

# Greater Chicago Chapter of HIMSS and the First Illinois Chapter of HFMA

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Executive Vice President HIMSS*

**April 6, 2011**





## Definitions and Agenda

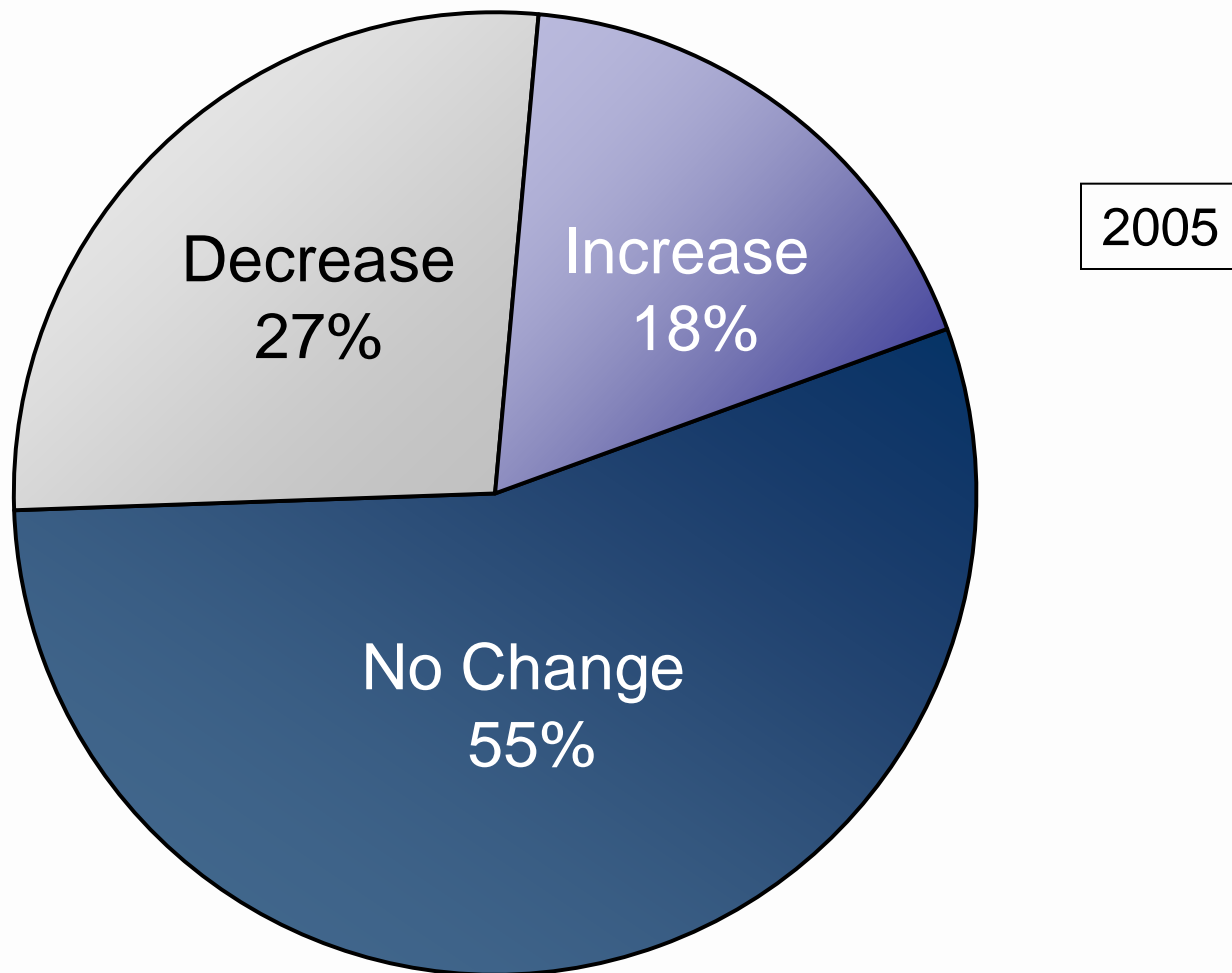
- **Market trends** – supported by data that shows true market movement toward or away from a certain technology or application.
- **Market glimmers** – supported by anecdotal data, market noise and industry hype

### Agenda:

- **Trends** – IT Budgets, PACS, Bar Coding, EMRs, CPOE
- **Glimmers** – RFID, Interoperability Standards, Deriving ROI from Clinical Systems, Digital Hospitals, Stark Relaxation, Benchmarking IT in Healthcare

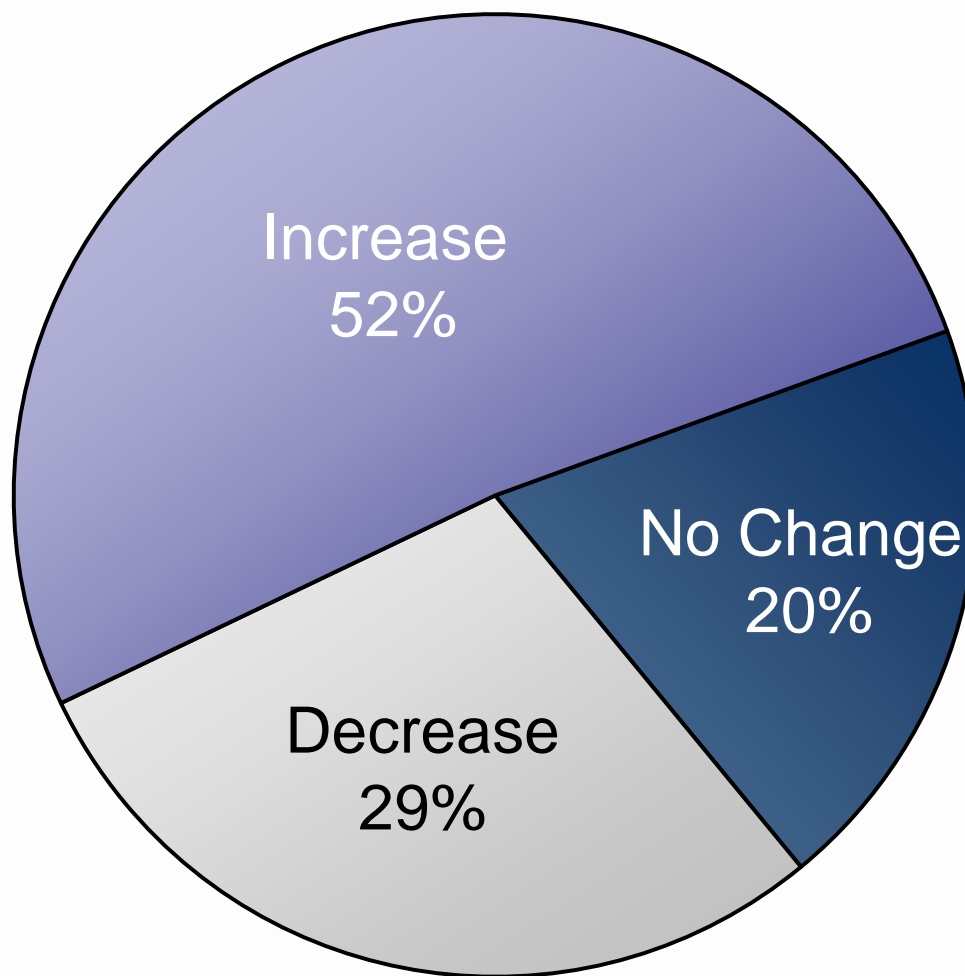


## Trends: IT Budgets are moving up



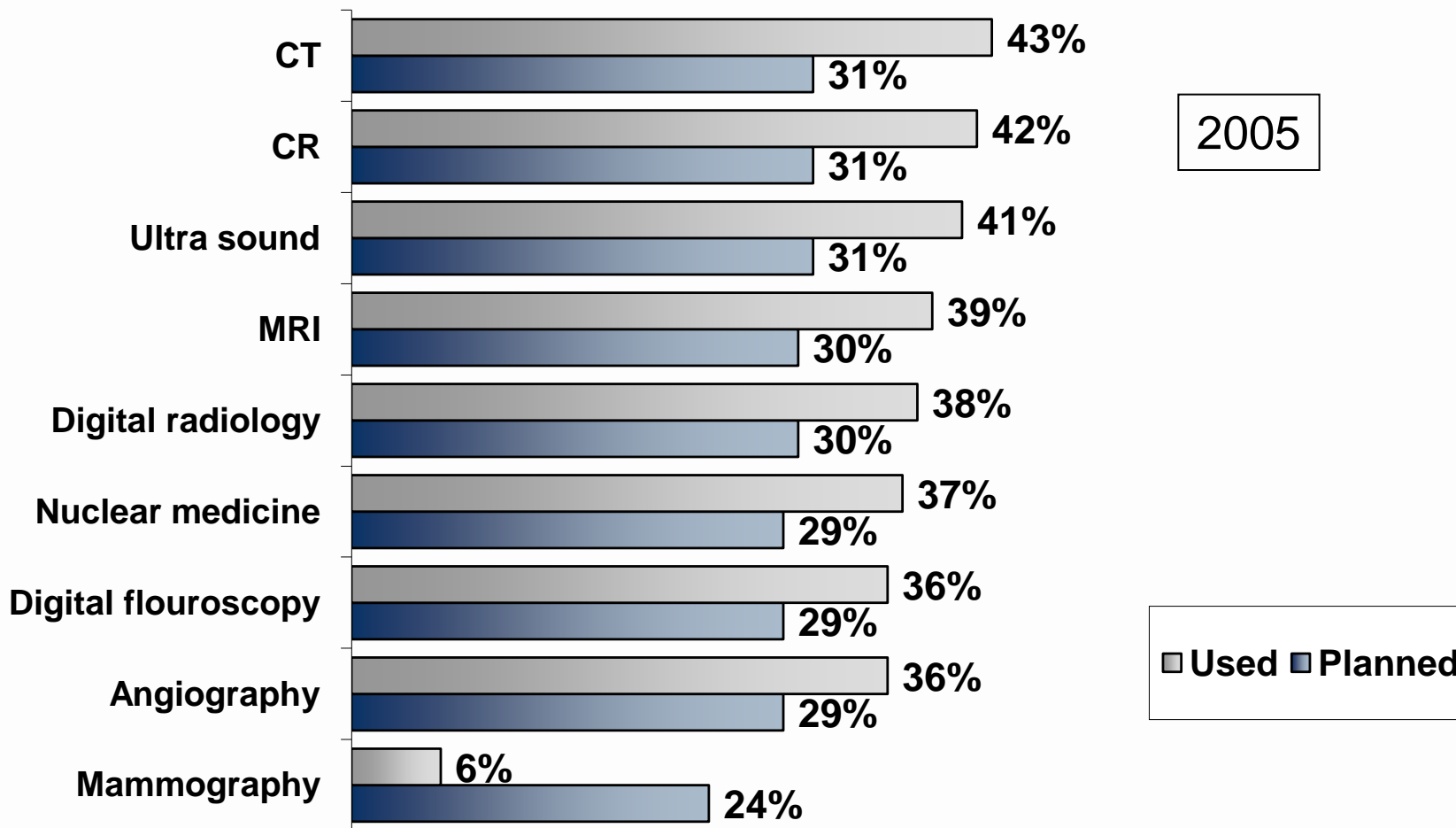


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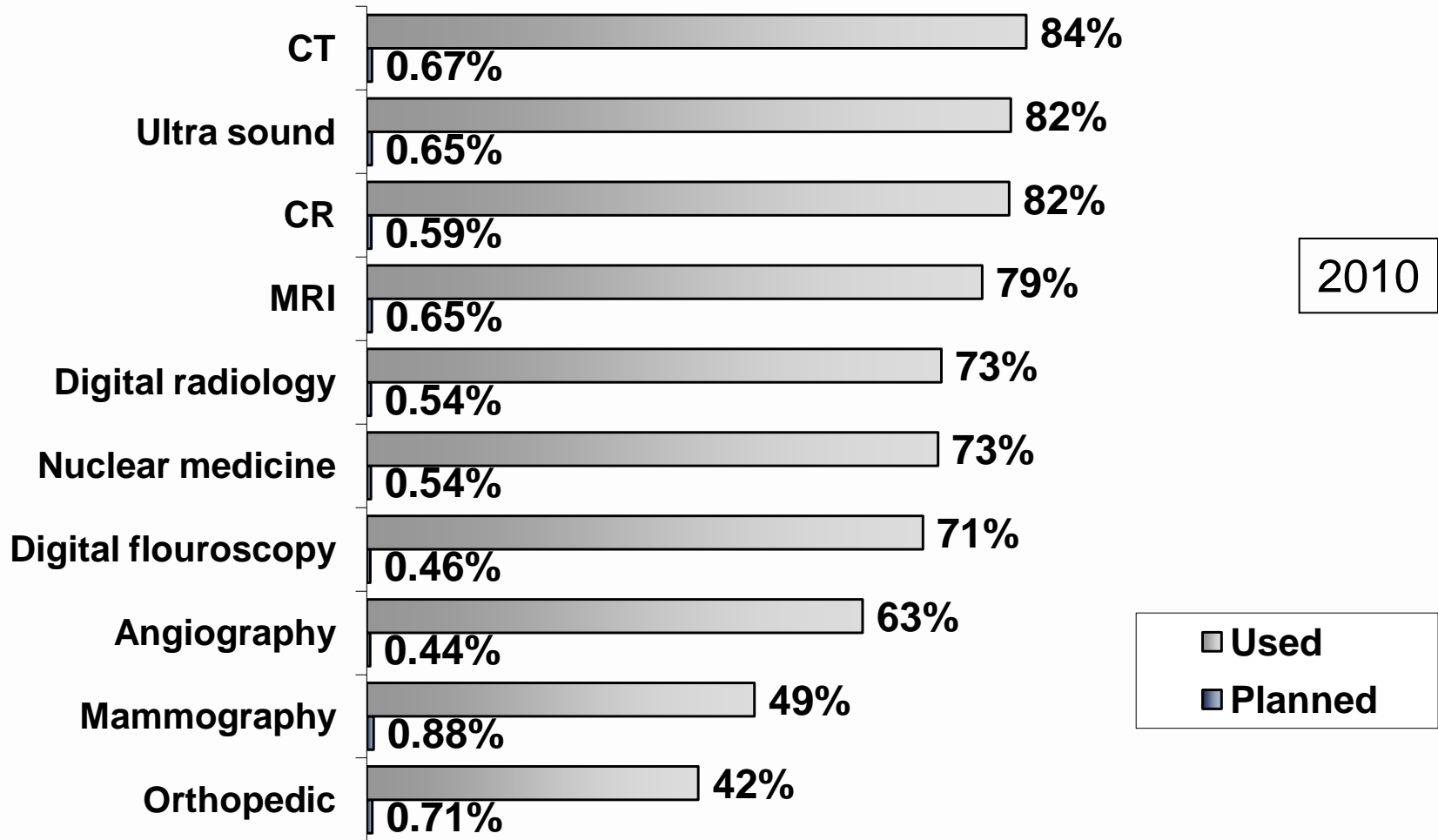
2010

# Trends: PACS — Not just for the Military Anymore

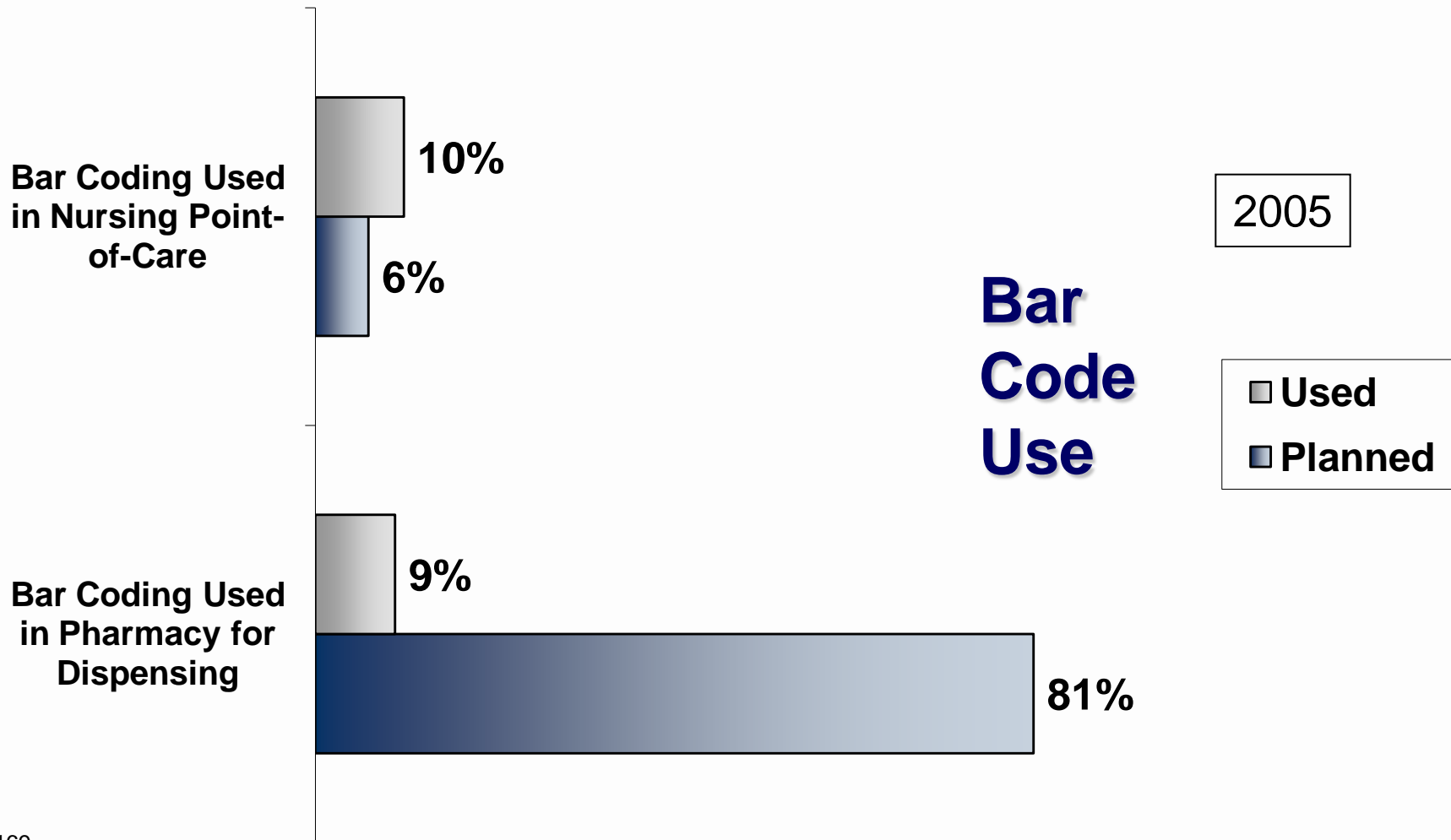




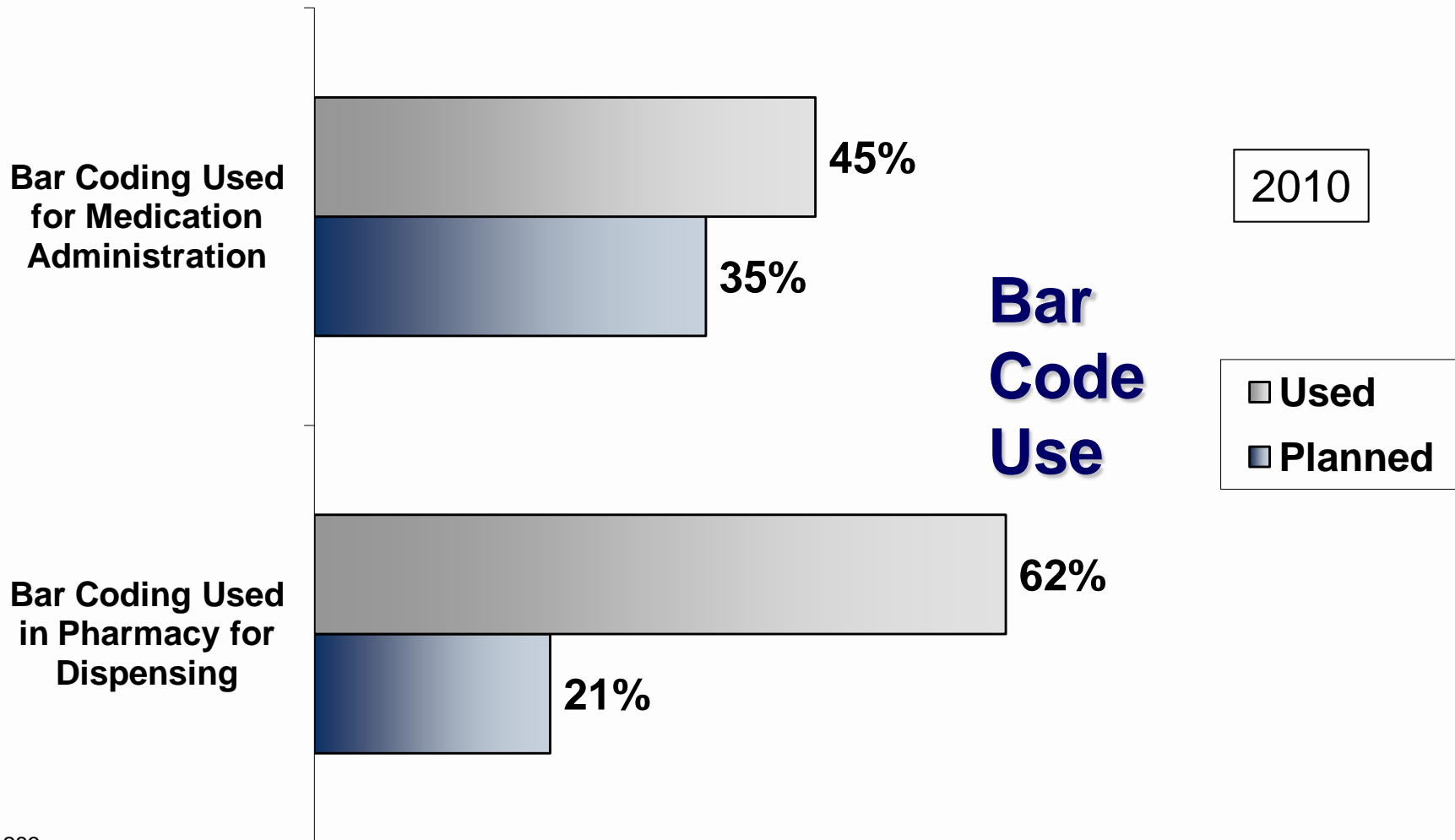
# Trends: PACS — Not just for the Military Anymore



# Trends: Bar Coding — Three Decades After Safeway



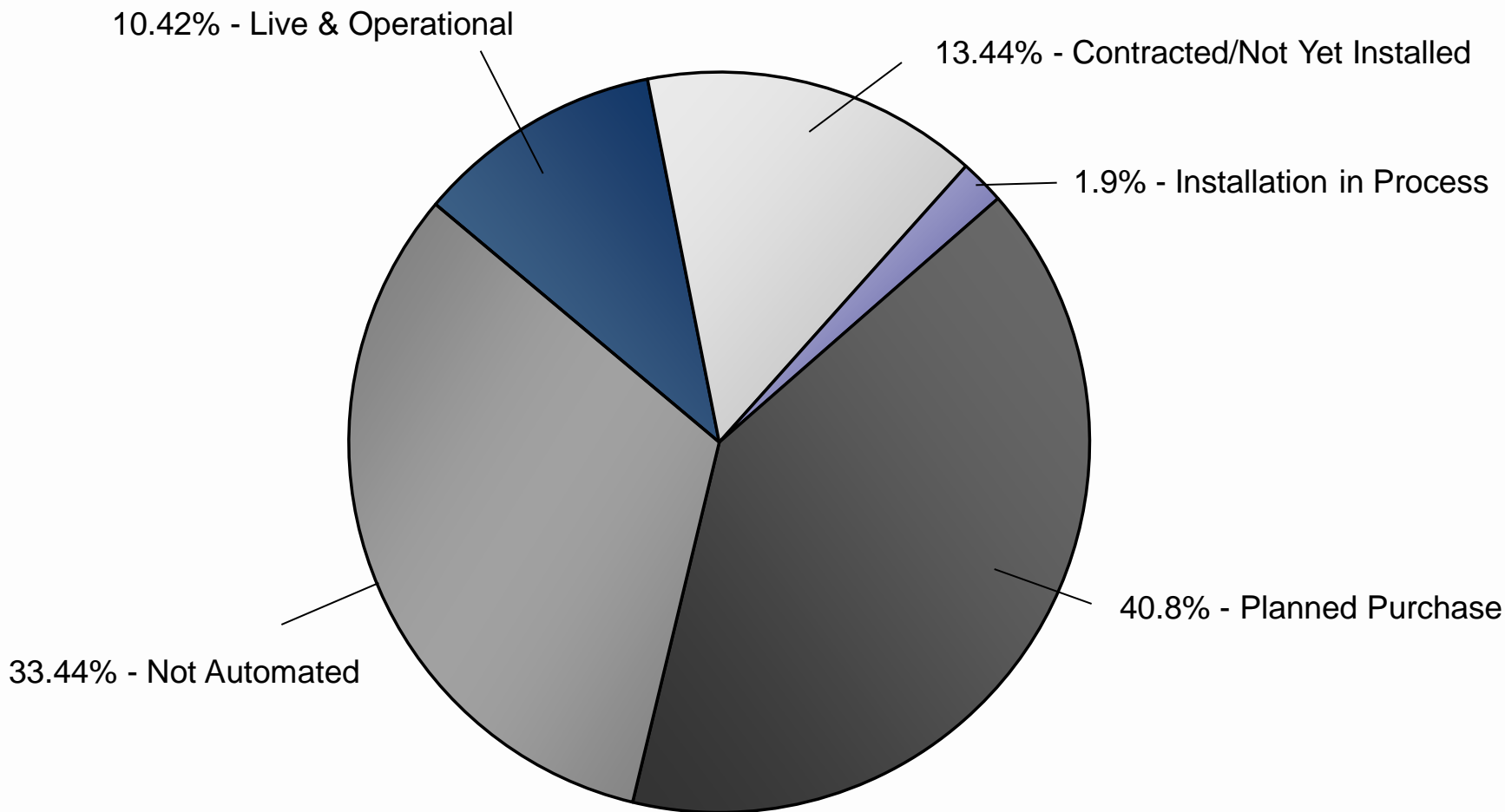
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# Trends: CPOE Adoption

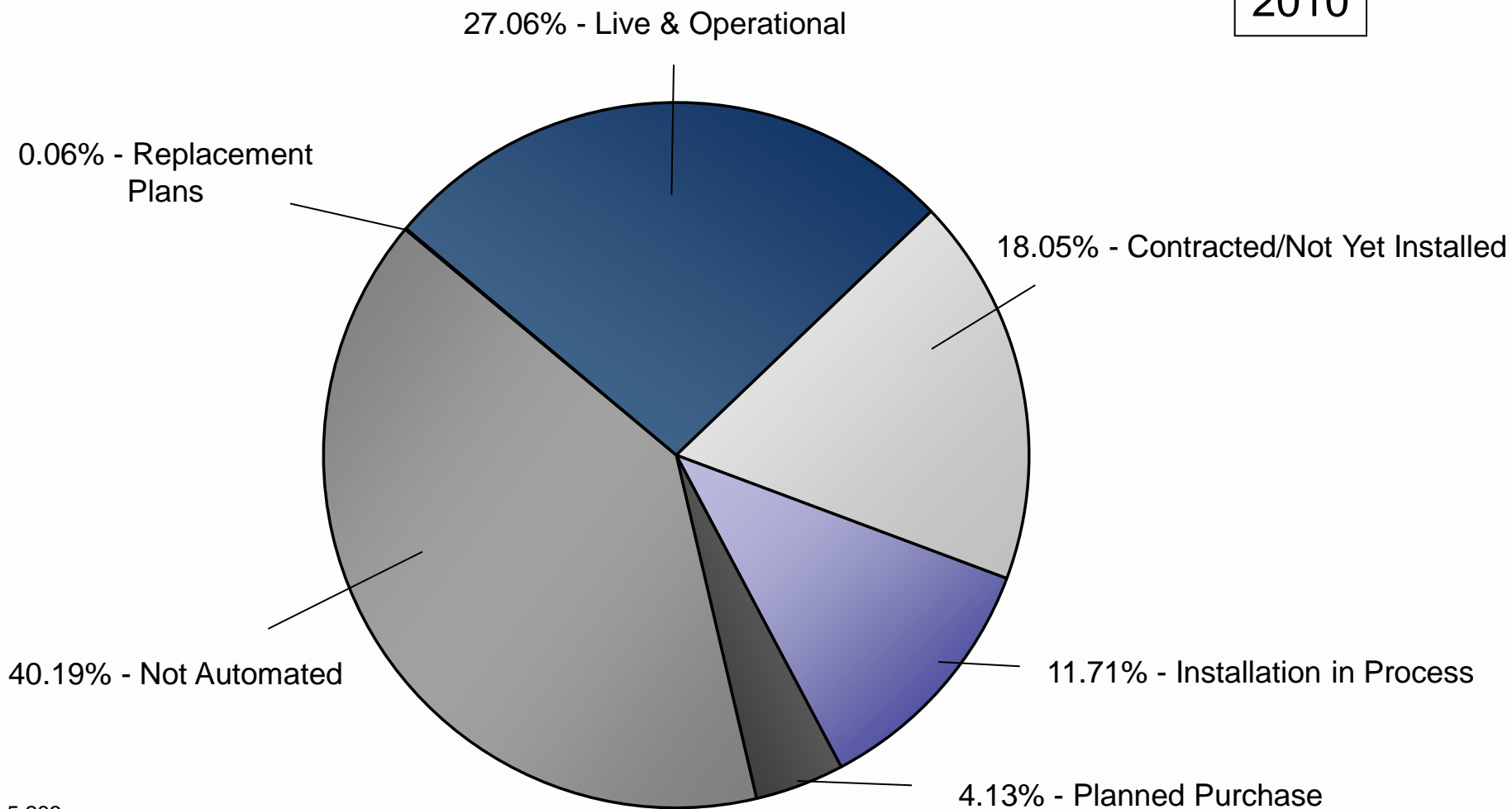
2005





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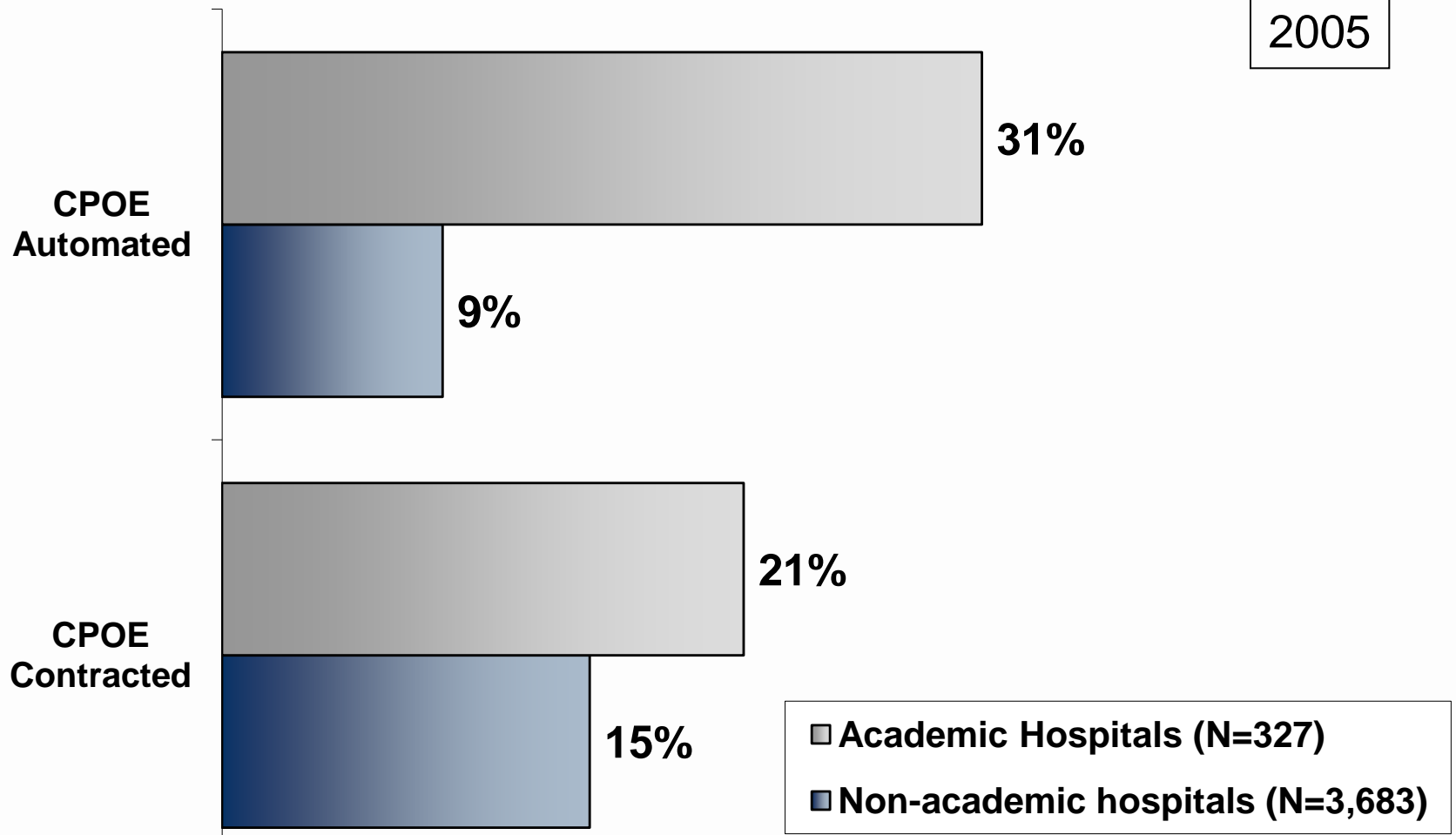
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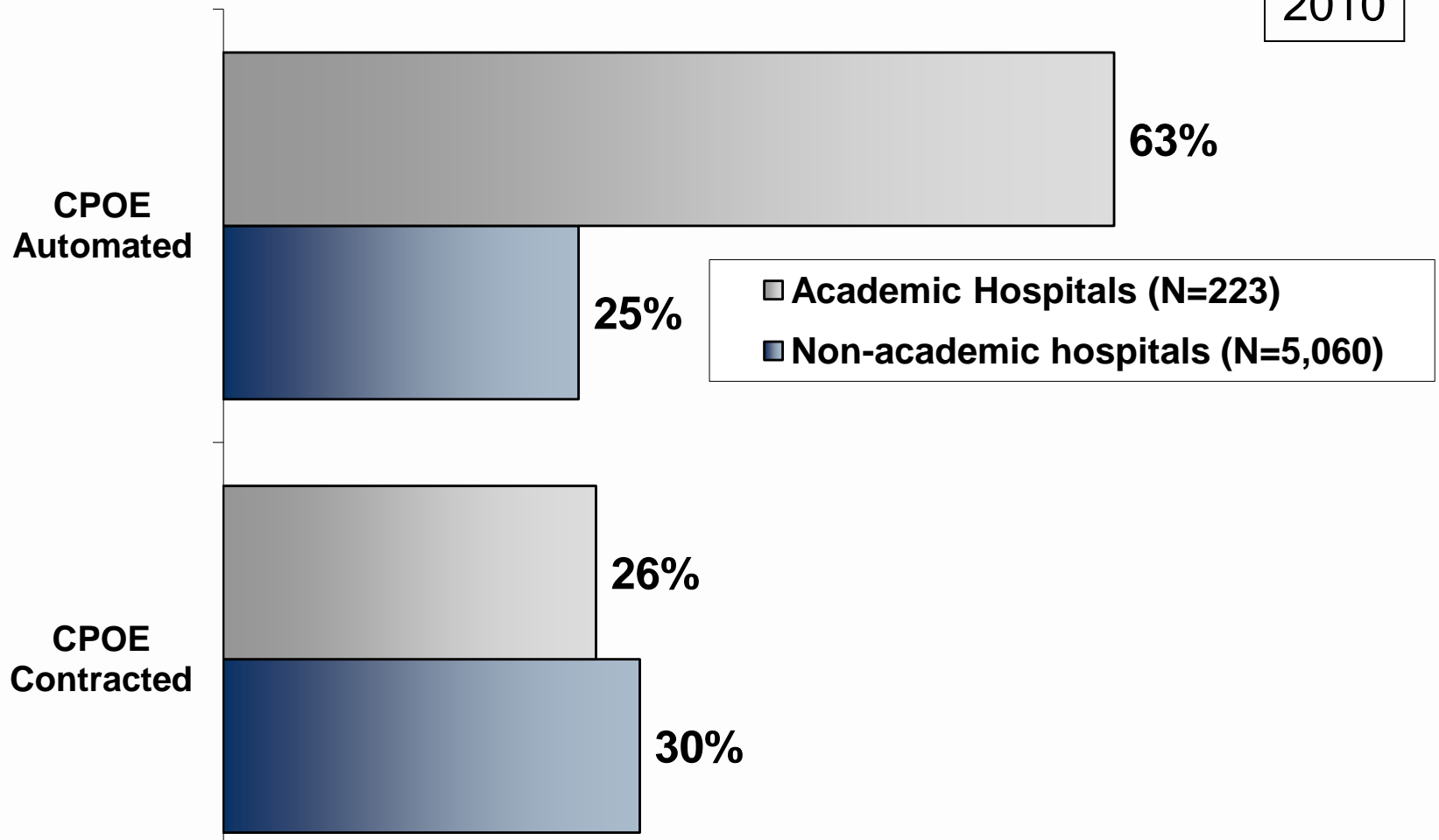
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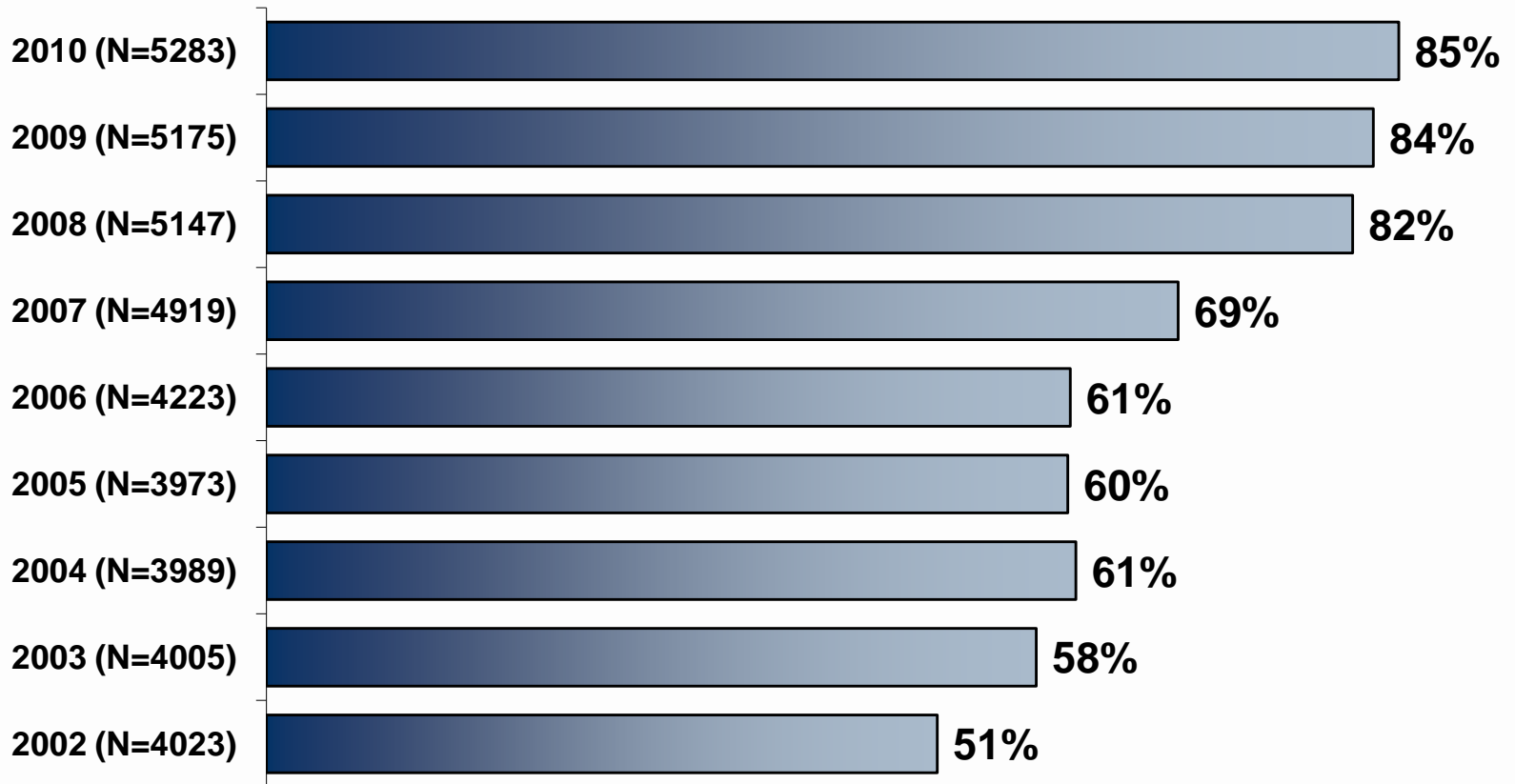


# Trends: CPOE Adoption

2010



## Trends: EMR Adoption





# EMR Adoption Model<sup>SM</sup>

## 2009 – 2010

2009 Final    2010 Final

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<b>Stage 6</b>	Physician documentation (structured templates), full CDSS (variance & compliance), full R-PACS	1.6%	3.2%
<b>Stage 5</b>	Closed loop medication administration	3.8%	4.5%
<b>Stage 4</b>	CPOE, Clinical Decision Support (clinical protocols)	7.4%	10.5%
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<b>Stage 2</b>	CDR, Controlled Medical Vocabulary, CDS, may have Document Imaging; HIE capable	16.9%	14.6%
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<b>Stage 0</b>	All Three Ancillaries Not Installed	11.5%	10.1%



# Glimmers: RFID — Just when you thought it was safe to bar code

## Bar Code vs. RFID





## Glimmers: Interoperability Standards

**Interoperability** - *the ability of two or more systems or components to **exchange** information and to **use** the information that has been exchanged.*\*

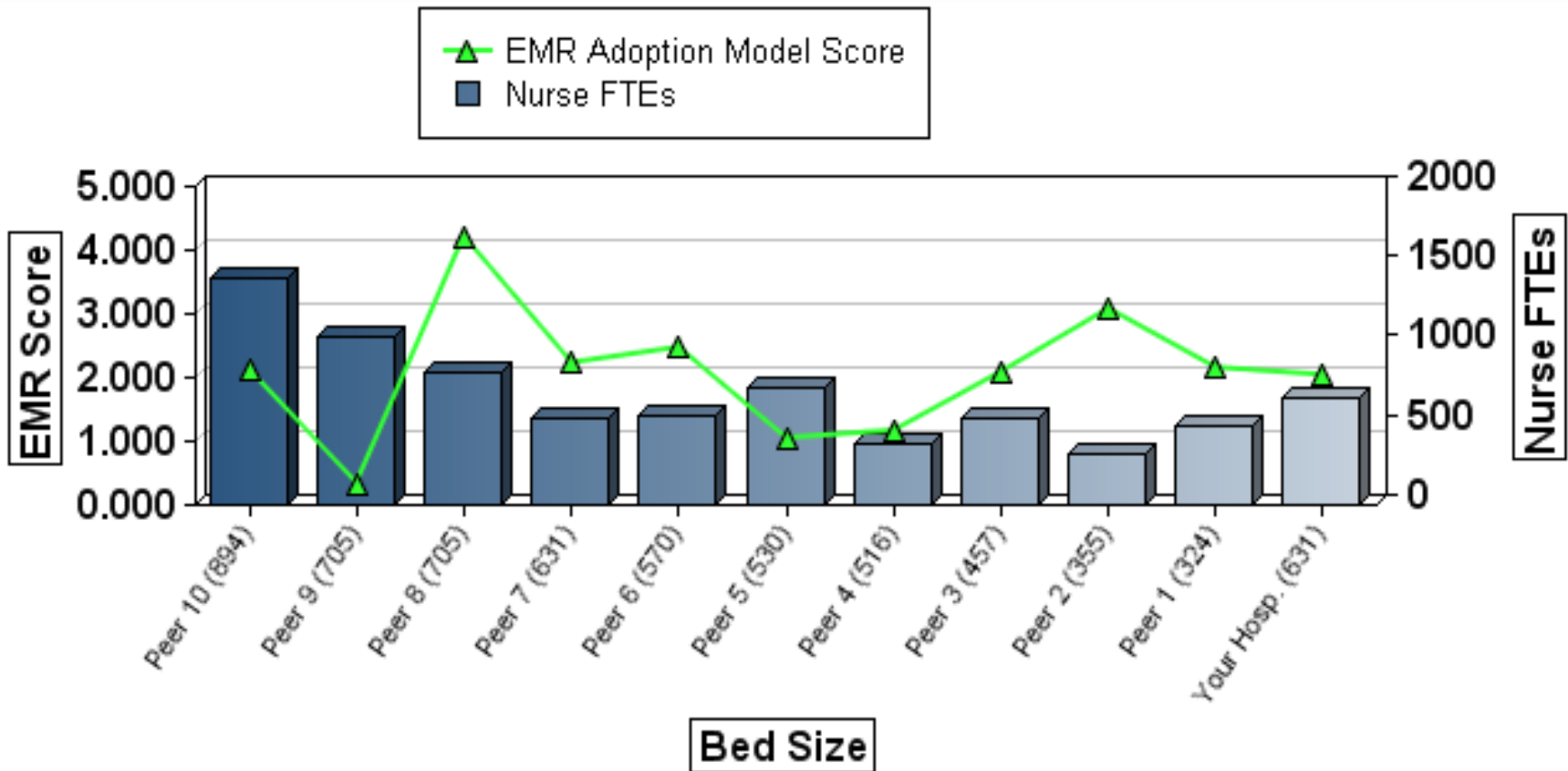
- Requires standards for exchange and content that haven't existed.
- Problems:
  - Key standards organizations have been battling over how to create the standards.
  - The federal government has been loath to “mandate” standards for exchange and content because before, they would never have passed Congress. The economy changed that – see ARRA.
  - We don't have CMV standards.
  - We don't have an atomic-level data dictionary.
- 80% Solution – Continuity of Care Document



# Glimmers: Digital Hospitals

- ***Indiana Heart Hospital***
  - Opened in December 2002
  - Features GE technology, including its electronic medical records system, CPOE, PACS and digital cardiovascular imaging and ultrasound systems
- ***St. Francis Heart Hospital***
  - Opened in September 2004
  - GE technology
- ***Kaiser Irvine Medical Center***
  - Opened in May 2008
  - Epic technology

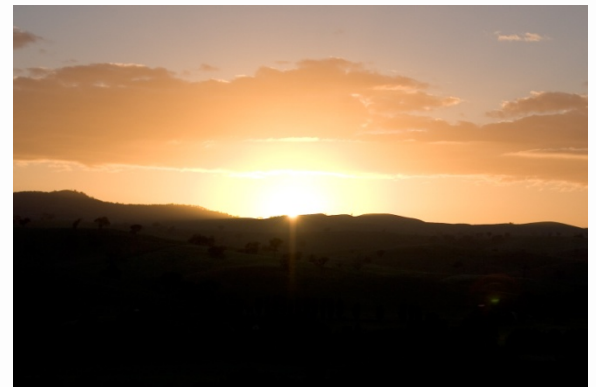
# Glimmers: Being able to “benchmark” IT in healthcare





# RETURN ON INVESTMENT FOR CLINICAL SYSTEMS

An Elusive Target.. But We Are Beginning to See Light





# Glimmers: Getting ROI out of clinical systems

- “Hard costs”
  - Reduction of duplicate medical orders
  - Reduction in length of stay, preventable readmissions
  - Shift to outpatient
  - Reduction of Adverse Drug Events (ADEs)
  - Reduction in paper based costs
    - Transcription
    - Scanning
    - Storage & handling
    - Administrative position reduction
  - Health Plan savings



# Glimmers: Getting ROI out of clinical systems

- “Soft costs and benefits”
  - Reduction in errors, reduces potential losses
    - Will eventually reduce liability insurance costs, including that of Medical Staff personally
  - Increase in employee staff satisfaction reduces turnover costs
    - Increase in direct patient care time
  - Increase in medical staff satisfaction
    - May result in more referrals, retention
    - Ease of internal referrals
  - “ED exit cycle”
  - Increase in family and patient satisfaction with CLMA
    - Hard to quantify “confidence”

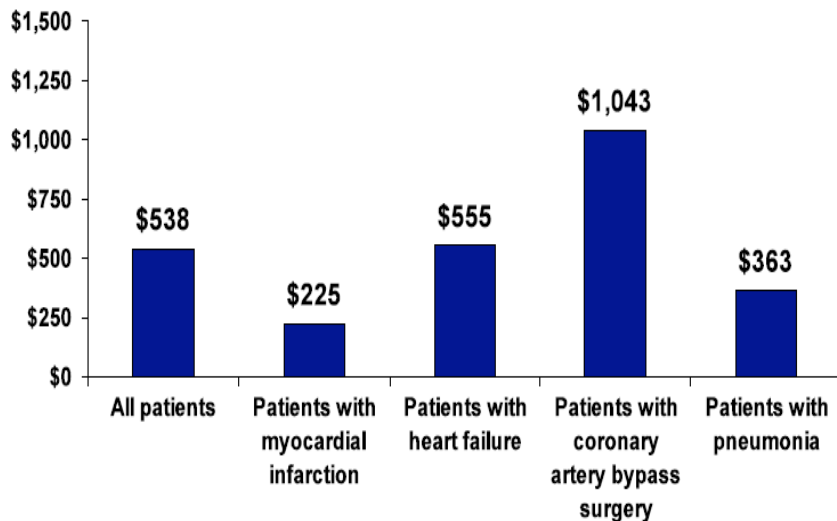


# Several research studies have documented significant financial and qualitative benefits from the effective use of EMRs with CPOE and CDS

## Study 1: A Cross-section of 41 urban hospitals in Texas

### Hospitals with Automated Clinical Decision Support Have Lower Costs

Mean adjusted hospital savings per hospitalization\*



\* Adjusted for patient complication risk; patient mortality risk; and hospital size, total margin, and ownership. Savings associated with a 10-point increase in Clinical Information Technology Assessment Tool subdomain score.  
 Source: Adapted from R. Amarasingham, L. Plantinga, M. Diener-West et al., "Clinical Information Technologies and Inpatient Outcomes: A Multiple Hospital Study," *Archives of Internal Medicine*, Jan. 26, 2009 169(2):108-14.

## Key Findings

Among the four clinical conditions studied—myocardial infarction, congestive heart failure, coronary artery bypass grafting, and pneumonia—higher technology scores were generally associated with decreased adjusted odds for fatal hospitalizations.

Among all hospitalizations, a 10-point increase in automation of notes and records was associated with a 15 percent decrease in the adjusted odds of hospital death.

Hospitals with more advanced order entry capability experienced decreases of 9 percent and 55 percent, respectively, in the adjusted odds of death for myocardial infarction and coronary artery bypass graft procedures.

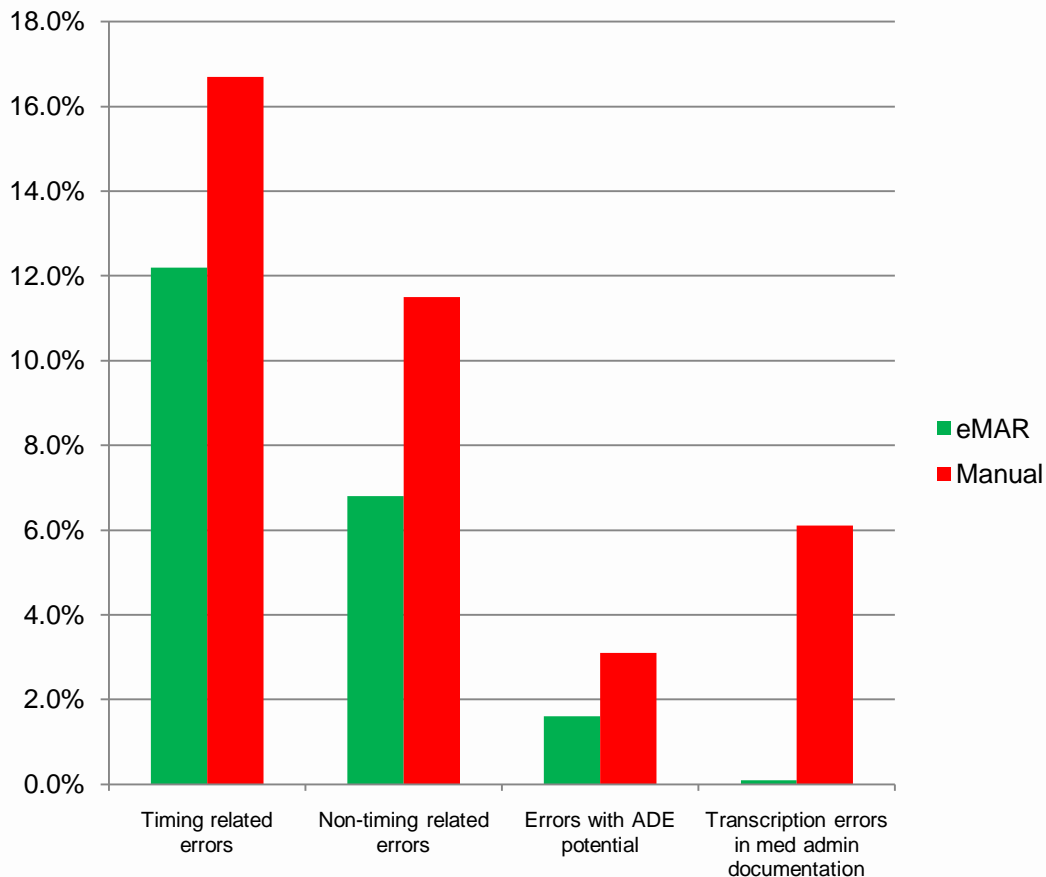
Facilities with higher scores in decision support were associated with a 16 percent decrease in the adjusted odds of complications for all causes of hospitalizations.

For nearly all clinical conditions, higher scores on automated test results, order entry, and decision support were overwhelmingly associated with lower hospital costs.

"Clinical Information Technologies and Inpatient Outcomes: A Multiple Hospital Study";  
 Publication Date January 26, 2009; "In the Literature", The Commonwealth Fund

# A key element of patient safety improvement, is Closed Loop Medication Administration

## Study 2: A Comparison of Medication Administration Error Rates with and without an e-MAR at Partners Healthcare (1)



### Key Findings

Wrong-medication errors were reduced by 57.4%, wrong-dose errors by 41.9%, and administration documentation errors by 80.3%.

There were significant reductions in potential adverse drug events associated with administration-documentation errors (80.3% reduction) and wrong-dose errors (33.0% reduction).

The overall incidence of medication doses directly observed to be administered either early or late decreased from 16.7% without the bar-code e-MAR to 12.2% with its use (a reduction of 27.3%). The majority of these errors were due to administrations that were late by 1 to 2 hours, which fell by 23.9% with use of the barcode e-MAR. The rate of potential adverse drug events associated with timing errors did not change significantly.

Observers noted 776 non-timing errors in medication administration on units that did not use the bar-code e-MAR (an 11.5% error rate) versus 495 such errors on units that did use it (a 6.8% error rate) — a 41.4% relative reduction in errors.

The rate of potential adverse drug events (other than those associated with timing errors) fell from 3.1% without the use of the bar-code e-MAR to 1.6% with its use, representing a 50.8% relative reduction.

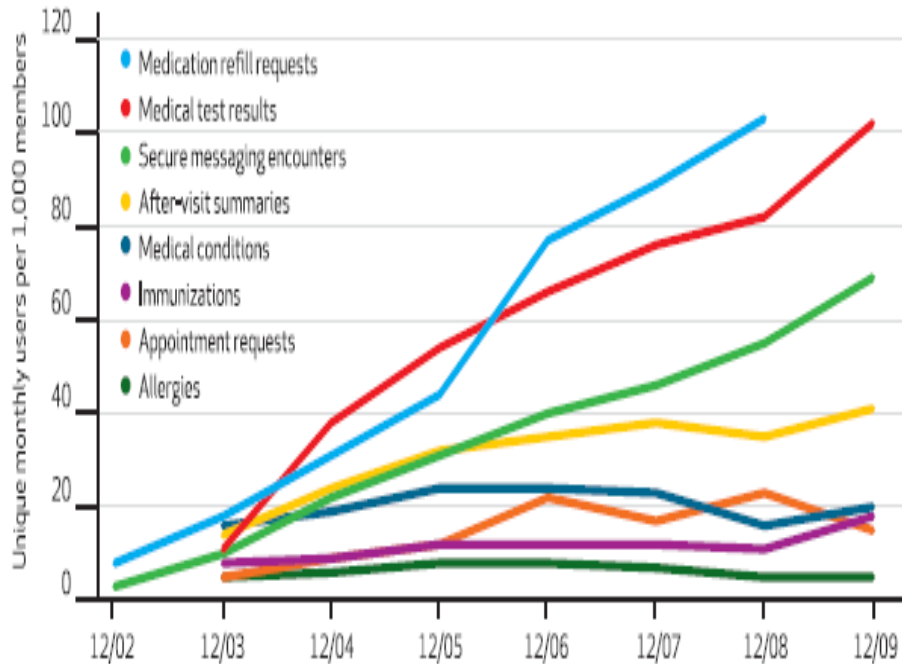
Transcription errors occurred at a rate of 6.1% on units that did not use the barcode e-MAR but were completely eliminated on units that did use it.

Source: Effect of Bar-Code Technology on the Safety of Medication Administration; Poon, Keohane, Bates, Lipsitz, et al, New England Journal of Medicine, 2010;362:1698-707, May 6, 2010

## Exemplar: Group Health Cooperative has reduced routine face to face ambulatory encounters by 30% through the use of via a web portal

EXHIBIT 2

Use Of Shared Electronic Record Services On The Group Health Cooperative Patient Web Site, December 2002-December 2009



source Authors' analysis of Group Health automated Web-site usage data.

- GHC implemented an EMR and web portal that supports secure doctor-patient communications.
- Benefits:
  - 30% of outpatient encounters are now done via lower-cost e-visits (i.e., secure electronic messaging), replacing face-to-face visits.
  - 10% of patients review medical tests online
  - 10% of patients order medication refills online, improving customer service.
- The system enables GHC to launch a medical home system to all 26 clinics.
- Internal surveys suggested that online services strongly influenced enrollees' choice to stay with GHC.



# Detail on Sentara Health System's EMR Return on Investment

Seven Hospitals Live from 2007 to 2010

115 Physician Practices Concurrently

18 Core Processes Redesigned





# 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	
<b>Total Cost of Ownership over 10 years</b>		<b>\$ 237 M</b>



# 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



# 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	\$13.0
- Increase Outpatient Procedures	\$5.6
- Increase Unit Efficiency/Retention of RNs	\$9.0
- Reduce Transcription Expense	\$2.8
- Reduce Med Records Supply Costs	\$1.8
- Reduce Medical Records Positions	\$1.8
- Reduced Optima (health plan) costs	\$3.0
- Improve Charge Capture	\$2.0
- Reduced 63 Administrative Positions	\$2.7
- Reduced other costs	<u>\$6.8</u>
<b>Total</b>	<b>\$48.5</b>

\*2010 for 6 Hospitals, Home Health and Healthplan



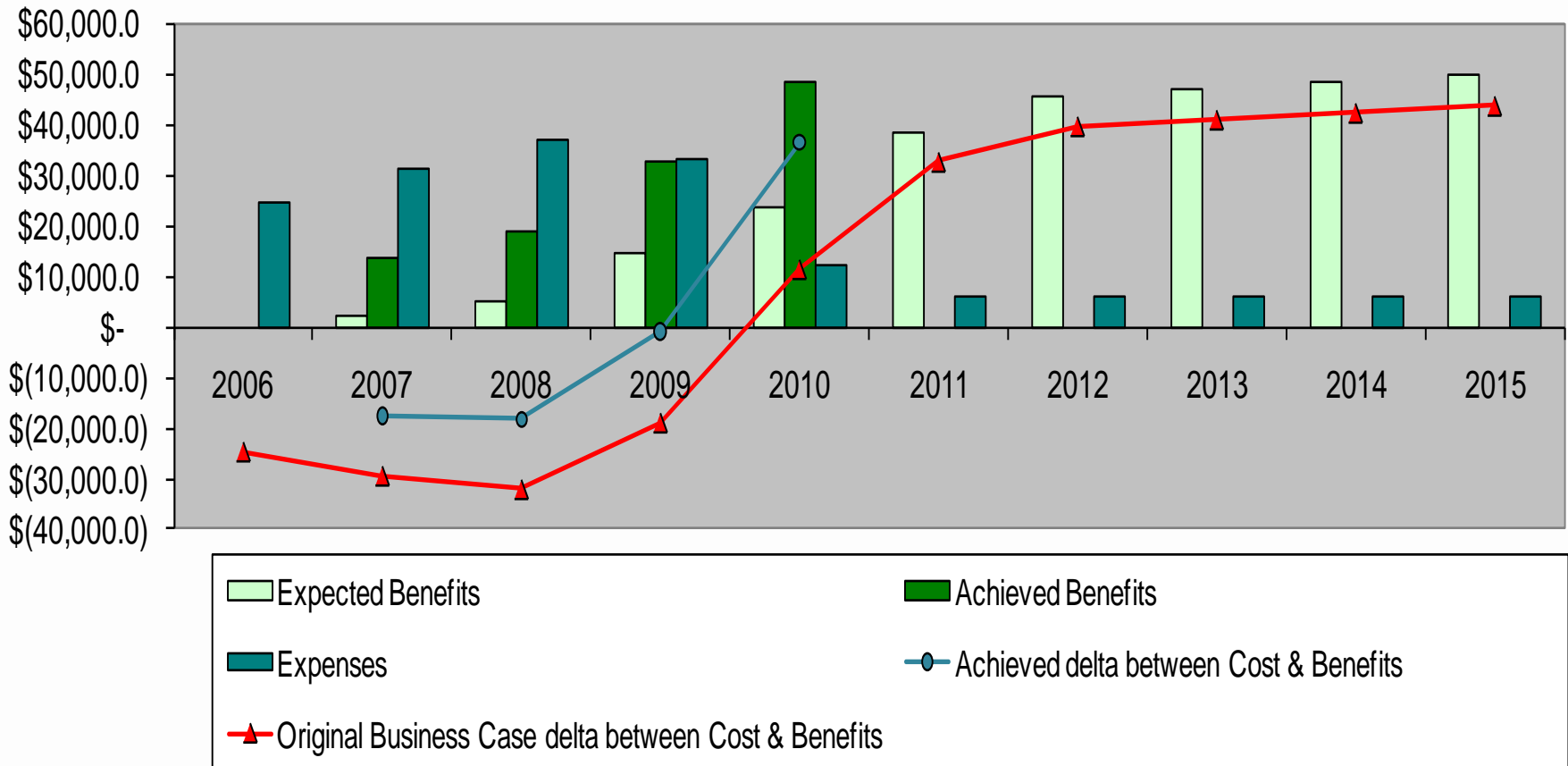
# Total Cost of Ownership & Benefits (10 years) at Sentara Health

## Summary

## Costs/Benefits

Total cost of ownership:	\$ 237 M
Less Physician subscription fees:	(\$ 20 M)
Less cost of replacing non-supported systems:	<u>(\$ 80 M)</u>
Net cost of ownership:	\$ 137 M
Annual benefits once fully implemented:	
- Hospitals: \$ 30.0 M	
- Post-Acute: \$ 2.7 M	
- Health Plan: <u>\$ 2.8 M</u>	
Total: \$ 35.5 M	
Phased-in 10 year value of benefits:	<u>\$ 253 M</u>
Net Costs/Benefits:	\$ 116 M
Internal Rate of Return (IRR):	12.3 %

# eCare® Costs and Benefits by Year





# 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
- Significant findings:

**Direct Patient Care Time**

**Pre-EMR**

**42.1%**

**Post-EMR**

**51.4%**



# Pre and Post eCare<sup>®</sup> Medications Management Improvements

- **Avoided 117,400 potential medication errors due to CLMA**
- **Reduced meds administration time**

	<b>Baseline</b>	<b>Post-eCare</b>
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

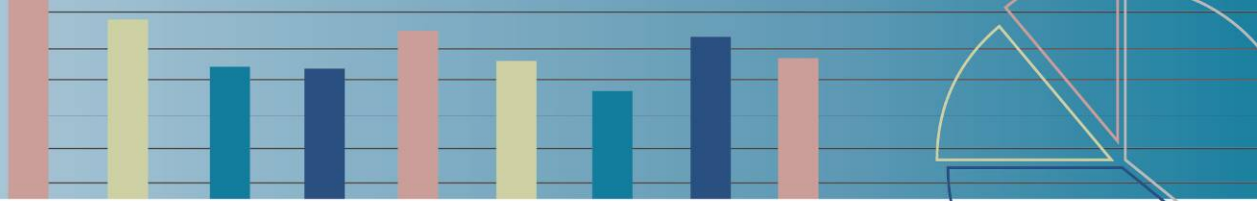


# Reduced Readmission Rate



Ratio is Actual Readmissions over Expected Readmissions;

1.0 is National Avg. Source: MedStat



# A Quick Look at Meaningful Use Preparedness

HIMSS Analytics Reports Data  
Quarterly on ARRA Questions

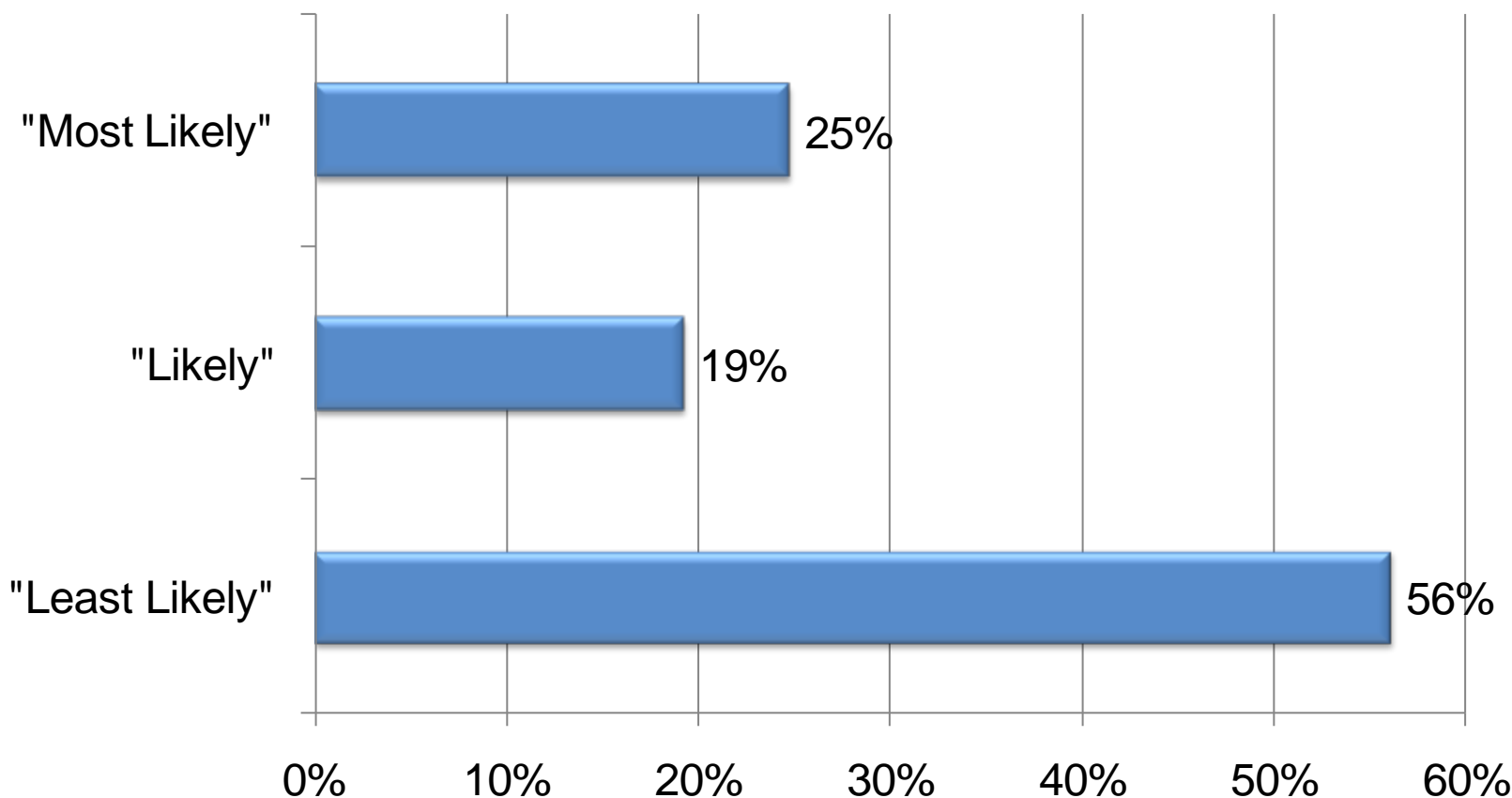


# Hospitals' Likelihood of Achieving Stage 1 MU Measures: Three Categories

- “Most Likely”
  - Hospitals with capability to achieve
    - 10 or more Core measures and
    - 5 or more Menu measures
- “Likely”
  - Hospitals with capability to achieve
    - 5-9 Core and 5 Menu; or
    - 10 or More Core and 3-4 Menu
- “Least Likely”
  - All other hospitals



# Percent of Sample Hospitals Expecting to Achieve Stage 1 MU Measures by Category



N=999



# EMRAM Score vs. Meaningful Use Readiness

Stage	“Most Likely”	“Likely”	“Least Likely”	Sample	2010 HA DB*
Stage 7	14.2%	0.5%	0.0%	3.6%	1.0%
Stage 6	15.4%	11.5%	1.4%	6.8%	3.2%
Stage 5	12.2%	9.4%	3.4%	6.7%	4.5%
Stage 4	28.3%	16.1%	6.8%	13.9%	10.5%
Stage 3	28.3%	54.2%	42.9%	41.4%	49.0%
Stage 0-2	1.6%	8.3%	45.5%	27.5%	31.8%
N	247	192	560	999	5,281

\* HIMSS Analytics Database as of December 31, 2010 (end of 2010)



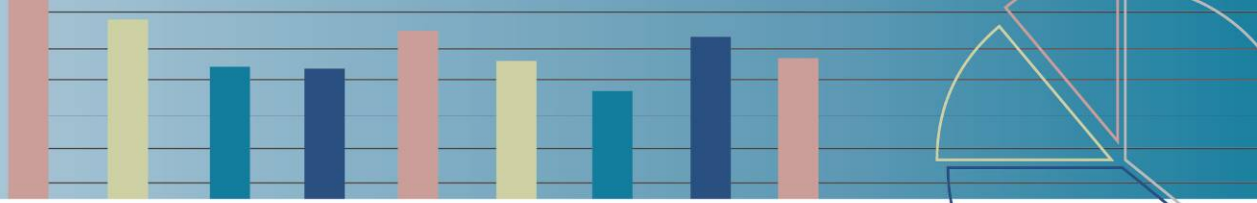
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**Thank You for this  
opportunity!**

**John P Hoyt FACHE, FHIMSS**

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