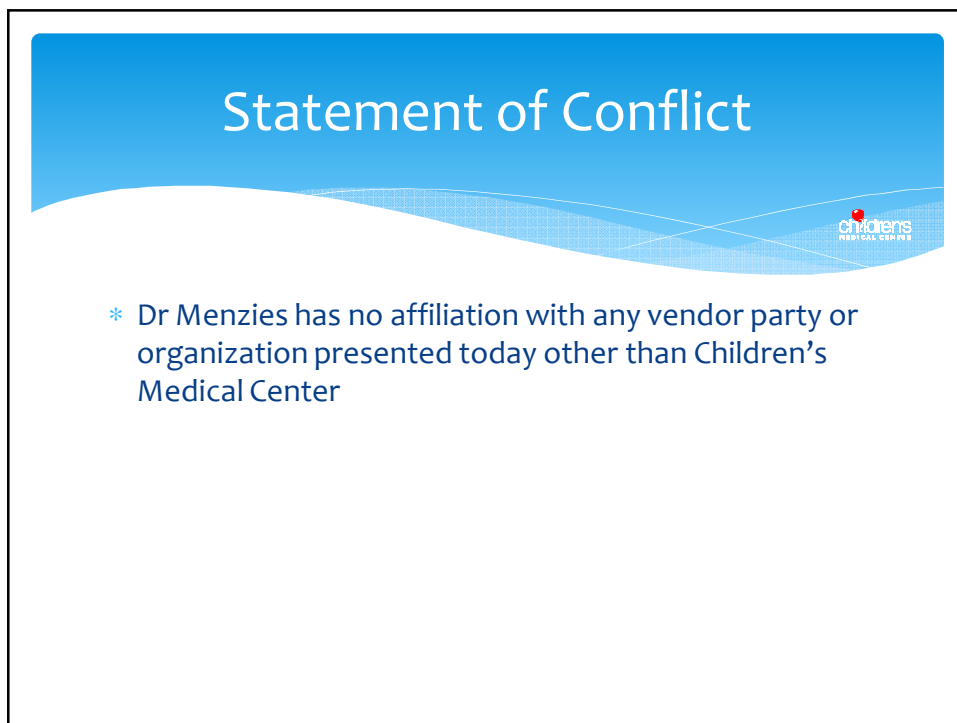


Meaningful Use and Beyond

Christopher Menzies MD
Chief Medical Information Officer
Children's Medical Center

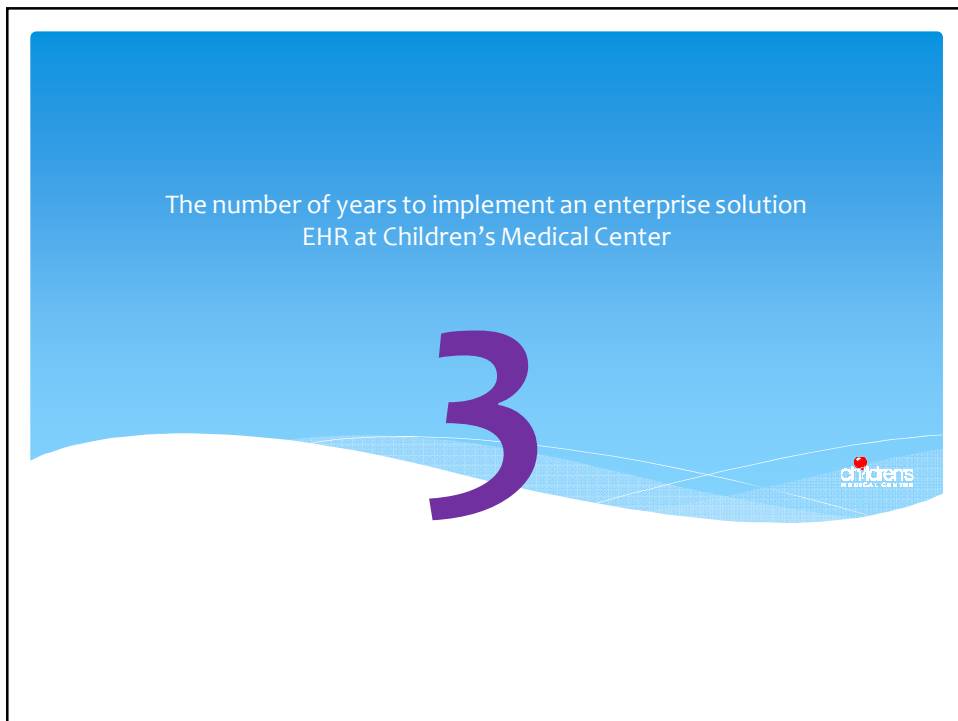
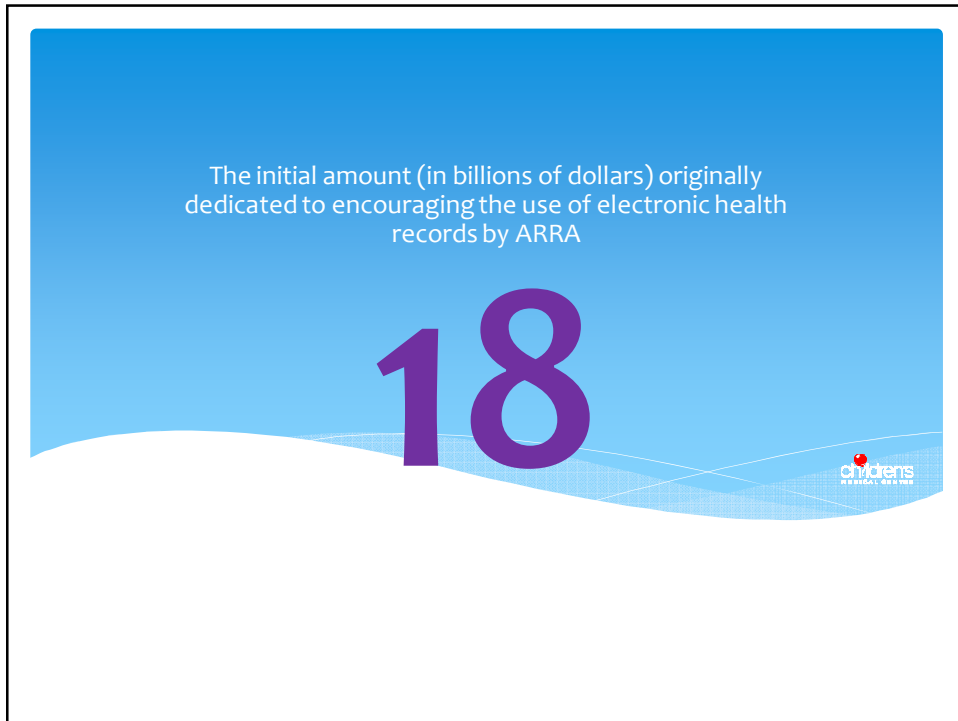
children
MEDICAL CENTER



Statement of Conflict


- * Dr Menzies has no affiliation with any vendor party or organization presented today other than Children's Medical Center

children
MEDICAL CENTER



The HIMSS electronic medical record adoption model
pinnacle stage that has been achieved by less than 1% of all
hospitals in the world, including Children's Medical Center


7



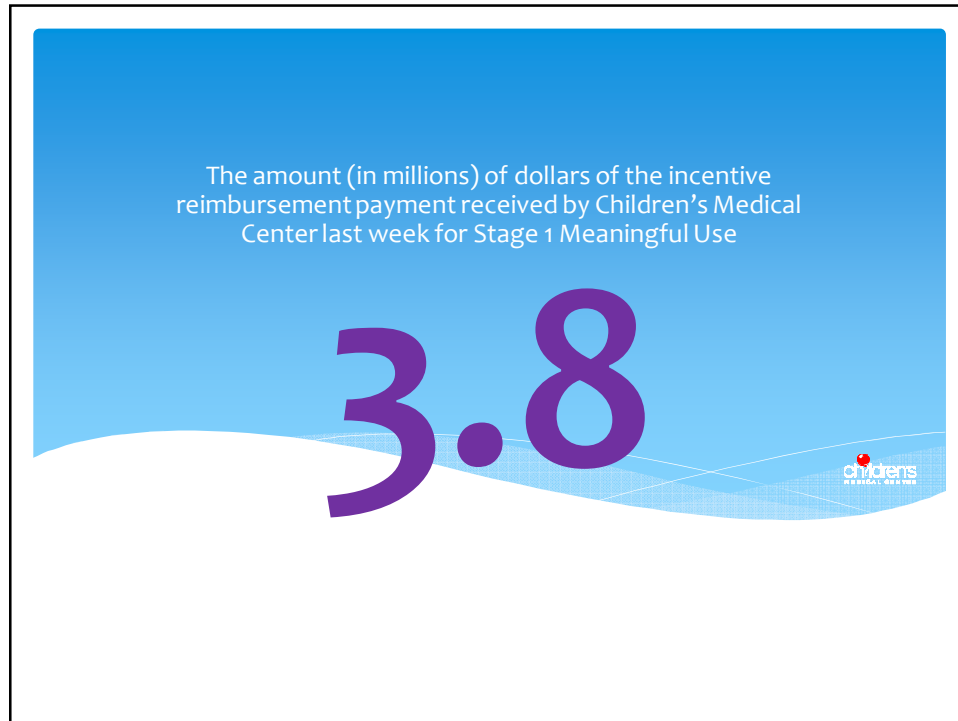
The slide features a blue background with a white wavy bottom edge. A large purple number '7' is centered in the lower half. The Children's Medical Center logo is in the bottom right corner.

The number of children touched by Meaningful Use
technology in 2010 at Children's Medical Center


1500000



The slide features a blue background with a white wavy bottom edge. A large purple number '1500000' is centered in the lower half. The Children's Medical Center logo is in the bottom right corner.



Objectives



- * Understand the clinical benefits that electronic medical records and information systems bring to an organization and patients
- * Understand some of the potential return of investment that can be achieved with the use of information systems in healthcare
- * Understand the potential benefits of data intelligence across information systems within an organization
- * Understand the importance of data in emerging strategies such as meaningful use and ACOs



Children's Medical Center

Private, not for profit, licensed for 483 beds
(Dallas - 411 & Legacy - 72)

Provide primary to quaternary care for North Texas region

Only level 1 pediatric trauma center in North Texas

Primary pediatric teaching facility for The University of Texas Southwestern Medical Center at Dallas


One of 14 pediatric research programs recognized by NIH

2009 Patient Volume: Inpatient – 23,652;
Outpatient – 350,596; Surgeries – 34,873

5,100+ employees
800+ physicians



Legislation and Regulations



- * On February 17, 2009, President Barack Obama signed the [American Recovery and Reinvestment Act \(ARRA\)](#). Title XIII of ARRA, called the Health IT for Economic and Clinical Health Act (HITECH), allocated \$19.2 billion toward health IT. This act seeks to bolster health IT to improve the delivery of healthcare in the United States. With various provisions and regulations, the Act provides assistance, tools, and resources to providers to allow for implementation and utilization of electronic health records.

Meaningful Use

Stage 1 contains 25 objectives/measures for Eligible Providers (EPs) and 24 objectives/measures for eligible hospitals. The objectives/measures have been divided into a core set and menu set. EPs and eligible hospitals must meet all objectives/measures in the core set (15 for EPs and 14 for eligible hospitals)

- * The American Recovery and Reinvestment Act of 2009 specify three main components of Meaningful Use:
 - * The use of a certified EHR in a meaningful manner, such as e-prescribing.
 - * The use of certified EHR technology for electronic exchange of health information to improve quality of health care.
 - * The use of certified EHR technology to submit clinical quality and other measures
- * The meaningful use of EHRs intended by the US government
 - * Improve care coordination
 - * Reduce healthcare disparities
 - * Engage patients and their families
 - * Improve population and public health
 - * Ensure adequate privacy and security

Requirements

- * A functional EHR certified by the Certification Commission for Healthcare Information Technology (CCHIT);
- * Electronic exchange of standardized patient data with clinical and administrative stakeholders using the Healthcare Information Technology Standards Panel's (HITSP) interoperability specifications and Integrating the Healthcare Enterprise's (IHE) frameworks;
- * Clinical decision support providing clinicians with clinical knowledge and intelligently-filtered patient information to enhance patient care; and
- * Capabilities to support process and care measurement that drive improvements in patient safety, quality outcomes and cost reductions.

Reporting



- * To demonstrate meaningful use successfully, eligible professionals, eligible hospitals and CAHs are required also to report clinical quality measures specific to eligible professionals or eligible hospitals and CAHs.
- * Eligible professionals must report on 6 total clinical quality measures: 3 required core measures (substituting alternate core measures where necessary) and 3 additional measures (selected from a set of 38 clinical quality measures).
- * Eligible hospitals and CAHs must report on all 15 of their clinical quality measures.

Definitions



- * **Adopted:** Acquired and installed certified EHR technology. (For example, can show evidence of installation.)
- * **Implemented:** Began using certified EHR technology. (For example, provide staff training or data entry of patient demographic information into EHR.)
- * **Upgraded:** Expanded existing technology to meet certification requirements. (For example, upgrade to certified EHR technology or add new functionality to meet the definition of certified EHR technology.)

Certified Technology



Nature of certification	Voluntary, robust	Mandatory for \$\$\$, to minimum government standards
Criteria and Testing Tool Development	Volunteer subject matter experts	Federal government
Providers served	Many types of providers seeking greater assurance when investing in new EHRs; specialty options available	All Medicare and Medicaid eligible providers and hospitals seeking incentive payments
Technology certified	Comprehensive, integrated EHRs + use verification, usability rating (Amb.) and vendor characteristics	Broadest array of EHR technologies: complete EHR and EHR modules
Accountable to	Providers	Providers, payers & public
Goals	Assurance of functionality, interoperability, security, meet provider needs for transparency of product	Meaningful use (as defined by CMS) to improve outcomes of care, support health reform

Why?

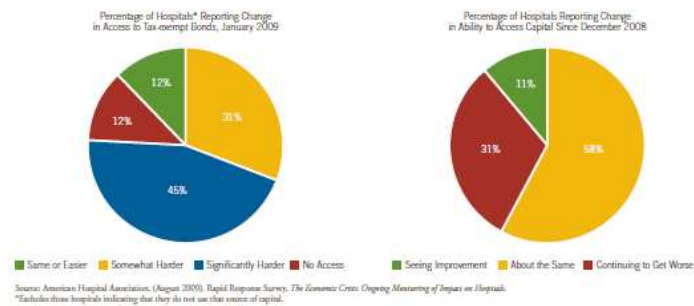
- * In a 2006 survey, lack of adequate funding was cited by 729 health care providers as the most significant barrier to adopting electronic records
- * At the American Health Information Management Association conference in October 2006, panelists estimated that purchasing and installing EHR will cost over \$32,000 per physician, and maintenance about \$1,200 per month (including the [amortization](#) of startup investment)
- * Vendor costs account for 60-80% of these costs

Cost of Ownership



Many hospitals are finding it more difficult to access capital since the 2008 recession.

Chart 12: Percentage of Hospitals Reporting Difficulty Accessing Capital in 2009



Why?

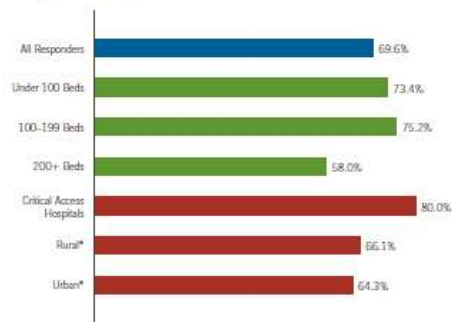


- * Some proponents of EHR systems suggest that startup costs will be recouped within 3 years
- * A study of the effects of EHRs in primary care settings published in the *American Journal of Medicine* estimated net benefits from EHR use of over \$86,000 per provider over a five-year period
- * Some physicians are skeptical of such published cost-savings claims; they believe the data is skewed by vendors and by others who have a stake in the success of EHR implementation. Many are resistant to invest in a system which they are not confident will provide them with a return on their investment

Cost as a Barrier

Nearly 70 percent of hospitals cited upfront costs as a barrier to achieving meaningful use.

Chart 13: Percentage of Hospitals that Identified Capital Costs as a Barrier to Meeting Meaningful Use Criteria

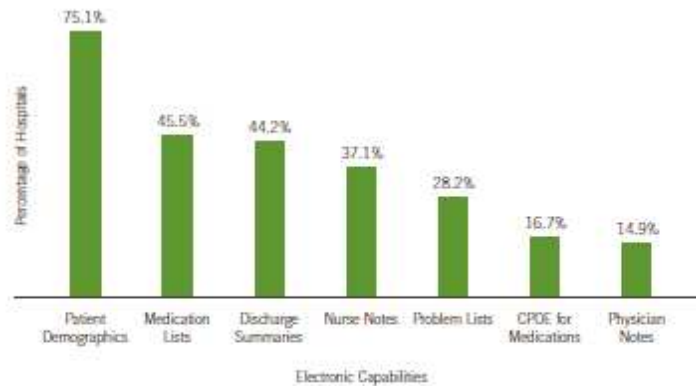


Source: American Hospital Association analysis of survey data from 795 non-federal, short-term acute care hospitals collected in January and February 2010. *Excluding critical access hospitals.
 Note: Hospital responses based on meaningful use as defined in the proposed rule released by the Centers for Medicare & Medicaid Services in January 2010. Responses may change based on final meaningful use specifications.

Why?

- * Brigham and Women's Hospital in Boston, Massachusetts, estimated it achieved net savings of \$5 million to \$10 million per year following installation of a computerized physician order entry system that reduced serious medication errors by 55 percent. Another large hospital generated about \$8.6 million in annual savings by replacing paper medical charts with EHRs for outpatients and about \$2.8 million annually by establishing electronic access to laboratory results and reports

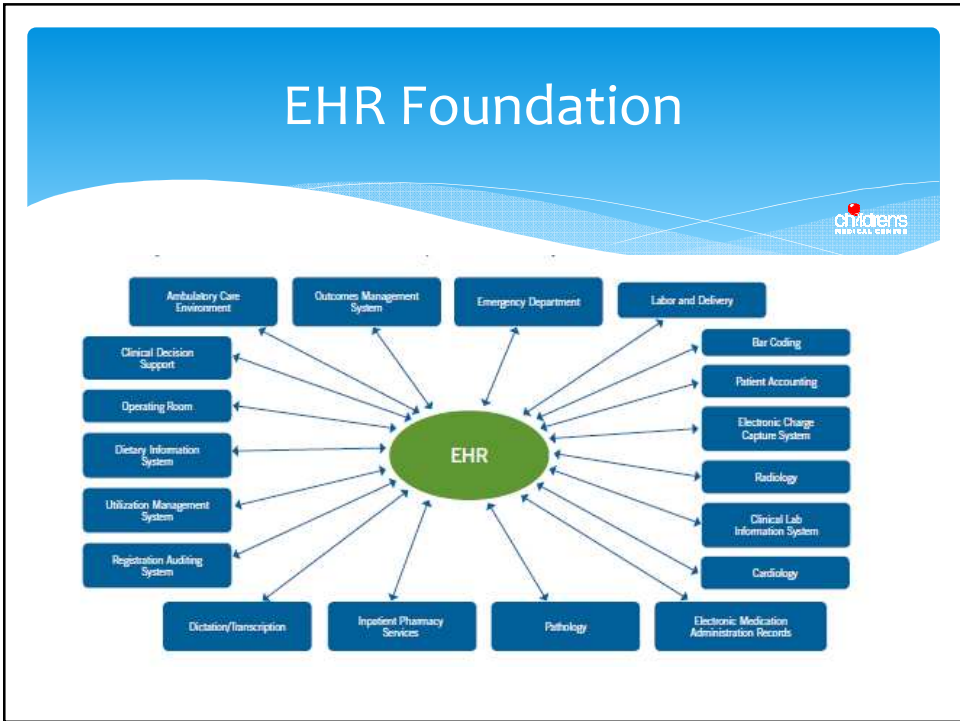
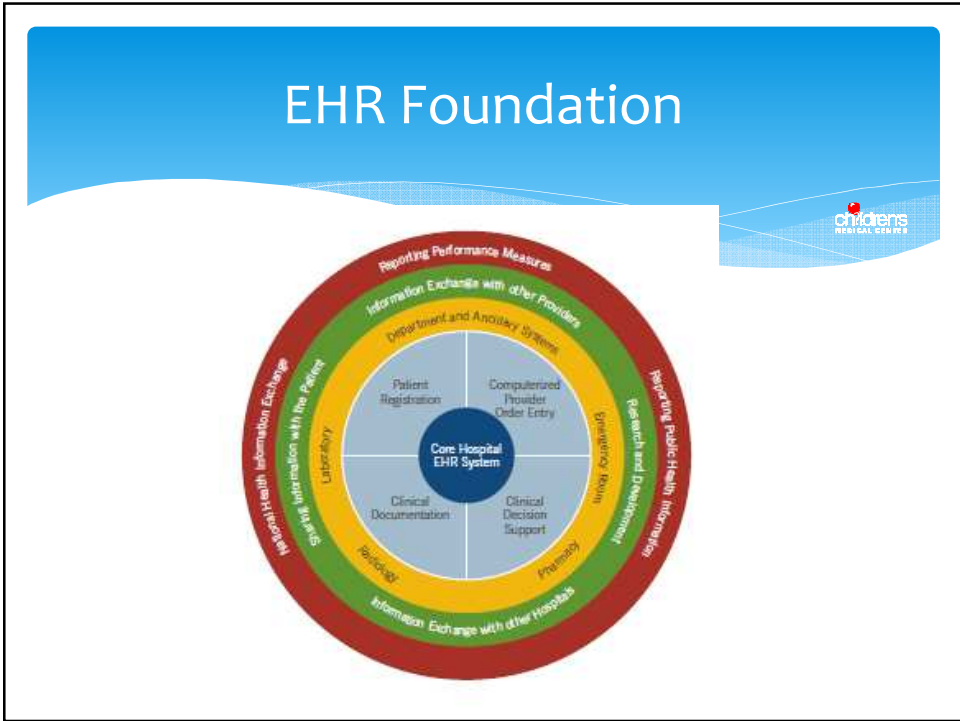
Current Electronic Capabilities



Source: American Hospital Association. (2009). *Annual Survey with Information Technology Supplement*. Washington, D.C.
CPOE = computerized provider order entry

Expected Progress

- * Since 2000, adoption of electronic health records in the United States was relatively slow. However, because the HITECH Act provides incentives to providers to adopt electronic health records, adoption is expected to increase as physicians seek incentives. With several baseline studies that capture EHR adoption rates before the HITECH Act, current research and advances seek to examine how rates will change as physicians and organizations seek to meet meaningful use requirements with their EHRs.



Electronic Medical Record



- * An application environment composed of the clinical data repository, clinical decision support, controlled medical vocabulary, order entry, computerized provider order entry, pharmacy, and clinical documentation applications. This environment supports the patient's electronic medical record across inpatient and outpatient environments, and is used by healthcare practitioners to document, monitor, and manage health care delivery within a care delivery organization (CDO). The data in the EMR is the legal record of what happened to the patient during their encounter at the CDO and is owned by the CDO.

Electronic Health Record



- * A subset of each care delivery organization's EMR, presently assumed to be summaries like ASTM's Continuity of Care Record (CCR) or HL7's Continuity of Care Document (CCD), is owned by the patient and has patient input and access that spans episodes of care across multiple CDOs within a community, region, or state (or in some countries, the entire country). The EHR in the US will ride on the proposed National Health Information Network (NHIN).

EMR Adoption Model



US EMR Adoption Model SM			
Stage	Cumulative Capabilities	2010 Final	2011 Q1
Stage 7	Complete EMR; CCD transactions to share data; Data warehousing; Data continuity with ED, ambulatory, OP	1.0%	1.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	3.2%	3.5%
Stage 5	Closed loop medication administration	4.5%	5.9%
Stage 4	CPOE, Clinical Decision Support (clinical protocols)	10.5%	10.7%
Stage 3	Nursing/clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	49.0%	48.4%
Stage 2	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	14.6%	14.1%
Stage 1	Ancillaries - Lab, Rad, Pharmacy - All Installed	7.1%	6.7%
Stage 0	All Three Ancillaries Not Installed	10.1%	9.6%

Data from HIMSS Analytics™ Database © 2011

N = 5,281 N = 5,275



HIMSS Stage 7

First organization in Texas

First free standing pediatric facility in the nation

Among only 1% of healthcare organizations in the world



Who is Eligible?



- * An acute care hospital is a primary health care facility where the average length of patient stay is 25 days or fewer. Hospitals with an average length of stay of 25 days or fewer and with a CMS Certification Number (CCN) that has the last four digits in the series 0001 – 0879 or 1300-1399 are eligible. This specification will include short term general hospitals, the 11 cancer hospitals, and critical access hospitals in the United States, District of Columbia, and U.S. territories. Acute care hospitals also must have 10 percent Medicaid patient volume in order to participate
- * Children's hospitals: only those hospitals that have CCNs in the 3300-3399 series will be considered children's hospitals.

Who is Eligible?



- * Eligible professionals practicing at FQHCs/RHCs must demonstrate that more than 50 percent of their clinical encounters occurred at an FQHC/RHC over a six-month period, and that they had a minimum of 30 percent of their patient volume from needy individuals.
- * Needy individuals are those receiving medical assistance from Medicaid or the Children's Health Insurance Program, individuals who are furnished uncompensated care by the provider, or individuals furnished services at either no cost or reduced cost based on a sliding scale determined by the individual's ability to pay.

Who is Eligible?



- * Eligible professionals and hospitals must meet patient volume thresholds, measured by a methodology selected by the state. The two options offered in the final rule include:
 - * 1) a ratio where the numerator is the total number of Medicaid patient encounters (or needy individuals) treated in any 90-day period in the previous calendar year and the denominator is all patient encounters over the same period
 - * 2) a similar ratio where the state may take into account Medicaid patients on a primary care patient panel.
- * For all eligible professionals except pediatricians, the minimum patient volume threshold is 30 percent; for pediatricians, it is 20 percent

Who is Eligible?



- * Specifies that entities promoting the adoption of certified EHR technology can be designated by states for EPs to voluntarily assign their incentive payments. The statute allows eligible professionals to assign their incentive payments to their employer or to state-designated "entities that promote the adoption of certified EHR technology."
- * The definition of such an entity requires the entity to enable oversight of the business, operational and legal issues involved in the adoption and implementation of EHR and/or the exchange and use of electronic health information between participating providers, in a secure manner

Who is Eligible?



- * **Eligible Professionals (EPs)** are physicians (primarily doctors of medicine and doctors of osteopathy), dentists, nurse practitioners, certified nurse midwives, and physician assistants practicing in a Federally Qualified Health Center (FQHC) led by a physician assistant or Rural Health Clinic (RHC) that is so led
- * **Eligible hospitals (EHs)** that can participate are acute care hospitals (which include cancer and critical access hospitals) and children's hospitals

Who is Eligible?



- * Statutory requirement that EPs must also not be hospital-based; meaning, that the EP provides “substantially all” of his or her professional services in a hospital setting
- * “Substantially all” is defined to mean that **90 percent** or more of the services are performed in an inpatient or emergency department setting. The proposed rule aligns the definition of hospital-based with the Medicare definition, but allows states to develop a process to verify that EPs are not hospital-based, and therefore eligible to participate

Eligible Professionals

Meaningful use includes both a core set and a menu set of objectives that are specific to eligible professionals or eligible hospitals and CAHs.



- * For eligible professionals, there are a total of 25 meaningful use objectives. To qualify for an incentive payment, 20 of these 25 objectives must be met.
 - * There are 15 required core objectives.
 - * The remaining 5 objectives may be chosen from the list of 10 menu set objectives.

Eligible Hospitals

Meaningful use includes both a core set and a menu set of objectives that are specific to eligible professionals or eligible hospitals and CAHs.



- * For eligible hospitals and CAHs, there are a total of 24 meaningful use objectives. To qualify for an incentive payment, 19 of these 24 objectives must be met.
 - * There are 14 required core objectives.
 - * The remaining 5 objectives may be chosen from the list of 10 menu set objectives.

When?



- * Hospitals are **eligible** to receive Medicare incentive payments in federal fiscal years 2011 through 2016. Medicare **penalties** for failing to meet meaningful use requirements will begin in 2015 and be phased in through 2017, at which point they are permanent.

Staging



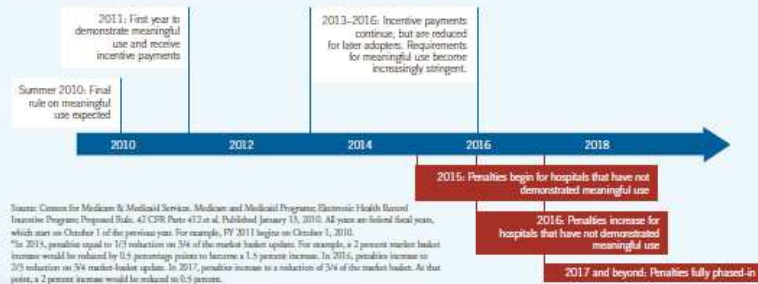
- * The criteria for meaningful use will be staged in three steps over the course of the next five years.
 - * Stage 1 (2011 and 2012) sets the baseline for electronic data capture and information sharing.
 - * Stage 2 (expected to be implemented in 2013) and Stage 3 (expected to be implemented in 2015) will continue to expand on this baseline and be developed through future rule making.

Timeline



The ARRA: Hospitals are eligible for incentive payments in 2011 and subject to penalties in 2015.

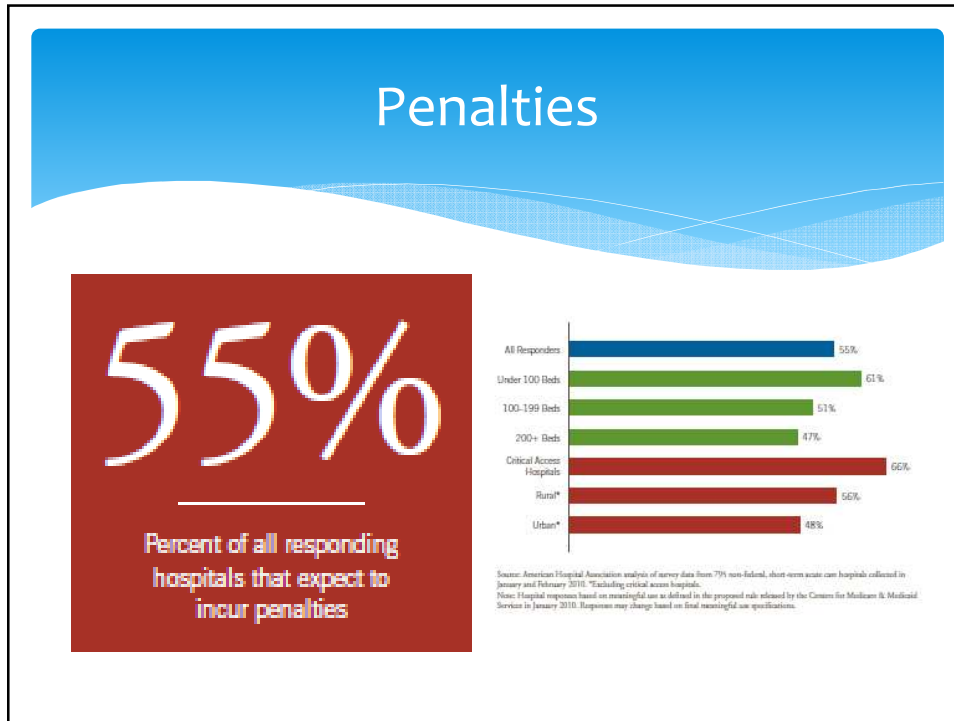
Chart 6: The ARRA Timeline for Medicare EHR Incentive Payments and Penalties



Timeline



- * October 1, 2010 – Reporting year begins for eligible hospitals and CAHs.
- * January 1, 2011 – Reporting year begins for eligible professionals.
- * January 3, 2011 – Registration for the Medicare EHR Incentive Program begins.
- * January 3, 2011 – For Medicaid providers, states may launch their programs if they so choose.
- * April 18, 2011 – Attestation for the Medicare EHR Incentive Program begins.
- * May 2011 – EHR Incentive Payments expected to begin.
- * July 3, 2011 – Last day for eligible hospitals to begin their 90-day reporting period to demonstrate meaningful use for the Medicare EHR Incentive Program.
- * September 30, 2011 – Last day of the federal fiscal year. Reporting year ends for eligible hospitals and CAHs.
- * October 1, 2011 – Last day for eligible professionals to begin their 90-day reporting period for calendar year 2011 for the Medicare EHR Incentive Program.
- * November 30, 2011 – Last day for eligible hospitals and critical access hospitals to register and attest to receive an Incentive Payment for Federal fiscal year (FY) 2011.
- * December 31, 2011 – Reporting year ends for eligible professionals.
- * February 29, 2012 – Last day for eligible professionals to register and attest to receive an Incentive Payment for calendar year (CY) 2011.



“ ”

from the field

“[The] extremely aggressive timeline in the American Recovery and Reinvestment Act (ARRA) of 2009 stimulus package places enormous pressure on healthcare practitioners and their organizations to rapidly implement EHRs, often forcing them to install technology without taking the time to tailor systems to organizational realities.... Such rapid implementations could lead to significant patient safety events.”²⁴

Dean Sitig, Memorial Hermann Health System informatics specialist, and Dr. David Classen, University of Utah in the *Journal of the American Medical Association*

The Journey



The EHR implementation process is lengthy and complicated and can last multiple years.


Chart 9: Sample EHR Implementation Process:



Discovery and Vendor Selection	Design of Workflows and Software Customization	Testing and Training	Deployment and Modifications
3-6 months	18-30 months		12+ months
<ul style="list-style-type: none"> • Articulate goals • Communicate with staff; gain physician buy-in • Model financials • Research systems • Interview vendors • Negotiate agreeable contract with vendor of choice • Potential waiting period between contract and implementation 	<ul style="list-style-type: none"> • Establish new workflows for all clinical departments by analyzing current processes and translating them into an electronic format • Customize system where necessary • Install and test system • Convert paper charts • Train staff • Inform patients 		<ul style="list-style-type: none"> • Troubleshoot problems and find solutions • Continue to customize system • Compare projected costs with actual costs • Update system and train staff on an ongoing basis

Source: Gagny, N. (2009). Healthcare Informatics. Link: http://www.healthcare-informatics.com/MEZ/infomat.asp?id_Article_Type=Blog&mod_View=TopicArticle.c?D636403914AD35826AD35D8F4780&id=7&L_AFF91F93E24939059D88EF770&L2

Children's EMR Vision Statement

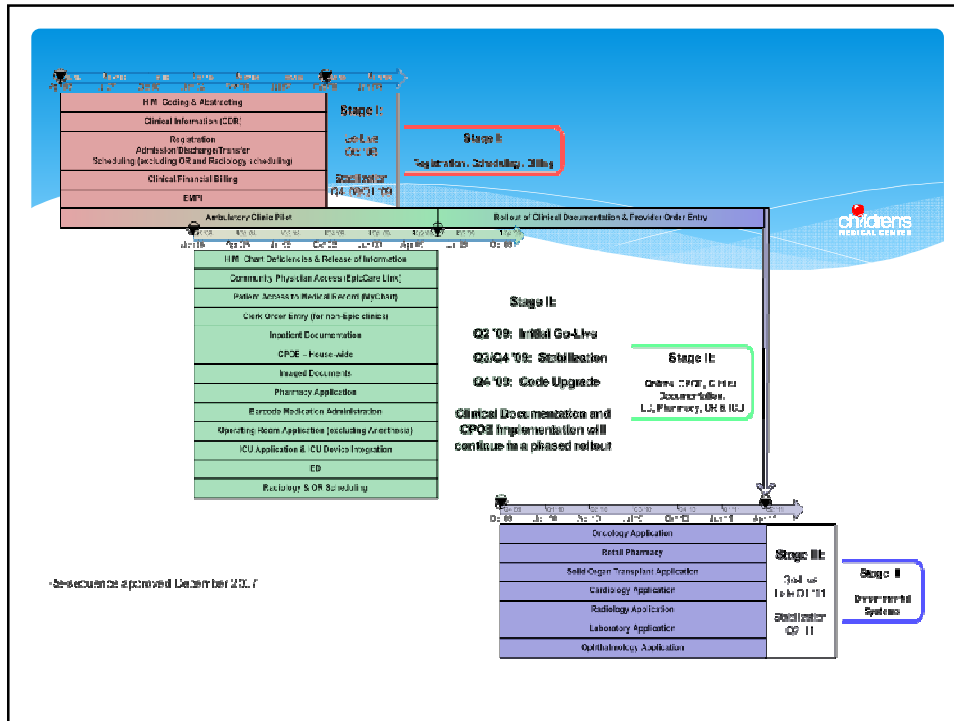


Our Electronic Medical Record (EMR) is patient-family centered with Quality, Safety and Accessibility at its core.

It supports anytime, anywhere:

- Our Children in both Wellness and Illness
- Clinicians in Care, Advocacy, Research, & Education
- Business Operations, both Financial and Legal

We accomplish this through a strategic relationship with a primary vendor, an organizational commitment to accuracy, efficiency, effectiveness and continuous improvement of processes and practices.



How much?

children's MEDICAL CENTER

- * CMS estimates that the total payments distributed to Medicare and Medicaid providers will be **between \$14 and \$27 billion over 10 years**, though total spending will depend on the number of providers that qualify

Calculation


(Overall EHR Amount) * (Medicaid Share)

Overall EHR Amount

* {Sum over 4 year of [(Base Amount Plus Discharge Related Amount Applicable for Each Year) * Transition Factor Applicable for Each Year]}

Medicaid Share


* {(Medicaid inpatient-bed-days + Medicaid managed care inpatient-bed-days) divided by [(total inpatient-bed days) times (estimated total charges minus charity care charges) divided by (estimated total charges)]}




Reimbursement

(Medicare EP)

Calendar Year	First CY for which the EP Receives an Incentive Payment				2015 and subsequent years
	2011	2012	2013	2014	
2011	\$18,000	---	---	---	---
2012	\$12,000	\$18,000	---	---	---
2013	\$8,000	\$12,000	\$15,000	---	---
2014	\$4,000	\$8,000	\$12,000	\$12,000	---
2015	\$2,000	\$4,000	\$8,000	\$8,000	\$0
2016	---	\$2,000	\$4,000	\$4,000	\$0
TOTAL	\$44,000	\$44,000	\$39,000	\$24,000	\$0



Reimbursement (Medicare EH)



Incentive Payment Calculation for Eligible Hospitals:

- Incentive Payment Amount equals [Initial Amount] x [Medicare Share] x [Transition Factor]
 - Initial Amount** equals \$2,000,000 + [\$200 per discharge for the 1,150th - 23,000th discharge]
 - Medicare Share equals $Medicare / (Total * Charges)$

Medicare equals [number of Acute Care Inpatient Bed Days for Beneficiaries Where Payment May be Made under Part A] plus [number of Acute Care Inpatient Bed Days for MA Beneficiaries]

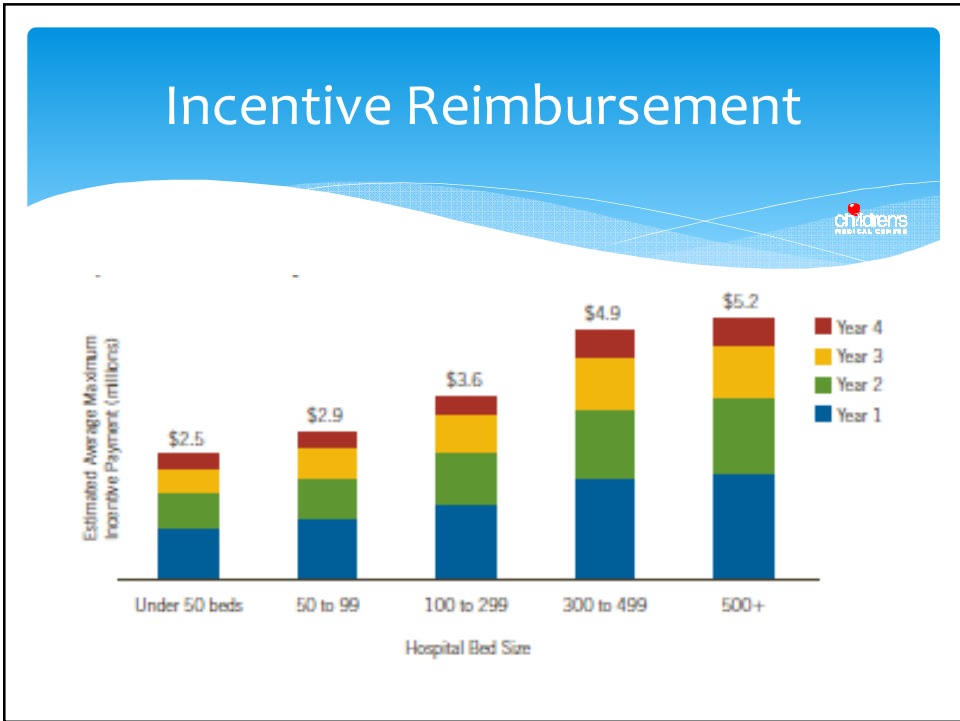
Total equals [number of Total Acute Care Inpatient Bed Days]


Charges equals [Total Charges minus Charges for Charity Care*] divided by [Total Charges]

*If data on charity care are not available, then the Secretary will use data on uncompensated care as a proxy. If the proxy data are also not available, then "Charges" will be equal to 1.

- Transition Factor**


Consecutive Payment Year	Transition Factor
1	1
2	¾
3	½
4	¼





“ ”
from the field

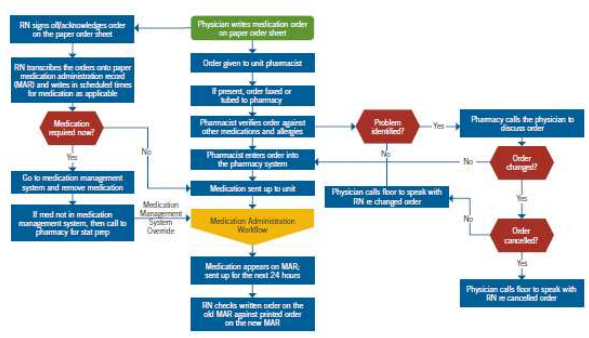
“The stimulus incentives to comply with the new requirements for purchasing, deploying, and maintaining interoperable EHRs do not come near to compensating the overall costs.”³³
PriceWaterhouseCoopers analysis, *Rock and a Hard Place*



Process Improvement

Hospital workflows are complex, multi-stage processes.

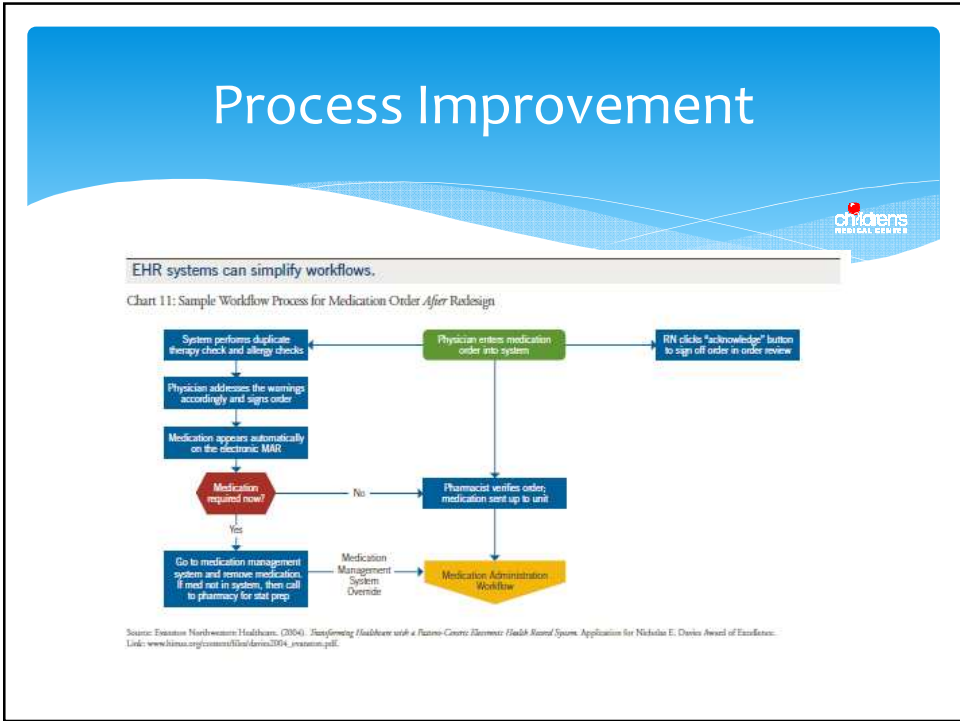
Chart 10: Sample Workflow Process for Medication Order *Reify* Redesign



```

    graph TD
      RN1[RN signs off/acknowledges order on the paper order sheet] --> RN2[RN transcribes the orders onto paper medication administration record (MAR) and signs in scheduled times for medication as applicable]
      RN2 --> RN3{Medication request now?}
      RN3 -- No --> RN4[Go to medication management system and remove medication]
      RN3 -- Yes --> RN5[If not met in medication management system, then call to pharmacy for that prep]
      RN5 --> Pharmacist[Pharmacist writes order against other medications and allergies]
      Pharmacist --> Pharmacist2[Pharmacist enters order into the pharmacy system]
      Pharmacist2 --> Pharmacist3[Medication sent up to unit]
      Pharmacist3 --> RN6[Medication Administration Workflow]
      RN6 --> RN7[Medication appears on MAR, sent up for the next 24 hours]
      RN7 --> RN8[RN checks written order on the old MAR against printed order on the new MAR]
      RN8 --> RN9[Physician writes medication order on paper order sheet]
      RN9 --> Pharmacist4[Order given to unit pharmacist]
      Pharmacist4 --> Pharmacist5{Problem identified?}
      Pharmacist5 -- No --> Pharmacist6[Physician calls floor to speak with RN re changed order]
      Pharmacist5 -- Yes --> Pharmacist7[Pharmacy calls the physician to discuss order]
      Pharmacist7 --> Pharmacist8{Order changed?}
      Pharmacist8 -- No --> Pharmacist9[Order cancelled?]
      Pharmacist8 -- Yes --> Pharmacist10[Physician calls floor to speak with RN re cancelled order]
  
```

Source: Evenson, Northrup, & Haskins, (2010). *Transforming Healthcare with a Patient-Centric Ecosystem/Health Record System: Application for Nicholas E. DeWitt Award of Excellence*.
Link: www.hims.org/summit/Healthcare2010/summit.pdf



Process Improvement (Pharmacy)

BEFORE	AFTER
<ul style="list-style-type: none"> * Medications delivered to units every 8 hours (cart fills) * Significant waste of expensive pharmaceutical products if patients are discharged before receiving meds or medical condition changes 	<ul style="list-style-type: none"> * Medications delivered to units every 2 hours * CPOE allows instant updating of required meds and supplies

Process Improvement

Post Intervention Waste

Pre intervention Waste

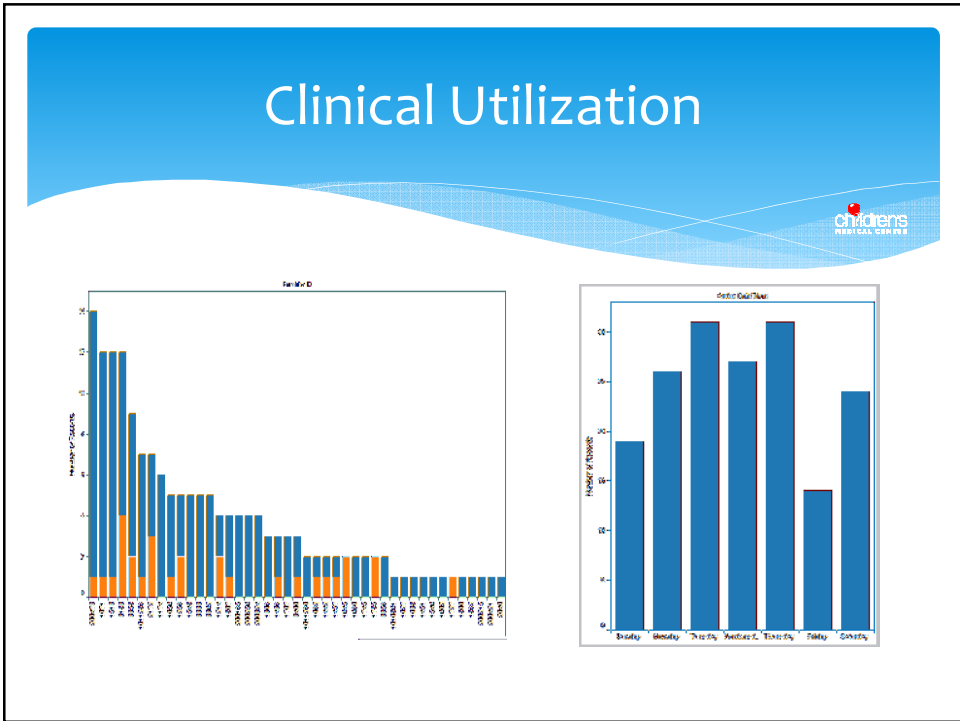
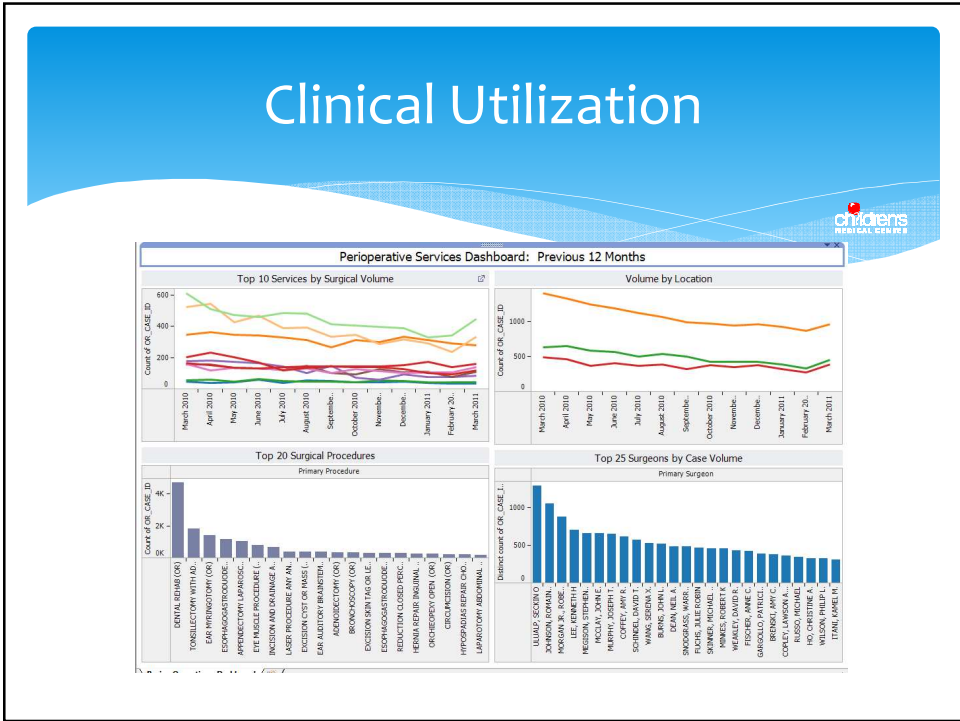


Data Intelligence



edison

Intelligence. Data. In. Action.



ACO



- * “In order for an organization of physicians to be able to do the things an ACO must do – clinical quality measures, advanced decision support, implementation of Business Intelligence systems to determine where to appropriate resources in a non-wasteful way – clearly, a modern EHR system is needed. An ACO can’t function without an electronic platform of clinical data.”

Sebelius, 2011

Guiding principals



