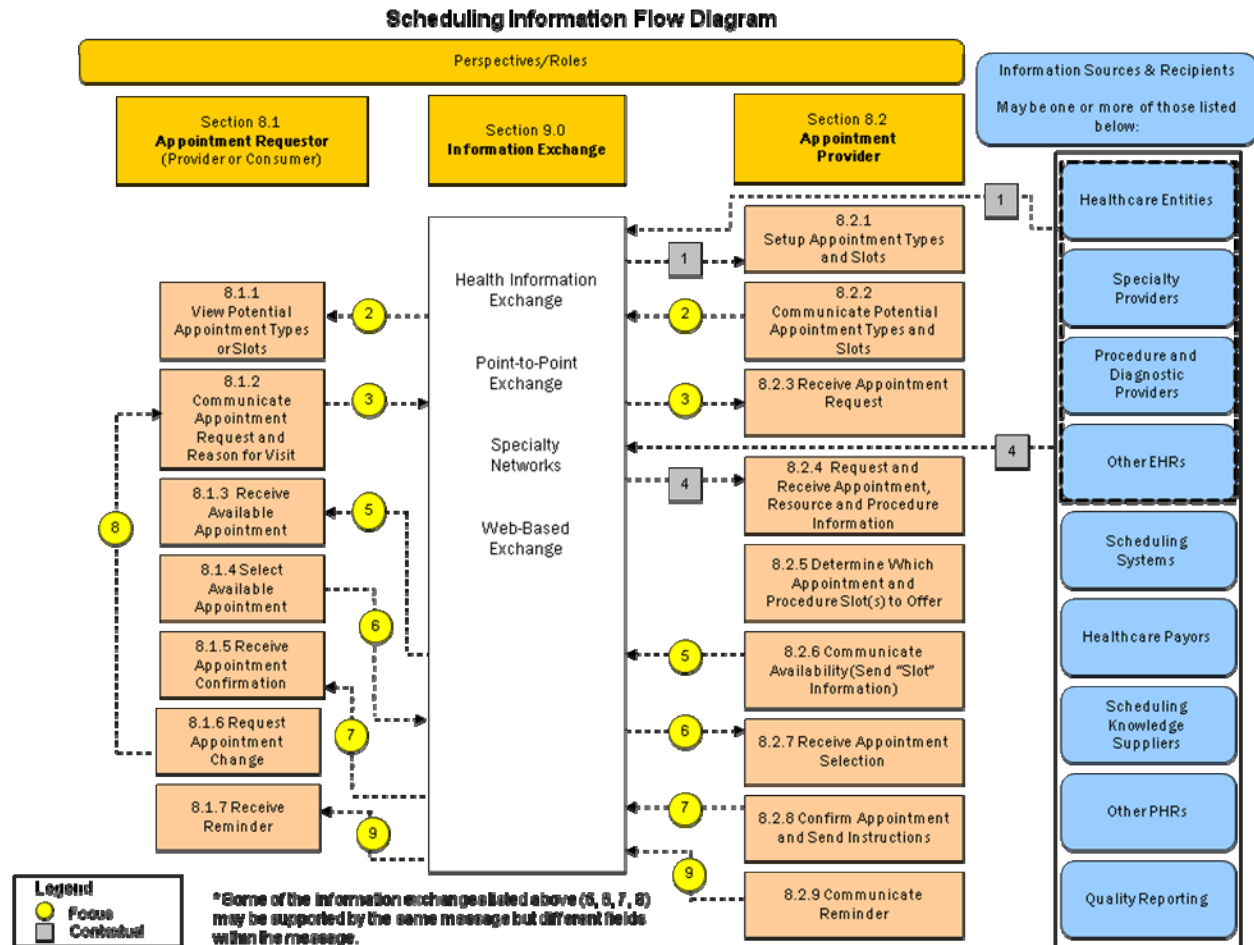
The 2009 Scheduling Extension/Gap describes the flow of information necessary to schedule appointments between appointment requestors and appointment providers. An appointment requestor may be a patient, consumer, proxy, surrogate, clinician, clinical support staff, scheduling support staff, or any healthcare provider organization. An appointment provider is a healthcare entity that supplies appointments and may include a clinician, clinical support staff, scheduling support staff, and/or any provider of healthcare.

Figure 8-2. Requesting and Scheduling Appointments

1 Contextual	Information is retrieved from various sources and may be incorporated into and/or used to set up the system with scheduling capabilities. This information may include standardized information such as appointment types, standardized appointment slots, standardized units of time, standardized intervals of time, structure that supports the sequencing of multiple appointments, structure that supports dependency and appointment timing. .
2 Focus	Following the set-up of standardized appointment types and slots, an appointment provider may communicate the potential availability of appointment types and slots. This communication may be done through view only or other interactions with an EHR, PHR, scheduling system, web portal, or other system that supports scheduling capabilities.
3 Focus	Appointment request information may be initiated to the appointment provider by another provider or by a consumer acting in the role of appointment requestor. The appointment request may be completed in an EHR, PHR, scheduling system, or other system and be communicated to the appointment provider through health information exchange activities. There may be circumstances where the appointment request may be communicated via secure messaging or web portal.
4 Contextual	Available appointments and appointment information are obtained from various sources through health information exchange activities. Information may be used to determine which appointments to offer the appointment requestor and may include information such as eligibility information, prior-authorization information, schedules of other healthcare entities and providers, and resource availability.
5 Focus	Appointment slot information is sent to the appointment requestor to show which appointment slot(s) are available. Appointment slots may be temporarily held while waiting for the appointment requestor's selection, to ensure that the slot is not simultaneously offered to another appointment requestor.
6 Focus	The appointment requestor communicates the selection of an appointment.

7 Focus	Following the appointment requestor's selection of an appointment, a message confirming the selection and scheduling of an appointment is sent from the appointment provider to the appointment requestor. This message may also include pre-appointment instructions.
8 Focus	Appointment change request information indicating new date, time or location is communicated. The exchange of the appointment change request may be associated with the original appointment request. For example the appointment change request may include information to identify and/or link to the original message.
9 Focus	Reminder information may be made available or sent by the appointment provider to the appointment requestor. The reminder message may also include pre-appointment instructions.

Figure 8-3. Scheduling – Appointment Requestor (Provider or Consumer) Perspective

Code	Description	Comments
8.1.1	**Event:** View Potential Appointment Types or Slots	**Figure 8-1 Focus Flow 2**
8.1.1.1	**Action:** View Potential Appointments	The appointment requestor may have the ability to check for potential appointment availability. Checking for potential appointment availability may be done through view only or other mechanisms such as EHR, PHR, scheduling system, web portal, a web-based service, or other system that supports communication of scheduling capabilities. While checking for potential appointments that are available, the appointment requestor may have the ability to see that appointment slots may support various appointment activities. Standardized appointment types (referenced in event 8.2.1) along with their descriptions may be made available by the appointment provider to the appointment requestor. While checking for potential appointments that are available, the appointment requestor may have the ability to view insurance acceptance information. Additional details regarding insurance acceptance is addressed in the 2009 Prior-Authorization Extension/Gap.
8.1.1.2a	**Alternative Action:** View Appointment Types and Slots	In some circumstances, the appointment requestor may have the ability to immediately view and select a preferred appointment type and slot. This action is supported by the appointment provider's business rules and technology. In this circumstance, the appointment requestor would move from event 8.1.1 to event 8.1.4.

Code	Description	Comments
8.1.2	**Event:** Communicate Appointment Request and Reason for Visit	**Figure 8-1, Focus Flow 3**
8.1.2.1	**Action:** Communicate Appointment Request	The request to schedule an appointment may occur through various mechanisms including EHRs, PHRs, scheduling systems, web portals, secure messaging, or other systems that supports scheduling functions. Specifics regarding secure messaging are discussed in the 2008 Patient – Provider Secure Messaging Use Case. Requesting an appointment may require the exchange of specific types of information. Examples of this information are addressed in the Data Set Considerations Section and Appendix B. Standardized information may assist in determining what type of appointment needs to be scheduled. The standardized information may be available from PHRs and/or EHRs and may be augmented by the appointment requestor. Depending on the complexity of patient needs, multiple appointments with sequencing, dependencies, or varying resource requirements may be simultaneously requested.
8.1.2.2	**Action:** Communicate Patient and Appointment Information	To effectively communicate the request to schedule an appointment, additional information may also be included in the appointment request. Examples of this information are further addressed in the Dataset Considerations Section and Appendix B and may include: appointment requestor contact information, appointment type, patient name, patient demographics, insurance information, relevant clinical information, and/or patient preferences such as a preferred clinician.

Code	Description	Comments
8.1.3	**Event:** Receive Available Appointment(s)	**Figure 8-1, Focus Flow 5**
8.1.3.1	**Action:** Receive Listing or View of Available Appointments	Appointment availability information is sent to the appointment requestor to show what applicable appointment slot(s) are available. Information associated with the available appointment slots may include information such as appointment type, date, time, duration, and provider. Appointment slots may be temporarily held while waiting for the appointment requestor's selection, to ensure that it is not also simultaneously offered to another appointment requestor.
8.1.4	**Event:** Select Available Appointment(s)	**Figure 8-1, Focus Flow 7**
8.1.4.1	**Action:** Select Available Appointment(s)	The appointment requestor may have the ability to select from a listing of available appointments. The appointment requestor may select an appointment slot or multiple appointment slots. Appointment slots may be temporarily held while waiting for the appointment requestor's selection, to ensure that it is not also simultaneously offered to another appointment requestor.

Code	Description	Comments
8.1.4.1a	**Alternative Action:** Refuse Available Appointment(s)	If none of the appointments listed are acceptable: The appointment requestor has the ability to refuse to select from the listing of available appointments. The appointment requestor has the ability to communicate a new appointment request as described in 8.1.2.
8.1.4.2	**Action:** Communicate Selection of Available Appointments	The selected appointment slots are communicated to the appointment provider. The selection may be associated with the initial appointment request.
8.1.5	**Event:** Receive Appointment Confirmation	**Figure 8-1, Focus Flow 8**
8.1.5.1	**Action:** Receive Appointment Confirmation	A message confirming the selection and scheduling of an appointment is sent from the appointment provider to the appointment requestor.
8.1.5.2	**Action:** Receive Appointment Instructions	The confirmation message to the appointment requestor may also include pre-appointment instructions.
8.1.5.3a	**Alternative Action:** Send, Import, or Incorporate Scheduled Appointment	The appointment requestor may have the ability to import the confirmed, scheduled appointment into a scheduling system, personal calendar, web-based calendar, and/or other system.
8.1.6	**Event:** Request Appointment Change	**Figure 8-1, Focus Flow 8**
8.1.6.1	**Action:** Request Appointment Change	An appointment change request that may include information such as new date, time or location is communicated to the appointment provider.

Code	Description	Comments
8.1.6.2	**Action:** Communicate Request for Appointment Change	The appointment change request is communicated. The appointment change request may be associated with the original appointment request as expressed in event 8.1.2.
8.1.7	**Event:** Receive Reminder	**Figure 8-1, Focus Flow 9**
8.1.7.1	**Action:** Receive Reminder	Reminder may be received by an EHR, PHR, scheduling system, or other systems with scheduling and/or reminder capabilities. See functional requirement K in section 3.0.
8.1.7.2a	**Alternative Action:** Receive Reminder in Secure Message	Reminders may be received by a consumer and/or provider through tools with scheduling and/or reminder capabilities. A reminder may be sent through secure messaging or a web portal. The use of secure messaging is discussed in the 2008 Patient – Provider Secure Messaging Use Case. A reminder may also come as a paper postcard, email, and or phone call.

Figure 8-4. Scheduling — Appointment Provider Perspective

Code	Description	Comments
8.2.1	**Event:** Set up Appointment Types and Appointment Slots	**Figure 8.2, Contextual Flow 1**
8.2.1.1	**Action:** Receive Standardized Appointment Types and Appointment Slots	Information is retrieved from various sources and may be incorporated into and/or used to configure a system with scheduling capabilities. This information may include standardized appointment types, standardized appointment slots, standardized units and standardized intervals of time, structure that supports sequencing of multiple appointments, and structure that supports dependency and timing capabilities. Similar types of information exchanges are addressed in the 2007 Medication Management Use Case, 2008 Public Health Case Reporting Use Case, and the 2008 Immunizations and Response Management Use Case.
8.2.1.2	**Action:** Incorporate and/or Set Up Standardized Appointment Types and Appointment Slots	Information may be incorporated and/or used to configure a system with scheduling capabilities.
8.2.1.3	**Action:** Apply and Assign Standardized Appointment Types and Appointment Slots	Standardized appointment types and slots may be assigned to specific providers, and/or be paired with specific resources.
8.2.1.4	**Action:** Configure Appointment Options	The appointment provider may have the ability to configure various appointment options such as acceptable alternatives to requested appointment information and/or resources. For example, if a specific orthopedic team was requested, another orthopedic team may or may not be acceptable.

Code	Description	Comments
8.2.1.5	**Action:** View Appointment Types, Appointment Slots, and Related Information	The appointment provider may have the ability to view appointment set-up information. Viewing appointment set-up information may be done through various mechanisms such as EHR, PHR, scheduling system, web portal, a web-based service, or other system that supports communication of scheduling capabilities.
8.2.2	**Event:** Communicate Potential Appointment Types and Appointment Slots	**Figure 8-2, Focus Flow 2**
8.2.2.1	**Action:** Communicate Potential Appointment Types and Appointment Slots	Following the set-up of standardized appointment types and slots, an appointment provider may communicate the potential availability of appointment types and slots. This communication may be done through an EHR, PHR, scheduling system, web portal, or other system that supports scheduling capabilities.
8.2.2.2	**Alternative Action:** Communicate Appointment Types and Slots	In some circumstances, the appointment provider may have the ability to immediately communicate available appointment types and slots. This capability requires supporting business rules and technology. In this circumstance, the appointment requestor may move from Event 8.1.1 to Event 8.1.4.
8.2.3	**Event:** Receive Appointment Request	**Figure 8-2, Focus Flow 3**

Code	Description	Comments
8.2.3.1	**Action:** Receive Appointment Request(s)	The request for an appointment may be received through various mechanisms aided by health information exchange activities and may include: EHRs, PHRs, scheduling systems, web portals, secure messaging (as discussed in the 2008 Patient – Provider Secure Messaging Use Case), or any other systems that supports scheduling functions. The receipt of appointment requests in a standardized format may assist the appointment provider to gain the information necessary to determine what appointment to schedule. Depending on the complexity of patient needs, multiple appointment requests with sequencing, dependencies, or varying resource requirements may be received by the same or multiple entities simultaneously.
8.2.3.2	**Action:** Receive Additional Relevant Information Pertaining to Appointment Request	Along with the appointment request, additional information may also be exchanged. Examples of this information are in the Data Set Considerations Section and Appendix B and may include: appointment requestor contact information, type of appointment being requested, patient name, patient demographics, insurance information, and/or relevant clinical information.
8.2.4	**Event:** Request and Receive Appointment, Resource and Procedure Information	**Figure 8-2, Contextual Flow 4**
8.2.4.1	**Action:** Request Appointment/Procedure Information	Based on the requested appointment/procedure, an appointment provider may coordinate with other entities to identify available appointment slots. The entities that an appointment provider may need to coordinate with may include: other healthcare entities, specialty services, procedure or diagnostic services, or other clinician's and EHRs, and/or additional scheduling systems. Examples may include information such as eligibility information, prior-authorization information, schedules of other healthcare entities and providers, and resource availability

Code	Description	Comments
8.2.4.2	**Action:** Receive Appointment/Procedure Information	The appointment provider may receive available appointment slots to meet scheduling needs based on information such as appointment type, availability of services, and/or availability of resources.
8.2.5	**Event:** Determine Which Appointment Slot(s) to Offer	
8.2.5.1	**Action:** Determine Which Appointment Slot(s) to Offer.	The appointment provider will determine that appointment slot(s) to offer the appointment requestor. Based on information in the appointment request, availability of services/resources, and/or business rules of the appointment provider.

The appointment provider may need to override the appointment offering limitation based on priority, preference, or clinical needs such as when a provider agrees to triple book an appointment slot due to the clinical urgency of a patient's condition. |
| 8.2.6 | **Event:** Communicate Availability (Send Available Slot Information) | **Figure 8-2, Focus Flow 5** |
| 8.2.6.1 | **Action:** Communicate Availability (Send Available Slot Information) | Information about available appointment slots is communicated to the appointment requestor. Information associated with the available appointment slots may include: appointment type, date, time, duration, provider, and/or specialty.

Appointment slots may be temporarily held while waiting for the appointment requestor's selection, to ensure that it is not also simultaneously offered to another appointment requestor. |
| 8.2.7 | **Event:** Receive Appointment Selection | **Figure 8-2, Focus Flow 6** |

Code	Description	Comments
8.2.7.1	**Action:** Receive Appointment Selection(s).	The appointment provider receives the selection of appointment(s) from the appointment requestor.
8.2.8	**Event:** Confirm Appointment	**Figure 8-2, Focus Flow 7**
8.2.8.1	**Action:** Communicate Appointment Confirmation	Following the communication of the appointment requestor's selection, a message confirming the selection as a scheduled appointment is sent from the appointment provider to the appointment requestor.
8.2.8.2	**Action:** Communicate Appointment Instructions	The confirmation message may include pre-appointment instructions.
8.2.9	**Event:** Communicate Reminder	**Figure 8-2, Focus Flow 9**
8.2.9.1	**Action:** Exchange Appointment Reminder(s)	Reminders may be initiated by a provider, clinician, organization, consumers, and/or their systems. Therefore a reminder may be generated by an EHR, PHR, scheduling system, or other system with scheduling capabilities and be communicated through health information exchange activities or other means.
8.2.9.2a	**Alternative Action:** Communicate Appointment Reminder(s)	Reminders may be initiated by a provider, clinician, organization, consumer, or tools with scheduling and/or reminder capabilities. Therefore, a reminder may be generated and/or communicated through secure messaging or a web portal.

The use of secure messaging is discussed in the 2008 Patient – Provider Secure Messaging Use Case.

A reminder may also come as a paper postcard, email, and or phone call. |

9.0   Information Exchange

The information exchange requirements for the effective communication of scheduling and appointment information may comprise:

- The ability to communicate a standardized electronic appointment request, including available appointment types and appointment request information;

- The ability to exchange information about schedules, including increments or blocks of time;

- The ability to communicate appointment reminders and notifications;

- The ability to exchange pre-registration information; and

- The ability to unambiguously maintain a relationship between the appointment requestor, request for appointment, available appointments.

Examples of information exchange capabilities described above and in Section 3.0 may include: Data Delivery, Routing, Data Retrieval, and Subject Data Matching. Full descriptions of each of these information exchanges are in the previous 2006 – 2008 AHIC Use Cases.

The functional capabilities may be provided fully or partially by a variety of organizations including: health information exchange organizations, integrated care delivery networks, provider organizations, health record banks, public health networks, specialty networks, and others.

While not described in this section, Health Information Exchange (HIE), Point-to-Point exchanges, and Web-Based exchanges assist in the completion of the processes described in this extension/gap. Examples of HIEs and Point-to-Point exchanges can be found in the previous 2006 – 2008 AHIC Use Cases.

10.0 Scheduling Dataset Considerations

The following non-exhaustive information categories and limited examples illustrate some of the information needs from this extension/gap document. Examples of routinely-used appointment and appointment slot detail requirements are included in Appendix B.

A. Appointments (scheduling) — Appointment detail requirements may include:

   i. Date

   ii. Time

   iii. Patient Identification Information

      a. Name

      b. Patient Demographics

        (1) Date of Birth, Gender

      c. Patient Enrollment Information

        (1) Address, Phone, Email

        (2) Insurance

   iv. Appointment Types

      a. New patient

      b. New problem

      c. Follow-up: medical, specialty, surgical, behavioral, obstetrical, gynecological, therapy

      d. Information therapy: group, disease/condition-oriented, dietary

      e. Wellness or Preventive Services Examinations: infant, child, adolescent, young adult, adult, geriatric

      f. Fitness for duty

      g. Procedure-based

        (1) Preparation

        (2) Procedure event

        (3) Recovery – setting

      h. Serial: sequenced, recurring, dependencies

   v. Chief Complaint/Reason for Visit

      a. Diagnosis

      b. Symptoms

   vi. Provider Identification Information

      a. Name

      b. Role

      c. Specialty

   vii. Location

a. Practice location (facility)

b. Geographic identifiers

viii. **Resources**

a. Staff

b. Equipment

c. Environment: operating room, procedure room, radiology services, laboratory

B. **Appointment Communication and Status** – Specific information that assists in the communication and tracking of an appointment may be considered. This information may include:

i.   **System Generated Appointment Identification Information**

ii. **Appointment Updates, Modifications, Cancellations**

iii. **Appointment Status**

iv. **Patient Instructions**

C. **Appointment Slots (creating appointment calendar for provider/department) –** Appointment slots identify availability of providers and resources. Appointment slot details may include:

i.   **Date**

ii.   **Time**

iii. **Duration**

iv.   **Appointment Type**

v.   **Provider**

vi.   **Location**

vii. **Resources**

Appendix A: Glossary

The 2006 – 2008 AHIC Use Cases contained general terms and their contextual descriptions. Listed below are the new terms that are specific to this extension/gap.

Appointment: A mutual agreement for a patient to be seen by or be in contact with one or more clinical service providers. Associated details usually include patient ID, provider ID, type of service, reason for visit, date, time, and location for visit. An appointment may be for follow-up visits, new patient visits, physical examinations, procedures, therapies, and/or tests.

Appointment Provider: The scheduler or supplier of scheduled times for clinical services. An appointment provider is a healthcare entity that supplies appointments and may include a clinician, clinical support staff, scheduling support staff, and/or any provider of healthcare.

Appointment Requestor: The client who requests scheduled times for clinical services. An appointment requestor may be a patient, consumer, proxy, surrogate, clinician, clinical support staff, scheduling support staff, or any healthcare provider organization.

Appointment Slot: A period of time designated as a block of time that may be scheduled or assigned for clinical services. Details may include types of appointments accepted for the period of time.

Appointment Type: A category of appointment that typically requires the same resources and times to complete the services. Examples include follow-up visits, new patient visits, physical examinations, procedures, therapies, and/or tests.

Scheduling Knowledge Supplier: Entities that use data, vocabulary, technology, and/or industry standards to provide scheduling-related information and tools to entities delivering healthcare, such as information on sequencing of appointments, typical durations, or patient instructions for various appointment types.

Scheduling: The processes and information exchanges needed to communicate healthcare appointment information.

Appendix B: Analysis and Examples

There are several existing standards for scheduling information exchange. These standards may include the following events and data elements.

Figure B-1. Potential Event Descriptions

Request new appointment booking
Request appointment rescheduling
Request appointment modification
Request appointment cancellation
Request appointment discontinuation
Request appointment deletion
Request addition of service/resource on appointment
Request modification of service/resource on appointment
Request cancellation of service/resource on appointment
Request discontinuation of service/resource on appointment
Request deletion of service/resource on appointment
Notification of new appointment booking
Notification of appointment rescheduling
Notification of appointment modification
Notification of appointment cancellation
Notification of appointment discontinuation
Notification of appointment deletion
Notification of addition of service/resource on appointment
Notification of modification of service/resource on appointment
Notification of cancellation of service/resource on appointment
Notification of discontinuation of service/resource on appointment
Notification of deletion of service/resource on appointment
Notification of blocked schedule time slot(s)
Notification of open ("unblocked") schedule time slot(s)
Notification that patient did not show up for schedule appointment
Query schedule information

Figure B-2. Potential Data Elements

Type of Information	Potential Element Name
Message Header Information	
	Sending Application/System
	Receiving Application/System
	Date/Time Of Message
	Message Type
	Trigger Event
Schedule Activity Information	
	Placer Appointment ID
	Filler Appointment ID
	Event Reason
	Appointment Reason
	Appointment Type
	Appointment Duration
	Appointment Duration Units
	Start Date/Time
	Stop Date/Time
	Filler Contact Person
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	Entered By Person
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	Filler Status Code
Patient Identification Information	
	Patient ID
	Patient Name
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	Date/Time of Birth
	Sex
	Race
	Patient Address
	Street Address
	City
	State

	Zip
	County Code
	Phone Number - Home
	Email address*
	Marital Status
	SSN
Patient Visit Information	
	Assigned Patient Location
	Facility
	Attending Doctor
	ID Number
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	AssigningAuthority
	Referring Doctor
	ID Number
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	Assigning Authority
Resource Information	
	Resource ID
	Resource Name
	Resource Type
	Resource Start Date/Time
	Resource Duration
Location Resource Information	
	Location Resource ID
	Facility Name
	Location Type
Personnel Resource Information	
	Personnel Resource ID
	Family Name
	Given Name
	Middle Name
	Suffix
	Prefix
	Resource Role
	Personnel Start Date/Time
	Personnel Duration