The Utility of Clinical Information Systems: Quality Measurement, Patient Safety, and Evidence Based Guidelines

Rosemary Kennedy, PhD, RN, MBA, FAAN
Vice President, Health Information Technology
National Quality Forum (NQF)
Curriculum Sections

- National Initiatives Related to Patient Safety and Quality
- Quality Measurement Overview
- Informatics Tools to Promote Safety and Measure Quality
- Using Clinical Information Systems to Measure and Improve Outcomes Using Evidence Based Guidelines
Section One
National Initiatives Related to Patient Safety and Quality
Learning Objectives

National Initiatives Related to Patient Safety and Quality

At the completion of this session, the learner will:

• Describe components of the National Quality Landscape
• Describe national safety and quality organizational initiatives
• Describe a framework for evaluating safety from a system perspective
• Identify three key patient safety areas important to improving patient safety
• Describe features of health information technology that impact safety
Institute of Medicine (IOM)

- The Institute of Medicine (IOM) is an independent, nonprofit organization that works outside of government to provide unbiased and authoritative advice to decision makers and the public involved in healthcare.
Six Aims for Improvement

1. Safe - Avoid injuries to patients from care intended to help
2. Effective – Apply scientific knowledge to those who could benefit and refrain from services not likely to benefit
3. Patient-centered – Respect preferences, needs, and values in all decisions
4. Timely - Avoid waits and delays
5. Efficient - Avoid waste in all resource use
6. Equitable – Provide equal treatment independent of personal characteristics

IOM Crossing the Quality Chasm, March, 2001
Six Dimensions of Quality

Six Aims for Improvement

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**All Six Aims Must be Addressed in Order to Improve Quality**

IOM Crossing the Quality Chasm, March, 2001
Six Dimensions of Quality

Outcome Measure Areas for the Six Aims

1. **Safe** - Analyzing medication error rates
2. **Effective** – Monitor drugs to avoid using in elderly populations based on evidence based guidelines of care
3. **Patient-centered** – Measuring patient experiences with care using surveys
4. **Timely** - Monitoring wait times in outpatient clinics
5. **Efficient** - Measuring costs of care by resource mix
6. **Equitable** – Evaluating differences in outcomes by gender and race
Health IT and Patient Safety
Building Safety Systems for Better Care
IOM Building Safer Systems

Building Safer Systems - Key IOM Findings

• Health information technology (IT) can improve patient safety in some areas such as medication safety

• Significant gaps in the literature regarding how health IT impacts patient safety overall

• Safer implementation and use begins with viewing health IT as part of a larger sociotechnical system

• All stakeholders need to work together to improve patient safety

IOM Crossing the Quality Chasm, March, 2001
Safety as a System Property

FIGURE 3-1
Sociotechnical system underlying health IT-related adverse events.

Source: Adapted from Harrington et al. (2010), Sittig and Singh (2010), and Walker et al. (2008).
Features of Safety Health Information Technology

Health Professionals, Health Care Organizations, Vendors

Safety Systems For Health IT

**FIGURE 4-1**
Interdependent activities for building a safer system for health IT.
Agency for Healthcare Research and Quality (AHRQ)

- AHRQ’s mission is to improve the quality, safety, efficiency, and effectiveness of health care for all Americans
- As 1 of 12 agencies within the Department of Health and Human Services, AHRQ supports research that helps people make more informed decisions and improves the quality of health care services
Organizations Involved in Healthcare Quality

Agency for Healthcare Research and Quality (AHRQ)

1. Information on comparative effectiveness of drugs, medical devices, tests, surgeries, or ways to deliver health care
2. Quality improvement and patient safety research and dissemination
3. Support to promote access to and encourage the adoption of health IT
4. Prevention and care management - translates evidence-based knowledge into recommendations to improve the health of all Americans
5. Health care value - produces the measures, data, tools, evidence, and strategies that stakeholders need to improve health care
Organizations Involved in HealthCare Quality

National Quality Forum

The National Quality Forum (NQF) is a nonprofit organization that operates under a three-part mission to improve the quality of American healthcare by:

• Building consensus on national priorities and goals for performance improvement and working in partnership to achieve them;
• Endorsing national consensus standards for measuring and publicly reporting on performance; and
• Promoting the attainment of national goals through education and outreach programs.
National Priorities Partnership

Equitable Access

Better Care
Affordable Care
Healthy People/Communities

Patient & Family Engagement
Population Health
Safety

Informed Consumer Decisionmaking
Performance-Based Payment
Public Reporting
Accreditation & Certification

Infrastructure Supports
- Workforce Development
- Health Information Technology
- System and Community Capacity
- Performance Measure Development and Application
- Research to Build the Evidence-Base
- Quality Improvement
Aligning Accountability Programs with Value: The Performance Measurement Enterprise

Priorities and Strategies → Standardized Measures → Electronic Data Platform → Alignment of Environmental Drivers → Evaluation and Feedback

- National Quality Strategy
- National Priorities Partnership
- High Impact Conditions
- NQF Endorsement Process
- Quality Data Model Measure Authoring Tool
- Measures Applications Partnership
- Quality Positioning System
- Measure Use Impact on Health, Health Care, and Cost
Measurement Requirements for HIT

HEALTH INFORMATION FRAMEWORK
Healthy People / Healthy Communities

Individual Characteristics
Behaviors, Social/Cultural Factors, Resources, Preferences

Community / Environmental Characteristics

HEALTH STATUS
Cross-Cutting Aims: Prevention, Safety, Quality, Efficiency

Clinical Data

Health Related Experience
Patient, Consumer, Care Giver

Data Sources
EHR PHR HIE
Public Health Survey
Registry Etc.

(Structured / unstructured, clinical, claims)
Organizations Involved in Healthcare Quality

The Joint Commission

- Accredits and certifies more than 19,000 health care organizations and programs in the United States
- In 2002, The Joint Commission established its National Patient Safety Goals (NPSGs) program to help accredited organizations address specific areas of concern in regard to patient safety
Sources of Nursing Sensitive Quality Measures

- ANA NDNQI (American Nurses Assoc National Database for Quality Indicators – 1500 Hospitals Contribute)
- CMS (Center for Medicare and Medicaid Services)
- NQF (National Quality Forum – Private public partnership for identification and endorsement of quality measures)
- TJC (The Joint Commission)
- CDC (Center for Disease Control)
- NQA (Nursing Quality Alliance)
National Database of Nursing Quality Indicators® (NDNQI®)

- NDNQI’s mission is to aid the registered nurse in patient safety and quality improvement efforts by providing research-based national comparative data on nursing care and the relationship to patient outcomes.
- NDNQI is a proprietary database of the American Nurses Association. The database collects and evaluates unit-specific nurse-sensitive data from over 1500 hospitals in the United States.
- NDNQI’s nursing-sensitive indicators reflect the structure, process, and outcomes of nursing care.

Retrieved from https://www.nursingquality.org
What are the benefits of NDNQI?

- National comparison data
- Widely collected data
- Reports within six weeks
- Research opportunities
- Secure, user-friendly web-based data entry
- Ability to trend data
- RN survey tool
- Training
- Continue education credits
- Publishing
What are the NDNQI indicators?

- Patient falls
- Patient falls with injury
- Pressure ulcers:
  - Community acquired
  - Hospital acquired
  - Unit acquired
- Skill mix
- Nursing hours per patient day
- RN Surveys:
  - Job Satisfaction
  - Practice Environment Scale
- RN education & certification
- Pediatric pain assessment cycle
- Pediatric IV infiltration rate
- Psychiatric patient assault rate
- Restraints prevalence
- Nurse turnover
- Healthcare-associated infections:
  - Ventilator-associated pneumonia (VAP)
  - Central line-associated bloodstream infection (CLABSI)
  - Catheter-associated urinary tract infections (CAUTI)
What are some uses for NDNQI Reports?

- Quality improvement. Unit-level comparisons of staffing data and patient outcomes with units in like hospitals
- Satisfy reporting requirements, e.g. for Joint Commission or the Magnet Hospital program
- RN retention efforts
- RN recruitment
- Patient recruitment
- Nursing administration (budget planning, resource allocation)
- Staff education
- Research
Data Standards and Organizations

NCVHS - National Committee on Vital and Health Statistics

- External Advisory Committee to Secretary and Data Council, DHHS; consists of 16 members with overlapping four-year terms. NCHS serves as Executive Secretary.
- Committee was established in 1949 in response to recommendation by the World Health Organization.
- Rechartered in January 1996 to include a more direct focus on data standardization and privacy activities.
WHO Collaborating Center for the Classification of Diseases for North America

- Established in 1974 at the National Center for Health Statistics (NCHS)
- WHO is a specialized agency of the United Nations
- Its responsibilities include the International Classification of Diseases
- This is performed in conjunction with collaborating centers, established primarily on the basis of language, in North America (NCHS), England, Australia, Paris, Nordic countries (Uppsala), Moscow, Beijing, Caracas, Sao Paulo and Kuwait. Other countries, such as Japan, have recognized ICD offices
NDNQI and CMS Reporting

Participation in the American Nurses Association’s National Database of Nursing Quality Indicators® (NDNQI®) satisfies CMS' reporting requirement.

The Centers for Medicare & Medicaid Services’ (CMS) program for Reporting Hospital Quality Data for Annual Payment Update (RHQDAPU) now includes a focus on measuring nursing quality. Beginning in fiscal year (FY) 2010, the CMS requirement will include hospital reporting on whether or not you participate in a systematic clinical database registry for nursing-sensitive care.

https://www.nursingquality.org/CMS.aspx
Organizations Involved in Healthcare Quality

World Health Organization (WHO)

Patient Safety Curriculum Guide
Multi-professional Edition
Key Safety Areas of National Focus

1. Improve the accuracy of patient identification
2. Improve the effectiveness of communication among caregivers
3. Improve the safety of using medications
4. Reduce the risk of health care-associated infections
5. Reduce the risk of patient harm resulting from falls
6. Prevent health care-associated pressure ulcers (decubitus ulcers)
7. Reduce health care-associated infection
8. Reduce injuries due to surgical and anesthesia errors
9. Reduce injuries due to medical devices
10. Reduce unsafe injection practices and blood products,
11. Reduce unsafe practices for pregnant women and newborns

http://www.jointcommission.org/standards_information/npsgs.aspx
World Health Organization Patient Safety Curriculum
CMS Never Events

• First introduced in 2001 by Ken Kizer, MD, former CEO of the National Quality Forum (NQF), in reference to particularly shocking medical errors (such as wrong-site surgery) that should never occur

• List has expanded to signify adverse events that are unambiguous (clearly identifiable and measurable), serious (resulting in death or significant disability), and usually preventable

• NQF initially defined 27 such events in 2002 and revised and expanded the list in 2006

• The list is grouped into six categorical events: surgical, product or device, patient protection, care management, environmental, and criminal

1. Describe one initiative of the IOM
2. Identify specific outcome measures for each of the six IOM aims for improvement
3. Identify one component of failure within the system property of safety
4. Identify one of the priorities identified by the national priorities partnership and the role health information technology can play
5. Identify one AHRQ initiative areas
6. Identify one of the Never Event safety areas
7. Identify one feature of health IT that impacts safer care
8. What are the benefits of NDNQI?
9. What are the NDNQI indicators?
10. What are some uses for NDNQI Reports?
Teaching Methods and Strategies

1. Lecture
2. Discussion Board
   - Present safety and quality scenarios within healthcare organizations
   - Present challenges student may face as a member of an organizational safety/quality committee
3. White papers answering questions posed on the prior slide
4. Development of use cases for each of the safety areas showing how one of the organizations provides tools for improving safety
5. Review of public testimonies and calls for comments – have the students respond to the national posts for comments
Questions & Discussion
Section Two
Quality Measurement Overview
Learning Objectives

Informatics Tools to Measure Quality and Promote Safety

At the completion of this session, the learner will:

• Describe health care quality
• Identify challenges and benefits related to using aggregated coded data for quality measurement
• Describe the types of performance management initiatives and the role for technology
• Describe the relationship between quality measurement and clinical decision support
Health Care Quality – What Is It?


IOM Committee to Design a Strategy for Quality Review and Assurance in Medicare:

“Quality of care is the degree to which services for individual and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge. . . . How care is provided should reflect appropriate use of the most current knowledge about scientific, clinical, technical, interpersonal, manual, cognitive and organization and management elements of health care.” (Lohr, 1990)
Donabedian’s Framework - 1966

• **Structure** - people, qualifications, organizational structure, targeted to provide high quality care

• **Process** - quality of process can vary on two dimensions: appropriateness and skill

• **Outcomes** - capture whether healthcare goals were achieved: quality, safety, cost-effectiveness
Quality Measurement Challenges and Opportunities
Challenges of Measurement Using Electronic Data

Current Challenges of Measurement Using Electronic Data

- Underutilization of health IT system capabilities, such as use of structured data fields
- Clinical workflow barriers, which lead to limited attention to and documentation of coordination processes
- Lack of data standardization, in particular coding of lab results and medication information
- Limited health IT system interoperability

Agency for Healthcare Research and Quality, Prospects for Care Coordination Measurement Using Electronic Data Sources, AHRQ Publication No. 12-0014-EF, March 2012
Challenges of Measurement Using Electronic Data

Current Challenges of Measurement Using Electronic Data (continued)

• Unknown clinical data quality in various electronic data sources
• Limitations in linking data
• Technical hurdles to accessing data
• Business models related to Health IT that facilitate competition rather than cooperation, especially in ways that prevent a full picture of the steps taken to care for a patient across settings and time

Agency for Healthcare Research and Quality, Prospects for Care Coordination Measurement Using Electronic Data Sources, AHRQ Publication No. 12-0014-EF, March 2012
Case Example

Percentage of *heart failure patients* discharged home with *written instructions or educational material* given to patient or caregiver *at discharge*
It is conservatively estimated that centers spend 22.2 minutes per heart failure case to abstract the data, which in aggregate amounts to more than 400,000 person-hours spent each year by US hospitals.

Mostly retrospective

Data are in different sources

Different kinds of data that do not map

Humans are “creating” the data

Quality Measurement

Shift From Using Claims Data And Chart Audits for Quality Measurement

To Using Electronic Point of Care Documentation For Quality Measurement

Burden Shifts from Abstractor to Point of Care
Advantages of Measurement Using Electronic Data

Electronic Data Offer

- Minimal data collection burden
- Structured data may be automatically extracted for quality measurement
- Rich clinical context

Agency for Healthcare Research and Quality, Prospects for Care Coordination Measurement Using Electronic Data Sources, AHRQ Publication No. 12-0014-EF, March 2012
Electronic Data Offer (continued)

- Health IT systems populated with clinical data (e.g., evidence-based orders, plans of care, patient response to treatment) offer a view of processes of care and clinical outcomes not possible from data sets based only on claims data.

- Longitudinal patient data aggregated from multiple sources over time. EHRs, PHRs, and HIEs aim to aggregate information from multiple providers, settings, and payers into a single location.

Agency for Healthcare Research and Quality, Prospects for Care Coordination Measurement Using Electronic Data Sources, AHRQ Publication No. 12-0014-EF, March 2012
<table>
<thead>
<tr>
<th>Types of Performance Management Initiatives</th>
<th>Simple Process</th>
<th>Complex Processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve Quality</td>
<td>Improve HEDIS rates</td>
<td>• Improve survival rates for cancer or AIDS</td>
</tr>
<tr>
<td></td>
<td>• Mammography</td>
<td>• Improve control of blood sugar for mild to moderate risk diabetics</td>
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<td></td>
<td>• Pap Smears</td>
<td>• Primary prevention of CAD events by reducing cardiovascular risk profile</td>
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<td></td>
<td>• Immunizations</td>
<td></td>
</tr>
<tr>
<td>Improve Quality and Reduce Costs</td>
<td>Improve HEDIS rates</td>
<td>• Improve management of patients at high risk for hospital admission</td>
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<tr>
<td></td>
<td>• Beta blockers for patients who had a heart attack</td>
<td>• High risk asthmatics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Class III of IV heart failure</td>
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<tr>
<td></td>
<td></td>
<td>• First six months after heart attack</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Discharge planning for hospitalized patients</td>
</tr>
<tr>
<td>Reduce Costs</td>
<td>• Increase use of generic and in-formulary drugs</td>
<td>• Attempts to attract only healthy members</td>
</tr>
<tr>
<td></td>
<td>• Avoid unneeded referrals and radiology studies</td>
<td>• Attempts to provide physicians with incentives to order and refer less</td>
</tr>
<tr>
<td></td>
<td>• CT, MRI during first month of acute low back pain</td>
<td></td>
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<tr>
<td>Typical Methods</td>
<td>• Evidence based guidelines</td>
<td>• Consensus based algorithms and protocols</td>
</tr>
<tr>
<td></td>
<td>• Reminders, alerts,</td>
<td>• Patient education</td>
</tr>
<tr>
<td></td>
<td>• Performance measurement with process variables</td>
<td>• Care managers</td>
</tr>
<tr>
<td>Enabling Technologies</td>
<td>• Reminders integrated into electronic health records</td>
<td>• Protocol driven team based are supported by workflow automation</td>
</tr>
<tr>
<td></td>
<td>• Data warehouse with comparative quality measures</td>
<td>• Outcomes data collection systems including patient satisfaction and patient reported outcomes</td>
</tr>
</tbody>
</table>
What Makes a Quality Measure Worth Measuring?
What Makes a Quality Measure Worth Measuring?

• **Measurement is based on:**
  - An established need to change the status quo (e.g., insufficient care, too much care, unsafe care or less than desirable outcomes) for which evidence shows that a change is effective
  - Research which drives evidence-based guidelines of care

• **Research**
  - A research study is a process that records information (data) for a group of people to answer questions about a healthcare problem
  - Definitions of types of studies used to evaluate evidence for measurement are available from the Agency for Healthcare Research and Quality (AHRQ) and the National Cancer Institute (NCI)
Evidence-Based Practice Guidelines

Evidence Based Guidelines

• Patients similar to those in the clinical studies are generally *included*. Those who are not, are *excluded*

• Criteria: gender, age, type of disease being treated, previous treatments, used as inclusion or exclusion criteria

• Grading method developed and maintained by the US Preventive Services Task Force (USPSTF)
  • Assigns letter grades to its recommendations (A, B, C, D, and I). ‘A’ has the strongest support and ‘D’ is not supported
  • USPSTF further ranks the certainty (the level of evidence) as high, moderate, or low
Evidence-Based Practice Guidelines

Evidence Based Practice Guidelines

- Agency for Healthcare Research and Quality (AHRQ) National Guideline Clearinghouse
- Translating research into practice can take up to two decades
- Guidelines can be integrated into EHRs to influence provider behavior at the point of care
- Actions designed to provide that influence are often called clinical decision support (CDS)
What is the Connection between Clinical Decision Support and Quality Measurement?
What is the Connection between Quality Measurement and Clinical Decision Support?

**Quality Measurement**
- Evaluates whether or not the expected services were provided or whether the patient’s status improved as expected
- Answers questions: “What percentage of the provider’s patients with diabetes had the test done and how many had results in normal range?”

**Clinical Decision Support**
- Efforts to influence behavior at the right time within the process of care
- CDS relies on *triggers* that initiate a rule, *input data* that the rule uses to evaluate what needs to happen, *interventions* that the rule tells the computer system to do to give the provider the *action steps* he or she can take to help the patient improve
Clinical Decision Support – Four Components

- Trigger
- Input Data
- Intervention
- Action Steps
Quality Measurement and Clinical Decision Support

- Close linkage between quality measures and clinical decision support
- Both are driven by the same clinical knowledge
- Each requires similar data and each plays a role in evaluating clinical performance
What is the Measure of a Measure?
Criteria for Quality Measures

1. **Important to measure and report:** the extent to which the measure focus is important to make significant gains in healthcare quality (safety, timeliness, effectiveness, efficiency, equity, patient centeredness)

2. **Scientific acceptability:** the extent to which the results of the measure are consistent (reliable) and credible (valid) if it is implemented as specified.

3. **Usability:** Extent to which those who will use the measure can understand the results and use them to make meaningful decisions

4. **Feasibility:** Extent to which the data required to compute the measure are readily available without undue burden, and can be implemented
Criteria for Measures

Measure Application Partnership

• NQF convenes the Measure Application Partnership (MAP), a public-private partnership to providing input to the US Department of Health and Human Services (HHS) about what performance measures it should select for public reporting and performance-based payment programs as required in the Affordable Care Act.

• Guided by the National Quality Strategy, measures are recommended that address national healthcare priorities and goals, such as making care safer and ensuring each person and family are engaged as partners in their care.
Section Two Questions

1. What’s the definition of health care quality?
2. What are the three components of Donabedian’s framework?
3. Name two challenges related to obtaining data necessary for quality measurement.
4. Name two advantages of using electronic clinical information systems for quality measurement.
5. What’s the relationship between quality measurement and clinical decision support?
6. What’s the relationship between quality measurement and evidence-based guidelines of care?
7. What are the four components of a clinical decision support framework?
8. What are the criteria for evaluating quality measures?
Teaching Methods and Strategies

1. Lecture
2. Discussion Board
   - Present safety and quality scenarios within healthcare organizations
   - Present challenges student may face as a member of an organizational safety/quality committee
3. White papers answering questions posed on the prior slide
4. Development of use cases for each of the safety areas showing how one of the organizations provides tools for improving safety
5. Review of public testimonies and calls for comments – have the students respond to the national posts for comments
Questions & Discussion
Section Three
Informatics Tools to Measure Quality and Promote Safety
Learning Objectives

Informatics Tools to Measure Quality and Promote Safety

At the completion of this session, the learner will:

• Define data, information, and knowledge
• Describe components of an architecture framework for clinical information systems
• Describe the value of structured data models
• Describe standards necessary for the electronic health record
Foundational Framework for the Benefits of Clinical Information Systems (CIS)

DIWK framework. Reprinted with permission from Nelson.
Architecture Framework for Clinical Information Systems

- Analysis Reporting
- Administrative Systems
- Analytical Data Repository
- Clinical Systems
- Clinical Data Repository
- Clinical Decision Support (Evidence Based Guidelines)
- Terminology Infrastructure (Data and Information)
- Workflow
- Clinician Workstation
Definitions

Rules Engine

• Software that automates policies and procedures within an organization, whether legal, internal or operational

• Requires placing the rules in an external repository that can be easily reviewed rather than buried inside the code of numerous applications

• Instead of a program executing internal algorithms, it goes out to the rules engine to obtain its business logic

http://java-source.net/open-source/rule-engines
Definitions

Common Vocabulary Engine

• Allows for the definition of terms and relationships, which can then be used for the definition of clinical protocols, clinical applications, quality reporting and research

• Allows for transformation and abstraction of data

• Contains all the clinical concepts needed for healthcare delivery, measurement, and research

Architecture Framework for Clinical Information Systems

- Performance Reporting
- Administrative Systems
- Analytical Data Repository
- Clinical Systems
- Clinical Data Repository
- Clinical Decision Support (Evidence Based Guidelines)
- Rules Engine
- Terminology Infrastructure (Data and Information)
- Terminology Engine
- Clinician Workstation
- Workflow Engine
Structured Terminology
A Foundation to Achieve

- Knowledge integration of evidence-based guidelines
- Documentation flexibility
- Care Coordination
- Quality measurement
- Nursing visibility
- Knowledge discovery

Agency for Healthcare Research and Quality, Prospects for Care Coordination Measurement Using Electronic Data Sources, AHRQ Publication No. 12-0014-EF, March 2012
What Standards Go Into the Common Vocabulary Engine?

What Standards are Needed for the Electronic Health Record?
LOINC - Logical Observation Identifier Names and Codes

- LOINC was developed at Regenstrief Institute for laboratory and clinical observation coding
- It is a universal code system for identifying laboratory and clinical observations
- It is available free-of-charge
LOINC - Logical Observation Identifier Names and Codes

Example

• Fall and injury risk assessment instrument
• The concepts contained in the instrument are well represented by Clinical LOINC and the UMLS
• Associated concepts have been identified in the existing clinical information system data dictionary for pre-population of the instrument
<table>
<thead>
<tr>
<th>Score</th>
<th>LOINC</th>
<th>Component</th>
<th>Property</th>
<th>Timing</th>
<th>System</th>
<th>Scale</th>
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<td>Morse Fall risk level</td>
<td>Find</td>
<td>Pt</td>
<td>Patient</td>
<td>Ord</td>
<td>Morse Fall Scale</td>
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<td>Find</td>
<td>Pt</td>
<td>Patient</td>
<td>Nom</td>
<td>OASIS-C</td>
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**59461-4  Morse Fall risk level Morse Fall Scale**

**NORMATIVE ANSWER LIST (LL905-1)**

<table>
<thead>
<tr>
<th>SEQ#</th>
<th>Answer</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>No Risk (MFS Score 0 - 24)</td>
</tr>
<tr>
<td>2</td>
<td>Low Risk (MFS Score 25 - 45)</td>
</tr>
<tr>
<td>3</td>
<td>High Risk (MFS Score 50+)</td>
</tr>
</tbody>
</table>

**PARTS**

<table>
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<tr>
<th>Part Type</th>
<th>Part No.</th>
<th>Part Name</th>
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<td>Morse Fall risk level</td>
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<tr>
<td>Property</td>
<td>LP6813-2</td>
<td>Find [Finding]</td>
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<tr>
<td>Time</td>
<td>LP6960-1</td>
<td>Pt [Point in time (spot)]</td>
</tr>
<tr>
<td>Super System</td>
<td>LP6985-8</td>
<td>Patient</td>
</tr>
<tr>
<td>Scale</td>
<td>LP7751-3</td>
<td>Ord</td>
</tr>
<tr>
<td>Method</td>
<td>LP100241-1</td>
<td>Morse Fall Scale</td>
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<tr>
<td>Fragments for synonyms</td>
<td>LP20732-1</td>
<td>Level</td>
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</table>
SNOMED International - Systematized Nomenclature of Human and Veterinary Medicine

- A structured nomenclature and classification of the terminology used in human and veterinary medicine developed by the College of Pathologists and American Veterinary Medical Association
- Terms are applied to one of eleven independent systematized modules
- SNOMED CT is owned, maintained and distributed by the International Health Terminology Standard Development Organisation (IHTSDO)
UMLS - Unified Medical Language System

• Under development by the National Library of Medicine as a standard health vocabulary
• Includes a Metathesaurus, a Semantic Network and an Information Sources Map
• The purpose of the UMLS is to help health professionals and researchers retrieve and integrate electronic biomedical information from a variety of sources, irrespective of the variations in the way similar concepts are expressed in different sources and classification systems
• Has incorporated most source vocabularies. Large-scale testing is taking place

http://faculty.washington.edu/ocarroll/infrmatc/database/data/players.htm
Section Three Questions

1. Describe the definition of data, information, and knowledge

2. Identify one benefit of using aggregated code data for quality measurement

3. Describe one of the standards necessary to extract data for performance measurement and improvement

4. Describe the role of LOINC and SNOMED in coding data for health IT

5. Describe one challenge in extracting data for quality measurement

6. Write the definition of a rules engine and vocabulary engine

7. What is the most important component of the health IT architecture
Teaching Methods and Strategies

1. Lecture

2. Discussion Board
   - Present safety and quality scenarios within healthcare organizations
   - Present challenges student may face as a member of an organizational safety/quality committee

3. White papers answering questions posed on the prior slide

4. Development of use cases for each of the safety areas showing how one of the organizations provides tools for improving safety

5. Review of public testimonies and calls for comments – have the students respond to the national posts for comments
Section Four
Using Clinical Information Systems to Measure and Improve Outcomes Using Evidence Based Guidelines
What Standards Are Needed for Quality Reporting from the Electronic Health Record?
Learning Objectives

Standards Needed for Electronic Quality Measurement

At the completion of this session, the learner will:

• Describe standards necessary to extract data for quality measurement and performance improvement
• Describe an electronic measure (eMeasure)
• Describe the components of a quality measure
• Describe the steps related to structuring EHR queries for quality measurement
Quality Measurement in the Clinical Realm

- Quality Measure
- Quality Data Model
- Measure Authoring Tool
- eMeasure
- EHR

Inform all Stakeholders

Electronic Reporting and Sharing

eMeasure: Health Quality Measure Format

Capture Data

Provide Care

Develop Performance Measures

Quality Measurement in the Clinical Realm

Electronic Reporting and Sharing

Capture Data

Provide Care
What are Quality Measures?

• Quality measures are tools that help us measure or quantify healthcare processes, outcomes, patient perceptions, and organizational structure and/or systems that are associated with the ability to provide high-quality health care and/or that relate to one or more quality goals for health care

• These goals include: effective, safe, efficient, patient-centered, equitable, and timely care

Quality Data Model: Overview

QDM: What is It?
- A structure and grammar to represent quality measures precisely and accurately in a standardized format that can be used across electronic patient care systems

Role in Quality Measurement
- Provides a standard way to describe concepts clearly and consistently for use across all quality measures
- Creates a common language across all healthcare stakeholders so quality measurement data can be consistently represented, captured, and shared across EHRs and other electronic patient care systems
- Only “standard” for eMeasures that exists today
- Backbone for the Measure Authoring Tool
QDM in the Clinical Realm

- Standard way to consistently describe concepts for use across all quality measures.
- Common language so quality measurement data can be consistently represented electronically........
Sample Measure

Percentage of patients aged 18 years and older with a diagnosis of CAD who were prescribed a lipid-lowering therapy

<table>
<thead>
<tr>
<th>Initial Patient Population</th>
<th>Patients aged 18 years and older before the start of the measurement period.</th>
<th>Patients that have a documented diagnosis of coronary artery disease before or simultaneously to encounter date</th>
<th>Patients who have at least 2 outpatient or nurse facility encounters during the measurement period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>Patients aged 18 years and older with a diagnosis of coronary artery disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Numerator</td>
<td>Patients who were prescribed lipid-lowering therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exclusions</td>
<td>Patients who have documentation of a medical, system or patient reason for not prescribed lipid lowering therapy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What data elements do we need?

<table>
<thead>
<tr>
<th>who...</th>
<th>What kind of data are we dealing with?</th>
<th>What about the data?</th>
<th>How do we define these data?</th>
</tr>
</thead>
<tbody>
<tr>
<td>...Are diagnosed with Coronary Artery Disease</td>
<td>Diagnosis</td>
<td>Active</td>
<td>ICD-9, ICD-10, SNOMED-CT</td>
</tr>
<tr>
<td>...Were prescribed Lipid-lowering Therapy</td>
<td>Medication</td>
<td>Administered Order</td>
<td>RxNorm</td>
</tr>
<tr>
<td>...Have had at least two encounters during the measurement period</td>
<td>Encounters</td>
<td>Dispensed Active</td>
<td>CPT</td>
</tr>
<tr>
<td>...Are at least 18 years old or older</td>
<td>Patient Characteristic</td>
<td></td>
<td>LOINC</td>
</tr>
</tbody>
</table>

Quality Data Model
QDM in the Clinical Realm

- Standard way to consistently describe concepts for use across all quality measures.
- Common language so quality measurement data can be consistently represented electronically........
What’s an eMeasure?

An **eMeasure** is the electronic format for quality measures using the Quality Data Model (QDM) and the Healthcare Quality Measure Format (HQMF), an HL7 standard.
Measure Authoring Tool (MAT)
Measure Authoring Tool (MAT): Overview

MAT: What is It?
A web-based, publicly-available tool that allows measure developers to create and maintain quality measures in an electronic format (eMeasures)

Role in Quality Measurement
Simplify the process of creating an eMeasure
Standardize how eMeasures are expressed, for greater comparability
Provides a quality measure in a standardized XML file that can be read by both humans and computer systems

http://www.qualityforum.org/Topics/HIT/Measure_Authoring_Tool_(MAT)/Measure_Authoring_Tool_(MAT).aspx
Measure Authoring Tool
Key Features and Functions

Create and share eMeasures and their corresponding code lists with other users

Create and reuse standard value sets and other measure components, limiting rework as new measures are developed

Use the Quality Data Model (QDM) as the grammar and structure to fully define and express eMeasures in a standard way, and

Export eMeasures in an EHR-readable format to enable collection of comparable healthcare quality data
## Sample Measure

### Percentage of patients aged 18 years and older with a diagnosis of CAD who were prescribed a lipid-lowering therapy

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
</table>
| **Initial Patient Population** | Patients aged 18 years and older before the start of the measurement period  
Patients that have a documented diagnosis of coronary artery disease before or simultaneously to encounter date  
Patients who have at least 2 outpatient or nurse facility encounters during the measurement period |
<p>| <strong>Denominator</strong>            | Patients aged 18 years and older with a diagnosis of coronary artery disease |
| <strong>Numerator</strong>              | Patients who were prescribed lipid-lowering therapy                      |
| <strong>Exclusions</strong>             | Patients who have documentation of a medical, system or patient reason for not prescribed lipid lowering therapy |</p>
<table>
<thead>
<tr>
<th><strong>eMeasure Title</strong></th>
<th>Demo - Coronary Artery Disease (CAD): Drug Therapy for Lowering LDL-Cholesterol (NQF 0074)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>eMeasure Identifier (Measure Authoring Tool)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NQF Number</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Measurement Period</strong></td>
<td>September 17, 2011 through September 17, 2012</td>
</tr>
<tr>
<td><strong>Measure Steward</strong></td>
<td>American Medical Association - Physician Consortium for Performance</td>
</tr>
<tr>
<td><strong>Measure Developer</strong></td>
<td>National Quality Forum</td>
</tr>
<tr>
<td><strong>Endorsed By</strong></td>
<td>National Quality Forum</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Percentage of patients aged 18 years and older with a diagnosis of CAD who were prescribed a lipid-lowering therapy (based on current ACC/AHA guidelines)</td>
</tr>
<tr>
<td><strong>Copyright</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Measure Scoring</strong></td>
<td>Proportion</td>
</tr>
<tr>
<td><strong>Measure Type</strong></td>
<td>Process</td>
</tr>
<tr>
<td><strong>Stratification</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Risk Adjustment</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Rate Aggregation</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Studies have demonstrated that active treatment with lipid-lowering therapy is associated with stabilization and regression of coronary atherosclerotic plaques and decreased incidence of clinical events. Recent clinical trials have further documented that LDL-lowering agents can decrease the risk of adverse ischemic events in patients with established CAD.</td>
</tr>
<tr>
<td><strong>Clinical Recommendation Statement</strong></td>
<td>The LDL-C treatment goal is &lt;100 mg/dL. Persons with established coronary heart disease (CHD) who have a baseline LDL-C 130 mg/dL should be started on a cholesterol-lowering drug simultaneously with therapeutic lifestyle changes and control of nonlipid risk factors [National Cholesterol Education Program (NCEP)].</td>
</tr>
<tr>
<td><strong>Improvement Notation</strong></td>
<td>Higher score indicates better quality</td>
</tr>
</tbody>
</table>
| **Definition** | Initial Patient Population(s): 
- Patient Age: Patients aged 18 years and older at the beginning of the measurement period. 
- Diagnosis Active: Patient has a documented diagnosis of coronary artery disease. 
- Encounter: At least 2 visits with the physician, physician's assistant, or nurse practitioner during the measurement period.

Denominator(s): All patients aged 18 years and older with a diagnosis of coronary artery disease.

Exclusion(s):
- Documentation of medical reason(s) for not prescribing lipid-lowering therapy (e.g., clinical contraindication, drug allergy, drug interaction, drug intolerance, other medical reason(s)).
- Documentation of patient reason(s) for not prescribing lipid-lowering therapy (e.g., patient declined).
- Documentation of system reason(s) for not prescribing lipid-lowering therapy.

Numerator(s): Patients who were prescribed lipid-lowering therapy.
Exclusion(s): None |
| **Guidance** |  |
| **Transmission Format** | None |
| **Initial Patient Population** | None |
| **Denominator** | None |
| **Denominator Exclusions** | None |
| **Numerator** | None |
| **Numerator Exclusions** | None |
**Initial Patient Population =**

AND: "Patient Characteristic: birth date" >= 18 year(s) starts before start of "Measurement Period"

AND: Count >= 2 of:

  OR: "Encounter: Nursing Facility Encounter"
  OR: "Encounter: Outpatient Encounter"

AND:

  OR: "Procedure, Performed: Cardiac Surgery" starts before or during
    OR: "Encounter: Nursing Facility Encounter"
    OR: "Encounter: Outpatient Encounter"
  OR: "Diagnosis, Active: CAD includes MI"

**Denominator =**

AND: "Initial Patient Population"

**Denominator Exclusions =**

None

**Numerator =**

AND:

  OR: "Medication, Active: Lipid Lowering Therapy"
  OR: "Medication, Order: Lipid Lowering Therapy"
  during "Measurement Period"

**Denominator Exceptions =**

AND:

  OR: "Medication, Order not done: Medical Reason HL7" for "Lipid Lowering Therapy RxNorm Value Set"
  OR: "Medication, Order not done: System Reason HL7" for "Lipid Lowering Therapy RxNorm Value Set"

**Data criteria (QDM Data Elements)**

"Diagnosis, Active: CAD includes MI" using "CAD includes MI Grouping Value Set (2.16.840.1.113883.3.560.4.13.25)"

"Encounter: Nursing Facility Encounter" using "Nursing Facility Encounter CPT Value Set (2.16.840.1.113883.3.560.4.13.26)"

"Encounter: Outpatient Encounter" using "Outpatient Encounter CPT Value Set (2.16.840.1.113883.3.560.4.13.27)"

"Medication, Active: Lipid Lowering Therapy" using "Lipid Lowering Therapy RxNorm Value Set (2.16.840.1.113883.3.560.4.13.29)"

"Medication, Order: Lipid Lowering Therapy" using "Lipid Lowering Therapy RxNorm Value Set (2.16.840.1.113883.3.560.4.13.29)"

"Medication, Order not done: Medical Reason HL7" using "Medical Reason HL7 HL7 Value Set (2.16.840.1.113883.3.560.4.13.30)"

"Medication, Order not done: System Reason HL7" using "System Reason HL7 HL7 Value Set (2.16.840.1.113883.3.560.4.13.30)"

"Patient Characteristic: birth date" using "birth date LOINC Value Set (2.16.840.1.113883.3.560.100.4)"

"Procedure, Performed: Cardiac Surgery" using "Cardiac Surgery SNOMED-CT Value Set (2.16.840.1.113883.3.560.4.13.31)"

**Supplemental Data Elements**

None
```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:stylesheet xmlns:xs="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance" version="1.0">
  <xs:output version="4.01" doctype-public="-//W3C//DTD HTML 4.01//EN" doctype-system="http://www.w3.org/TR/html4/strict.dtd" encoding="ISO-8859-1" indent="yes" method="html"/>
  <!-- global variable title -->
  <xs:variable name="title">
    <xs:choose>
      <xs:when test="string-length(/n1:QualityMeasureDocument/n1:title) == 1">
        <xs:value-of select="/n1:QualityMeasureDocument/n1:title"/>
      </xs:when>
      <xs:when test="/n1:QualityMeasureDocument/n1:code/displayName">
        <xs:value-of select="/n1:QualityMeasureDocument/n1:code/@displayName"/>
      </xs:when>
    </xs:choose>
    <xs:otherwise>
      <xs:text eMeasure xmlns:e=""></xs:text>
    </xs:otherwise>
  </xs:variable>
  <xs:variable name="short_title">
    <xs:if test="string-length($title) > 0">
      <xs:choose>
        <xs:when test="contains($title, '(NQF')">
          <xs:value-of select="substring-before($title, '(NQF')"/>
        </xs:when>
        <xs:otherwise>
          <xs:value-of select="$title"/>
        </xs:otherwise>
      </xs:choose>
    </xs:if>
  </xs:variable>
  <xs:preserve-space elements="n1:content"/>
  <!-- Main -->
  <xs:template match="/">
    <xs:apply-templates select="n1:QualityMeasureDocument"/>
  </xs:template>
  <!-- produce browser rendered, human readable clinical document -->
  <xs:template match="n1:QualityMeasureDocument">
    <html>
      <head>
        <title>
          <xs:value-of select="$title"/>
        </title>
        <xs:call-template name="eddCSS"/>
      </head>
      <body>
        <h1 class="h1center">
          <xs:value-of select="$title"/>
          <xs:if test="n1:subjectOf/n1:measureAttribute[n1:code[n1:originalText='NQF ID Number']]/n1:value/@extension">
            <xs:text>(NQF</xs:text>
            <xs:value-of select="n1:subjectOf/n1:measureAttribute[n1:code[n1:originalText='NQF ID Number']]/n1:value/@extension"/>
            <xs:text>)</xs:text>
          </xs:if>
        </h1>
        <table class="header_table">
          <tbody>
            <!-- START display top portion of clinical document -->
            <xs:call-template name="documentGeneral"/>
            <xs:call-template name="relatedDocument"/>
            <xs:call-template name="emMeasureBrief"/>
            <xs:call-template name="subjectOf"/>
          </tbody>
        </table>
      </body>
    </html>
  </xs:template>
</xs:stylesheet>
```
Using Health IT to Measure and Improve Outcomes

Considering automated queries for measurement – how to ask questions to an EHR
# Quality Measure Structure

<table>
<thead>
<tr>
<th>Initial population</th>
<th>• All patients who share a common set of specified characteristics.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denominator</td>
<td>• May be identical to the initial population or a subset of it to further specify the purpose of the eMeasure.</td>
</tr>
</tbody>
</table>
| Denominator Exclusions | • Information about the patients or events that should be removed from the eMeasure population and denominator.  
  • Exclusions are used to be sure the measure evaluates only those patients for whom the information in the numerator should apply, based on the available evidence. |
| Denominator Exceptions | • Some measures remove patients or events from the denominator only if the numerator interventions or outcomes are not met. Denominator exceptions allow for adjustment of the calculated score for those providers with higher risk populations. |
| Numerator          | • The interventions (processes) that are expected or the outcome that is expected, based on the evidence, for all members of the denominator. |
Using Health IT to Measure and Improve Outcomes

Exercise
Example 1
Identify all children with normal blood pressure

First Question: What is the time period of interest? 
This is needed to identify the population.
Population

All children seen in the office at least twice during the calendar year 2012

However, EHRs do not contain the label children, so we need to specify an age range (ages are in EHRs)

Population (updated)

All persons whose 18th birthday occurs during the calendar year 2012 and who are seen in the office at least twice during the same year
Getting Quality Measure Data from the EHR

Numerator

Denominator

Population

All persons whose 18th birthday occurs during the calendar year 2012 and who are seen in the office at least twice during the same year
Example 1

Identify all children with normal blood pressure

• Providers don’t record blood pressure as “normal blood pressure” or “abnormal blood pressure.”
• They measure and record every blood pressure as two values, the systolic and diastolic (the pressure when the heart is resting between beats).
Getting Quality Measure Data from the EHR

**Numerator**
All persons in the population (denominator) whose systolic blood pressure is less than the 90th percentile based on age, sex and height according to the NHLBI blood pressure tables

**Denominator**
All persons whose 18th birthday occurs during the calendar year 2012 and who are seen in the office at least twice during the same year
Getting Quality Measure Data from the EHR

There are Two Missing Facts
Getting Quality Measure Data from the EHR

Missing Facts

1. Children seen during a calendar year have several blood pressure readings. Which reading is the one we want the EHR to report – the first, the most recent, an average of all systolic blood pressure readings?

2. Most providers don’t record the percentile rank for systolic blood pressure when recording blood pressure values, so the information is not available in the EHR. The EHRs do have fields for systolic blood pressure, height, sex and birth date so all are available to compare to the NHLBI charts and find a percentile rank.
Getting Quality Measure Data from the EHR

Numerator

All persons in the population (denominator) whose most recent systolic blood pressure is less than the 90th percentile based on age, sex and height according to the NHLBI blood pressure tables.

Denominator

All persons whose 18th birthday occurs during the calendar year 2012 and who are seen in the office at least twice during the same year.
Getting Quality Measure Data from the EHR

Missing Facts

1. Children seen during a calendar year have several blood pressure readings. Which reading is the one we want the EHR to report – the first, the most recent, an average of all systolic blood pressure readings?

2. Most providers don’t record the percentile rank for systolic blood pressure when recording blood pressure values, so the information is not available in the EHR. The EHRs do have fields for systolic blood pressure, height, sex and birth date so all are available to compare to the NHLBI charts and find a percentile rank.
Getting Quality Measure Data from the EHR

Solutions

• The measure would need to ask for all data required (the birth date, the sex, the most recent height and the most recent systolic blood pressure) and provide the NHLBI charts with a string of codes that any EHR can read to perform the calculation for reporting

• EHR products could provide the feature as a standard component, but since that is not a consistent EHR process we can’t rely on it for our measure

• Encourage better standard use of EHRs and work with some vendors to include pediatric blood pressure percentile ranking because it adds value to clinical care
Redefinition of the Electronic Health Record

The EHR must support care delivery AND quality measurement – all in ‘real time”
Crossing the Quality Chasm

• “This sort of change in healthcare will not be evolutionary but revolutionary, like going from water to steam”

• This vision is a chasm that cannot be crossed in two steps
Redefinition of the Electronic Health Record

• What was ‘secondary use of data’ is now ‘primary use of data’

• Creation of a Strategic Plan for “Data”

• “If You Can’t be There Yourself, Don’t Send Anyone”
  
  Deming 1985
Know what to do with the data you have
Exponential Growth of Patient Data Available for Quality Measurement
http://www.youtube.com/watch?v=f-dfWLaDBPE
Meaningful Use
Stage 2
Proposed Measures
Meaningful Use Stage 2
Quality Measures for Hospitals

Requires eligible hospitals and CAHs to report 24 clinical quality measures from a menu of 49 clinical quality measures, including at least 1 clinical quality measure from each of the 6 domains:

• Clinical Process/Effectiveness
• Patient Safety
• Care Coordination
• Efficient Use of Healthcare Resources
• Patient & Family Engagement
• Population & Public Health
Proposed Meaningful Use Stage 2 Quality Measures

1. AMI-1 Aspirin at arrival
2. Discharge Instructions
3. AMI-3, ACEI or ARB for LVSD
4. AMI-2 Aspirin Prescribed at Discharge
5. Relievers for inpatient asthma
6. Systemic corticosteroids for inpatient asthma
7. PN-6 Initial Antibiotic Selection for Community-Acquired Pneumonia (CAP) in Immunocompetent Patients
8. PN-3b Blood Cultures Performed in the Emergency Department Prior to Initial Antibiotic Received in Hospital
Proposed Meaningful Use Stage 2 Quality Measures

9. AMI-5 Beta Blocker Prescribed at Discharge
10. AMI-8a Primary PCI within 90 minutes of Hospital Arrival
11. AMI-7a Fibrinolytic Therapy received within 30 minutes of hospital arrival
12. SCIP-VTE-2 Surgery Patients Who Received Appropriate Venous Thromboembolism (VTE) Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery
13. SCIP-Card-2 Surgery Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker During the Perioperative Period
14. SCIP-Inf-4 Cardiac Surgery Patients with Controlled 6 AM Postoperative Serum Glucose
15. SCIP-Inf-6 Surgery Patients with Appropriate Hair Remove
16. Home Management Plan of Care Document Given to Patient/Caregiver
17. PICU Pain Assessment on Admission
18. PICU Periodic Pain Assessment
19. Venous Thromboembolism Prophylaxis
20. Intensive Care Unit Venous Thromboembolism Prophylaxis
21. Venous Thromboembolism Patients with Anticoagulation Overlap Therapy
Proposed Meaningful Use Stage 2 Quality Measures

22. Venous Thromboembolism Patients Receiving Unfractionated Heparin with Dosages/Platelet Count Monitoring by Protocol or Nomogram

23. Venous Thromboembolism Discharge Instructions

24. Incidence of Potentially-Preventable Venous Thromboembolism

25. Venous Thromboembolism Prophylaxis

26. Discharged on Antithrombotic Therapy

27. Anticoagulation Therapy for Atrial Fibrillation/Flutter

28. Thrombolytic Therapy

29. Antithrombotic Therapy by End of Hospital Day Two
Proposed Meaningful Use Stage 2
Quality Measures

30. Discharged on Statin Medication
31. Stroke Education
32. Assessed for Rehabilitation
33. SCIP-Inf-9 Urinary Catheter Removed on Postoperative Day 1 (POD1) or Postoperative Day 2 (PDO2) with day of surgery being day zero
34. Elective Delivery
35. Exclusive Breast Milk Feeding
36. First Temperature Measured Within One Hour of Admission to the NICU
37. First NICU Temperature < 36 degrees C
38. Proportion of Infants 22 to 29 Weeks Gestation Treated with Surfactant Who Are Treated Within 2 Hours of Birth
39. Median Time from ED Arrival to ED Departure for Admitted ED Patients
40. ED-3 Median Time from ED Arrival to ED Departure for Discharged ED Patients
41. Admit Decision Time to ED Departure Time for Admitted ED Patients
42. SCIP-Inf-1 Prophylactic Antibiotic Within 1 Hour Prior to Surgical Incision
43. SCIP-Inf-2 Prophylactic Antibiotic Selection for Surgical Patients
44. SCIP-Inf-3 Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time, 48 Hours for Cardiac Surgery
45. AMI-10 Statin Prescribed at Discharge
46. Healthy Term Newborn
47. Hearing Screening Prior to Hospital Discharge (EHDI-1a)
48. IMM-1 Pneumococcal Immunization (PPV23)
49. IMM-2 Influenza Immunization
Section Four Questions

1. What are quality measures?
2. What is the Quality Data Model?
3. Why is the human readable output for a measure important?
4. What is the Measure Authoring Tool?
5. What are the five parts of a quality measure?
6. Define one meaningful use quality measure
Teaching Methods and Strategies

1. Lecture
2. Discussion Board
   - Present safety and quality scenarios within healthcare organizations
   - Present challenges student may face as a member of an organizational safety/quality committee
3. White papers answering questions posed on the prior slide
4. Development of use cases for each of the safety areas showing how one of the organizations provides tools for improving safety
5. Review of public testimonies and calls for comments – have the students respond to the national posts for comments
Questions & Discussion