DEPARTMENT OF HEALTH & HUMAN SERVICES USA

Office of the National Coordinator for Health Information Technology
(ONC)

Quality
Prototype Use Case

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1.0 Introduction

1.1 Use Case Description

In January 2007 the American Health Information Community (AHIC) approved a recommendation to develop a use case that captures the integration of data to support quality measurement and reporting into electronic health records (EHRs), and allows for the aggregation of quality information across multiple providers and entities to support public reporting of healthcare quality. The recommendation included the following AHIC prioritized needs:

- Hospital-based quality measures (core set):
    - Automate data capture and reporting of Hospital Quality Alliance (HQA) measures through EHRs in support of provider workflows; and
    - Communicate HQA quality measures to external entities for aggregation and reporting.
- Clinician-level measures (core set):
    - Automate data capture and reporting of AQA measures through EHRs in support of provider workflows; and
    - Communicate AQA quality measure data to external entities for aggregation and reporting.
- Feedback to Clinicians (self-assessment)
    - Enable real-time or near-real time feedback to clinicians regarding specific quality indicators which are relevant for a particular patient. This may occur through event detectors in EHRs that identify significant variances in practice. In order to be meaningful, such event detectors should be based on evidence-based practice guidelines, and driven by clinical information about the patient. If coupled with automated collection of adherence, non-adherence and exclusion criteria, both delivery of high quality care and quality reporting could be enabled as part of the decision-making process; and
    - Enable provision of tailored performance information to clinicians on quality measures for specific patient groups.
- Public Reporting
    - Aggregate data across multiple sources (claims data, medication data, laboratory data, etc.) to support quality measurement, promote accountability among providers, and aid consumers in making informed choices; and
    - Communicate quality measurement data quickly and clearly in a manner that makes it useful to a wide variety of decision makers, patients, health care

providers, payers, health plans, and regulators who are all involved with this process.

This use case has been developed by the Office of the National Coordinator for Health Information Technology (ONC), with opportunities for review and feedback by interested stakeholders within both the private and public sectors. To facilitate this process, the use case is being developed in two stages:

- The **Prototype Use Case**, which describes the flows of the use case at a high level and facilitates initial discussion with stakeholders; and
- The **Detailed Use Case**, which will document all of the events and actions within the use case at a detailed level.

This document is the Prototype Use Case.

1.2 Scope of the Use Case

Widespread adoption of electronic health records is a goal of the national HIT agenda. To achieve this, the AHIC Quality Use Case focuses on: 1) the impact that collection of electronic health information through an EHR has on driving quality of care through better, more comprehensive clinical information at the point of care; 2) measuring and reporting quality with a minimum of burden assessed on the provider; and 3) the aggregation of health information for the purpose of public reporting of quality. This use case depicts two scenarios related to quality measurement and reporting with respect to a patient’s encounter with the healthcare delivery system: quality measurement of hospital-based care and of care provided by clinicians.

Each scenario has two views. The first is an information collection and feedback view, in which the information flow related to the health encounter is described, with a focus on the collection and feedback of quality measurement information for internal quality improvement, as well for exchange between providers and a measurement and reporting entity, using an electronic health record. The second is an information reporting view which describes the information flow associated with the exchange of quality measurement information for the purpose of public reporting, as well as the secondary uses of this same information if aggregated across sources.

This use case assumes the presence of EHRs within the health care delivery system and promotes the development of longer-term efforts.

The use case models the exchange of information between the EHR and the quality measurement and reporting systems. The use case allows for a hybrid model of data collection, where claims and or manual data collection will be required to support certain measures that are not supported through EHRs. It does not try to model systems which may be present in a hospital or clinician practice setting which do not provide input into quality data collection systems nor does it attempt to proscribe a definitive approach to the location of data aggregation. The use case also does not describe harmonized quality measures. Separate AHIC processes will determine the initial and subsequent quality measures to be used. The data flows indicated are not intended to be comprehensive or limiting.

2.0 Use Case Stakeholders

Stakeholder	Working Definition
Ancillary Entities	Organizations that perform an auxiliary role in delivering healthcare services. It may include diagnostic and support services such as laboratories, imaging and radiology services, and pharmacies that support the delivery of healthcare services. These services may be delivered through hospitals or through free-standing entities.
Clinicians	Health care providers with patient care responsibilities, including physicians, advanced practice nurses, physician assistants, nurses, and other credentialed personnel involved in treating patients.
Consumers	Members of the public, all of whom are possible users of the health care system. Consumer is intended to include members of the public who are engaged in health prevention activities. Consumers also include caregivers, patient advocates or surrogates, family members, and other parties who may be acting for, or in support of, a patient.
Health Care Delivery Organizations	Organizations, such as hospitals and physician practices, that manage the delivery of care.
Health Care Payors	Insurers providing health care benefits to enrolled members and reimbursing provider organizations and pharmacies for services provided. As part of this role, they provide information on eligibility and coverage for individual consumers, as well as claims-based information on consumer medication history.
Health Information Exchanges	Organizations that may provide trust and governance relationships for a network of users and applications. Organizations playing this role may be, but are not limited to, statewide or regional groupings, or geographically diverse networks. Some HIEs may receive networking services from other health information providers.
Health Researchers	Those performing research using health care information.
Processing Entities	Organizations which collect, aggregate and process healthcare information for primary or secondary use. In this use case, processing entities deal with quality information, and usually follow standards or guidelines established by a Quality Organization (see below).
Public Health Agencies (Local/State/Federal)	Federal, state, local organizations and personnel that exist to help protect and improve the health of their respective constituents.

Stakeholder	Working Definition
Quality Organizations	Public/private organizations active in the healthcare quality measurement enterprise. These organizations include entities which set priorities, endorse measure sets, harmonize quality measures across settings, establish guidelines for collection and reporting, and support quality improvement. Examples of various quality organizations include the National Quality Forum (NQF), Hospital Quality Alliance (HQA), AQA, The Joint Commission, Centers for Medicare and Medicaid Services (CMS), Quality Improvement Organizations (QIOs).

3.0 Issues and Obstacles

Realizing the full benefits of health information technology and its potential to enable quality measurement and reporting is dependent on overcoming a number of issues and obstacles in today's environment. Inherent in this use case is the premise that some of the issues and obstacles in today's environment will be addressed through health information technology standardization and harmonization activities, policy development, and other related initiatives.

Data Interoperability and Standards

Lack of standardized quality measures. The healthcare industry needs to reach consensus on a baseline group of standardized quality measures. Great effort is now being invested by many quality organizations to reach this goal.

Lack of standardized electronic patient information. There is limited standardization of electronic health records, and electronic health records are often customized during implementation, resulting in a lack of detailed, standardized implementation specifications for collecting data pertaining to quality metrics in an EHR. Also, local practice often drives the documentation process, so standardization of what is documented and where it is documented is an issue. Additionally, clinical documentation is often unstructured and uses non-standardized nomenclature, with no standards for many important data elements. The lack of established standards for structured clinical documentation makes it difficult to easily retrieve data from many EHR systems currently being used.

Lack of standardized EHR functionality. EHR implementation specifications are not optimized for data collection to occur through electronic health records. Specifications are not currently created in a way that a vendor could universally adopt to automate quality reporting.

Data Ownership, Sharing, & Responsibility

Lack of uniform operating rules and standards for the sharing, aggregation and storage of quality data. There are limited coordinated strategies for collecting, aggregating, analyzing and reporting healthcare quality information across both the private and public sectors. Additionally, proliferation of multiple regional efforts to collect and report quality data is resulting in uncoordinated demands of providers for quality measurement data, increasing the burden on providers.

Stewardship of aggregated data. Consensus must be established on managing and storing aggregated patient-indexed data; stewardship issues for the data must be considered and resolved.

Patient privacy concerns. Consumers are concerned about the confidentiality and privacy of their data, particularly as it relates to the secondary uses of their health information.

Health information security concern. The lack of data/coding standardization, data integrity/harmonization, system interoperability, and shared, secure authentication and authorization mechanisms impact the ability of most organizations to transfer and/or store data readily within or outside their boundaries.

Limited EHR penetration

Initial cost to automate patient medical records might be viewed as prohibitive especially by the smaller size healthcare delivery organization.

Furthermore, providers must be assured that information received via EHRs and other sources is valid, reliable, and accurate.

Lack of integration into provider workflow

Electronic health records do not currently support efficient data capture and reporting or providing clinicians with non-burdensome methods of using quality data in support of patient care. The electronic capture of health quality information has not been consolidated into a provider's workflow or into the EHR workflow in such a way as to minimize clinician burden in measurement and reporting of quality.

4.0 Use Case Perspectives

The Quality Use Case describes the flow of quality information through an EHR system for the purpose of quality measurement and reporting, and describes several perspectives. Each perspective represents the exchange of quality information from the viewpoint of the major stakeholders involved in the measurement, feedback, and reporting of hospital and clinician quality. Quality information is collected at the point of care through an electronic health record system, and transmitted at a patient-level initially, and subsequently aggregated to either hospital level or clinician level for public reporting purposes.

Within the scope of the use case noted above, the following perspectives have been defined:

- ***Hospital-based Care***

  Hospital performance is currently evaluated by the widespread collection and reporting of nationally supported HQA measures. This perspective describes the flow of quality information through an EHR at a hospital when a patient is seen for care and treatment. This may include acute care and specialty hospitals.

- ***Clinicians***

  AQA measures have been established to measure physician performance, and may expand to include other clinicians as well. This perspective describes the flow of quality information through an EHR whenever a specific physician can be identified as accountable for ensuring adherence to best practice. The terms “clinician” and “clinician practice” are used throughout this use case to represent physicians, physician practices as well as any other clinicians for whom quality measures are developed and implemented.

- ***Hospital-level Measurement and Feedback***

  Individual patient-level information is collected and calculated to determine hospital performance. This perspective describes the collection of patient-level quality data for purposes of hospital quality measurement, internal reporting of quality measurement information back to the hospitals being measured (provision of feedback), and external reporting of hospital quality measurement to external entities (e.g., public reporting, payors). In doing so, this perspective includes the flow of information for validation of data comprehensiveness, application of measure algorithm, and validation of quality measurement data with individual hospitals. Examples of organizations included in this perspective include the Joint Commission-contracted Performance Measurement System vendors, Centers for Medicare and Medicaid Services (CMS) and hospitals themselves.

- ***Multi-hospital and Multi-entity Measurement and Reporting***

  This perspective describes the processes included in collecting data from a number of sources and repositories, and may include matching patients across data sources and aggregating these data to better measure quality. Comparative information on many hospitals or clinicians may then be reported out for multiple purposes. The Multi-Hospital and Multi-entity Measurement and Feedback entities may perform all or part of these services. Examples include CMS and The Joint Commission. Health Information Service Providers are another possible example of such an entity, particularly if they play a central collection and processing.

5.0 Use Case Scenarios

In the Quality Use Case there are two scenarios:

5.1 Hospital-based Care

This scenario covers the documentation, collection and transmission of patient information relevant to the calculation of an established quality measure, when care is provided to a patient within a hospital setting.

5.2 Clinicians

This scenario covers the documentation, collection and transmission of patient information relevant to the calculation of an established quality measure for clinician quality, when care is provided to a patient within an ambulatory or inpatient care setting, but where a specific clinician can be identified as responsible for ensuring adherence to best practice.

The event descriptions in the sections that follow represent a high-level view of healthcare processes that pertain to this use case. In some instances, an event, or a sequence of events, may occur in more than one process, or more than one use case. For the prototype use cases, these common processes have not been specifically recognized. In the forthcoming detailed use cases some common processes will be detailed with the intent that reusable models can be referenced in these and future use cases. Examples of these common processes could include:

- ***Adjudication of identities***

  Systems involved in exchanging patient-specific information need mechanisms to reconcile person identity between nodes (e.g. between health information service providers).

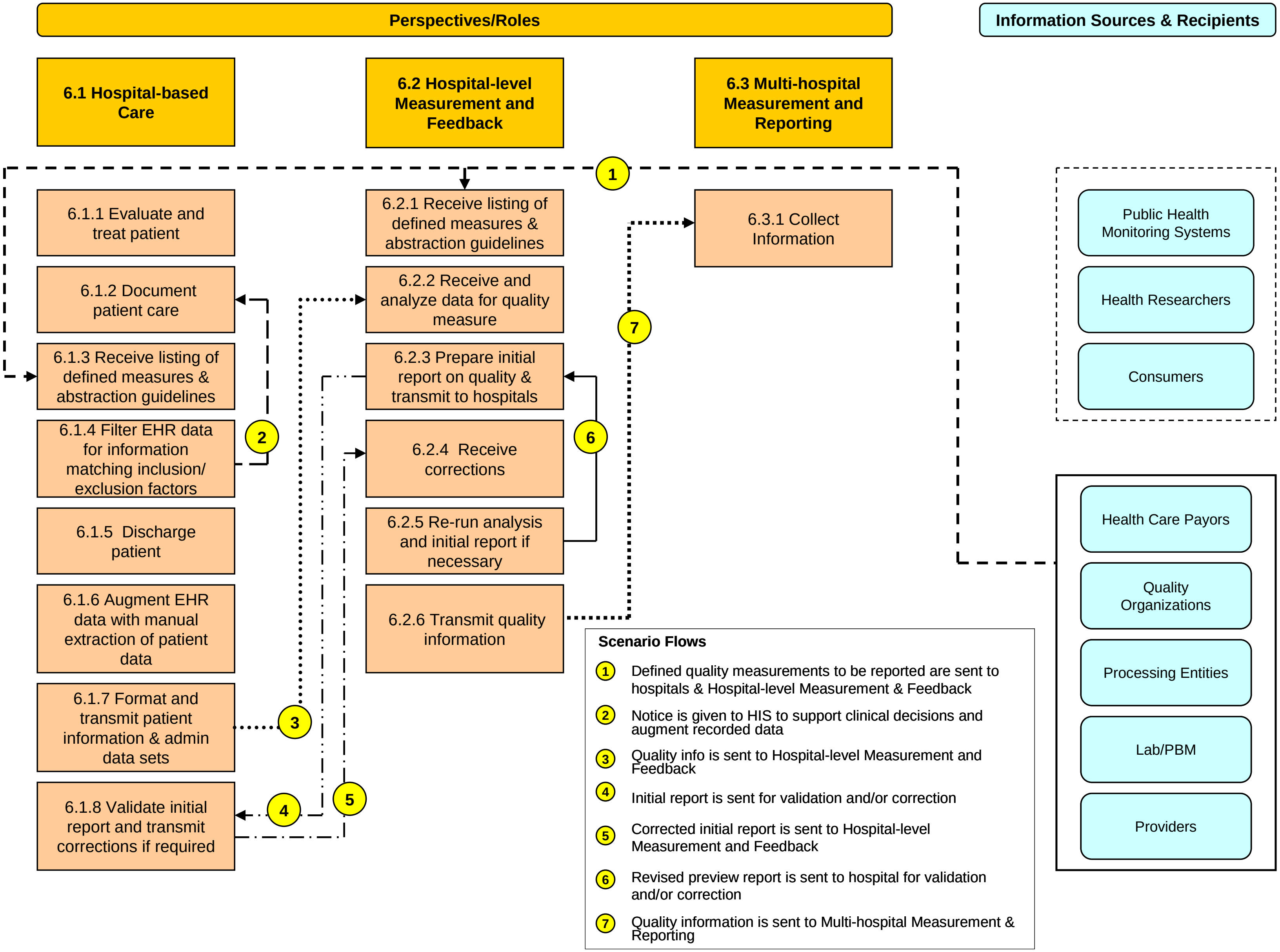
- ***Provisioning for secondary use***

  Secondary use systems could communicate reporting needs to provider systems in a form that could be used to configure those systems to gather and report needed information. The focus would be to electronically describe the data needs, terminologies, algorithms, etc. in a way which could be readily used in the target systems to report the needed information.

- ***Augmenting clinical information***

  Target systems may not contain all of the information needed to support secondary use reporting, so target system may need to be configured to prompt the appropriate user to provide additional information. In some instances the mechanism to collect this additional information could be provided through the provisioning for secondary use process.

Hospital-based Care Quality Information Collection and Feedback Flow



Perspectives/Roles

Information Sources & Recipients

6.1 Hospital-based Care

6.1.1 Evaluate and treat patient

6.1.2 Document patient care

6.1.3 Receive listing of defined measures & abstraction guidelines

6.1.4 Filter EHR data for information matching inclusion/ exclusion factors

6.1.5 Discharge patient

6.1.6 Augment EHR data with manual extraction of patient data

6.1.7 Format and transmit patient information & admin data sets

6.1.8 Validate initial report and transmit corrections if required

6.2 Hospital-level Measurement and Feedback

6.2.1 Receive listing of defined measures & abstraction guidelines

6.2.2 Receive and analyze data for quality measure

6.2.3 Prepare initial report on quality & transmit to hospitals

6.2.4 Receive corrections

6.2.5 Re-run analysis and initial report if necessary

6.2.6 Transmit quality information

6.3 Multi-hospital Measurement and Reporting

6.3.1 Collect Information

Public Health Monitoring Systems

Health Researchers

Consumers

Health Care Payors

Quality Organizations

Processing Entities

Lab/PBM

Providers

Scenario Flows

① Defined quality measurements to be reported are sent to hospitals & Hospital-level Measurement & Feedback

② Notice is given to HIS to support clinical decisions and augment recorded data

③ Quality info is sent to Hospital-level Measurement and Feedback

④ Initial report is sent for validation and/or correction

⑤ Corrected initial report is sent to Hospital-level Measurement and Feedback

⑥ Revised preview report is sent to hospital for validation and/or correction

⑦ Quality information is sent to Multi-hospital Measurement & Reporting

6.0 Hospital-based Care Quality Information Collection and Feedback Flow

6.1 Hospital-based Care

6.1.1 Evaluate and treat patient

Clinical personnel treat the patient's injuries or illness. Appropriate diagnostics and treatments are ordered and completed.

6.1.2 Document patient care

The clinician documents care into the EHR, which collects data attributed to the quality measures in a standardized fashion. The entry may be documentation of treatment, or a standardized notation indicating why the care is not appropriate (justification for exclusion from measure consideration). The EHR may have features that allow for additional information based on evidence-based guidelines, and tailored for the patient’s diagnosis and treatment. The clinician enters the pertinent standardized responses into the EHR.

> ***Data Exchange:*** Where appropriate, an intelligent internal EHR communication may be received, supporting decision making at the point of care while enabling quality measurement by providing additional information to the clinician based on evidence-based guidelines and specific information regarding the patient’s diagnosis and treatment.

6.1.3 Receive the listing of defined measures and abstraction guidelines

Receive the listing of quality measures and detailed measure specifications for how a measure will be calculated from Multi-hospital Measurement and Reporting entities.

> ***Data Exchange:*** The Multi-hospital Measurement and Reporting entities notify hospitals of which quality measures will be used to publicly report hospital quality. Detailed measure specifications that describe numerator, denominator, algorithm, etc. for calculation of measure are provided to the hospitals, in addition to abstraction guidelines that provide standard instruction on what types of patient information should be abstracted from the patient record. The hospital’s internal quality improvement program/department receives the listing of defined quality measures and their associated abstraction guidelines and works with its EHR vendor to update internal systems such as the EHR accordingly.

6.1.4 Filter EHR data for information matching inclusion /exclusion factors

The hospital’s health information systems check the EHR for clinical information for inclusion in each relevant HQA quality measure. If the information is present, the patient is identified as being eligible for the measure.

> ***Data Exchange:*** Where appropriate, information regarding evidence-based guidelines related to a patient's diagnosis and treatment may be available to the clinician.

6.1.5 Discharge patient

The patient is discharged from the hospital, and standardized information such as a discharge summary is recorded in the EHR.

6.1.6 Augment existing EHR data with augmentation and manual extraction of patient data

Information related to a quality measure that is not automated through an EHR is manually extracted from the patient record.

6.1.7 Format and transmit patient information and administrative data sets

The hospital's HIS retrieves data matching the designated parameters required for the appropriate quality measure (including data automatically collected through the EHR, manually extracted data, and administrative data such as claims information), prepares it in the specified format and transmits it to a Hospital-level Measurement and Feedback entity, such as Joint Commission contracted hospital vendors. A small percentage of hospitals fulfill the Hospital-level Measurement and Feedback role directly, without contracting with a vendor.

In the future as EHR systems become more robust and complete, the processing and initial reporting functions performed at the Hospital-level Measurement and Feedback entities may be performed instead by the hospital's EHR.

> ***Data Exchange:*** The formatted data are transmitted to a Hospital-level Measurement and Feedback entity.

6.1.8 Validate initial report and transmit corrections if required

An initial report with detailed, patient-level quality information and hospital-level quality measurement (including initial hospital scores per quality measure) are received from Hospital-level Measurement and Feedback entity. The report is validated by the hospital for accuracy of the data. If data corrections are required, they are sent to the Hospital-level Measurement and Feedback entity. Hospitals are able to begin making adjustments in practice and initiate quality improvement activities based on this initial feedback.

> ***Data Exchange:*** Initial quality measurement report is received from the Hospital-level Measurement and Feedback entity. Corrections to the report are sent back to the Hospital-level Measurement and Feedback entity.

6.2 Hospital-level Measurement and Feedback

6.2.1 Receive listing of defined measurements and abstraction guidelines.

Receive the listing of quality measures and detailed measure specifications for how a measure will be calculated from Multi-hospital Measurement and Reporting entities.

> ***Data Exchange:*** The Multi-hospital Measurement and Reporting entities notify Hospital-level Measurement and Feedback entities of which quality measures will be used to publicly report hospital quality. Detailed measure specifications that describe numerator, denominator, algorithm, etc. for calculation of measure are provided, in addition to abstraction guidelines that provide standard instruction on what types of patient information should be abstracted from a patient record.

6.2.2 Receive and analyze data for quality measure

Patient-level quality data are received from hospitals. Established micro-specifications are followed and algorithms are applied to measure the quality of hospital performance for each patient encounter reported.

> ***Data Exchange:*** Quality data are received from hospitals served by the Hospital-level Measurement and Feedback entity.

6.2.3 Prepare initial report and transmit to hospitals

Output of quality data analysis is used to prepare an initial report, detailing patient-level and hospital-level quality measurement. The initial report is transmitted back to the individual hospital for data validation and correction if necessary.

In the future as EHR systems become more robust and complete, the processing and initial reporting functions performed at the Hospital-level Measurement and Feedback entities may be performed instead by the hospital’s EHR.

> ***Data Exchange:*** The initial report is transmitted to the appropriate hospital entity for data validation and data correction.

6.2.4 Receive corrections

Any necessary corrections to the initial report are received from the hospital entity.

> ***Data Exchange:*** If required, corrections to the draft initial report are received from the appropriate hospital.

6.2.5 Re-run analysis and initial report if necessary

The initial quality measurement report is re-run and sent to the hospital for data validation and data correction if necessary.

> ***Data Exchange:*** The revised quality measurement report is transmitted to the appropriate hospital entity for data validation and data correction.

6.2.6 Transmit quality information

The data are released and transmitted to the designated Multi-hospital Measurement and Feedback entity for aggregation and public reporting of hospital quality measures.

> ***Data Exchange*:** The formatted data are transmitted by secure means to a Multi-hospital Measurement and Feedback entity.

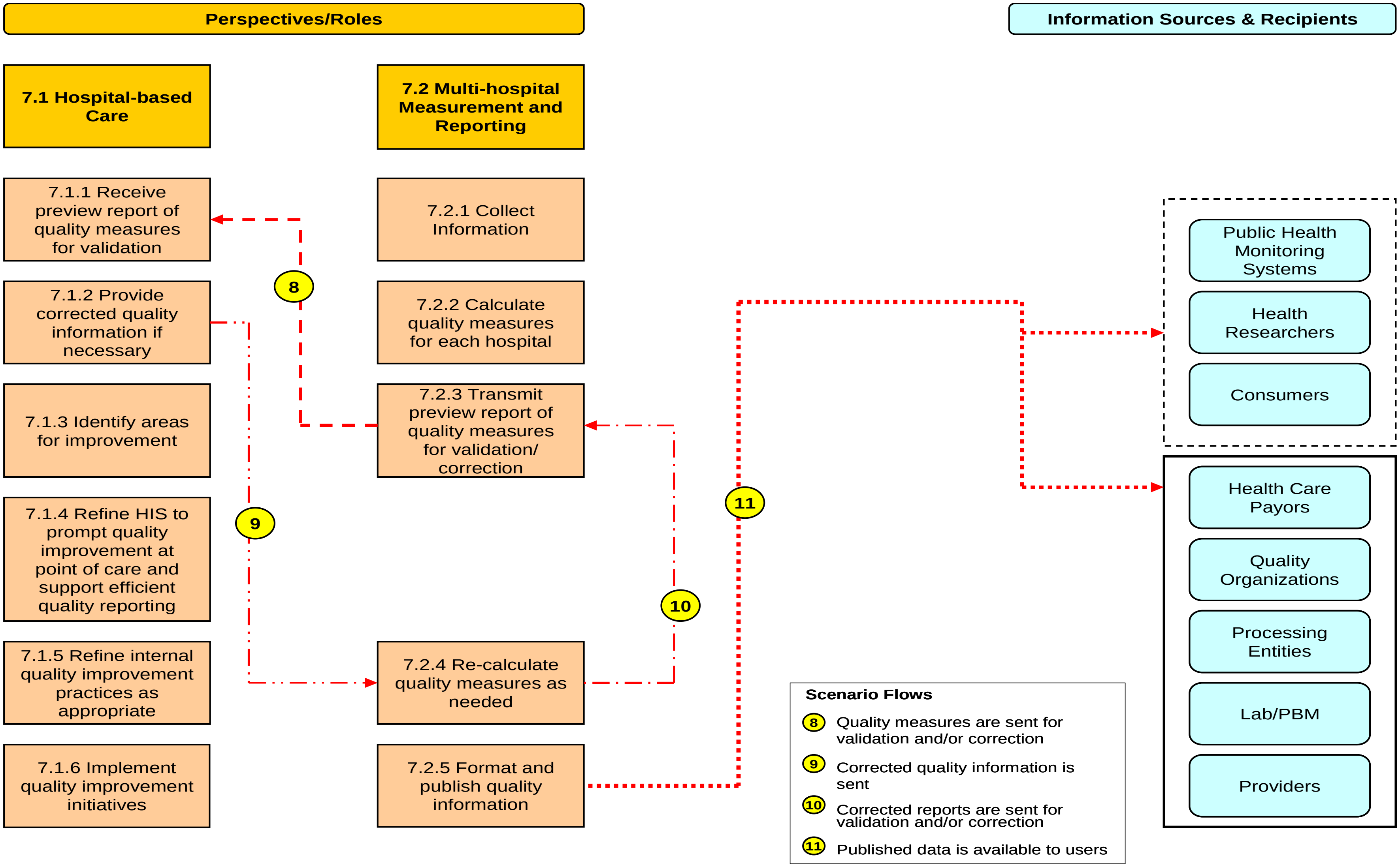
6.3 Multi-hospital Measurement and Reporting

6.3.1 Collect Information

Information dealing with hospital quality measurement is gathered from the Hospital-level Measurement and Feedback entity.

> ***Data Exchange:*** Hospital-level information is received from the Hospital-level Measurement and Feedback entity (for select organizations such as CMS, both patient and hospital level quality information is received).

Hospital-based Care Quality Information Reporting Flow



Perspectives/Roles

Information Sources & Recipients

7.1 Hospital-based Care

- 7.1.1 Receive preview report of quality measures for validation
- 7.1.2 Provide corrected quality information if necessary
- 7.1.3 Identify areas for improvement
- 7.1.4 Refine HIS to prompt quality improvement at point of care and support efficient quality reporting
- 7.1.5 Refine internal quality improvement practices as appropriate
- 7.1.6 Implement quality improvement initiatives

7.2 Multi-hospital Measurement and Reporting

- 7.2.1 Collect Information
- 7.2.2 Calculate quality measures for each hospital
- 7.2.3 Transmit preview report of quality measures for validation/ correction
- 7.2.4 Re-calculate quality measures as needed
- 7.2.5 Format and publish quality information

- Public Health Monitoring Systems
- Health Researchers
- Consumers

- Health Care Payors
- Quality Organizations
- Processing Entities
- Lab/PBM
- Providers

Scenario Flows

- (8) Quality measures are sent for validation and/or correction
- (9) Corrected quality information is sent
- (10) Corrected reports are sent for validation and/or correction
- (11) Published data is available to users

7.0 Hospital-based Care Quality Information Reporting Flow

7.1 Hospital-based Care

7.1.1 Receive preview report of quality measures for validation

The Hospital entity receives a preview report from the Multi-hospital Measurement and Reporting entity for review. The report is checked to ensure the underlying data are correct.

> ***Data Exchange:*** The preview report is received from the Multi-hospital Measurement and Feedback entity.

7.1.2 Provide corrected quality measures if necessary

If review of the preview report shows data errors, the correct data are sent back to the Multi-hospital Measurement and Reporting entity for correction and recalculation of the hospital-level quality measures. A small percentage of hospitals fulfill the Hospital-level Measurement and Feedback role directly, without contracting with a vendor. If a hospital uses a vendor, revised quality data will be transmitted through the Hospital-level Measurement and Feedback entity, otherwise hospitals will communicate revised data directly to the Multi-hospital Measurement and Reporting entity.

> ***Data Exchange:*** Corrected data are sent back to the Multi-hospital Measurement and Reporting entity.

7.1.3 Identify areas for improvement

Based on the initial report of quality measurement provided by Hospital-level Measurement and Feedback entities (Event # 6.1.8), hospitals begin analyzing information to identify areas for improvement and systemic process changes that support overall quality improvement.

7.1.4 Refine Hospital's HIS where possible to support quality improvement at the point of care and to promote more efficient reporting of quality data

Based upon analysis of quality measurement information (both initial report and preview report), the HIS may be modified to provide more relevant information for the treating clinician to support decision-making and to facilitate better capture of quality measure information in an electronic format, lessening the burden over time of manual extraction of patient information for purposes of quality measurement.

7.1.5 Refine internal quality improvement practices as appropriate

Analysis of the hospital's quality measurement information (initial report and preview report) may identify areas for improvement that could be incorporated into the hospital's overall quality improvement initiatives. Tailored strategies to improve quality and hospital performance such as improvements in clinical workflow, efforts to address cultural changes, and targeted programs such as medication reconciliation and safety may be developed and included in the hospital's overall quality improvement practices as relevant.

7.1.6 Implement quality improvement initiatives

Quality improvement initiatives are implemented.

7.2 Multi-hospital Measurement and Reporting

7.2.1 Collect data

Patient-level quality data are received from the Hospital-level Measurement and Feedback level. Over time, as measures are expanded and phased in, the data collected may expand to other sources of data to support collection of longitudinal data.

> ***Data Exchange:*** Patient-level quality data are received from Hospital-level Measurement and Feedback entities. It may also be received from other data sources over time.

7.2.2 Calculate measures for each hospital

Algorithms are applied to patient-level data to develop hospital-level quality measurement information. A report is prepared for each hospital.

7.2.3 Transmit preview report of hospital-level quality measurement for validation/correction

Preview reports of hospital-level quality measurement are sent to hospitals for data validation and if necessary, data correction.

> ***Data Exchange:*** Preview reports of hospital-level quality measurement are sent to hospitals for data validation and correction if required. Either corrected patient-level quality data or revised hospital-level quality measurement is re-submitted depending on the Multi-hospital Measurement and Reporting entity.

7.2.4 Re-calculate quality measures as needed

Revised quality information is received from the hospitals or their designated Hospital-level Measurement and Feedback entities. The reports may be re-calculated again if necessary and sent to hospitals for data validation and correction if needed. This feedback is repeated as often as necessary to ensure the correct data are used to calculate hospital-level quality measurement.

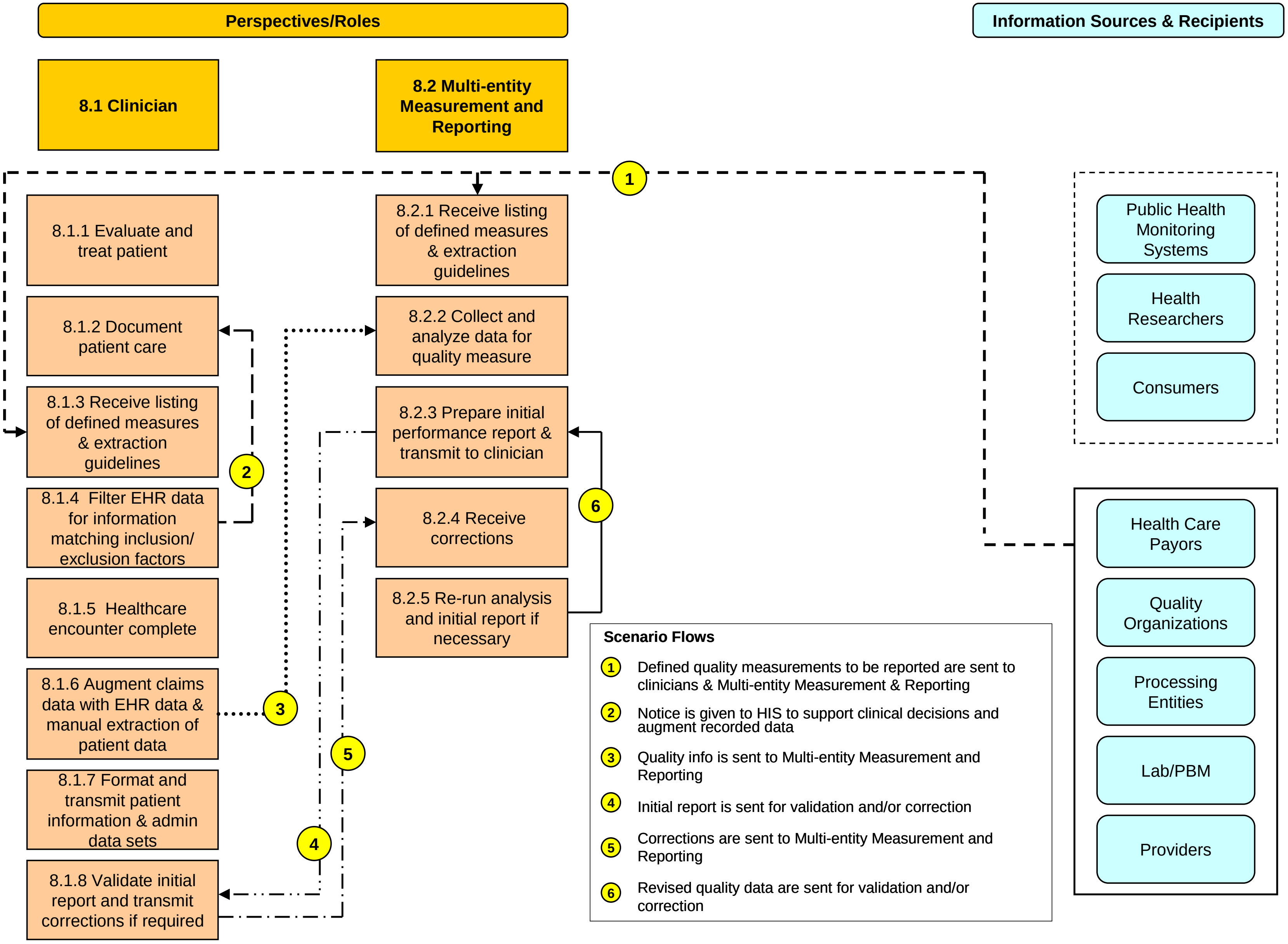
Data Exchange: Corrected data are received by the Multi-hospital Measurement and Reporting entity. Re-calculated reports are sent to the hospital for data validation and if needed data correction.

7.2.5 Format and publish quality information

The final hospital-level quality measurement data are published to a public website. It is made available in appropriate formats to users for viewing and possibly for downloading.

Data Exchange: The completed hospital -level quality measurement report is published and made available to users for viewing and possibly downloading.

Clinician Quality Information Collection and Feedback Flow



Perspectives/Roles

Information Sources & Recipients

8.1 Clinician

- 8.1.1 Evaluate and treat patient
- 8.1.2 Document patient care
- 8.1.3 Receive listing of defined measures & extraction guidelines
- 8.1.4 Filter EHR data for information matching inclusion/ exclusion factors
- 8.1.5 Healthcare encounter complete
- 8.1.6 Augment claims data with EHR data & manual extraction of patient data
- 8.1.7 Format and transmit patient information & admin data sets
- 8.1.8 Validate initial report and transmit corrections if required

8.2 Multi-entity Measurement and Reporting

- 8.2.1 Receive listing of defined measures & extraction guidelines
- 8.2.2 Collect and analyze data for quality measure
- 8.2.3 Prepare initial performance report & transmit to clinician
- 8.2.4 Receive corrections
- 8.2.5 Re-run analysis and initial report if necessary

- Public Health Monitoring Systems
- Health Researchers
- Consumers

- Health Care Payors
- Quality Organizations
- Processing Entities
- Lab/PBM
- Providers

Scenario Flows

① Defined quality measurements to be reported are sent to clinicians & Multi-entity Measurement & Reporting

② Notice is given to HIS to support clinical decisions and augment recorded data

③ Quality info is sent to Multi-entity Measurement and Reporting

④ Initial report is sent for validation and/or correction

⑤ Corrections are sent to Multi-entity Measurement and Reporting

⑥ Revised quality data are sent for validation and/or correction

8.0 Clinician Quality Information Collection and Feedback Flow

8.1 Clinician

8.1.1 Evaluate and treat patient

Clinicians treat the patient's injuries or illness. Appropriate diagnostics and treatments are ordered.

8.1.2 Document patient care

The clinician documents care into the EHR, which collects data attributed to the quality measures in a standardized fashion. The entry may be documentation of treatment, or a standardized notation indicating why the care is not appropriate (justification for exclusion from measure consideration). The EHR may have features that allow for additional information based on evidence-based guidelines, and tailored for the patient's diagnosis and treatment. The clinician enters the pertinent standardized responses into the EHR.

> ***Data Exchange:*** Where appropriate, an intelligent internal EHR notification may be received, supporting decision making at the point of care while enabling quality measurement by providing additional information to the clinician. This additional information should be based on evidence-based guidelines as well as specific information regarding the patient's diagnosis and treatment.

8.1.3 Receive the listing of defined measures and abstraction guidelines.

Receive the listing of quality measures and detailed measure specifications for how a measure will be calculated from Multi-entity Measurement and Reporting organizations.

> ***Data Exchange:*** The Multi-entity Measurement and Reporting organizations notify clinician organizations such as clinician practices of which quality measures will be used to publicly report clinician quality. Detailed measure specifications that describe numerator, denominator, algorithm, etc. for calculation of measure are provided, in addition to abstraction guidelines that provide standard instruction on what types of patient information should be abstracted from the patient record. The clinician or clinician practice's internal quality improvement program receives the listing of defined quality measures and their associated abstraction guidelines and works with the EHR vendor to update internal systems such as the EHR accordingly.

8.1.4 Filter EHR data for information matching inclusion /exclusion factors

The clinician's HIS checks the patient's EHR for clinical information for inclusion in each relevant AQA quality measure. If the information is present, the patient is identified as being eligible for the measure.

> ***Data Exchange:*** Where appropriate, information regarding evidence-based guidelines related to a patient's diagnosis and treatment may be available to the clinician.

8.1.5 Healthcare Encounter Complete

The patient's encounter with the clinician is formally complete, and the patient is "discharged." Standardized information such as follow-up and care plan summary are recorded in the EHR.

8.1.6 Augment claims data with EHR data and manual extraction of patient data

Clinician-generated claims data are augmented with information related to a quality measure from the EHR. Remaining information needed to determine quality measurement is manually extracted from the patient record.

8.1.7 Format and transmit patient information and administrative data sets

The clinician's HIS retrieves data matching the designated parameters required for the appropriate quality measure (claims data, data automatically collected through the EHR, and manually extracted data), prepares it in the specified format and transmits it to a Multi-entity Measurement and Reporting organization.

As future EHR systems become more robust and complete, the processing and reporting functions performed by Multi-entity Measurement and Reporting organizations may be performed instead by the clinician's EHR System.

> ***Data Exchange:*** The formatted data are transmitted to a Multi-entity Measuring and Reporting organization.

8.1.8 Validate initial report and transmit corrections if required

Initial quality measurement reports are received from a Multi-entity Measurement and Reporting organization. The reports are validated for accuracy of the data. If data corrections are required, they are sent to the Multi-entity Measurement and Reporting organization.

> ***Data Exchange:*** Initial quality measurement reports are received from the Multi-entity Measurement and Reporting organization. Corrected data are sent back to the Multi-entity Measurement and Reporting organization.

8.2 Multi-entity Measurement and Reporting

8.2.1 Receive listing of defined measurements and abstraction guidelines

Receive the listing of quality measures and detailed measure specifications for how a measure will be calculated from Multi-entity Measurement and Reporting organization.

> ***Data Exchange:*** Individual Multi-entity Measurement and Reporting organizations charged with public reporting of measures notify other Multi-entity Measurement and Reporting organizations of which quality measures will be used to publicly report clinician quality.. (e.g., CMS may establish guidelines that are followed by other entities). Detailed measure specifications that describe numerator, denominator, algorithm, etc. for calculation of measure are provided, in addition to abstraction guidelines that provide standard instruction on what types of patient information should be abstracted from a patient record.

8.2.2 Collect and analyze data for quality measure

Patient-level quality data are received from clinicians. Established micro-specifications are followed and algorithms are applied to measure clinician-level performance for each patient encounter reported.

> ***Data Exchange:*** Patient-level quality data are received from clinicians.

8.2.3 Prepare initial report and transmit to clinicians

Output of quality data analysis is used to prepare an initial quality measurement report, detailing patient-level and clinician-level quality measurement. The initial report is transmitted back to the individual clinician or clinician practice for data validation and correction if necessary.

In the future as EHR systems become more robust and complete, the initial quality measurement and reporting functions may be performed instead by the clinician's EHR.

> ***Data Exchange:*** The initial quality measurement report is transmitted to clinicians or clinician practices for data validation and data correction.

8.2.4 Receive corrections

Any necessary corrections to the initial quality measurement report are received from the clinician or clinician practice.

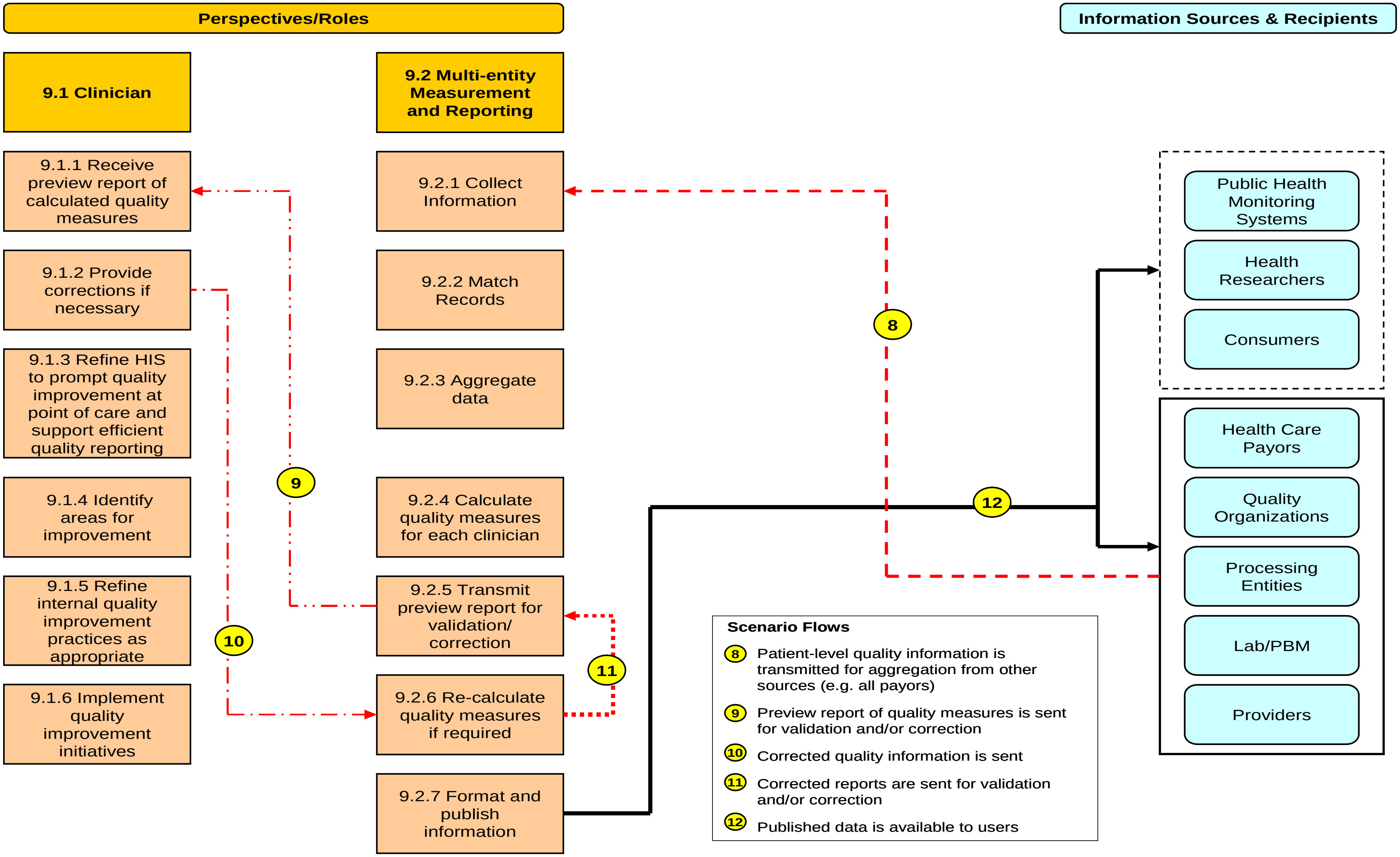
> ***Data Exchange:*** If required, corrections to the initial quality measurement report are received from the clinician or clinician practice.

8.2.5 Re-run analysis and initial report if necessary

The initial quality measurement report is re-run and sent to the clinician or clinician practice for data validation and data correction if necessary.

> ***Data Exchange:*** The initial quality measurement report is transmitted to the clinician or clinician practice for data validation and data correction.

Clinician Quality Information Reporting Flow



Perspectives/Roles

9.1 Clinician

- 9.1.1 Receive preview report of calculated quality measures
- 9.1.2 Provide corrections if necessary
- 9.1.3 Refine HIS to prompt quality improvement at point of care and support efficient quality reporting
- 9.1.4 Identify areas for improvement
- 9.1.5 Refine internal quality improvement practices as appropriate
- 9.1.6 Implement quality improvement initiatives

9.2 Multi-entity Measurement and Reporting

- 9.2.1 Collect Information
- 9.2.2 Match Records
- 9.2.3 Aggregate data
- 9.2.4 Calculate quality measures for each clinician
- 9.2.5 Transmit preview report for validation/ correction
- 9.2.6 Re-calculate quality measures if required
- 9.2.7 Format and publish information

Information Sources & Recipients

- Public Health Monitoring Systems
- Health Researchers
- Consumers

- Health Care Payors
- Quality Organizations
- Processing Entities
- Lab/PBM
- Providers

Scenario Flows

8	Patient-level quality information is transmitted for aggregation from other sources (e.g. all payors)
9	Preview report of quality measures is sent for validation and/or correction
10	Corrected quality information is sent
11	Corrected reports are sent for validation and/or correction
12	Published data is available to users

9.0 Clinician Quality Information Reporting Flow

9.1 Clinician

9.1.1 Receive preview report of calculated quality measures

The clinician or clinician practice receives a preview report of quality measurement from the Multi-entity Measurement and Reporting organization. The report is checked to validate that the resulting quality measurement is correct.

> ***Data Exchange:*** The preview report is received from the Multi-entity Measurement and Reporting organization.

9.1.2 Provide corrections if necessary

If review of the quality measures shows data errors, the corrections are sent to the Multi-entity Measurement and Reporting organization for correction and recalculation of the quality measures.

> ***Data Exchange:*** Corrected data are sent back to the Multi-entity Measurement and Reporting organization.

9.1.3 Refine Clinician's HIS where possible to support quality improvement at the point of care and to promote more efficient reporting of quality data

Based upon analysis of quality measurement information (both initial report and preview report), the HIS may be modified to provide more relevant information for the treating clinician to support decision-making and to facilitate better capture of quality measure information in an electronic format, lessening the burden over time of manual extraction of patient information for purposes of quality measurement.

9.1.4 Identify areas for improvement

Based on the initial report of clinician quality measurement received from Multi-entity Measurement and Reporting organizations (Event # 8.1.8), clinician practices begin analyzing information to identify areas for improvement and systemic process changes that support overall quality improvement.

9.1.5 Refine internal quality improvement practices as appropriate

Analysis of the clinician's or clinician practice's quality measurement information (initial report and preview report of clinician-level quality measurement) may identify areas for improvement that could be incorporated into the clinician practice's overall quality improvement initiatives. Tailored strategies to improve quality and clinician practice performance such as improvements in clinical workflow, efforts to address cultural changes, and targeted programs such as medication reconciliation and safety may be developed and included in the clinician practice's overall quality improvement practices as relevant.

9.1.6 Implement quality improvement initiatives

Quality improvement initiatives are implemented.

9.2 Multi-entity Measurement and Reporting

9.2.1 Collect information

In addition to the patient-level quality information collected and analyzed from individual clinician practices, claims data specific to a particular clinician spanning various payors, and supplemented by other sources of data such as laboratory and pharmacy data are collected for the purpose of aggregation and measurement of clinician performance.

> ***Data Exchange:*** Queries may be sent out to other repositories, requesting relevant data for use in calculating clinician-level quality measures.

9.2.2 Match Records

Information received from other sources is matched to insure that data for unique individuals is matched across data sets.

9.2.3 Aggregate quality data

Patient-level data received from various sources are aggregated.

9.2.4 Calculate measures for each clinician

Algorithms are applied to patient-level data to develop clinician-level measure information. A clinician-level quality measurement report is developed.

9.2.5 Transmit quality measures for validation/correction

The clinician-level quality measurement reports are sent to clinicians or clinician practices for data validation and if necessary, data correction.

> ***Data Exchange:*** Clinician-level quality measure reports are sent back to clinicians or clinician practices for data validation and correction if required.

9.2.6 Re-calculate quality measures as needed

Revised data are received from clinicians and clinician practices after their review. Clinician-level quality measurement is re-calculated and again sent to the clinicians and clinician practices for data validation and correction if needed. This feedback is repeated as often as necessary to ensure the correct data are used to calculate the reports.

> ***Data Exchange:*** Corrected data are received by the Multi-entity Measurement and Reporting organizations. Revised quality measurement reports are sent to the clinicians and clinician practices for data validation and, if needed, data correction.

9.2.7 Format and publish information

Clinician-level quality measurement data are published to a public website. It is made available in appropriate formats to users for viewing and possibly for downloading.

> ***Data Exchange:*** The clinician-level quality measurement report is published and made available to users for viewing and possibly for downloading.

Appendix A: Glossary

AHIC: American Health Information Community.

AQA: Broad based collaborative of physicians, consumers, purchasers, health insurance plans and others focused on a) improving health care quality and patient safety through a collaborative process in which key stakeholders agree on a strategy for measuring performance at the physician or group level; and b) collecting and aggregating data in the least burdensome way; and reporting meaningful information to consumers, physicians and other stakeholders to inform choices and improve outcomes.

Care: Relieving the suffering of individuals, families, communities, and populations by providing, protecting, promoting, and advocating the optimization of health and abilities.

Evidence-based guidelines: clinical practice guidelines based on evidence-based medicine, designed to inform clinical practice decisions about appropriate health care for specific clinical circumstances.

Evidence-based medicine: the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.[1]

Department of Health and Human Services (HHS): This is the federal agency responsible for human health, and has oversight over many other federal agencies such as FDA, NIH, CDC, CMS, AHRQ, SAMHSA, and others.

Diagnostic Test Results: Results of any diagnostic tests ordered: blood or urine tests, X-rays, EKG, etc.

Discharge plan: A synopsis of the treatments recommended for the patient to complete upon leaving the institution, including medications, medical appointments, other therapeutic interventions, further diagnostic studies, and recommendations for follow-up.

Electronic Health Record (EHR): The electronic health record is a longitudinal electronic record of patient health information generated in one or more encounters in any care delivery setting. This information may include patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory information and radiology reports.

Episode of Care: A health problem from its first encounter with a health care provider through the completion of the last encounter. An episode of care is distinct from an episode of disease or illness.

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[1] **Sackett, D.L. et al. (1996) Evidence based medicine: what it is and what it isn't. BMJ 312 (7023), 13 January, 71-72).**

Healthcare Information Exchanges: Organizations that may provide trust and governance relationships and information exchange for a network of users and applications. Organizations playing this role may be, but are not limited to, statewide or regional groupings, or geographically diverse networks. Having the role of HIE does not imply that the HIE directly provides networking services.

Health Information Services (HIS): Services provided by Health Information Networks for information exchange and interoperability.

Health Information Service Providers: A network service provider that enables or oversees the access to and exchange of health information, in a secure manner, for the purpose of supporting clinician and consumer needs.

Health Registries: A health registry is an organized system for the collection, storage, retrieval, analysis, and dissemination of information on individual persons who have either a particular disease, a condition (e.g., a risk factor) that predisposes to the occurrence of a health-related event, or prior exposure to substances (or circumstances) known or suspected to cause adverse health effects.

Health Researchers: Organizations or individuals who normally perform analysis of health trend information. They normally use anonymized patient information in their studies.

Hospital Quality Alliance (HQA): Public-private collaboration to improve the quality of care provided by the nation's hospitals by measuring and publicly reporting on that care. HQA consists of organizations that represent consumers, hospitals, doctors, employers, accrediting organizations, and Federal agencies. The HQA effort is intended to make it easier for the consumer to make informed healthcare decisions, and to support efforts to improve quality in U.S. hospitals. The major vehicle for achieving this goal is the consumer-oriented Hospital Compare website.

Measure specification: detailed instructions necessary to convert health care data into a quality measure.

ONC: Office of National Coordinator for Health Information Technology.

Personal Health Record (PHR): A health record that can be created, reviewed, annotated, and maintained by the patient or the care giver for a patient. The personal health record may include any aspect(s) of the health condition, medications, medical problems, allergies, vaccination history, visit history, or communications with healthcare providers.

Population health: A population health perspective encompasses the ability to assess the health needs of a specific population; implement and evaluate interventions to improve the health of that population; and provide care for individual patients in the context of the culture, health status, and health needs of the populations of which that patient is a member.

Problem List: A synopsis of the patient's medical conditions, such as diabetes, hypertension, ankle fracture, etc.

Provider: provider of medical or health services; any person or organization that furnishes, bills, or is paid for healthcare services.

Quality measure: A mechanism to assign a quantity to quality of care by comparison to a criterion. Clinical performance measure is a subtype of quality measure that is a mechanism for assessing the degree to which a provider competently and safely delivers clinical services that are appropriate for the patient in the optimal time period.

Quality Improvement Plan: Use of quality information and analyses/trending to help providers improve quality of care delivered and endeavor to reach quality goals.

Quality Improvement Organization (QIO): Organizations responsible for ongoing review of the inpatient hospital care provided to people who are eligible for Medicare. QIOs work with consumers and physicians, hospitals, and other caregivers to refine care delivery systems to make sure patients get the right care at the right time, particularly patients from underserved populations.