

The Electronic Health Record: Is there a Return on Investment?



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Why We're Here / Food for Thought

Why we're here?

- Is it that there is not an ROI, or we do not have a culture in healthcare to support identifying it
- Is there a litmus test to determine if your culture will support a robust evaluation of ROI?
- If you believe there is a ROI is it just that the methods to get at it are unclear?
- Do you have the aptitude to reduce FTEs?

Food for thought

- Return On Investment from EMRs - Overview
- Hard vs. Soft ROI
- Enablers of ROI
- Case Examples
- Challenges Ahead
- Sentara Experience

Overview

Types of ROI measured by hospitals and physician practices (ambulatory setting) include:

Hard ROI

- Measurable financial benefits
 - Positive revenue impact
 - Cost savings impact



Soft ROI

- Qualitative benefits
- Process improvements

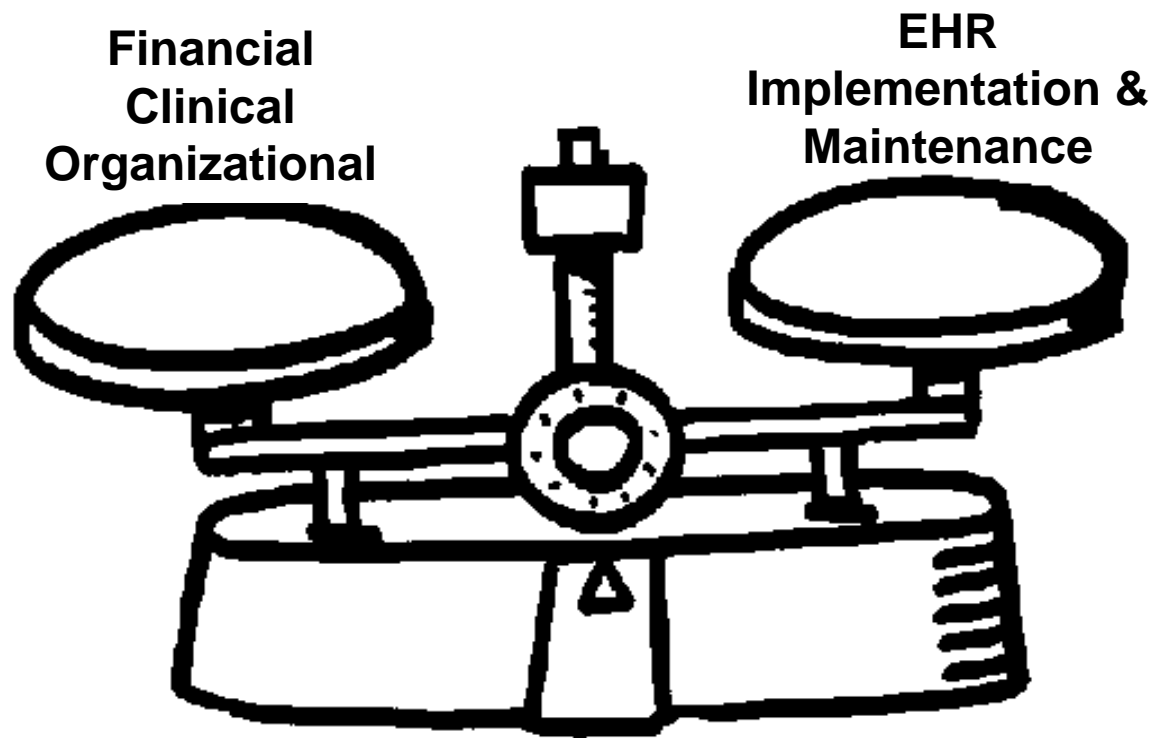


Initial Costs

- **The predictable costs:**
 - Hospitals should expect to spend 1-3 percent of their usual operating budget on EHR implementation.
 - Approximately \$14,500 per bed for implementation
 - Approximately \$2700 per bed per year for maintenance.
 - Physician office's cost for EHR implementation range from \$25,000 - \$45,000 per physician.
 - Approximately \$3000- 9000 per physician per year for maintenance.
- **Unpredictable costs:**
 - Initial loss of productivity during implementation



Do the Benefits Outweigh the Costs?



CLINICAL



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Soft ROI

Improvements that impact patient care and operations positively

Qualitative benefits

- Elimination of illegible orders
- Remote physician and patient access to medical records
- Use of evidence-based guidelines improving care consistency



Process improvements

- Reduced duplicate lab tests
- Reductions in medication order cycle time
- Staff reductions due to increased efficiency
 - Health information management
 - Quality outcomes data abstraction



Patient Care

- Lists of allergies and home medications can be shared among providers.
- Single EHR allows multiple providers to view a patient's chart without waiting.
- Quicker shift reports and ease of documentation allows nurses to devote more time to patient care.
- Elimination of handwritten MAR.
 - Decreases errors
- Personalized care
 - Education and instructions
- Improved compliance
 - DNRs
 - Advanced Directives
 - Restraints



Patient Safety

- Prevention of Medicare Never Events
 - EHR calculates the Braden Skin Scale automatically alerting the staff to turn the patient preventing pressure ulcers.
 - Alerts staff to ambulate patients at risk for a DVT.
- Electronic MAR
 - Reduces late or missed medication doses
- Clinical decision support
 - Reduction in number of lab and radiology tests
 - Decreases adverse drug events (ADEs) due to allergic reactions
- Alerts
 - Immediately notifies physicians of critical results and requires that they acknowledge receiving them.
 - Notifies nursing staff of new orders.
- CPOE
 - Reduces time from order entry to administration of medication

FINANCIAL



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Hard ROI

Bottom Line Impact: financial performance improvement resulting in increased revenues and or cost savings

Positive revenue impact

- Decreased claims denial rates
- Improved charge capture and coding

Cost savings impact

- Reduced litigation expenses
- Less uncompensated care resulting from medical errors
- Reduction in management of paper medical records



Medicare and Medicaid Incentives

- Medicare Incentives
 - Eligible Professionals can receive up to \$44,000 over five years
 - Eligible Hospitals may receive incentives starting at a base of \$2 million.
- Medicaid Incentives
 - Eligible Professionals may receive up to \$63,750 over six years.
 - Eligible Professionals may also receive up to 85% of technology costs of EHR.
 - Eligible Hospitals may receive incentives starting at a base of \$2 million.

Revenue

- Charge capture
 - EHR allows charges to be directly linked to orders reducing missed billing opportunities.
 - Eliminate 3rd party billing
 - More accurate coding
 - Claims filed immediately
 - Increases collection rates
 - Eliminates denials because of coding errors
 - Items used during procedures appropriately charged
- Transcription Costs
 - Eliminate transcription completely
 - Dictated notes are also more accessible with EHR
 - Reduces time used for searching for notes in a paper chart
 - Savings range from 50-100% of original costs
- Resources
 - Pre-printed forms
 - Usually 50-70% reduction
 - Scheduling system
 - Staff overtime

Malpractice Insurance

- Causes of higher malpractice premiums
 - Lack of documentation
 - EHR enables complete, legible and accountable documentation
 - Incomplete medical records and unreported lab and test results
 - EHR eliminates important items slipping through.
 - It tracks procedures and tests from the initial order until all appropriate actions have been taken.
 - Approved templates ensure all necessary items are addressed.
 - Delay or neglecting to order tests
 - Decision support tools ensure that physicians follow certain guidelines for procedures and diagnoses.
- Case Study: Maimonides Medical Center, New York
 - 8% of malpractice lawsuits were obstetric
 - Represent 37% of total malpractice payouts
 - Average payout was \$919,254
 - No successful OB/GYN malpractice claim for the first three years after EHR implementation.
 - Reduced malpractice premiums = Savings of \$1.75 million

ORGANIZATIONAL



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“A Paperless World”

- Elimination of paper charts
 - Average of \$2-3 per new chart
 - Reclaim space formerly used for storage of charts.
 - Staff hours can be devoted elsewhere instead of:
 - Copying and faxing records
 - Pulling and filing charts
 - Chart pull is \$5/ pull = \$6000/ year/ physician
 - Chart prep
 - An ambulatory facility that performs approximately 32,000 procedure per year reported a savings of \$26,000 in printing and paper costs.



Productivity

- Eventual increased productivity (Survey by CDW)
 - Approximately 15% increase
 - Additional \$150,000 per year
 - Ability to see more patients
 - Ability to leave office early
- Streamlined Workflow
 - Decrease the number of phone calls between physicians
 - Reduce pharmacy callbacks to physicians due to illegible, incomplete or contraindicated prescriptions.
 - Time needed to process prescription refills decreases from 15 min to 3 min.
 - Exposure of unnecessary processes in the workflow.
 - More time to see patients
 - Reduction in staff or realignment of duties
 - Removes handwritten processes (i.e. MAR, ordering labs)
 - Eliminates chart chasing and results tracking



Enablers

Regulatory

- CMS Meaningful Use incentives
- Pay for performance

“ Given that the returns of health IT to the providers who invest in such systems are less than the returns to society as a whole, ... the federal government’s intervention is necessary to raise the rate of the technology’s adoption ...”
Dr. Peter Orszag, CBO Director 7/24/08

Technology Growth

- Health information exchange
- Secured patient messaging
- ePrescribing
- Computerized Physician Order Entry



Cultural Transformation

- Workflow standardization



CASE EXAMPLES



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Financial Improvement- Allina

2007 HIMSS Davies Organizational Award Winner

Improvements realized from 12/05 to 11/06

- A/R days – 21% improvement
- Claims denied – 27% improvement
- # wrong insurance claims – 50% improvement
- Eligibility determination – 25% improvement
- 29% reduction in drug utilization costs

Anticipated Annual Revenue Cycle Benefits	
Hospital	Benefit Amount
Accounts Receivable	\$2,432,014
Denials	\$15,491,938
Data Quality	\$7,756,882
Net Revenue	\$5,117,693
FTEs	\$768,768
Total Hospital Savings	\$31,537,295
Clinic	Benefit Amount
Accounts Receivable	\$512,296
Denials	\$2,597,330
Medical Records	\$1,476,743
Data Quality	\$83,746
Net Revenue	\$143,973
FTEs	\$242,112
Total Clinic Savings	\$5,056,200
Total Revenue Cycle Savings	\$36,623,495

**Anticipated TOTAL Annual Clinical / Revenue Cycle Benefits:
\$65,541,319**

Financial and Process Benefits

2008 Davies Organizational Award Winner- Eastern Main Medical Center (EMMC)

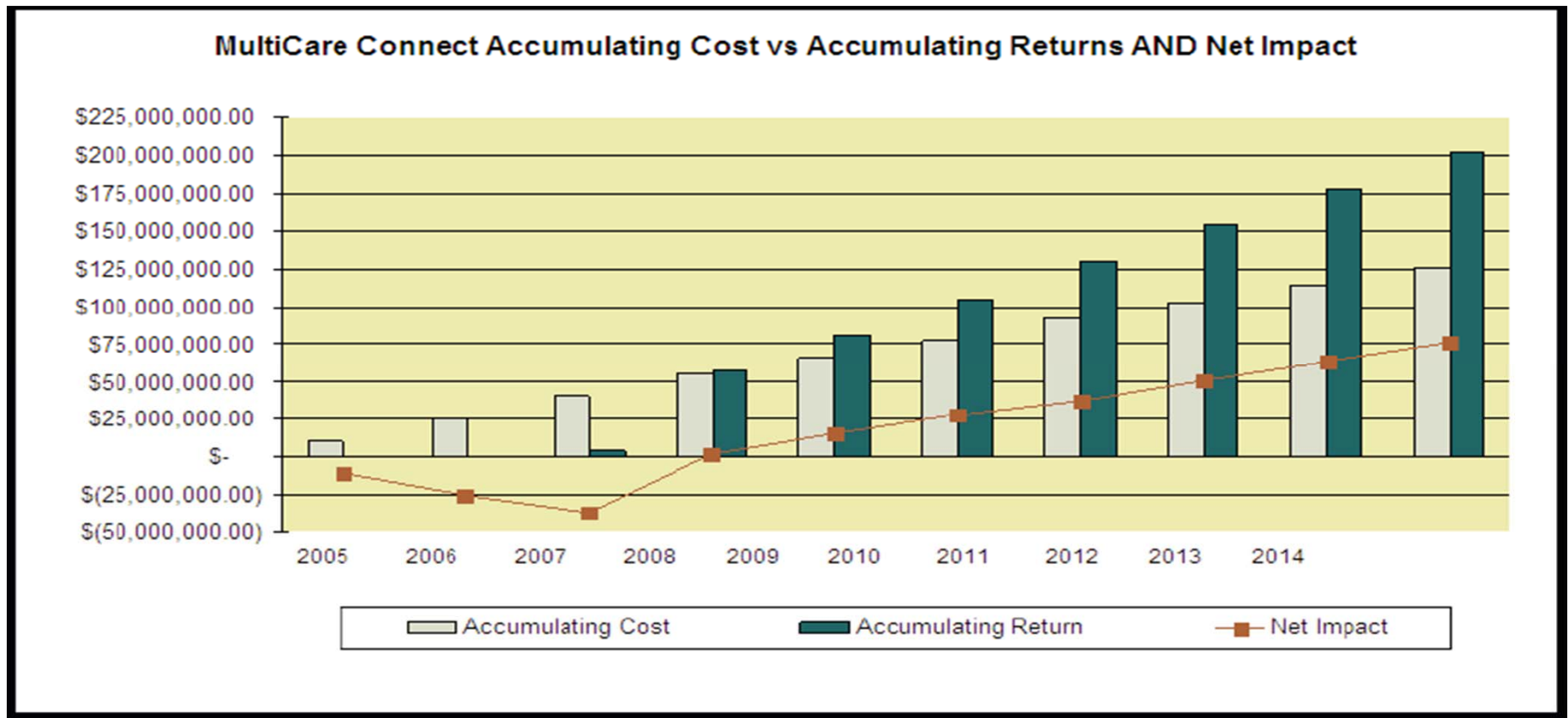
- Used data extractions to participate in Anthem Quality Payment Incentive program. Approximate benefit of **\$250,000 annually**
- Approximate 50% reduction in time to abstract data through electronic means vs. manual paper chart review
- Increased inpatient admissions by 9 %, outpatient visits by 5%, and average LOS declined from 5.48 to 5.16 over last 2 years



Participated in ONC-HIT pilot program for “e-visits” and having patient communication via email which yielded approximate benefit of \$280,000 annually

MultiCare Connect- ROI

2009 Davies Award Winner- Four hospital system in Tacoma, WA- Projected break-even in 2012 based on ROI

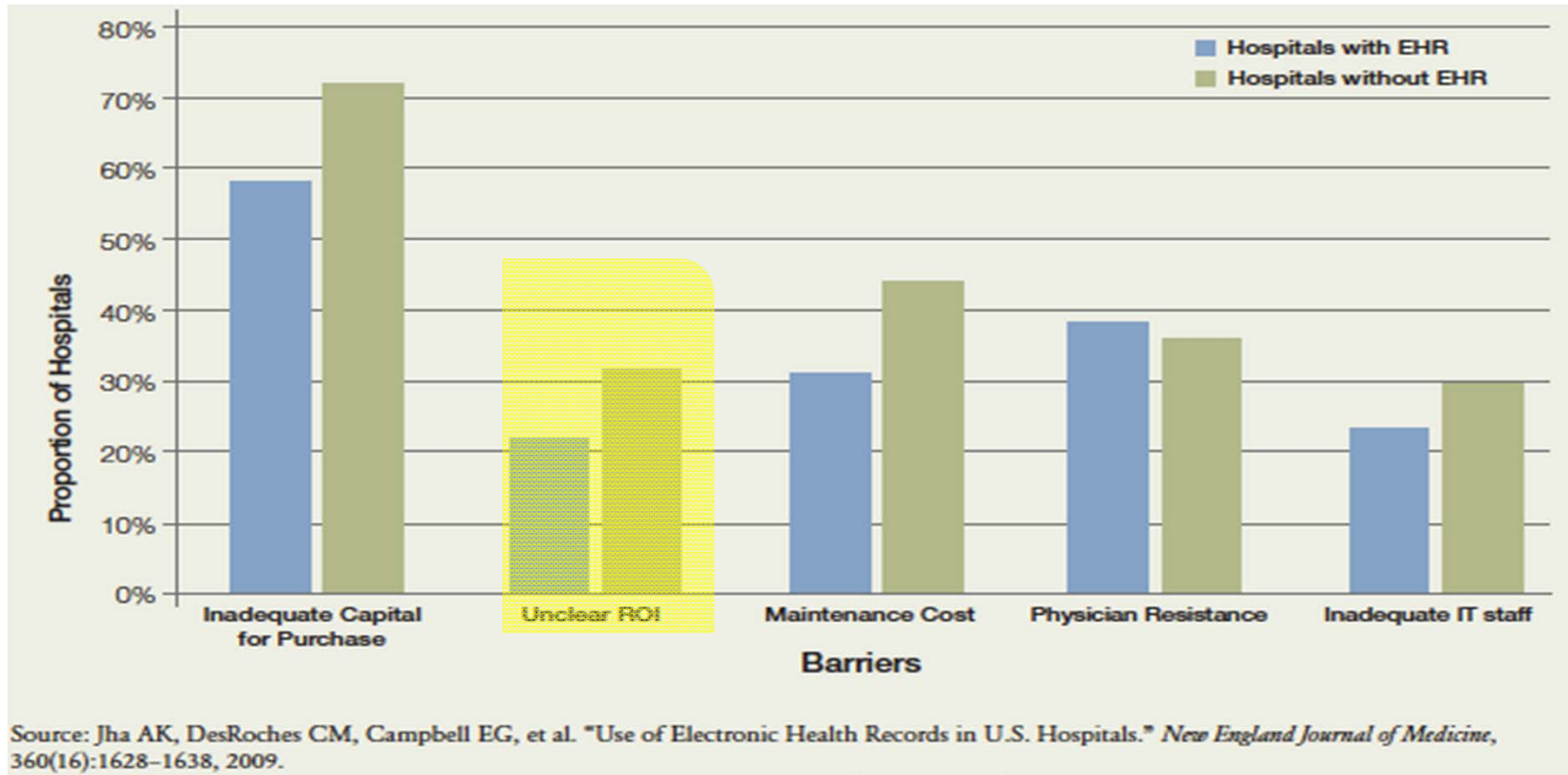


CHALLENGES AHEAD



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Unclear ROI- Barrier to EHR Adoption



Clarifying the ROI for executives is one of the challenges faced in accelerating adoption

The Road to Improve ROI

Achieving successful activation of enablers

Strong funding strategies to absorb implementation costs

“Funding is the barrier to HIT adoption and implementation most commonly cited not only by providers and hospitals, but also by state governments...”

2009 RFWJ Report. Stephanie Bristol, B.S. October 2009

Strong leadership and implementation strategies

“...projections of large cost savings assume levels of health IT adoption and interoperability that we are nowhere near achieving, and therefore realizing the projected benefits will require proper alignment of the health care financing system, strong leadership, effective implementation strategies, and focused efforts to successfully adapt the EHR system.”

Goldzweig, MD, et. al. Health Affairs. January 2009

Need for standardization in ROI evaluation of EMR implementations



Conclusion

Davies Award winning organizations provide great examples of Hard and Soft ROI

Other stakeholders are producing positive financial benefits and improved quality of patient care

While we are making progress, work remains to clarify this important issue for today's CIOs and the health care community



THE SENTARA EXPERIENCE



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Sentara and Epic

- Sentara's Care Transformation: eCare[®]
- eCare[®] ... What is it?
 - Epic Implementation
 - A shared medical record for patients across the continuum of care
 - Opportunity for Process Redesign
 - Re-evaluate and optimize 18 major processes
- ***“eCare[®] is bigger than Epic”***



Project Overview

Timelines:

- Sep 2005: Epic contract signed
- Nov 2005 – April 2006: Process redesigns
- May 2006 – June 2007: Design, Build, Validate
- 2007: Hospital EDs & 4 MD Offices implemented
- 2008: 3 Hospitals & 36 MD offices implemented
- 2009: 3 Hospitals & 57 MD offices implemented
- 2010: 1 Hospital & 18 MD offices implemented
- 2011: 2 Hospitals & 1st community practice implemented

Total Cost of Ownership 10 Year Overview

Capital		\$ 67 M
Operating Expenses		\$ 170 M
Hardware Maintenance	\$ 15 M	
Software Maintenance	\$ 50 M	
Disaster Recovery	\$ 3 M	
Work Redesign	\$ 36 M	
Training	\$ 16 M	
Implementation	\$ 22 M	
Ongoing Support	\$ 22 M	
Other Non-Salary Support	\$ 6 M	
Total Cost of Ownership over 10 years		\$ 237 M

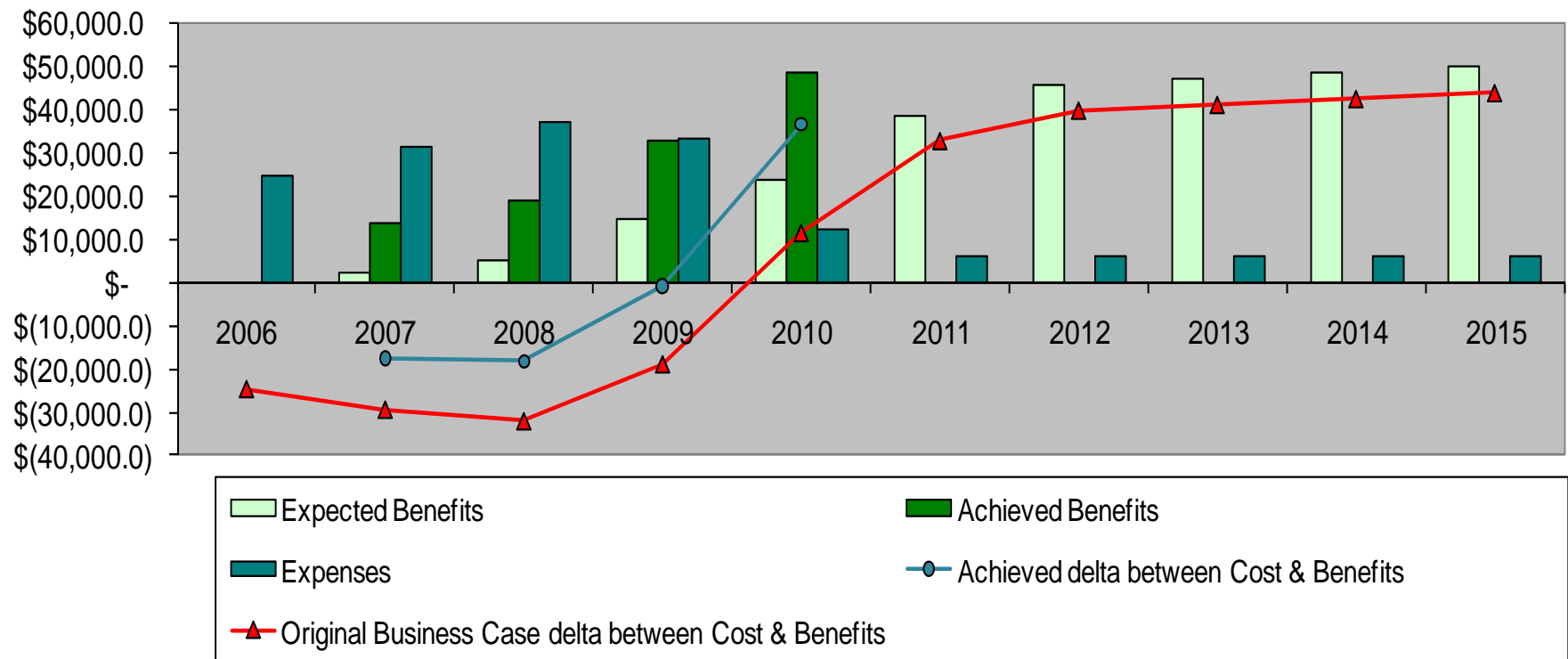
Annual Expected Business Case Benefits

Hospitals Total	\$30.0 M
Improved Nursing Efficiency	\$ 4.9 M
Reduced IT Maintenance	\$ 3.6 M
Reduced Medical Records/Transcription	\$ 3.6 M
Increased Outpatient Services	\$ 4.8 M
Reduced Length of Stay	\$ 3.8 M
Improved Pharmacy Process/ADEs	\$ 3.0 M
Reduced Paper/Storage	\$ 2.7 M
Other Improvements	\$ 3.6 M
Home Health Total	\$ 1.8 M
System Health Plan Total	\$ 2.3 M*
System Healthcare Total	\$ 35.5 M**

* 62% of health plan benefits will be passed on to employers

** Excludes \$2.7 M in physician practice benefits which will accrue to physicians

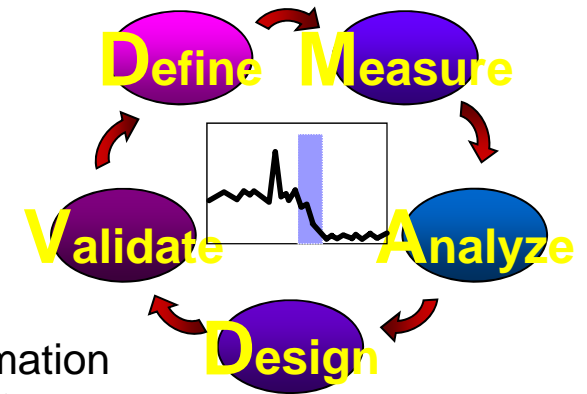
eCare[®] Costs and Benefits by Year



eCare[®] Process Innovations

- Redesigned 18 major processes covering entire continuum of care
- Lean Six Sigma Methodology

- | | |
|----------------------------|----------------------------------|
| 1. Arrival Management | 10. MD Processes |
| 2. Bed Management | 11. Medical Records |
| 3. Case Management | 12. Meds Management |
| 4. Charge Capture | 13. Monitoring/ Recording |
| 5. Claims Processing | 14. Order Sets |
| 6. Clinical Communications | 15. Patient Care Transformation |
| 7. Disease Management | 16. Patient/ Member Satisfaction |
| 8. Emergency Department | 17. Physician Practice |
| 9. Home Health | 18. Scheduling |



- Complementary Technology: Bar-coding; Document Management; Device Integration

System 2010 ROI Scorecard

Q4 YTD 2010 eCare Benefits Achieved									
Unfavorable to 2006 Baseline			Red						
Favorable to 2006 Baseline			Yellow						
Favorable to 2010 Expected Benefits			Green						
Benefit Achieved 2010 YTD									
#	eCare Hospital Benefit	Process Owner	SLH	SVBGH	SBH	SNGH	SCH	SWRMC	Total
1-3	Streamline Record Completion	MS	\$258,452	\$319,031	\$175,813	\$602,364	\$311,382	\$181,209	\$1,848,252
4	Reduce Transcription Costs	MS	\$509,764	\$685,590	\$255,614	\$746,226	\$413,412	\$205,064	\$2,815,670
5	Streamline Coding Process	MS	\$72,302	\$53,680	\$93,381	\$128,615	\$60,995	\$25,715	\$434,688
6	Streamline HIS Management	MS	\$30,169	\$28,912	\$23,913	\$58,295	\$0	\$51,070	\$192,359
7	Reduce Risk Mgmt Claims & Uninsured Losses	FS	\$41,667	\$41,667	\$41,667	\$41,667	\$41,667	\$41,667	\$250,000
8,21	Reduce Length of Stay and/ or Reduce ADEs	GY/ TJ	\$2,230,949	\$2,177,040	\$49,879	\$4,334,703	\$2,790,701	\$1,504,885	\$13,088,159
9	Reduce Paper Related Supply Costs	MS	\$248,712	\$395,018	\$56,907	\$615,842	\$373,586	\$120,913	\$1,810,979
10,11	Increase Unit Efficiency/Retention of RN's	LK	\$294,334	\$378,240	\$355,087	\$3,172,134	\$4,371,045	\$452,079	\$9,022,918
13	Improve Charge Capture	AW	\$554,909	\$679,318	-\$122,562	\$788,164	-\$413,055	\$604,124	\$2,090,898
20	Increase Outpatient Procedures	AW/ KH	\$912,653	\$1,128,673	\$563,048	\$1,826,189	\$826,990	\$431,033	\$5,688,586
22	Reduce Pharmacist Order Entry	TJ	\$58,752	\$71,353	\$24,354	\$106,417	\$37,012	\$16,996	\$314,884
	Cumulative Hospital Benefits		\$5,212,662	\$5,958,520	\$1,517,102	\$12,420,617	\$8,813,736	\$3,634,757	\$37,557,392
#	Other eCare Benefits	Process Owner	Q1	Q2	Q3	Q4			YTD
*	SHP realized benefits	AP	\$765,701	\$765,701	\$765,701	\$765,701			\$3,062,802
*	SE realized benefits	RD	\$191,958	\$243,956	\$420,841	\$579,623			\$1,436,377
*	Reduce IT maintenance expense	BR	\$933,124	\$933,124	\$933,124	\$933,124			\$3,732,497
*	Total Additional e-Care Benefits								\$2,764,823
	Total 2010 eCare Benefits Achieved								\$48,553,891

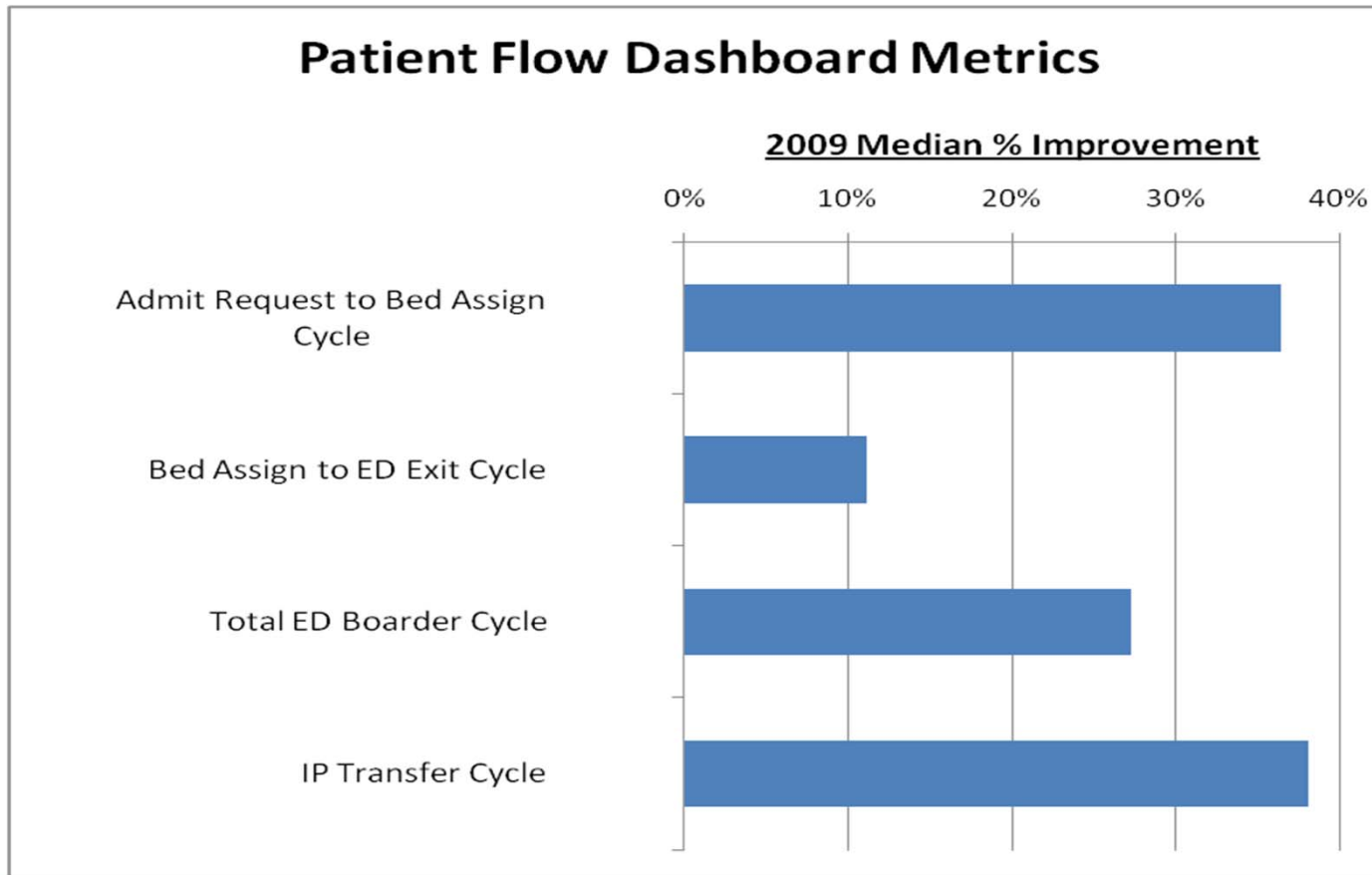
Cumulative ROI Business Case Benefits

\$29.3 M Budgeted for 2010; \$48.5 M Achieved

eCare® Benefit Category	Benefit (Millions)*
- Reduce Length of Stay/ Reduced ADEs	\$13.1
- Increase Outpatient Procedures	\$5.7
- Increase Unit Efficiency/Retention of RNs	\$9.0
- Reduce Transcription Expense	\$2.8
- Reduce Med Records Supply Costs	\$1.8
- Reduce Medical Records Positions	\$2.5
- Reduced Optima (health plan) costs	\$3.1
- Improve Charge Capture	\$2.1
- Reduced 63 Administrative Positions	\$2.7
- Reduced other costs	<u>\$5.7</u>
Total	\$48.5

*2010 for 6 Hospitals, Home Health and Healthplan

Select Throughput Improvements 2009 versus 2008 Patient Flow Performance

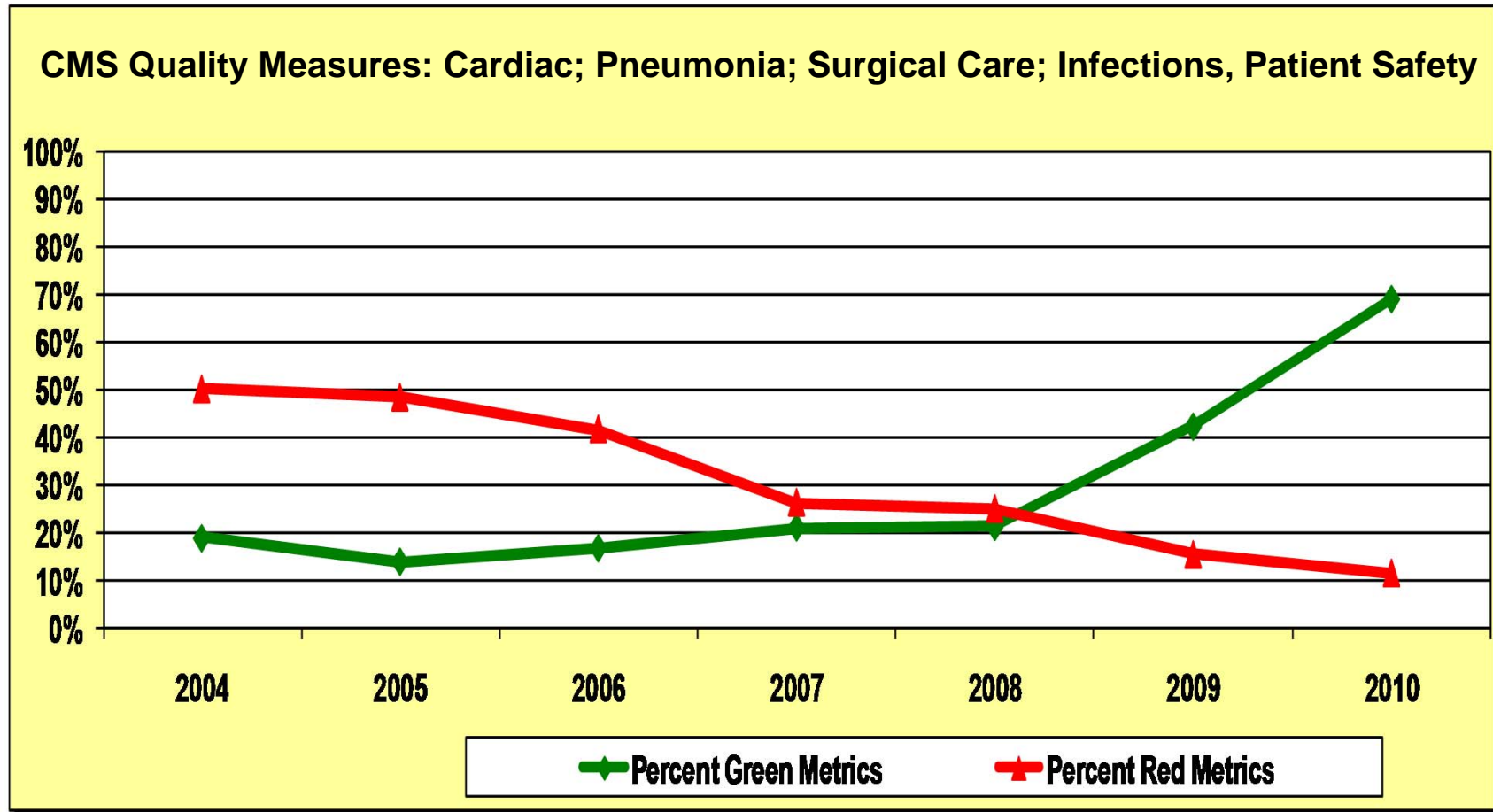


Post eCare[®] Nursing Unit Study

- Consultants conducted time/motion studies pre & post go-live:
 - Measure direct versus indirect patient care activities
 - Assess impact of implementing a Stage 7 EMR with computerized physician order management (CPOM), Barcoding & Scanning
 - Identify work flow changes and/or other opportunities for enhancement
- Four units selected at tertiary care facility
 - Surgical, Med Surg/Stepdown, Medicine, Cardiac
- Collected over 31,000 data points
 - All skill mix roles; 24/7
 - Included “in room” activities to capture work moved to the bedside

	Pre-EMR	Post-EMR
Direct Patient Care	42.1%	51.4%

Red Light Green Light: Percent Green vs. Percent Red



Pre and Post eCare[®] Medications Management Improvements

- Avoided 117,400 potential medication errors due to medications barcoding
- Reduced meds administration time

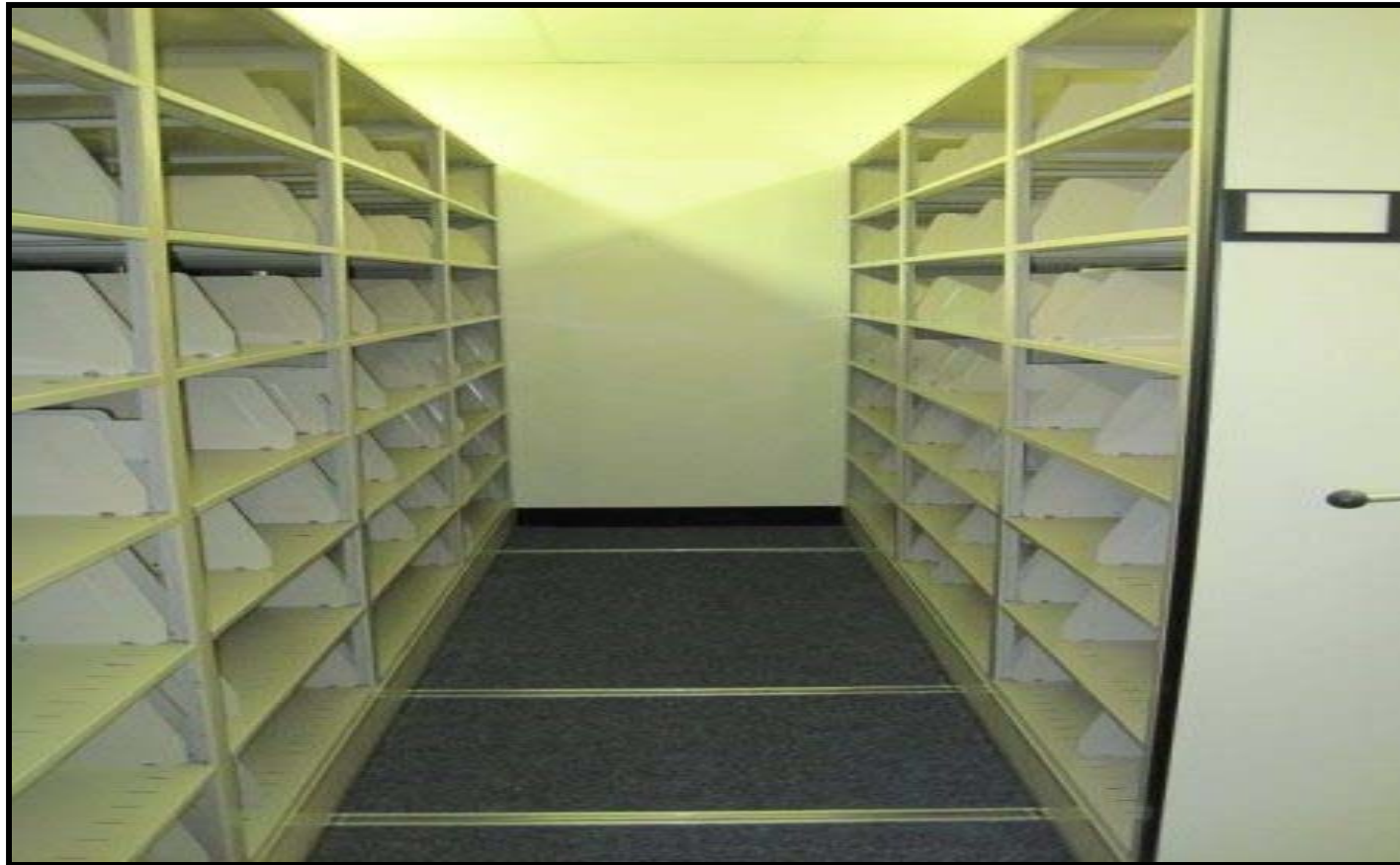
	Baseline	Post-eCare
Average time from order written to order available to act on	59.0 minutes	4.5 minutes
Average time from order written to med administration (NOW orders)	132.0 minutes	38.4 minutes

Pre-Epic SNGH Medical Records Department



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Post-Epic SNGH Medical Records Department



Sentara eCare[®]

- **eCare[®] Today**

- EMR at 7 Sentara hospitals, 8th hospital go-live October 2011
 - 87% CPOE (Computerized Physician Order Entry)
 - Realized benefits (\$48.5M) exceed plan (\$35.5M)
 - 115 SMG locations
 - 65,000 MyChart patients (patient portal)

HIMSS Davies Award
NICHOLAS E. DAVIES Awarding IT: Improving Healthcare

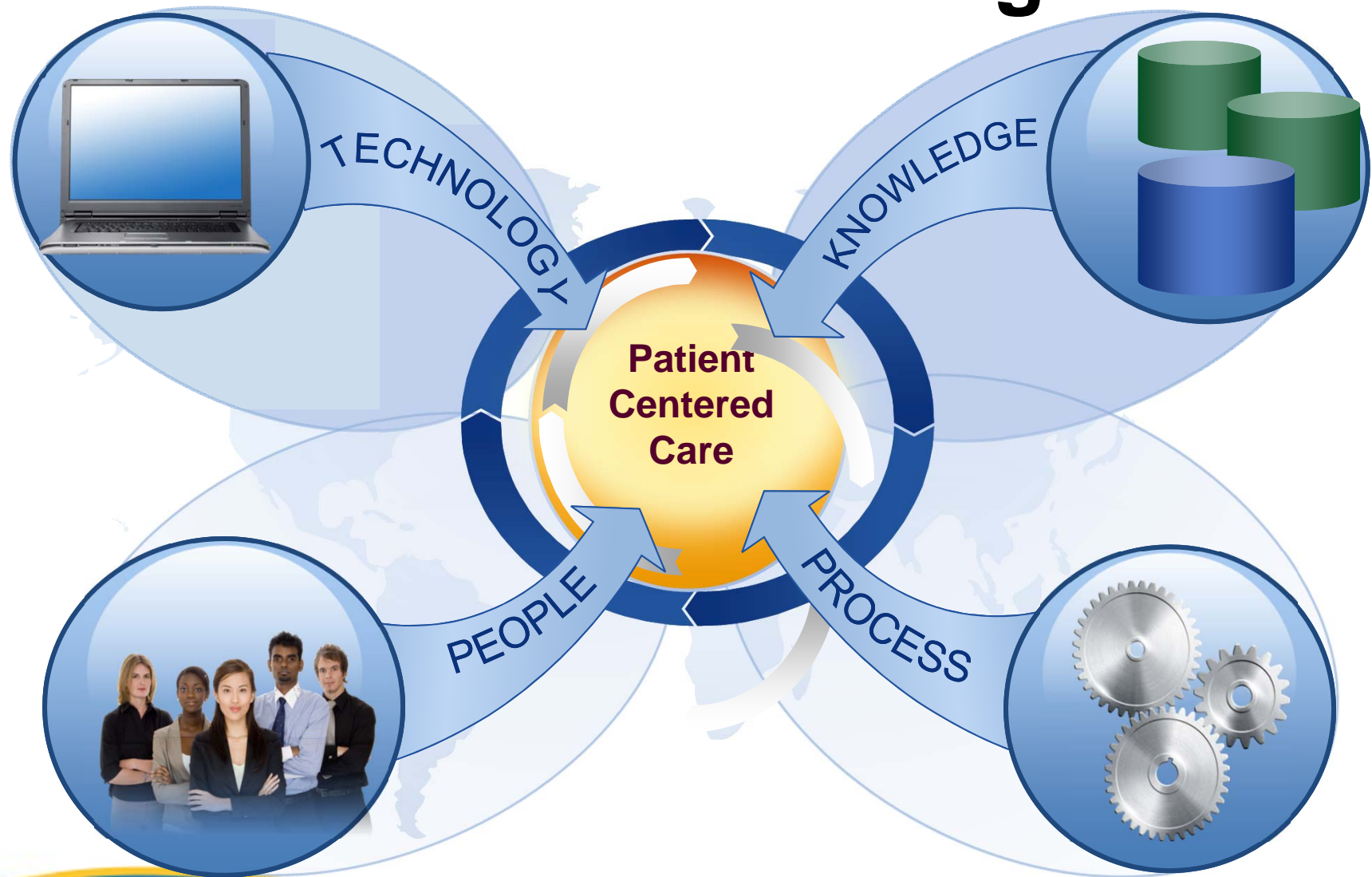


Lessons Learned

What Sentara did to achieve \$48.5 M ROI

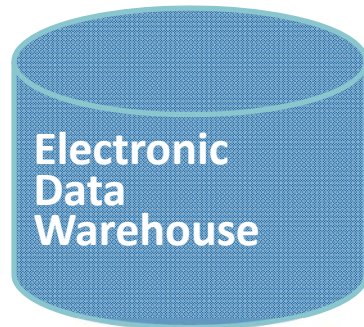
- Practically paperless
- Medications barcoding and device integration
- Process Redesign before, during and after DBV
- DBV across inpatient and ambulatory
- Optimization teams deployed to help realize benefits
- Process owners engaged and accountable
- Progress measured monthly
- Embed benefits in goals and budgets

Welcome to the Starting Line



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Informatics – Knowledge Management



Dash Board Key Performance Indicator (KPI)

Daily Census by Bed Type, Surgery, MRI, CT Counts, Financials, ED Wait Times, Flu Tracking, Glucose, Central Lines, Patients in LOS Ques, Long Stays, Bed Availability, Executive Reports

Improved Outcomes

Lower Costs

Better Quality

Improved Satisfaction

In Development

Pattern Recognition

Predictive Modeling

Continuous Improvement Loop

Concurrent Clinical Decision Support

Tools – Smart Alerts

Escalation (notification/engagement of others when process is “off track”)

Questions / Discussion



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Thank you for your time

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