Collaboration of the Health IT Policy and Standards Committees

Policy and Standards Federal Advisory Committees on Health Information Technology to the National Coordinator

Interoperability Experience Task Force

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Anjum Khurshid, co-chair

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Membership

Member	Organization	Role
Jitin Asnaani	**CommonWell Health Alliance**	**Co-Chair**
Anjum Khurshid	**Louisiana Public Health Institute**	**Co-Chair**
Shaun Grannis	Regenstrief Institute	Member
Ty Faulkner	Lawrence Technological University	Member
Janet Campbell	Epic	Member
Larry Wolf	Strategic Health Network	Member
Phil Posner		Member
A. John Blair, III	MedAllies, Inc.	Member
Lawrence Garber	Reliant Medical Group	Member
Kelly Aldrich	Center for Medical Interoperability	Member
George Cole	Allscripts	Member
Jorge Ferrer	*Veterans Health Administration*	*Federal Ex Officio*
Anastasia Perchem	*ONC*	*ONC Staff Lead*

Agenda

I. Opening Remarks

II. IXTF Charge

III. IXTF Approach

IV. Top 3 Identified Needs to Improve the Interoperability Experience

V. Recommendations & Next Steps

VI. Adjourn

Interoperability Taskforce Charge

- **Provide recommendations on the most impactful policy, technical, and public-private approaches that could be implemented to improve the interoperability *experience* for providers and patients.**
  - Assume that the stakeholder has access to a system(s) that can interoperate with at least one other system from outside
  - Identify the top 3 to 5 most important needs for these stakeholders
  - Narrow the scope of work to where the most (doable) impact can be made
  - Make specific/actionable recommendations for ONC, in collaboration with others (e.g., standards bodies, commercial parties and other Federal entities)

Additional Context and Expectations from ONC

- Consider the Federal Health IT Strategic Plan and Interoperability Roadmap as a foundation
- The Taskforce would be expected to gain an understanding of:
  - What is working in the field
  - What factors are impeding a better interoperability experience for each prioritized need
- It is also expected that to the degree more detailed work is necessary on policy or technical matters that this Taskforce would so indicate as an output of its work (i.e., recommendation)
  - An appropriate group(s) would be subsequently formed to conduct more detailed work.

We selected five broadly applicable use cases to quickly hone in on needs

1. **Transitions of Care:** Automated query from ER physician in one state to the patient's PCP EHR record where the patient is regularly seen and have it imported directly to the ER physician's EHR.
2. **Shared Care Plans:** All health professionals sharing care for a cancer patient have access to care plan developed by the oncologist.
3. **Patient-Initiated Data:** A diabetic patient's caregiver gathers notes and lab results from her PCP and Endocrinologist and submits the patient's glucometer readings to both doctors.
4. **Clinical Information Transparency for Patients/PCP:** Hospital discharge of high-risk patient to post-acute care with appropriate involvement of PCP. The patient is able to access and review their health information, view costs for medications and pharmacies; in addition to payer coverage.
5. **Quality Improvement:** Allow persons in quality management and health care organizations (such as ACOs) the ability to interchange and review clinical quality data for a patient or a population.

* For detailed steps involved in the Use Case, see Appendix A

7 distinct priority needs were identified across the 5 use cases. Further discussion uncovered 35+ sub-needs *(leading examples shown below)*

Ability to identify patients nationwide

- *Capture standardized demographics*
- *Patient matching algorithms*
- *Show how to communicate with patients*

Ability to locate relevant patient records

- *Show providers affiliated with patients*
- *Show roles of affiliated providers*
- *Show patient authorizations for communication with specific providers*

Ability to locate and identify providers

- *Show provider services offered*
- *Show capabilities to communicate electronically, incl'g certs/addresses*
- *Enable locations to be continuously & automatically updated by EHRs/HIT*

Ability to access and interpret consents/authorizations

- *Detail types & uses of data, restrictions on re-disclosure & timeframes*
- *Show how to convey requirements & assert they've been received from patient*
- *Show how to convey authorization for proxy access on behalf of patient*

Ability to encode data that is syntactically and semantically interoperable

- *Standardized encoding for computable data*
- *Standardized formatting of (or access to) discrete data*
- *Standardized formatting of free text/descriptions*

Ability to exchange health information

- *Querying & retrieving data from EHRs/HIT*
- *Pushing to & receiving from EHRs/HIT*
- *Submitting device data to EHRs/HIT*

Governance

- *Effective user training*
- *Clear program accountability*
- *Compliance mechanisms*

* For detailed prioritized needs, see Appendix B

To inform the relative priority of these needs, a broad set of industry/ community stakeholders were invited to a virtual hearing.

Three Panels

- Healthcare stakeholders
  - Get Real Health
  - Galileo Analytics
  - Aledade
  - Sutter Health
- Health IT stakeholders
  - Athenahealth
  - Cerner
  - Surescripts
  - PatientPing
- State & Federal stakeholders
  - Denver Public Health Department
  - Apex Data Solutions
  - Healthix
  - PCORnet
  - Indiana Health Information Exchange

Themes Mentioned

(a) Frequently-cited:

- Cognitive burden for providers, e.g., Clinical information reconciliation
- Privacy & Safety, especially Trusted connections between systems & devices
- Coding data for automation
- Wearables, esp. ability & accuracy of reporting
- Data overload for clinicians and patients
- Alignment of incentives

(b) Infrequently or Never-cited:

- Functional limitations of existing vendor solutions
- Regulations and mandatory standards compliance stifles innovation
- Prior authorizations
- Provider directory
- Locator services (patient, records)

Illustrative Virtual Hearing Feedback

“True interoperability entails more than the ability to just share the data, the real value comes in actually using that exchanged data to drive better patient outcomes.“ *Lara Sinicropi-Yao, PatientPing*

“We must create an ecosystem or marketplace where a consumer can easily find all of his or her information using the tools of his or her choice . . .” *Christina Caraballo, MBA, Get Real Health*

“**Today the burden of reconciling outside data is so grand that most providers just don't do it.**” *Steven Lane, M.D., Sutter Health*

“. . . **anybody who has data that is relevant to what's happening in the clinical setting or the patient setting needs to be required to have an open API and to make that data available.** “ *Anna McCollister-Slipp, Galileo Analytics*

“EMR technology should be able to accept direct communications from patients and VDT should truly become view, download, transmit and receive.” *Christina Caraballo, MBA Get Real Health*

The testimony and discussion suggested an inherent “formula” that seems to underlie the Interoperability Experience

$$\text{Interoperability Experience} \propto \frac{\text{User Delight}}{\text{Perceived Friction}}$$

i.e., the Interoperability Experience is

- Proportional to *User Delight*,
  e.g., relevance and timeliness of insight, surfacing of previously unknown opportunity to improve care, relevant and pertinent data, etc.
- Inversely proportional to *Perceived Friction*,
  e.g., # contracts, # connections, degree of deviation from regular workflow, # windows, # steps, # clicks, etc.

From this point of view, we identified the Top 3 Priority Needs based on the experience of IXTF members and virtual hearings

Ability to identify patients nationwide

Ability to locate relevant patient records

Ability to locate and identify providers

Ability to access and interpret consents/authorizations

Governance

Ability to effectively utilize health information

Ability to encode data that is syntactically and semantically interoperable

Ability to exchange health information

- Focusing on these aspects will drive greater Interoperability *demand* and create pull-through that will in turn drive better infrastructure on the *supply* side

- From a process point of view, important to note that:
    - All eight needs received some vote/mention during the IXTF discussion and Virtual Hearings. All were deemed as "important" to interoperability.
    - However these three emerged as the clear **Priority Needs** that impact the *Interoperability Experience* today, by directly increasing the delight or reducing the perceived friction

Aspects of the Priority Needs that drove the discussion and feedback

- Ability to effectively utilize health information
  - » Effective incorporation of user experience design, and task centered and goal centered workflows
  - » Greater intelligence in the curation process to reduce cognitive burden
  - » Reduce the burden of clinical data import, e.g., time spent navigating and reviewing imported data for clinical and contextual information
    - – Effective reconciliation of relevant information
    - – Effectively-applied automation may have a role to play here
    - – Data provenance
  - » Reduce the burden of clinical data entry
    - – While this is a property of the system (e.g., EHR) rather than on interoperability itself, it has significant direct impact on the *demand* for interoperability, e.g., time available for interoperability, user satisfaction, user effectiveness, etc.
  - » Logical integration into all the relevant workflows
  - » Ability to incorporate the data into the EHR in alignment with policy, business, and technical needs

Aspects of the Priority Needs that drove the discussion and feedback, continued

- Ability to encode data for syntactic and semantic interoperability:
  - Builds upon existing work that has been done to improve the CCDA
  - Identify a parsimonious set of interface terminologies (e.g. code sets, terms and nomenclatures)
  - Code data to improve the specificity of the clinical interpretation, e.g., how blood pressure was measured
    - Seamless care transition
    - Patient safety
    - Important to balance usability vs. specificity in discussing code sets, as moving to more specific and granular coding can burden the provider with documentation requirements that may not be clinically relevant.
  - Enable greater usability of the data itself, especially for quality measures

Aspects of the Priority Needs that drove the discussion and feedback , continued

- Ability to exchange health information:
  - Enabling easier access, e.g.,
    - Fostering open APIs
    - Build on existing exchange infrastructure; e.g., 2014 Edition EHRs; DSNs and HIOs; and existing document, messaging, data and transport standards
    - Transparency of interface costs
  - Harmony of policies from state to state:
    - Consent
    - Privacy & security
    - Cost of doing exchange, particularly in terms of working with State HIEs
  - Accepting direct communication from patients and other forms of patient-generated data
  - Transparency of cost burden to the consumer (from the point of view of both providers and patients)

Caveats and context

- IXTF focused on the experience of interoperability; deliberately avoided going “down the rabbit-hole” of technical solutions
- Possible that subsequent “root-cause” analysis will tie back highest Priority Needs to those Needs that did not bubble up to the top.
- Some priority needs imply underlying sub-needs which were not specifically mentioned in all cases
- Subsequent work will need to factor in user preferences, as “interoperability” really means having the information that a user needs at the time that he/she needs it
- Clinician-patient encounter is important; the burden of clinician-patient communication is not on the EHR but on behaviors of patients and clinicians and the clinical environment

Ability to effectively utilize health information

Recommendation to ONC:

- Create a Joint Task Force to improve clinical information reconciliation across interoperability contexts (e.g., for what data and under what circumstances should data automation be expected, and what are the expected behaviors of individuals involved)
- Sponsor challenges centered around user-centered design opportunities

Potential Elements of Solution + Key Considerations:

- Automation of interop experience, from data import to “insights at point of care/need”
- Goal-centered design that drives meaningful clinical workflows
- Visual design that eases cognition
- Lean-forward policy solutions, that use consistent outcome-based metrics to fully align incentives for providers and engage them to act on the data in a truly transformative way
- Awareness that not all data to be reconciled. Appropriately selecting content that is relevant – ignore noise and find key data.
- Appropriate privacy and security safeguards for processing data
- Tools for Usability Testing
- Potentially going beyond “challenges” to sponsorship of pilots for reconciliation

Ability to encode data that is syntactically and semantically interoperable

Recommendation to ONC:

- Create Joint Task Force focused on recommending a path forward for standardizing non-clinical data (behavioral, social, other non-MU)
- Create work streams focused on separate semantic interoperability issues:
    1. Understand the tools and opportunities that enable data to be efficiently captured
    2. Understand how natural language processing and data mining is being utilized in industry today to achieve semantic interoperability through unstructured data
    3. Continue/renew efforts with terminology stakeholders to improve the coverage and value of existing industry terminologies and codesets (e.g. LOINC)

Potential Elements of Solution + Key Considerations:

- Inform the ISA and get feedback form the ISA Task Force
- Incorporation of priorities as articulated by prior art, Federal roadmaps, ISA; also impact on the interop experience where applicable (e.g., auto-reconcilable data elements)
- Commonly used terminologies that enhance data exchange and care coordination
- Engagement with EHR vendors to standardize data used nationally
- Data structure/standardization that allows multiple sources (consumer apps, devices, wearables, etc.) the ability to effectively and accurately transmit information to EHRs
- Standardized formatting of non-clinical health determinants
- Role and opportunity for NLP/data mining on social, behavioral and other data

Ability to effectively exchange health information

Recommendation to ONC:

- Substantial components already within purview of API Task Force
  - Incremental suggestion to API Task Force scope: requirements and considerations, if any, for other Health IT systems (beyond EHRs) to enable Open APIs
- Highlight opportunities and best practices for successful incorporation of patient-generated data into the provider's decision-making process, e.g.,
  - Formal case studies or research
  - Sponsoring challenges, hackathons, etc.

Potential Elements of Solution + Key Considerations:

- Role of Open APIs and associated standards/technologies (OAuth2, etc.) to support non-EHR and patient-facing data exchange
- Build on existing exchange capabilities
- Transparency of affordability of interfaces/exchange
- Acceptance of communication/data from patients, including technical and cost implications
- Variability of state to state HIE requirements and costs
- Transparency of cost burden to the consumer (providers and patients)

Workplan of IXTF

Meeting Dates	Task
~~Tue, Mar 8, 2016 - 3:00pm ET~~	✓ ~~Task Force Kickoff~~ ✓ ~~Needs identified by Task Force~~
~~Wed, Mar 23, 2016 - 1:00pm ET~~	✓ ~~Finalize the Use Case Framework~~ ✓ ~~Topics for the virtual hearing (time permitting)~~
~~Wed, Apr 6, 2016 - 1:00pm ET~~	✓ ~~Review Use Case Homework~~ ✓ ~~Planning for Virtual Hearing #1~~
~~Wed, Apr 20, 2016 - 1:00pm ET~~	✓ ~~Administrative planning call for hearing (not public)~~
~~Tue, Apr 26, 2016 – 1:00pm ET~~	✓ ~~Refine the use case framework~~
~~Fri, May 6, 2016 - 10:30am ET~~	✓ ~~Virtual Hearing~~
~~Wed, May 11, 2016 - 10:30am ET~~	✓ ~~Summarize hearing outcomes~~
~~Wed, Jun 1, 2016 - 1:00pm ET~~	✓ ~~Review Top 3 Priority Needs & Components~~ ✓ ~~Begin to Draft recommendations~~
~~Tue, June 14 , 2016 – 10:30pm ET~~	~~Draft recommendations~~
~~Tue, June 21 , 2016 – 1:00pm ET~~	~~Refine recommendations~~
June 23, 2016 - Joint HITSC/HITPC Meeting	***Draft Recommendations presented to HITSC/HITPC***
Tue, July 12, 2016 – 1:00pm ET	Revise and edit recommendations
July 27, 2016 - Joint HITSC/HITPC Meeting	***Final Recommendations presented to HITSC/HITPC***

Appendix A: Use Case Detail
Use Case #1

USE CASE #1	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Automated query of Massachusetts PCP's patient summary when HIV+ patient visits ER in Florida	ER's EHR needs to know who where outside records are available, including which organization/EHR has the data (for providers that work in multiple locations)	**No** - There are sporadic Record Location Services or Relationship Listing Services (RLS) available but not nationally for all sources (including patients). No national standards for RLS.	**High** – If you don't know where to look, you won't be able to find it. Also, automated processes (which are necessary for "Hassle-Free HIE") can only happen with RLS-type functionality
	ER's EHR needs to know the roles each source of outside records play (e.g. who the PCP is or which is the patient's PHR)	**No** - sporadic use of roles in RLSs	**Medium** - Less efficient if EHRs can't do focused queries to PCP, particular specialty, or patient's PHR, but it is not an absolute obstacle to communication.
	ER's EHR needs to know how to electronically contact EHR of PCP (protocols, certificates, addresses, etc…)	**No** – There are multiple implementations of provider directories and standards (HPD, HPD+, etc..) but no national standard, and no standard for keeping them up to date through EHR updates	**High** - If the requesting EHR doesn't know how the releasing EHR sends the data, transactions can't take place

Appendix A: Use Case Detail
Use Case #1, Slide #2

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Appendix A: Use Case Detail
Use Case #1, Slide #3

USE CASE #1	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Automated query of Massachusetts PCP's patient summary when HIV+ patient visits ER in Florida	ER's EHR needs to be able to import the clinical data	**Display - Yes** **Incorporate Using Manual Reconciliation – Variable**, mostly for Meds, Allergies and Problems from C-CDA documents **Automatic Incorporation - Sporadic** (Lack of Lab Test standard required for mapping, and Data Provenance standard required to determine whether data are trusted for automatic incorporation)	**Display – High** (If you cant see it, this was all a waste!) **Incorporate Using Manual Reconciliation – Medium** **Automatic Incorporation – Medium**
	ER's EHR needs to notify ER doc that PCP's data are available	**Variable** – varying levels of notification, and some do no notification, particularly for automated queries	**High** – if you don't know that data has been retrieved, you don't know to look at it
	ER's EHR needs to be able to publish that patient was seen in that ER	**Sporadic** – some places do event notifications, and fewer update RLSs	**High** – Required to enable others to query for ER's records

Appendix A: Use Case Detail
Use Case #2

USE CASE #2	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Oncologist orders a blood draw. Home health nurse sharing care for the patient collects the specimen. The specimen is resulted by the lab and results are communicated to appropriate stakeholders.	Order should be performed in most appropriate and patient-friendly care setting (e.g., at home if an HH episode exists, lab if not).	Generally, all of these steps can be fulfilled in some way, but I don't think there is a single standard to point to.	**High**
	The order should be added to the appropriate HH nurse's "to do" list		**High**
	Results should be communicated back to the oncologist		**High**

Appendix A: Use Case Detail
Use Case #2, Slide #2

USE CASE #2	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Oncologist orders a blood draw. Home health nurse sharing care for the patient collects the specimen. The specimen is resulted by the lab and results are communicated to appropriate stakeholders.	Results should be communicated to the patient	Generally, all of these steps can be fulfilled in some way, but I don't think there is a single standard to point to.	**High**
	Results should be communicated to other interested parties on the care team as appropriate.		**High**
	Results should mark the order as “done”		**High**

Appendix A: Use Case Detail
Use Case #2, Slide #3

USE CASE #2	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Oncologist orders a blood draw. Home health nurse sharing care for the patient collects the specimen. The specimen is resulted by the lab and results are communicated to appropriate stakeholders.	If the nurse is unable to collect the specimen, the order should be escalated as unfulfilled	Generally, all of these steps can be fulfilled in some way, but I don't think there is a single standard to point to.	**High**
	Results should be discrete and able to be interweaved with other results from tests performed at other labs.		**High**
	Results communicated back to the Home Health Agency		**High**

Appendix A: Use Case Detail
Use Case #3

USE CASE #3	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Diabetic patient's caregiver gathers notes and lab results from her PCP and Endocrinologist, graphs the Hemoglobin A1c results from both, and submits the patient's glucometer readings to both doctors	Patient needs to provide authorization for caregiver to access her data	Sometimes, as a consent based authorization within EHRs, Patient portals, and paper-based. Usually 1 to 1 authorization not 1 to many?	**High** Should be made as a simple query process, portal use even non-EHR portals, password controls is also a high ranked issue, who has access to the users account including family or caregiver.
	Patient's caregiver needs to query for HgbA1c data	Sometimes using direct connect, or an API recall method provided by HIE	**High** Technology standards for 3rd party data need to be decided and certified by ACB or others to create automatically be generated data
	Patient's caregiver needs to submit "patient-entered" device (glucometer) data to providers	Patient generated data rarely integrated 10-20%, unstructured data, few standards	**High** Would be nice for device standards to automatically provide data via commercially approved tools FDA regs are underway, this data can be provided without Caregiver intervention

Appendix A: Use Case Detail
Use Case #3, Slide #2

USE CASE #3	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Diabetic patient's caregiver gathers notes and lab results from her PCP and Endocrinologist, graphs the Hemoglobin A1c results from both, and submits the patient's glucometer readings to both doctors	Patient should be able to specify context of data (patient-entered) and responsibility (i.e., primary responsibility to endocrinologist and CC to PCP)	Patient portal data, free text boxes, governance needed	**High**
	Need to appropriately route incoming data appropriately to endocrinologist's & PCP's EHRs	Rarely, standards in the works for referrals, CCDA query,	**High**

Appendix A: Use Case Detail
Use Case #4

USE CASE #4	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Hospital discharge of high-risk patient to post-acute care with appropriate involvement of PCP	Hospital needs to be able share Discharge Summaries, and other content, with the appropriately identified Patient's caregiver, PCP, Specialists and Home Health Agency (HHA)	Partially met, but not satisfactorily. The identification function is often performed by care directors, outside of the hospital per se, so that the total care team list is fragmented. Distribution of Discharge Summaries to the identified care team members, and patient, is happening from many hospitals, but we have no real measure of the extent of coverage.	**High**
	Hospital to have the ability to dynamically provide Discharge Summaries	Partial.	**High**

Appendix A: Use Case Detail
Use Case #4, Slide #2

USE CASE #4	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Hospital discharge of high-risk patient to post-acute care with appropriate involvement of PCP	Patient's healthcare teams need to identify patient and reconcile patient chart data	No. However reconciliation of content does take place at many encounters. Unfortunately, it is mostly manually performed, and typically involves only a small subset of the clinical content. Medication List, Allergies are more commonly reconciled than other content.	**High**

Appendix A: Use Case Detail
Use Case #4, Slide #3

USE CASE #4	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Hospital discharge of high-risk patient to post-acute care with appropriate involvement of PCP	Patient and primary care physician should have access to medication lists, medication adherence and medication reconciliation	Partially met, as the sharing of Medication Lists is not uncommon. Adherence, at least in terms of fulfillment, is also sometimes available. Adherence, or compliance, is most likely unknown. This data should be available to the PCP and patient/patient care team as well as outpatient recovery orders/suggestions (medical pharm, pt, etc).	high Follow up is critical, since simple communication at the time of discharge is often lost by the patient and caregiver who are not particularly receptive to large amounts of new information at a stressful time..

Appendix A: Use Case Detail
Use Case #4, Slide #4

USE CASE #4	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Hospital discharge of high-risk patient to post-acute care with appropriate involvement of PCP	Patient and primary care physician should have access to medication information management information	no See above	**High**
	Patient's PCP HHA and PCP needs to know medication management Care Plan to follow-up with patient	no See above	**High**

Appendix A: Use Case Detail
Use Case #5

USE CASE #5	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Allow persons in quality management and health care organizations the ability to interchange and review clinical quality data for a patient.	EHR needs to identify where a patient's data resides.	Partially	**HIGH**
	EHR needs to be able to query that source for raw data that underlies that measure (Standards for Query and Response)	Partially	**HIGH**
	EHR needs to perform a calculation on the data (Access standard computable definition of the measure)	Partially	**HIGH**

Appendix A: Use Case Detail
Use Case #5, Slide #2

USE CASE #5	NEED	NEED BEING FULFILLED?	HOW IMPORTANT IS THE NEED? (Low/Medium/High) + Reason
Allow persons in quality management and health care organizations the ability to interchange and review clinical quality data for a patient.	EHR needs to store calculated value (Make it accessible in a standardized format)	Yes	**HIGH**
	EHR needs to report on calculated measure externally (PQRS, MU, ACO, HEDIS)	Yes	**HIGH**
	Surface the measure at the right time in the decision making process (Nurse-sensitive indicators)		**HIGH**

Appendix B: Prioritized Needs and Sub-needs identified by IXTF, Slide-1

1 Ability to identify patients nationwide
1.1 Capture standardized demographics for patients
1.2 Patient matching algorithm(s)
1.3 Show how to communicate with patients
1.4 Show proxy relationships and how to communicate with them
1.5 Show authenticated devices and how to communicate with them
2. Ability to locate relevant patient records
2.1 Show providers affiliated with patients
2.2 Show roles of affiliated providers
2.3 Show patient authorizations for communication with specific providers
2.4 Show provider subscriptions for specific types of information, including events
2.5 Show how to retrieve record (or alternatively, enable native access/connection to record)

3. Ability to locate and identify providers
3.1 Show provider services offered
3.2 Show provider capabilities to communicate electronically, including necessary certificates/addresses (or alternatively, enable native access/connection to provider EHR/HIT)
3.3 Enable locations to be continuously and automatically updated by provider EHRs/HIT
4. Ability to access and interpret consents/authorizations
4.1 Detail types of data, uses of data, restrictions on redisclosure, timeframes, etc…
4.2 Show how to convey requirements and assert that they have been received from patient
4.3 Show how to convey authorization for proxy access (e.g. to parents of minors, or children of elderly parents) on behalf of patient

Appendix B: Prioritized Needs and Sub-needs identified by IXTF, Slide-2

5. Ability to encode data that is syntactically and semantically interoperable
5.1 Standardized encoding for computable data (esp. orderable tests and procedures)
5.2 Standardized formatting of (or access to) discrete data
5.3 Standardized formatting of (or access to) free-text descriptions/explanations
5.4 Standardized formatting of (or access to) non-clinical data (e.g., social, behavioral, etc.)
5.5 Ability to determine provenance of the data
6. Ability to exchange health information
6.1 Querying & retrieving data from EHRs/HIT
6.2 Pushing to & receiving from from EHRs/HIT
6.2 Submitting device data to EHRs/HIT
6.3 Accept data push directly from patients

7. Ability to effectively utilize the health information (at the least, reduce cognitive burden)
7.1 Seamlessly reconciling data
7.2 Surfacing clinical insights from data
7.3 Usability/Visualization
7.4 Usability/Workflow design
8. Governance
8.1 Effective User Training
8.2 Clear Program Accountability
8.3 Compliance Mechanisms
8.4 Appropriate Incentives
8.5 Trust Framework - Technical (national vs. local)
8.6 Organizational/Community Alignment (national vs. local)

Appendix C: Important Elements from the Interoperability Roadmap & Federal Health IT Strategic Plan

The goals of the Interoperability Roadmap provide the context and foundation for the charge of this Taskforce:

- 2015-2017: Send, receive, find and use priority data domains to improve health care quality and outcomes.
- 2018-2020: Expand data sources and users in the interoperable health IT ecosystem to improve health and lower costs.
- 2021-2024: Achieve nationwide interoperability to enable a learning health system, with the person at the center of a system that can continuously improve care, public health, and science through real-time data access. improve technical standards and implementation guidance for priority data domains and associated elements.

In the near-term, the Roadmap focuses on using commonly available standards, while pushing for greater implementation consistency and innovation associated with new standards and technology approaches, such as the use of APIs.

Rapidly shift and align federal, state, and commercial payment policies from fee-for-service to value-based models to stimulate the demand for interoperability.

- Clarify and align federal and state privacy and security requirements that enable interoperability.
- Coordinate among stakeholders to promote and align consistent policies and business practices that support interoperability and address those that impede interoperability.

Appendix C: Important Elements from the Interoperability Roadmap & Federal Health IT Strategic Plan, continued

Drivers

A. A supportive payment and regulatory environment

Policy and Technical Components

B. Shared decision-making, rules of engagement and accountability
C. Ubiquitous, secure network infrastructure
D. Verifiable identity and authentication of all participants
E. Consistent representation of authorization to access electronic health information
F. Consistent understanding and technical representation of permission to collect, share and use identifiable health information
G. Industry-wide testing and certification infrastructure
H. Consistent data semantics
I. Consistent data formats
J. Standard, secure services
K. Consistent, secure transport technique(s)
L. Accurate individual data matching
M. Health care directories and resource location

Outcomes

N. Individuals have access to longitudinal electronic health information, can contribute to that information, and can direct it to any electronic location
O. Provider workflows and practices include consistent sharing and use of patient information from all available and relevant sources

Appendix C: Important Elements from the Interoperability Roadmap & Federal Health IT Strategic Plan, continued

Consistent Data Semantics

As electronic health information is shared and used among different stakeholders, its meaning must be consistently maintained in order to maximize its usage and value in a learning health system.

Background and Current State

The clinical vocabularies and coding systems used to represent clinical information in a health IT system are often referred to as data "semantics." Semantic interoperability is the "ability to automatically interpret the information exchanged meaningfully and accurately in order to produce useful results as defined by the end users of both systems." If sending and receiving systems are not developed and configured to adhere to a common and consistent set of vocabularies, code sets and value sets, the users of those systems will have difficulty with interoperability. For example, a health professional would readily understand that "Tylenol" and "acetaminophen" are generally used interchangeably. However, two computer systems exchanging those phrases may treat the terms entirely differently if the systems are not bound to a standardized vocabulary or terminology that equates them as synonyms. If two systems do not agree the terms are synonyms, then data passing through them will not be equally interpreted without additional effort.

Overall, improvements in the consistent use and specificity of semantic representations of data will help advance and support new modes of information exchange, specifically those where stakeholders will be able to selectively request or access only the information they need (compared to the predominant document-based exchange used today). While information may still be sent as a point-in-time snapshot of a person's encounter or condition, it will increasingly be an answer to a specific, value-driven question or query. For example, while the pharmacist may request a person's current medications and allergies, their endocrinologist will likely request blood sugars, hormone levels, eye exams and the individual's person-centered plan and thus each user will receive only the information they ask for or deem relevant.

Appendix C: Important Elements from the Interoperability Roadmap & Federal Health IT Strategic Plan, continued

Consistent Data Formats

Consistently representing electronic health information across different stakeholders and systems is the bedrock of successful interoperability. In a learning health system, while user interfaces can and should be different depending on the user, the format in which electronic health information is shared between health IT systems must be consistent and machine readable, so that the meaning and integrity of information is retained as a variety of users interact with it.

Additionally, SDOs will need to align semantic standards (vocabulary, code set, value set, and structure where applicable) for data elements associated with the priority data domains across various format standards. In some cases that will require updating format standards and/or implementation guidance to effectively accommodate data element details, such as inclusion of usable period metadata for address and telephone number in CCDA, so that technology developers and users can account for current and historical aspects of these elements to support more accurate individual data matching. Alignment efforts should start with formats and semantic standards for priority data domains and associated data elements already defined in ONC’s 2015 Edition final rule.69 Once format standards are consistently aligned for those data domains and associated elements, SDOs and stakeholders will need to agree on common semantic standards for remaining data domains and elements and align their respective format standards accordingly.

Appendix C: Important Elements from the Interoperability Roadmap & Federal Health IT Strategic Plan, continued

“The Medicare Access and Children’s Health Insurance Program Reauthorization Act of 2015 (MACRA) requires the government to design programs that strongly emphasize high-value health care and unimpeded health information exchange. MACRA implementation will increase the widespread interest and business support for coordinating care, shifting care delivery and reimbursement from fee-for-service to value-based care. This will expedite the necessity and increased desire for better information and related management and decision systems. High-quality, accurate, and relevant electronic health information improves the ability of providers to manage and advance population health. Interoperable electronic health information provides a foundation to measure, report, and provide feedback on care Quality for a number of public-facing and internal purposes. “

“Public health entities require interoperable electronic health information to detect, track, and manage illness outbreaks. Improved and coordinated access to information from inside and outside the formal delivery system among public health entities and home- and community-based supports increases their ability to analyze population health trends, identify at-risk populations, address local social and health determinants, pursue proactive illness prevention and health promotion strategies, and promote healthy choices for all populations and diverse communities. It can also help protect communities during public health emergencies and increase the ability to conduct and contribute to medical product safety surveillance.”