The Lessons and Experience of EMR Implementation: The Good, Bad and Ugly

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CONTENTS

- Current status
- The Factors
  - Keys for Success
  - Traps for Failure
- The Map to Success:
  - People
  - Technology
  - Process
EMR Implementation: No Way Out!!!

The HITECH Act and CMS Mandate
Use of EHR in a meaningful way

- Incentive programs for Medicare and Medicaid
- To get maximum Medicare payments, eligible providers need to qualify by 2012 with hospitals in 2013
- Medicaid providers last year to initiate program is 2016 and last payment year 2021
The Status of EMR Implementation

- EMR implementations failure rate:
  - **50% or greater**
    - David Brailer
      Office of the National Coordinator for HIT, 2005,
  - **73%**
    - Renner
      NEJM and confirmed by the AC Group, 2009
Definition of “Successful Implementation”

- 12 months after purchasing an EMR system, the physician-user was able to see and document at least 80% of patients using the EMR.

- If the product is not being used 80% of the time, or according to its intended use, the implementation must be considered a failure.
The Good

- **Southeast Texas Medical Associated (SETMA)**
  Ferdinand Velasco, MD  *CMIO, Texas Health Resources*

- Met National quality and Best Practice Standards
  - 2005 Davis Award Excellence for the Use/Implementation EHR
  - EHR securely connects 3 clinic, 2 hospitals, ED, 22 nursing homes, provider residencies, and 6 non-clinical locations.
  - Real time performance reporting and auditing
  - Framework for making informed decisions and continuously improving the quality of care

- Recently received more than $19.5 million in Medicare incentive payments for meeting first stage meaningful use
The Bad

- Cedars Sinai Medical Center in Los Angeles spent $34 million developing and deploying a CPOE system.

- The system refused to recognize even slight misspellings.

- Alerts became an unending series of questions, reminders and requests on fairly basic decisions.

- Unable to strike a balance between useful computer warnings and constant observant, *hiding life saving alerts.*
The Bad

$34 million developing and deploying the system

Technical issues:
- “refused to recognize even slight misspellings”
- “Alerts became an unending series of questions, reminders and requests on fairly basic decisions”
- “hiding life saving alerts”

Training...

Implementation...
The Ugly

Missed diagnosis for CHF: The echo report from the cardiologist with low LVEF file to the wrong patient record. The correct patient went untreated and eventually died.

Infant death: A young, non-English speaking mother in hard labor with her baby under duress. But the Application Programming Interface (API) failed to capture contraction waveforms and heart data to display those for remote viewing in the EHR. The nurses were left unaware of the patients' condition and the treating OB/GYN, who was monitoring the patient from his home via the patient's EHR, was left unaware. The young and frightened mother continued quietly through her labor, giving birth in the hospital bed, unattended. Her baby was born brain-dead and later died due to umbilical strangulation.
EHR Implementation: Which One is the Most Important?

1. Technology
2. People
3. Process
Best Practice of EHR Implementation

1. Technology
2. People
3. Process
Figure 1 Phases and Tasks in EHR Implementation
Best Practice of EHR Implementation

Technology

- Data Preload and Integration
- Technology Usability
- Business Continuity
Best Practice of EHR Implementation

People:

- Governance
- Project Management leadership
- Involve multiple stakeholders
- User groups
- Incentives
Best Practice of EHR Implementation

**Process**

1. **Pre-Implementation:**
   - Choose software carefully
   - Sell benefits: managing attitude, assessing preparedness and addressing barriers
   - Early Planning
Best Practice of EHR Implementation Process

2. Implementation & Pre-Implementation:
   - Workflow redesign
   - Implementation Assistance
   - Training
   - Privacy & Confidentiality
   - Feedback & Dialogue
   - Technical Support
Key success factors

- Incremental or gradual EMR implementation
- Templates designed around the clinical content of specific areas of specialty
- Selecting an EMR vendor with a vested interest in your ongoing success using the a pay-as-you-go model.
Failure Sources

- Software Issues
- Bad Vendors
- Not Enough “Buy In”
- First Year Pains
- Slow Documentation
- Limited Initial Return on Investment
- Procrastination or Delaying the Inevitable
- “Big Bang” Implementation
Software

- Over 700 EMR vendors
- “Yes, we can do it”. Take it as granted
- “Show me”: Give examples and walk through the process
Vendors

- Over 400 EMR vendors currently. Each year, ~50 out of business.
- The New Owner “sunsets” the product, lacking parts, service over time.

**Background check:**
- any former medical professionals on their team
- what type of customer & technical support after the purchase
- what type of training, on-site support, and telephone help-desk support

**Continuing Monitoring**
- “Yes, we can do it”. Do not take it as granted
- “Show me”: Give solid examples and walk through your practice process
- Monitor the promised Timeline and write on the Contract
“Certification” to What

- ONC-ATCB (Office of the National Coordinator Authorized Testing Certification Bodies)
  - CCHIT (Certification Commission for Health Information Technology)
  - Drummond Group

- Understand “What are certified”
  - Functions and buttons
  - Not the customized process, function and path to outcomes
Transitioning to an EMR is changing the culture of the practice, and emotional to physician and practice.

- Assures physician and staff the final results (a state-of-the-art practice operating more efficiently through use of EMR) are worth the few months of stress.

- Once prior data are in the system and people adjusts to a new way, EMR benefits become more obvious: it really saves a lot of time on that 2nd or 3rd visit.

- Initial training using common scenarios of physician practice.

- Be available through the implementation.

- Focus on people and their workflow, not the software.
Buy-ins

Lack of buy-in has a high implementation failure rate

Need:
- Top: Need commitment by planning, staff, funding from the Board/CEO/CFO/CIO
- Middle: implementation team
  - Must “a champion”. one person can make the difference
  - Better with at least a MD and a RN
  - a point-person in place who wants it, who encourages others and really ‘owns’ the process
- Bottom: advocate for EMR on staff the practice has to be looking forward to having EMR, without having it forced down their throats.”
Limited Initial ROI

Setup the Right Models with Vendor Relationship:

- “Up front”. A sizeable initial investment. Vendor may lack the financial incentive to get the office up and running - and reaching the meaningful use, delay a positive ROI.

- “Pay as you go”. A “win-win” relationship. Stronger incentive to make sure your practice is a successful. Higher rates of implementation success with a “pay as you go” vendor as compared to others. They have a vested interest in your success decrease your initial investment, thereby lowering your exposure to risk.

Understanding Incentives

- CMS Incentives is for improvement in the quality of care. Anys Anderson
- Need a years worth of data in your system to show those trends.
- You better get ahead of the game.

Understand the Delay:

- Look at 1-2 years out, because it’s going to take that long to get really efficient with the product and to get enough data in there.
- Use the EMR in a ‘meaningful way’ to report improvements in quality.
Slow Documentation

- Decreasing Efficiency. A MGMA study: practices using EMR can decrease physician productivity up to 15% for up to a year.

- If unprepared for this the extra time, doctors often frustrated and will abandon the new system and go back to dictating or hand writing their notes.

- EMR implementation often fails when physicians stop using it. Not only does this waste $$$ dollars invested in technology, the practice also misses out on future gains in efficiency and savings often experienced after the system is in place for more than a year.

- Templates should be customized to speed time spent documenting patients - not slow them down.
Slow Documentation

- Causes of decreasing productivity:
  - software that doesn’t function properly or smoothly
  - lack of adequate user training
  - templates non-intuitive or not customized to specialty
  - doctors required to input too much information
  - lack of access patient history and info already in the system

- More time and Customization are required
  - system implementation is rushed, or condensed into a single week.
  - more time is necessary to properly prepare
  - the EMR users and customize the system for optimum efficiency and smoother integration into existing workflow of the practice.
Prepare Slow Documentation

- More time required
  - implementation cannot be rushed/condensed into 1 week
  - more time to prepare the EMR users and customize for efficiency and smoother integration into existing workflow

- Customization required
  - Using existing/creating templates with clinical content of your specialty to avoid the expense, time and frustration of doing the fine-tuning
  - Input as much info as you can on active patient, using the lowest level staff or have the vendor to help transition to electronic medical records into their appropriate fields
  - Simply scanning old paper records may not properly populate data fields and adequate to meet the “meaningful use” criteria for incentives for EMR
Delaying the Inevitable

- ScarlettO’Hara-like approach and plan to “worry about that tomorrow.”
- Tomorrow is coming sooner than we anticipate.
- Time to implement and learn how to use EMR is now. Physicians can begin to enjoy benefits ASAP.
EHR Implementation: Adoption of New Technology

What to do
Systematic approach at organizational level and individuals

Misconception
New technology will immediately increase efficiency with no little effort

Reality
The transition to the digital world is going to happen no matter how you feel about it.

Focus on the benefits that outweighing the cost and learning curve.

Open mind and willingness to learn a lot of new lessons, no matter your age or experience level.

A focused approach to sustained end user adoption and learning is required for Meaningful Use.
The Learning Curve

As technology is used, producers learn to make it more efficient and effective often with reduced input costs and waste rates.
Failure Source: “Big Bang” Implementation

- The physician closes up shop for up to a week for an intensive EMR training and the “new way” of doing things. After that, the office reopens and the new system should be up and running with everyone on board and ready to go.

- Many vendors may be responsible for the high EMR failure rate trying to do everything at once in one week, versus trying to do a little bit each week for 8-12 weeks.

- Take longer than a few days to fully understand and feel comfortable with change in daily duties and office culture.

- Being fire hosed with information, without having enough time to absorb critical details and system nuances, results in staff feeling stupid, overwhelmed and then abandoned by the trainer and vendor provider. It’s the stuff that EMR disasters are made of.
Incremental Approach

“An incremental approach toward implementation has proven to be 95% effective versus the 27% effectiveness of this Big Bang approach. It’s the most influential factor on failures.” – Anderson

- Starting with simple functionality first, such as electronic labs and ePrescriptions
  - people can see the benefit right away.
  - Over time, gradually add on complicated and comprehensive functions

"Incremental implementation is the single most important factor in EMR success."
Definition of Processes and Workflows

- Sequence of connected steps serving as a virtual representation of actual work
- A model to represent real work for further assessment
- Workflows are designed to achieve processing intents
  - physical transformation
  - service provision
  - information processing
EHR Implementation: An Example Workflows in Diabetes Care

Aim Statement

- Over the next 12 months we will improve care by:
  - Identifying our diabetic population
  - Establishing targets for selected diabetic parameters
  - Devising appropriate interventions to enable us to meet our improvement goals for our diabetic population
EHR Implementation: Workflows in Diabetes Care

Process analysis-key questions

- Are patients coming in regularly?
- Are providers ordering needed tests according to guidelines?
- Are patients following through with provider recommendations and taking ownership of self-management?
- Are A1c, LDL and BP where patient and provider would like them to be?
EHR Implementation: Workflows in Diabetes Care

People involved in the process

10 Patients
7 Providers
3 Health Educators
2 Nutritionists
1 Epic and 1 Data Support staff
2 Support staff
1 Health Plan staff
Designing the Workflows
Understanding the Process

Measures

- Establishing targets for selected diabetic parameters

- HgbA1c ordered 2x annually
- HgbA1c <7
- LDL <100
- BP <130/80
- Microalbumin ordered annually
## Baseline Data and Goals

<table>
<thead>
<tr>
<th>Measure</th>
<th>Baseline</th>
<th>Goal</th>
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<tbody>
<tr>
<td>HgbA1c (2x annually)</td>
<td>71%</td>
<td>85%</td>
</tr>
<tr>
<td>HgbA1c &lt;7%</td>
<td>47%</td>
<td>62%</td>
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<tr>
<td>LDL &lt;100</td>
<td>43%</td>
<td>60%</td>
</tr>
<tr>
<td>BP &lt;130/80</td>
<td>28%</td>
<td>45%</td>
</tr>
<tr>
<td>Microalbumin (annually)</td>
<td>54%</td>
<td>63%</td>
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</table>

WHERE IS THE BOTTLENECK
Awareness and Intervention

**Barriers to reach goals**
- Patient: ownership and self-management
- Providers: competing priorities
- Process: variation between clinics
- Environment: obesity increasing
- Systems: not maximizing EMR capabilities

**Intervention to Improve**
- Provider CME
- EMR-based tools to support providers in the exam room
- Patient Awareness Materials
- Monthly measurement and feedback to providers
- Registries
- Outreach letters to patients
## Process Results

<table>
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<tr>
<th>Measure</th>
<th>Jan 04 *</th>
<th>May 05*</th>
<th>Goal</th>
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<tbody>
<tr>
<td>HgbA1c ordered 2x annually</td>
<td>71%</td>
<td>75%</td>
<td>85%</td>
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<tr>
<td>LDL ordered annually</td>
<td>74%</td>
<td>81%</td>
<td>-</td>
</tr>
<tr>
<td>Microalbumin ordered annually</td>
<td>54%</td>
<td>63%</td>
<td>63%</td>
</tr>
<tr>
<td>HgbA1c &lt;7%</td>
<td>47%</td>
<td>49%</td>
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</tr>
<tr>
<td>BP &lt;130/80</td>
<td>28%</td>
<td>34%</td>
<td>45%</td>
</tr>
</tbody>
</table>

* Patients with at least 2 diabetes visits in 12 months
Better Outcomes

Diabetes Bundle
Feb 2007

Labs Ordered*
Labs Resulted*
Clinical Values in Compliance**

* A1c, LDL, Microalbumin
** A1c<7, LDL<100, BP<130/80
Continuing Intervention

- Practice Redesign “Care by Design”
- Templates and workflows for Pre-Visit and Visit Planning (acute and chronic)
- Patient Activation through mutual goal setting and motivational interviewing
  - System-wide Staff Development Institute
  - Templates for goal setting
  - Patient education information imbedded in EMR
- “Pay for Performance” incentive plan to work registries
Workflow Changes
Enhance Quality & Efficiency

- **Chronic care workflow redesign to focus on proactive care**
  - Automatic appointment reminders
  - Standards of care based on national guidelines are incorporated into templates
  - EMR triggers a set of questions for the provider to ask the patient, along with a standard education module for the provider to use.
  - Follow up for recommended tests and treatments
  - EMR triggers reviews of adherence to recommended follow up appointments

- **Performance reports and benchmarking**

Agency of HealthCare Research and Quality
Workflow Changes
Positive ROI

- Improvements in processes & documentation:
  - Bonuses insurer-developed and quality-based incentive programs, **more than $30,000 in 3 years**
  - Other insurer-sponsored pay-for-performance programs provided funding to help with system implementation and upgrades
- As a result, Four Seasons achieved a positive ROI within 2.5 years of implementing the EMR.

Agency of HealthCare Research and Quality
EHR Implementation: Save Time and Money

- **Improved coding**
  How many times do physicians:
  - Meet the requirements for a level 4 visit
  - Charge for a level 3 visit
  - Document for a level 2 visit

*Medical Economics* estimates a $40,000 loss to physicians down coding one level.

- **Fewer chart pulls** Cost of chart pull is $3-5 per chart
- **Improved efficiency of telephone refills**
- **Reduced transcription** Cost to provider is $4-7 per document
Top Barriers to EHR Implementation

- Lack of capital resources to invest in the
- Concern about loss of productivity during transition
- Concern about interoperability (exchanging patient information electronically) with other departments within the facility.
- Usability apprehension, hard to use and not well engineered for clinician workflow.
- Computer Illiteracy/training
Don’t Get Frustrated
Strategies for Adoption of EHR

Why do you need an EHR?

Better patient outcomes needs to be the ultimate goal to drive decisions about infrastructure, product selection, customization, staff training, and roll-out.

Are you ready?
EHR Implementation
Time to Act is Now

- Funding is Front Loaded
  - $30,000 (close to 70% of the funding) comes in the first two years
  - Funding decreases significantly every year thereafter

- You Need to Demonstrate Meaningful Utilization
  - Purchase and Implementation are not enough - you must use it

- Funding is Time Stamped
  - Incentives start in 2011, decrease over time and go away after 2015
  - Penalties begin in 2015
CONCLUSIONS

- The EMR implementation is an integration of people, technology and process.
- The implementation process clearly has ongoing issues and will have more growing pains.
- It should be treated as a vital important initiative to:
  - Proceed as a complicated project management involving any healthcare providers from top to bottom.
  - Build foundation of new healthcare in the information age.
  - Learn, adopt, innovate and improve in the continuing and evolving process to optimize clinical and service outcomes.
Reaching Meaningful Use … and Optimizing Clinical Outcomes after EHR Implementation

James E. Tcheng, MD, FACC, FSCAI, FESC
Professor of Medicine
Professor of Community and Family Medicine
(In informatics)
Duke Clinical Research Institute
Duke University Medical Center and Health System
The Meaning of Meaningful Use

- Perspectives
  - Virtuous Cycle of Quality

- Fundamentals of Meaningful Use
  - Technical requirements

- Optimizing clinical processes and outcomes
  - The HIT-enabled workflow
  - Central role of CPOE
  - Leave no MD behind!
  - Analytics, quality, and reporting
  - Promise of secondary data use
The Virtuous Cycle of Quality: Generating Evidence to Inform Policy

HITECH (Healthcare Information Technology for Economic and Clinical Health) Act

- Provides framework, defines timetable and expectations for Meaningful Use of HIT
- Healthcare: $59 billion, net $19 billion
  1. Leadership
  2. Funding and incentives
  3. Standards
  4. Certification
  5. Research and development
  6. Education and outreach
  7. Privacy and security
Distribution of HITECH Funds

ARRA HITECH Funding (In Billions)

EHR MU: $34 billion total, $20.8 billion net (entitlement)
HITECH Medicare / Medicaid Incentive Programs

- Hospital incentives for Meaningful Use of HIT
  - Hospitals eligible for both Medicare and Medicaid Incentives (must meet definition by 2013)

- Eligible Professional (EP) incentives for Meaningful Use of HIT
  - Eligible professionals may qualify for either Medicare or Medicaid Incentive
How do EPs get Medicare incentive payments?

- Medicare
  - MD, DO, DDS, DPM, Optometrist, Chiropractor
    Hospital-employed EPs qualify, provided they are not “hospital-based”
  - Meet minimum HIT requirements for incentives
    - Use certified EHR for 50% of encounters
    - Fulfill MU criteria
  - Incentive payments available from CMS as early as May 2011
Why Meaningful Use?

“... The ultimate goal of Meaningful Use of Health IT is to enable significant and measurable improvements in population health through a transformed health care delivery system.”

## Core Objectives

<table>
<thead>
<tr>
<th>Eligible Providers (15)</th>
<th>Eligible Hospitals (14)</th>
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<tbody>
<tr>
<td>CPOE</td>
<td>CPOE</td>
</tr>
<tr>
<td>Maintain Up to Date Problem List</td>
<td>Maintain Up to Date Problem List</td>
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<tr>
<td>Maintain Active Med List</td>
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<td>Maintain Active Med Allergy List</td>
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<td>Record Changes in Vital Signs</td>
<td>Record Changes in Vital Signs</td>
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<td>Record Smoking Status for pts &gt; 13 Years</td>
<td>Record Smoking Status for pts &gt; 13 Years</td>
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<td>Drug/Drug and Drug/Allergy Checking</td>
<td>Drug/Drug and Drug/Allergy Checking</td>
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<td>Record Demographics</td>
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<td>Implement 1 Clinical Decision Support Rule</td>
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<td>Protect Electronic Health Information</td>
<td>Protect Electronic Health Information</td>
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<td>Electronically Exchange Clinical Information</td>
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<td>Provide Patients with E-Copy of Health Info</td>
<td>Provide Patients with E-Copy of Health Info</td>
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<td>Report Ambulatory Quality Measures</td>
<td>Report Hospital Quality Measures</td>
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<td>Provide Clinical Summaries of Office Visits</td>
<td>Provide E-copy of Discharge Instructions</td>
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<td>E-Rx via EDI</td>
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## Menu Objectives

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<td>Drug/Formulary Checks</td>
<td>Drug/Formulary Checks</td>
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<td>Incorporate Labs as Structured Data</td>
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<td>* Generate Lists of Patients By Condition</td>
<td>* Generate Lists of Patients By Condition</td>
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<td>Pt. Specific Educational Resources</td>
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<td>Medication Reconciliation</td>
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<td>Exchange Summary of Care Record</td>
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<tr>
<td>* Capability to E-Submit to Immunization Registry</td>
<td>* Capability to E-Submit to Immunization Registry</td>
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<tr>
<td>* Capability to Provide Synd. Surveillance Data</td>
<td>* Capability to Provide Send Surveillance Data</td>
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<td>* Capability to E-Submit Reportable Lab Results</td>
<td>Send Reminders To Patients for Preventive Care</td>
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<td>Record Advanced Directives for Patients &gt; 65 Yrs</td>
<td>Provide Patients Timely E-Access to Health Info</td>
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* = Population Health Measures (must select 1)
### EP Quality Core (Choose 3)

#### CQM Core Set

<table>
<thead>
<tr>
<th>NQF Measure Number &amp; PQRI Implementation Number</th>
<th>Clinical Quality Measure Title</th>
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<tr>
<td>NQF 0013</td>
<td>Hypertension: Blood Pressure Measurement</td>
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<td>NQF 0028</td>
<td>Preventive Care and Screening Measure Pair: a) Tobacco Use Assessment, b) Tobacco Cessation Intervention</td>
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<tr>
<td>NQF 0421 PQRI 128</td>
<td>Adult Weight Screening and Follow-up</td>
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#### CQM Alternate Core Set

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<td>NQF 0024</td>
<td>Weight Assessment and Counseling for Children and Adolescents</td>
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<td>NQF 0041 PQRI 110</td>
<td>Preventive Care and Screening: Influenza Immunization for Patients 50 Years Old or Older</td>
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<td>NQF 0038</td>
<td>Childhood Immunization Status</td>
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<td>1.</td>
<td>Diabetes: Hemoglobin A1c Poor Control</td>
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<td>2.</td>
<td>Diabetes: Low Density Lipoprotein (LDL) Management and Control</td>
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<td>3.</td>
<td>Diabetes: Blood Pressure Management</td>
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<td>4.</td>
<td>Heart Failure (HF): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy for Left Ventricular Systolic Dysfunction (LVSD)</td>
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<td>Coronary Artery Disease (CAD): Beta-Blocker Therapy for CAD Patients with Prior Myocardial Infarction (MI)</td>
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<td>Pneumonia Vaccination Status for Older Adults</td>
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<td>7.</td>
<td>Breast Cancer Screening</td>
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<td>8.</td>
<td>Colorectal Cancer Screening</td>
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<td>Coronary Artery Disease (CAD): Oral Antiplatelet Therapy Prescribed for Patients with CAD</td>
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<td>10.</td>
<td>Heart Failure (HF): Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD)</td>
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<td>11.</td>
<td>Anti-depressant medication management: (a) Effective Acute Phase Treatment, (b) Effective Continuation Phase Treatment</td>
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<td>13.</td>
<td>Diabetic Retinopathy: Documentation of Presence or Absence of Macular Edema and Level of Severity of Retinopathy</td>
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<td>14.</td>
<td>Diabetic Retinopathy: Communication with the Physician Managing Ongoing Diabetes Care</td>
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<td>Asthma Pharmacologic Therapy</td>
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<td>16.</td>
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<td>Appropriate Testing for Children with Pharyngitis</td>
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<td>19.</td>
<td>Oncology Colon Cancer: Chemotherapy for Stage III Colon Ca</td>
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<td>Prostate Cancer: Avoidance of Overuse of Bone Scan for Staging Low Risk Prostate Cancer Patients</td>
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<td>Diabetes: Eye Exam</td>
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<td>23.</td>
<td>Diabetes: Urine Screening</td>
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<td>24.</td>
<td>Diabetes: Foot Exam</td>
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<td>Coronary Artery Disease (CAD): Drug Therapy for Lowering LDL-Cholesterol</td>
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<td>Heart Failure (HF): Warfarin Therapy Patients with Atrial Fibrillation</td>
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<tr>
<td>27.</td>
<td>Ischemic Vascular Disease (IVD): Blood Pressure Management</td>
</tr>
<tr>
<td>28.</td>
<td>Ischemic Vascular Disease (IVD): Use of Aspirin or Another Antithrombotic</td>
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<tr>
<td>29.</td>
<td>Initiation and Engagement of Alcohol and Other Drug Dependence Treatment: a) Initiation, b) Engagement</td>
</tr>
<tr>
<td>30.</td>
<td>Prenatal Care: Screening for Human Immunodeficiency Virus (HIV)</td>
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<td>31.</td>
<td>Prenatal Care: Anti-D Immune Globulin</td>
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<tr>
<td>32.</td>
<td>Controlling High Blood Pressure</td>
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<tr>
<td>33.</td>
<td>Cervical Cancer Screening</td>
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<tr>
<td>34.</td>
<td>Chlamydia Screening for Women</td>
</tr>
<tr>
<td>35.</td>
<td>Use of Appropriate Medications for Asthma</td>
</tr>
<tr>
<td>36.</td>
<td>Low Back Pain: Use of Imaging Studies</td>
</tr>
<tr>
<td>37.</td>
<td>Ischemic Vascular Disease (IVD): Complete Lipid Panel and LDL Control</td>
</tr>
<tr>
<td>38.</td>
<td>Diabetes: Hemoglobin A1c Control (&lt;8.0%)</td>
</tr>
</tbody>
</table>
What Do I Need to Do Now?

1. Get a certified EHR (use in >80% of patients)
   • Consider Regional Extension Center (REC) assistance

2. Implement the MU requirements
   • e-Prescribe!
   • Adapt your workflow to accomplish MU
   • Select the quality metrics you plan to measure
   • Select the Menu Set objectives you plan to fulfill
   • Use your certified EHR per the MU specifications for at least 3 months (first year)

3. Register for incentives
   https://www.cms.gov/EHRIncentivePrograms/20_RegistrationandAttestation.asp

4. Attest to performance

5. Deposit check in bank
Implementation and adoption are not synonymous
- but they are almost universally treated as the same

Very few organizations track end-user adoption
- in terms of clinical and financial outcomes

Physician adoption is highly dependent on the degree of engaged leadership
- physician leaders need to be involved early and be empowered to make decisions that impact the use of the application

Traditional training methods, like classroom training, do not produce proficient users
- inadequate education of end users contributes to poor EHR adoption and ultimately poor business outcomes

Successful organizations develop 3 to 5 year plans
- to sustain adoption past the implementation
The Meaning of Meaningful Use

- Perspectives
  - Virtuous Cycle of Quality

- Fundamentals of Meaningful Use
  - Technical requirements

- Optimizing clinical processes and outcomes
  - The HIT-enabled workflow
  - Central role of CPOE in CDS and quality
  - Leave no MD behind!
  - Analytics, quality, and reporting
  - Promise of secondary data use
What is Informatics?

- the sciences devoted to the gathering, storing, management and analysis of data, the conversion of that data into information, and the transformation of information into knowledge

- the discipline dealing with the resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine

- a broad academic field encompassing human-computer interaction, information science, information technology, algorithms, and social science

*Wikipedia*
What Is HIT-Enabled Workflow?

• **Continuum of care**
  – outpatient, inpatient, transitions

• **Data integrity**
  – ADT (Admission, Discharge, Transfer) interfaces
  – Orders in, results out, billing interfaces
  – Codified, structured data
  – Re-use of data (collect once, use many)

• **Standards compliance**
  – e.g, DICOM, IHE profiles, CV vocabularies

• **Consumers**
  – Clinicians (efficiency, decision support, communication, HIE)
  – Quality and outcomes reporting, registries, public health
  – Business of medicine (pre-cert / Appropriate Use, billing)
Documentation Directions

• Create (only) **elements** of structure where the documents are natively / inherently unstructured (e.g., **clinic / hospital notes**)
  – SPEED, efficiency, accuracy, productivity, reuse of information
  – (Limited) creation of data
  – Quality, outcomes, billing, secondary use of data (<100 critical data elements for cardiology), CDA export, HIE
  – Workflow: asynchronous, clinician oriented
  – Misalignment of MD culture, funding models

• Create **structured documents** where there is inherently structured content (e.g., **procedure notes**)
  – SPEED, efficiency, accuracy, productivity, reduced repetition
  – Data as a byproduct of report creation
  – Compliance with regulatory, Intersocietal Commissions
  – Workflow: technologist oriented
  – Alignment of users with administration
CPOE Development: Guiding Doctrines

- Provide decision support at the point of contact
  - from the simple to the complex
  - heuristics rather than algorithms (probabilistic vs. deterministic)

- Utilize existing work product, experts
  - don’t recreate the wheel
  - embrace, incorporate evidence-based guidelines / EBM

- Marry content with (and improve) workflow
  - requires intimate understanding of existing processes
  - adapt and improve processes, reduce workarounds

- Incorporate regulatory / compliance elements
  - Quality Initiatives, ICD-9 coding

- Maintain consistency, organization, & structure
  - don’t make doctors think (left brain → right brain)
Leave No EP Behind!

- Business decisions
  - Do not skimp on training!
  - What do you do about the part-time MD?

- Radiologists
  - Additions to RIS and PACS to comply
  - RIS: modular certification
  - Organizational EHR: for rest of portfolio

- PQRI submission process for (mass) attestation of MU quality measures?
US CV Clinical Registries

- **Society of Thoracic Surgery: 900+ centers**
  - Coronary artery bypass surgery
  - Valve surgery
  - Congenital heart surgery
  - Thoracic surgery

- **National Cardiovascular Data Registry: 1600+ Hospitals**
  - Cath/Percutaneous coronary intervention
  - Implantable cardiac defibrillators (ICD)
  - Acute coronary syndromes (ACS)
  - Carotid stenting
  - Ambulatory CV disease (launching)

- **AHA-Get With The Guideline Program: 1500+ hospitals**
  - Coronary artery disease (CAD)
  - Heart failure
  - Stroke
  - Ambulatory module (launching)
Major challenges in 21st century health care include evaluating all of the innovations and determining which:

- Represent added value
- Offer minimal enhancements over existing choices
- Fail to reach their potential
- Work for some patients and not for others

Carolyn Clancy (AHRQ Director), 2/2008
Observations

- The medical community is in a transition from the small business proprietorship model to the interoperable healthcare ecosystem.
- Informatics provides the discipline to accomplish semantic data interoperability within that ecosystem.
  - More emphasis needed on usability, workflow integration.
- Transformation enables the Virtuous Cycle of Quality:
  - Clinical decision support, healthcare delivery, quality & performance improvement, provider education, CME / MOC, syndromic surveillance, comparative effectiveness research, clinical research ...