

U.S. Department of Health and Human Services
Office of the National Coordinator for Health Information Technology



Order Sets
Draft AHIC Extension/Gap
August 15, 2008



Table of Contents

| | | |
|-----|---|----|
| 1.0 | Preface and Introduction | 1 |
| 1.1 | Background | 1 |
| 1.2 | Progress to Date | 1 |
| 2.0 | Overview and Scope | 3 |
| 2.1 | Document/Request Overview | 3 |
| 2.2 | Scope | 4 |
| 3.0 | Functional Needs | 5 |
| 4.0 | Stakeholder Communities | 8 |
| 5.0 | Issues and Obstacles | 9 |
| 6.0 | References to Use Case Scenarios | 11 |
| 6.1 | Reference to Prior Use Case: 2007 Consultations and Transfer of Care (CTC) | 12 |
| 6.2 | Reference to Prior Use Case: 2007 Medication Management (Scenario 1) | 13 |
| 6.3 | Reference to Prior Use Case: 2008 Personalized Health Care (Scenario 1) | 14 |
| 6.4 | Reference to Prior Use Case: 2008 Personalized Healthcare (Scenario 2) | 15 |
| 6.5 | Reference to Prior Use Case: 2007 Quality (Scenario 1) | 16 |
| 6.6 | Reference to Prior Use Case: 2008 Public Health Case Reporting (Scenario 1) | 17 |
| 7.0 | Information Exchange | 18 |
| 8.0 | Order Set Dataset Considerations | 19 |
| | Appendix A: Glossary | 22 |
| | Appendix B: Analysis and Examples | 23 |



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 Order Sets. AHIC specifically requested that the Order Sets Extension/Gap address the electronic exchange of order sets among electronic health records (EHRs) and other related systems.

This extension/gap document is being developed by Office of the National Coordinator (ONC) to represent the AHIC priorities and provide context for the national health agenda activities, beginning with the selection of harmonized standards by the Health Information Technology Standards Panel (HITSP). Components that need to be considered during the standards identification and harmonization activities include standardized data sets, data elements, vocabularies, naming conventions, capabilities, and technical standards that support the information needs and processes of the clinician and intra-organizational systems utilizing order sets during clinical care for patients. During the development of the document there will be an opportunity for review and feedback by interested stakeholders within both the public and private sectors.

1.2 Progress to Date

To date, the national health agenda, including the activities of AHIC and HITSP, has not formally addressed the communication of order sets between clinicians and healthcare entities.

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 Consultations and Transfers of Care (CTC) Use Case describes the needs for electronic access and exchange of clinical documents between EHRs. This information exchange could include peer to peer exchange of order sets;
- The 2007 Medication Management Use Case describes needs for communicating medication information between clinicians and pharmacists in inpatient and ambulatory settings;



- The 2008 Personalized Healthcare Use Case describes the needs for considering genomic/genetic research findings while selecting genomic/genetic laboratory tests;
- The 2007 Quality Use Case describes the needs for considering leading practices and research findings represented in the quality indicators; and
- The 2008 Public Health Case Reporting Use Case describes the needs for considering reporting to public health when specific reporting criteria are met.



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 order sets. The Order Sets 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 which 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 which may need to be planned for, addressed, or resolved to achieve the capabilities described in the Extension/Gap;
- Section 6.0, References to Use Case Scenarios, describes various scenarios and information exchanges which assist in the communication of information. Scenarios may re-used from previously published 2006 – 2008 Use Cases and/or new scenarios may be described;
- Section 7.0, Information Exchange, describes information exchange capabilities which are needed to support the scenarios and the high-level role of information exchange;
- Section 8.0, order set Data Set 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, Additional Data Set Considerations, identifies specific data types, data sets, data elements, vocabularies, naming conventions, capabilities, and technical standards which may support future industry efforts in the identification, development, and harmonization of standards.



2.2 Scope

Order sets can be described as a grouping of clinical-care orders, information about those orders, and information or rules and relationships related to the order set.

This extension/gap request is limited to the inter-organizational communication of order sets. Some examples of organizations that may create and communicate order sets are knowledge suppliers, research entities, clinical communities, EHR and clinical ordering systems. The technical design of order sets applied during intra-organizational activities is out of scope of this extension/gap document, however it is likely to be affected in order to fully facilitate inter-organizational communication of order sets.

Therefore, requirements for order sets Extension/Gap request can be summarized as:

- A Clinician's ability to access, create, modify, and share order sets that support point-of-care decision making; and
- A healthcare entity's ability to access, modify, and communicate order sets among other healthcare entities.

The identification, development, and harmonization of standards to support the creation and communication of interoperable order sets will require focus from the national health agenda standardization activities. There are ongoing efforts to identify, strengthen, and harmonize standards to support the exchange of order sets. Examples of gaps in existing industry standards are outlined in the upcoming sections of this Extension/Gap document.



3.0 Functional Needs

This section describes a combination of end-user needs and system behaviors considered necessary to support users during the exchange of order sets among EHRs and other related systems. Rather than an all-inclusive list of functional requirements, some key capabilities are outlined below. The descriptions in this section are not intended to prescribe policy nor to propose architectures required to implement capabilities.

- A. The ability for a clinician to electronically exchange order sets with healthcare systems, peers, or other entities.
- B. The ability for a clinician to access and review a listing of available order sets to support point of care decision-making.
 - i. The ability for a clinician to access and/or review orders grouped together by categories related to clinical care management of a patient. Some examples of order set categories: admission and/or discharge; changes in levels of care, such as transfer to long term care, or home care; treatment possibilities, such as herbal, evidence-based, or investigational for diseases, conditions, or symptoms; pre and/or post-procedure care.
 - ii. The ability for a clinician to compare and contrast order set utilization information.
 - a. The clinician may, for example, compare and contrast by: order set author name and/or author information; knowledge supplier name and/or knowledge supplier information; dates, such as authoring, modification, or other dates; reporting requirements associated with the order set; codified information, such as symptoms, procedures, conditions, diseases; or clinical scenarios that identify the purpose of the order set.
 - iii. The ability for a clinician to review order sets grouped together by one or more characteristics of order sets. For example, by types of orders, purpose, or other grouping that is an identifying characteristic of an order set.
- C. The ability for a clinician to select a specific order set from a listing of available order sets.
 - i. The ability for a clinician to access an order set listings, along with the detailed information that uniquely identifies the order set from the clinician's EHR or clinical ordering system or from external sources.
- D. The ability for a clinician to combine or link two or more order sets together to modify orders to meet specific clinical care needs for a patient.



- i. The ability for a clinician to modify order sets to meet the clinical care needs for a patient who has a combination of one or more conditions.
 - a. The ability for a clinician to choose multiple order sets to provide comprehensive care for patient-specific considerations. An example of this might be a patient who has essential hypertension and develops bacterial pneumonia and shortness of breath that requires the patient to be hospitalized. Another example might be a patient who has Type II Diabetes and is having knee replacement surgery.
 - b. The ability for a clinician to modify or remove duplicate, contradictory, and/or clinically contraindicated orders prior to using the combined order set for a patient.
 - ii. The ability for a clinician to identify and manage duplicate, contradictory, and/or clinically contraindicated orders resulting from combining two or more order sets.
 - a. The ability for a clinician to remove duplicate, contradictory, and/or clinically contraindicated orders from an order set prior to making the order set available to others.
 - iii. The ability for a clinician to select and modify specific orders from nested orders within an order set. (See Appendix B for examples)
 - a. The ability for a clinician to access and use a nested order set to place all orders necessary for planning care for a patient. For example, a patient may require management of diabetes with routine blood glucose monitoring and sliding scale insulin administration while undergoing rehabilitation from an arthroscopic knee reconstruction.
 - (A) A standard of care guideline-derived order set may be augmented by embedding one or more sets of orders for management of chronic diseases.
 - (B) The nested orders may have relationships between two or more orders such as embedded logic of simple operators, sequencing, and/or skip patterns.
 - b. The ability for a clinician to resolve conflicts in logic between the primary order set and a nested order set.
- E. The ability for a clinician to review, accept, modify, or remove orders and/or order details from within an order set. (See Appendix B for examples)



- i. Based upon patient-specific information and the clinician's interpretation of that information, the clinician may need to modify or delete order details. Some examples of order details that might be modified: timing of medication administration; links between vital sign and medication administration orders; skip patterns for laboratory orders, such as; "CBC every other day, beginning tomorrow" or; duration of vital sign frequencies, such as "vital signs every 15 minutes for two hours, then every 30 minutes for two hours" and more.
- F. The ability for a clinician to fully modify, including adding to, an order set from within the local clinical ordering system.
- i. An available order set may have limited number of types of orders and/or specific orders. However, a clinician may need to expand or contract an order set to accommodate patient-specific information, such as patient drug or food allergies, physical, psychological, or other patient-specific limitations.
 - ii. Among other considerations that may require order set modification by the clinician may be treatment preferences, local practice guidelines, formularies, and/or available diagnostic testing.
- G. The ability for a clinician to add to, modify, or maintain relationships among individual orders within the order set.
- i. The clinician may review and/or modify embedded logic operators that apply to orders within the order set, such as "and", "or", or "not"; and conditional operators such as "if", "after", or "by".
 - ii. The clinician, based upon any number of factors, may need to determine and/or modify thresholds within an order set. One Example: notification thresholds for alerting the clinician about changes in the patient, such as changes in level of consciousness, vital sign thresholds, or tolerance to activity.
- H. The ability to modify an order set to meet local or external requirements, constraints, and business or medical practices.
- i. The ability to electronically fulfill internal or external reporting requirements utilizing information gathered for, or augmented by, the order set.
 - ii. The ability for a clinician or system interacting with an order set to exchange information with an external healthcare entity to satisfy reporting requirements.



4.0 Stakeholder Communities

Examples of stakeholders who may be directly or indirectly involved in the exchange of order sets 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 order sets may include: Ordering Clinicians, Clinical Support Staff, and clinician peer group.

Stakeholders that may assist in order sets communication may include: EHR system suppliers, clinical ordering system suppliers, and Public Health system suppliers.

Stakeholders that may be sources or recipients of order information and/or order requirements for order sets may include: Patients, Consumers, Knowledge Suppliers, Public Health, Government Agencies, Healthcare Payors.



5.0 Issues and Obstacles

A number of issues in today's health information technology environment are obstacles to achieving the full potential of electronic health information exchange (HIE). Some general issues were described within the 2006 – 2008 AHIC Use Cases. Examples of specific issues and obstacles related to order sets are outlined below.

A. Terminology:

- i. For clinicians and other entities to effectively build and exchange order sets, standard terminology and naming conventions may be required.
 - a. Without the ability to map current coding standards to each other, it may be difficult to efficiently build, review, sort, and/or select order sets or to unambiguously communicate order set details. Examples of terminology standards for consideration to support order set communication include SNOMED CT, RxNorm, ICD, LOINC, and CPT; and
 - b. Without the identification and adoption of standard naming or coding conventions for order sets, types of orders, and order names, or other order details, it may be difficult to effectively build links among orders within or between order sets.

B. Order Source & Identification:

- i. For clinicians and entities to effectively exchange order sets, systems may need to be capable of generating unique identifiers associated with an order set.
 - a. It may be difficult to effectively exchange order sets and link them to outcome measurements without system capabilities to generate unique order set identifiers. Examples of unique identifiers include order set source, including name of and/or supply-system id; order-set name and/or id, type-of-order id(s), order link-type id, information-type id, such as reporting requirements, patient considerations; author information, such as name, professional title, affiliations; dates, such as creation, modifications, or verification dates.

C. Standard Document Type:

- i. To meet the functional needs outlined in this extension/gap document, it may be necessary to use standard messaging and/or document types for the communication of order sets.



- a. It may be difficult to identify components of an order set without a standard messaging format and/or document type designated for representing each component of an order set.
- b. It may be difficult to determine what the specific intent of the order set is without standard messaging format and/or document type designated for order set communication of specific information to convey the intent.



6.0 References to Use Case Scenarios

The Order Sets Extension/Gap Document focuses on the exchange of a core set of information related to an order set. Specific events and information exchanges have been selected from 2006-2008 AHIC Use Cases to illustrate the context of order set information exchanges.

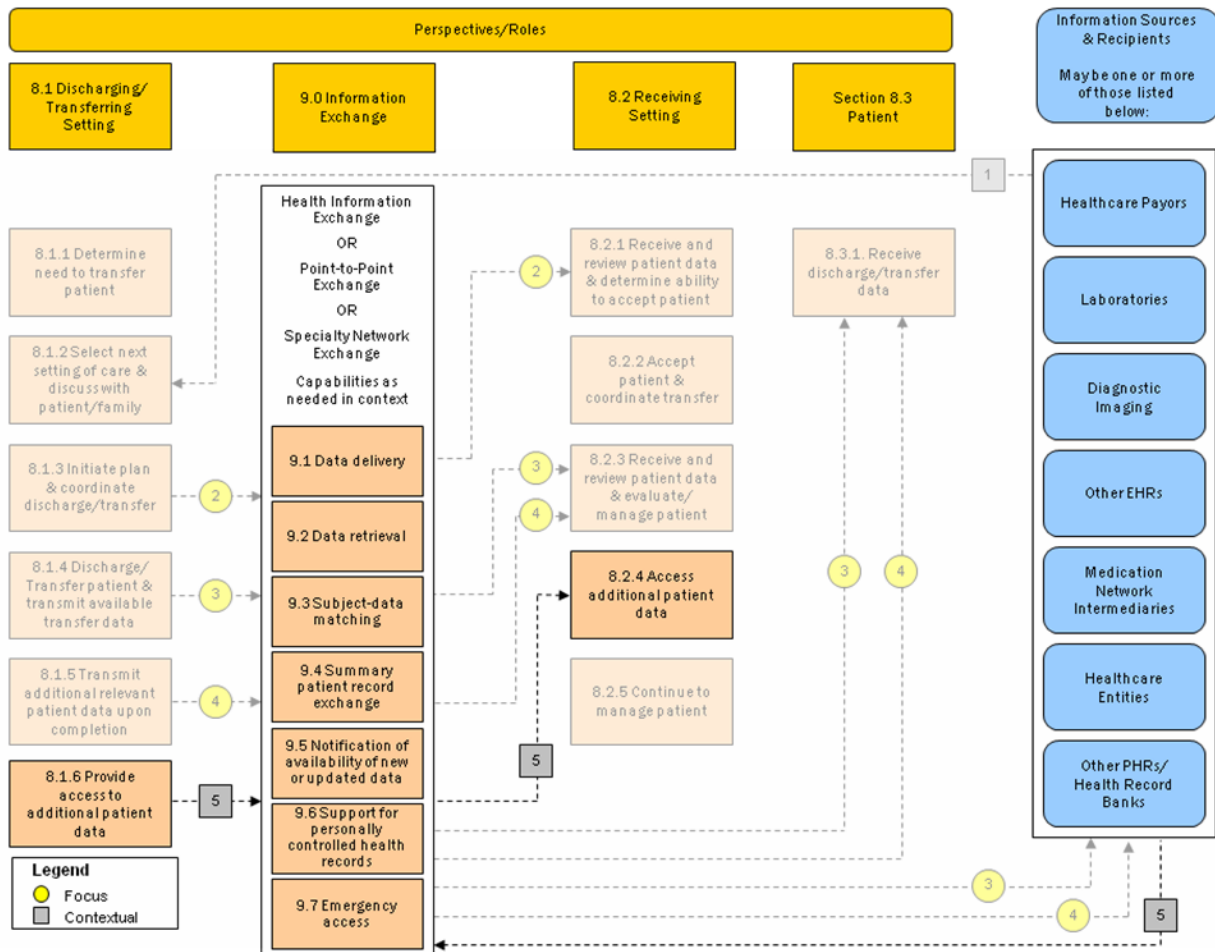
There are five previously published AHIC use cases that illustrate the contextual information flows of order sets. The details of the information and contextual relationships of order sets to these use cases are outlined in the following pages. Below are applicable copies of the scenarios and information flows from 1) Consultations and Transfers of Care (CTC), 2) Personalized Healthcare 3) Medication Management, 4) Quality, and 5) Public Health Case Reporting Use Cases.

The events and information flows in each of these use cases that are pertinent to the Order Sets Extension/Gap Document are shown in bold. All other events and information flows have been faded out.



6.1 Reference to Prior Use Case: 2007 Consultations and Transfer of Care (CTC)

Figure 6-1. Transfer Additional Information



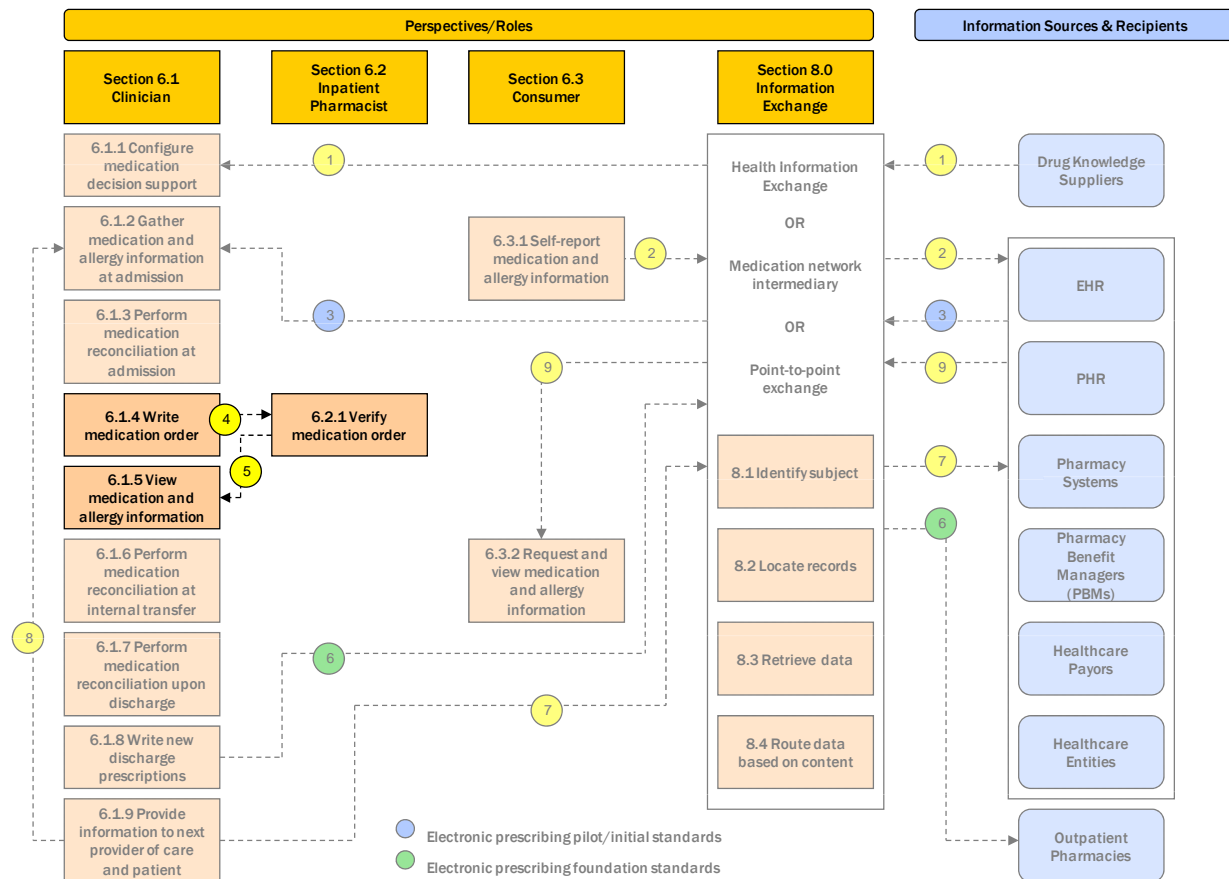
As expressed in the 2007 Consultations and Transfers of Care Use Case (CTC), events 8.1.6 and information flow 5 supports the information flow between systems, providing additional patient data through access, transfer and incorporation of data into provider-used systems, such as EHRs and/or public health systems.

Out of scope for this Extension/Gap request are order sets associated with a specific patient's EHR. However, the exchange of modified order sets includes peer-to-peer or system-to-system exchanges and may use this information flow for those communications.



6.2 Reference to Prior Use Case: 2007 Medication Management (Scenario 1)

Figure 6-2. Inpatient Medication Reconciliation



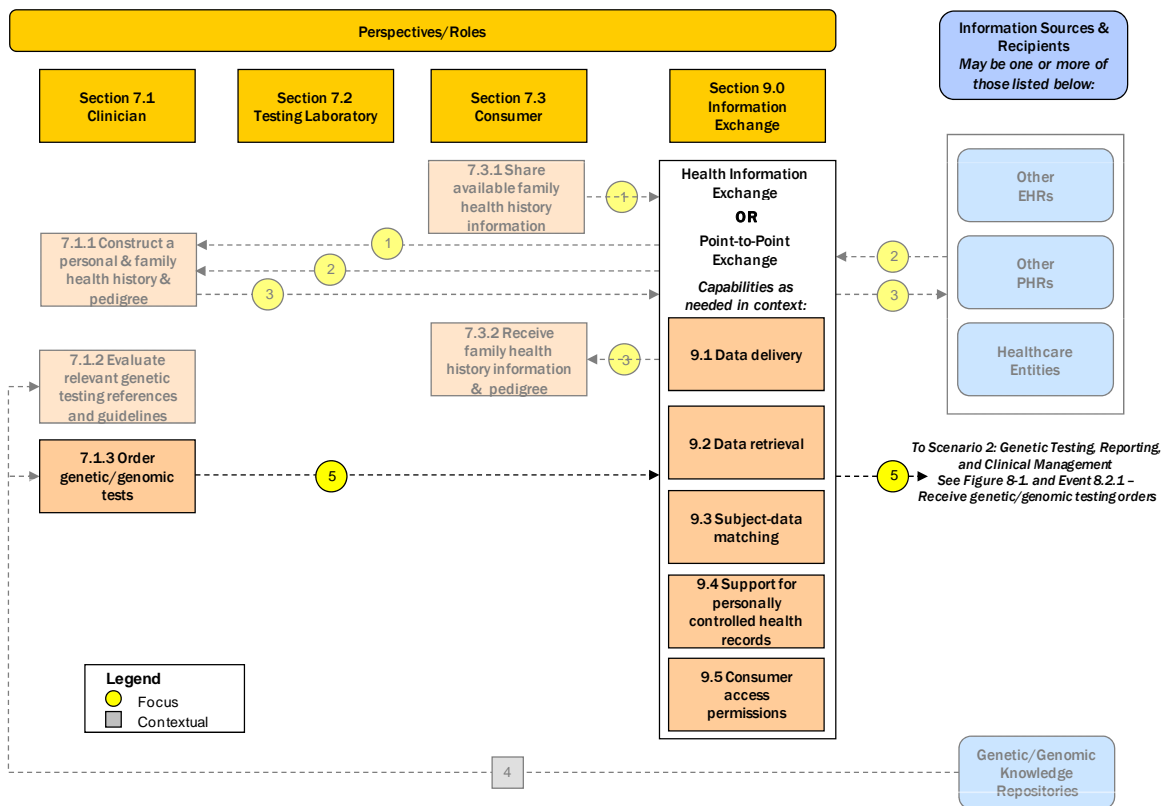
As expressed in the 2007 Medication Management Use Case Events 6.1.4, 6.1.5 and information flows 4 and 5, orders, including all order details, may be communicated directly between a clinician and an inpatient pharmacist.

The inpatient example from Medication Management Use Case is applicable to multiple care settings for the Order Sets Extension/Gap request. A clinician may communicate an order set with the type of order, "Medication." Associated order specifications may be communicated directly to a fulfilling pharmacy or pharmacist. Therefore, information flows 4 & 5 should be referenced when addressing the information exchanges for the Order Sets Extension/Gap request.



6.3 Reference to Prior Use Case: 2008 Personalized Health Care (Scenario 1)

Figure 6-3. Clinical Assessment



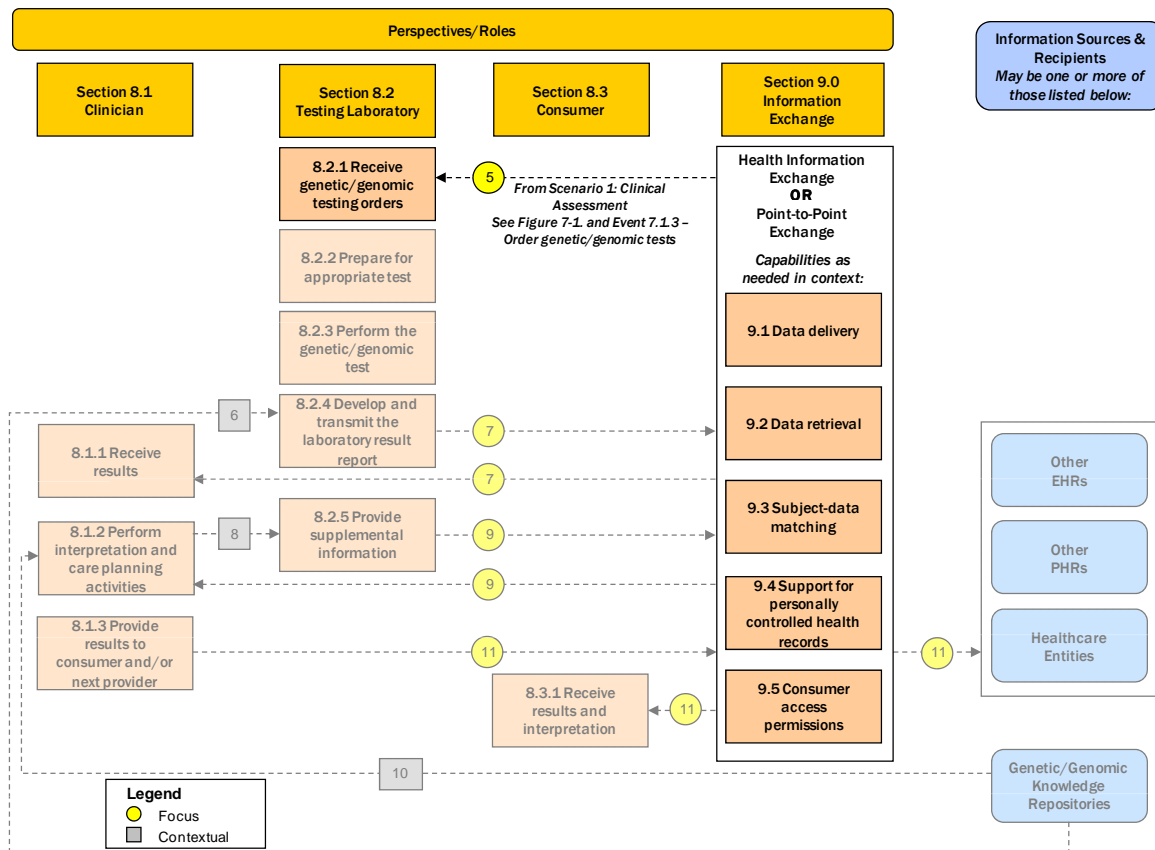
As expressed in the 2008 Personalized Healthcare Use Case –Events 7.1.3 and information flow 5, orders including all order details may be communicated directly between a clinician and a testing laboratory using HIE activities.

In the case of order sets, a clinician may communicate order sets, including all order set details using HIE activities. Therefore, information flow 5 should be referenced when addressing order sets exchange of information.



6.4 Reference to Prior Use Case: 2008 Personalized Healthcare (Scenario 2)

Figure 6-4. Genetic Testing, Reporting, and Clinical Management



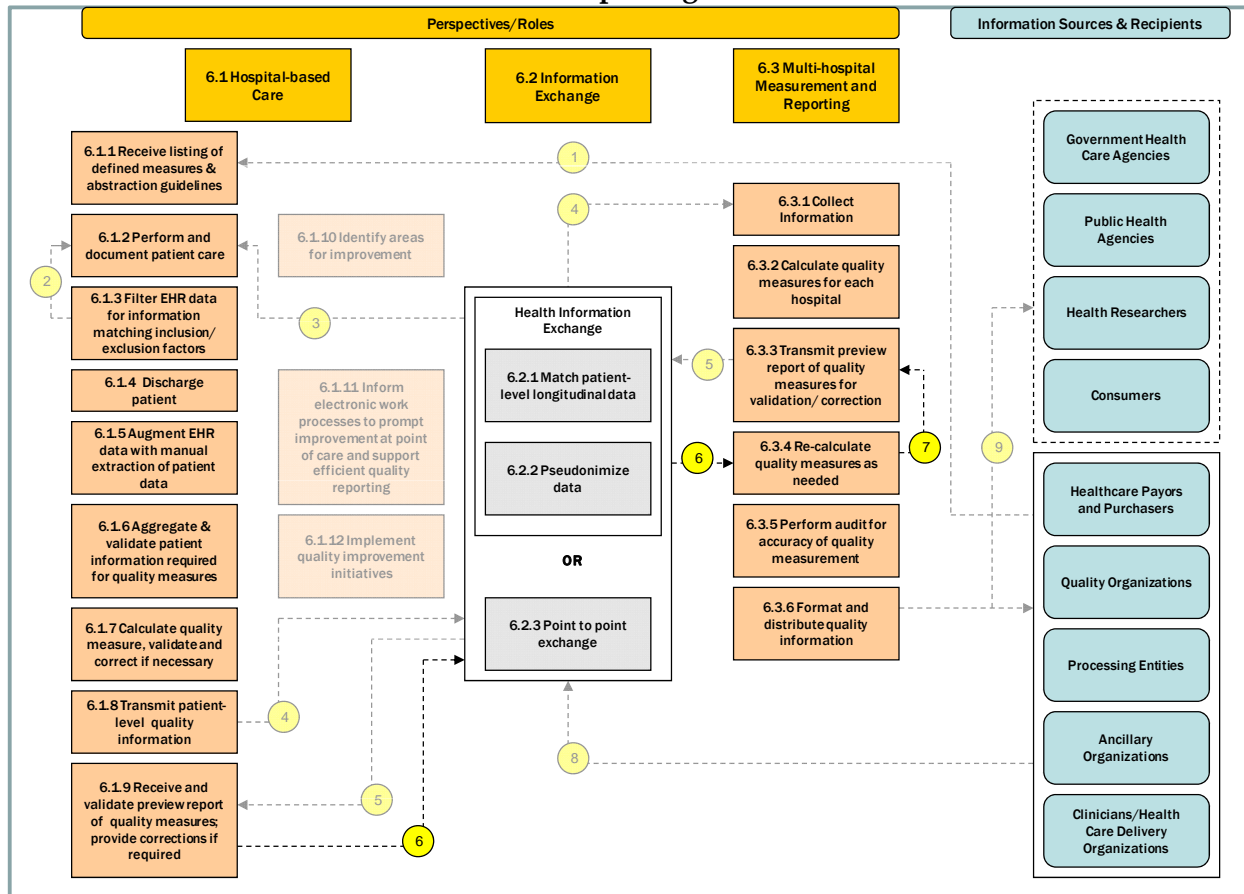
As expressed in the 2008 Personalized Healthcare Use Case –Events 8.2.1, 9.1, 9.2, 9.3, 9.4, and 9.5,, and information flow 5, may apply to order sets including all order details that may be communicated directly between a clinician and a testing laboratory using HIE activities.

In the case of communicating order sets a testing laboratory may communicate genetic testing orders, including all order details and information about the order set. Therefore, information flow 5 should be referenced when addressing order sets communication.



6.5 Reference to Prior Use Case: 2007 Quality (Scenario 1)

Figure 6-5. Hospital-based Care Quality Information Collection and Reporting



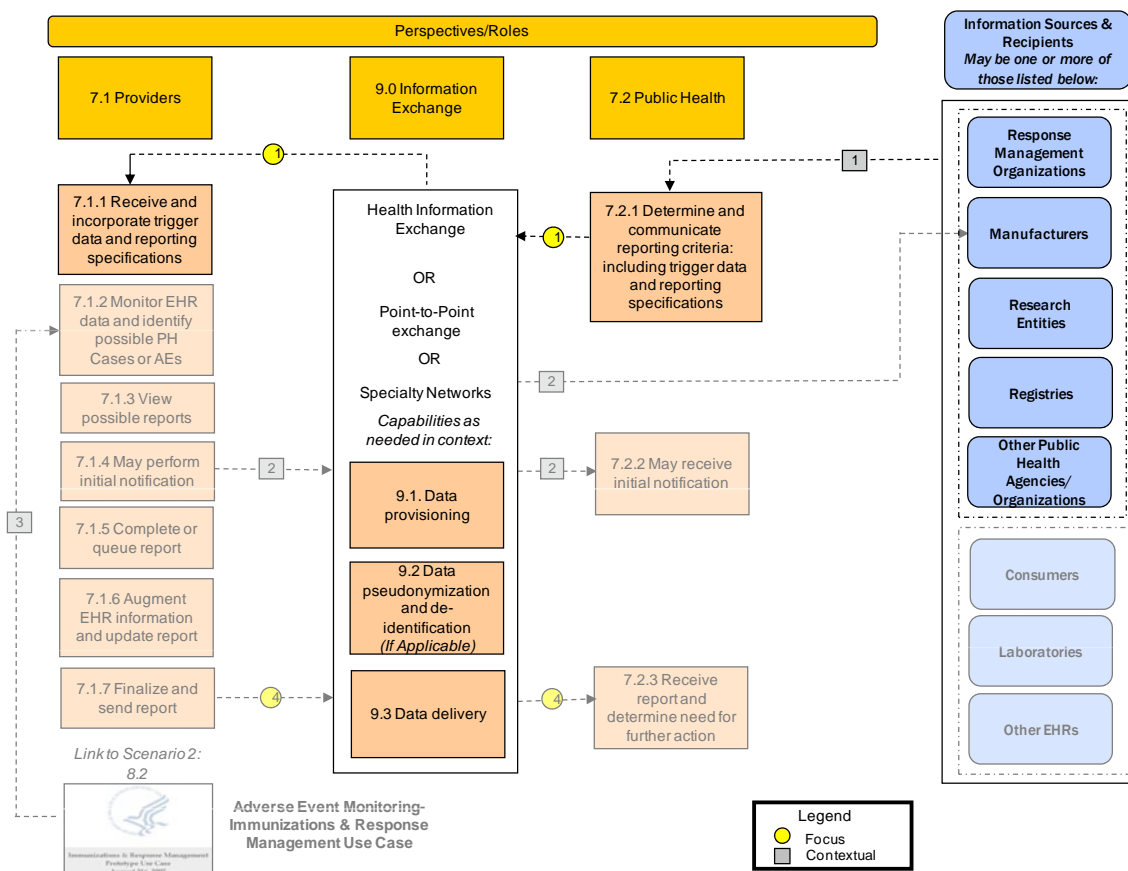
As expressed in the 2007 Quality (Scenario 1) Use Case, Events 6.1.1, 6.1.2, 6.1.3, 6.1.4, 6.1.5, 6.1.6, 6.1.7, 6.1.8, 6.1.9, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.8 and 3.2, 6.3.4, 6.1.6, and information flows 6 and 7 may apply to an information flow resulting from adjustments to the parameters of order sets. Information Sources and Recipients in Scenario 1 of the 2007 Quality Use Case should also be considered valid in the order sets information flows.

Quality and outcome measurements may be collected from information derived from an order set utilized in a clinical care setting. Therefore, information flows 6 and 7 may apply to an order set when the order set is part of the Quality Information collection and reporting.



6.6 Reference to Prior Use Case: 2008 Public Health Case Reporting (Scenario 1)

Figure 6-6. Reporting from EHRs



As expressed in the 2008 Public Health Case Reporting Use Case events 7.1.1, 7.2.1 and information flow 1; reporting criteria, including trigger data and reporting specifics may be communicated via HIE activities and incorporated into provider systems, e.g. EHRs and/or public health systems.

In the case of order sets, Knowledge Suppliers/Sources or others may communicate order set information or reporting requirements together with order sets via HIE activities. Reporting requirements may be obtained and incorporated into order sets from a variety of sources, including public health, government agencies, EHRs and ordering system suppliers.



7.0 Information Exchange

The information exchange requirements for effective communication of order sets may include:

- The ability to communicate order set requirements or order set purpose;
- The ability to generate, communicate, and/or translate a unique order set identification number;
- The ability to generate, communicate, and/or translate a unique order identification number;
- The ability to communicate order set information as a component of an order set;
- The ability to communicate all uniquely paired order details and orders from within an order set;
- The ability to communicate modifications to an order set, retaining the unique identification of the order set; and
- The ability to unambiguously maintain explicit relationships and links among orders within an order set.

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

The functional capabilities may be provided fully or partially by a variety of organizations including: free-standing or geographic HIEs (e.g., Regional Health Information Organizations), integrated care delivery networks, provider organizations, public health networks, specialty networks, and others.

While not described in this section, HIE, and Point-to-Point exchanges assist in the completion of the processes described in this order set Extension/Gap. Examples of HIEs and Point-to-Point exchanges can be found in the previous 2006 – 2008 AHIC Use Cases.



8.0 Order Set Dataset Considerations

The following non-exhaustive information categories and limited examples illustrate some of the information needs found in the Order Sets Extension/Gap document. Examples of Order Sets and some common order set component details are included in Appendix B.

Order Sets - Determining and standardizing all order set names may not be practical. However, focusing on commonly used order sets that are named with coded terms found within SNOMED CT, ICD, CPT, LOINC, or other vocabularies within the National Library of Medicine (NLM) may be a valuable starting point. Specific information that further describes the order sets should also be marked for consideration by SDOs. This information may include:

- Order Set Names
- Order Set Information and Descriptions
- Order Set Identification Codes
- Type of Order
- Type of Order Specifications
- Order Set Link Types
- Order Set Component Names

Types of Orders - Order sets may be classified in many different ways. One way is to classify an order set by the types of orders within the order set. For example, a pre-operative medication order set may be made up of only one type of order, the medications that are prescribed as part of pre-operative care. Types of orders may also include various categories of treatment for disease or condition management and may usually be considered appropriate for a clinical scenario or within clinical care settings. Examples of treatment categories commonly understood are medications, laboratory testing services, diagnostic imaging, nursing orders, adjunct therapy, and food and nutrition management. Each treatment category may have one or many sub-classifications of types of orders within that particular type of order. For example, medication orders may have a sub-classification of anti-infective agents, and further be classified by types of anti-infective agents. Clinician support to unambiguously identify any order for selection, modification, placement, and communication may be further clarified using a distinction of type of order.

Order Set Information – Various types of orders and/or specific orders may be linked together as an order set. One component of the order set may also be order set



information. Order set information may have standard formatting, vocabularies, sequencing, and other details about the order set that may include:

- Ordering indications
- Life-stage for the order set
- Outcomes measurement criteria
- Reporting details for public health or government agencies and others
- Related order set identification;
- Ordering contraindications
- Description of specific order sequencing logic
- Type of Order parameters

Order Specifications –Order specifications may occur at the order set, type of order, and/or order level. Standard order specifications may be required or optional depending on the order and/or the purpose of the order set. Examples of order specifications are listed below:

- Order logic
- Date(s) such as authoring date and modification date
- Order identification
- Type of order
- Order name
- Order duration
- Order skip patterns
- Order links

Order Set Communication and Status – Specific information that assists in the cataloging, communication, and tracking of an order set may be considered. This information may include:

- System-Generated order set identification information



- System-Generated type of order Identification Information
- Order set update, modification and/or cancellation information
- Order set categorization information



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.

Order SetsS: A collection of related orders, goals and communications assembled to organize and communicate a portion of a care plan.

Order Set Author: A person, persons, or knowledge supplier that creates any portion or all of an order set.

Clinical Ordering System Suppliers: Provider of electronic health records and physician order entry systems.

Order Set Communication and Status - Specific information that assists in the cataloging, communication, and tracking of a collection of orders.

Clinical Support Staff: Personnel that assist providers during plan of care activities.

Clinical-care Orders: Actionable items, goals and communications that make up a portion of a care plan.

Order Specifications: Information necessary and optional that describes use of components of an order set, type of order, or specific order.

Order Set Identification –Computer-process-able classification of a collection of orders that may be used to catalog, sort, and make use of order sets.

Order Set Names: Human readable title for a collection of orders that may be used to catalog, sort, and make use of order sets.

Order Set Information: Specifics associated with a collection of orders that may have standard formatting, vocabularies, sequencing, and other particulars about the collection of orders.

Type of Order: Categorization assigned to a specific order to denote the order's affinity to a kind of treatment or therapy.

Order Set Link Types: Explicit relationships between orders within a collection of orders or from one order set to another order set.



Appendix B: Analysis and Examples

Order Sets from extant systems may help to demonstrate the concepts of nesting and grouping.

The first example is an order set that may be modified and used for a patient scheduled for a specific type of procedure. This example order set has multiple examples of embedded order sets, types of orders, and guidelines for care within a primary order set. Each embedded order set is followed by an elipsis.

The second example is an order set transcribed from a paper-based health record system into a proprietary EHR system. This order set illustrates embedded logic, order details that may be modified, treatment options, and embedded/nested order sets.

These examples are included for discussion purposes and may or may not be included in the final document.

First example:

| Admission Orders | |
|-------------------------------|------------------------------------|
| Diagnosis | |
| Condition | |
| Attending | |
| Allergies | |
| PT Movement | Patient Movement... |
| Nursing and Monitoring | Vitals T/BP/P/R/Q4H |
| | I&O Q4H |
| | Activity... |
| | Foley to gravity |
| | Foley care... |
| | Foley teaching |
| | JP Orders... |
| | SCD orders... |
| | ICS orders... |
| | Suture removal supplies at bedside |
| | Other Nursing orders... |
| Diet | Clear Liquid diet |
| | Other diet orders... |
| IV Fluids | D5LR@150ML/HR |
| | Other IV Fluid Orders... |
| Medication Orders | Cepacol Lozenge 1 PO Q1H PRN |
| | Main Med Orders Menu... |



| Admission Orders | |
|--------------------------|---|
| | Single Med Orders... |
| Laboratory Orders | JP Fluid for CR (Lab and Nsg Orders)... |
| | CBC Collect Immediately in PACU |
| | CBC in AM |
| | Other lab orders... |



Second example

| Standing Orders - Ischemic Stroke/TIA | | |
|---|---------------------|---|
| Attending | | |
| Diagnosis: <i>Ischemic Stroke</i> | | |
| Condition | | |
| Allergies | | |
| Admit To | Critical Care Unit | if tPA given, follow TPA protocol for vital sign frequency and BP control |
| | | If no tPA, then vital signs every 1 hour x 24 hours, then every 2 hours |
| | | Neuro checks every 2 hours |
| | Step Down Unit | Vital signs every 2 hours x 24 hours, then every 4 hours |
| | | Neuro checks every 4 hours |
| | General Floor | Vital signs every 4 hours X 24 hours then every 8 hours |
| | | Neuro checks every 4 hours |
| | Telemetry | Vital signs every 4 hours X 24 hours then every 8 hours |
| | | Neuro checks every 4 hours |
| Nursing | Notify attending if | Decline in level of consciousness |
| | | Systolic BP is greater than 220 mmHg or less than 110 mmHg |
| | | Diastolic BP is greater than 100 mmHg or less than 60 mmHg |
| | | Pulse is greater than 120 or less than 50 |
| | | Fever is greater than 101 |
| | | Respirations greater than 30 or less than 12 |



| Standing Orders - Ischemic Stroke/TIA | |
|---------------------------------------|---|
| | Seizure Precautions |
| | Fall Alert |
| | Foley catheter |
| | I&O |
| | One touch/Accucheck |
| | Pneumatic compression device |
| | Smoking cessation counseling |
| Activity | Bedrest |
| | Elevate head of bed to x degrees |
| | Activity |
| Diet | NPO until swallowing screen done. Consult speech therapy if patient fails study |
| | Consult speech therapy |
| | Diet |
| | Liquids ___consistency |
| Ventillation | Oxygen therapy: titrate SpO2 greater than 94% per oximetry |
| | Ventilator: |
| | Respirations/minute |
| | TV |
| | A/C |
| | FiO2 |
| | SIMV Peep |
| Consults | Neurologist |



| Standing Orders - Ischemic Stroke/TIA | |
|---------------------------------------|--|
| | Intensivist |
| | Physiatrist |
| | PCP |
| | Physical Therapy |
| | Occupational Therapy |
| | Nutrition Services |
| Diagnostics | Cranial CT w/o contrast -24 hours from admission if tPA administered |
| | Trans _____ ECHO _____ with bubble study |
| | Dr. _____ to read |
| | Carotid doppler |
| | Transcranial doppler |
| | Dr. _____ to read |
| | Cranial MRI w/o contrast |
| | Extra cranial MRA - no contrast |
| | Intracranial MRA - no contrast |
| | Other |