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# HIMSS Europe CIO Summit

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**22 November 2011**



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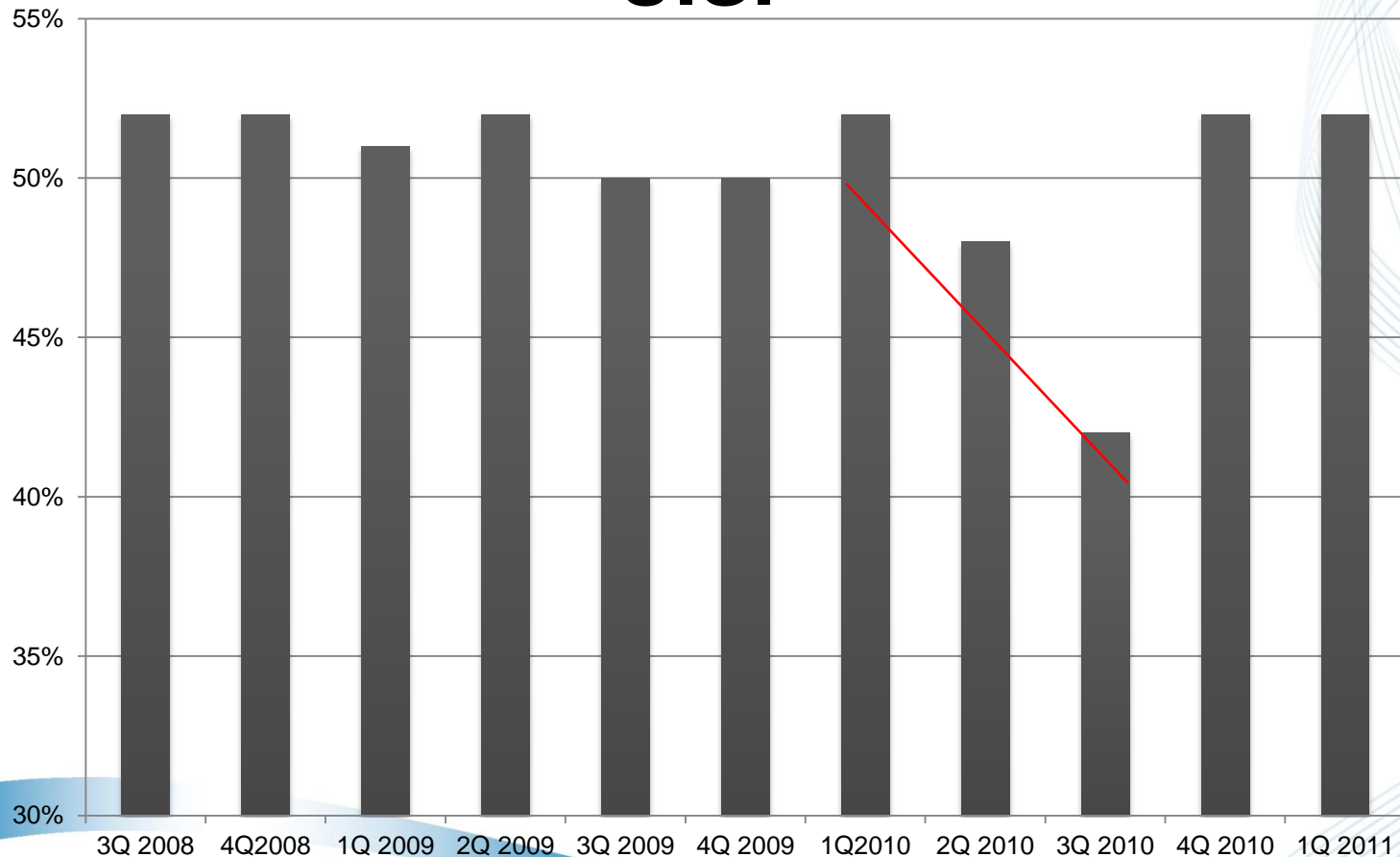
# My Topics - Quickly

- Current Trends as seen in the US HIMSS Analytics Data Base
- Return on Investment
  - Examples
  - A construct to follow for your health system / region

# A Quick Look at Key Trends

HIMSS Analytics Data from U.S.

# Recession Effect on IT Budgets Counter Acted by Stimulus Funding in U.S.



# Average IT Operating Expenses as a Percent of Total Annual Operating Expense

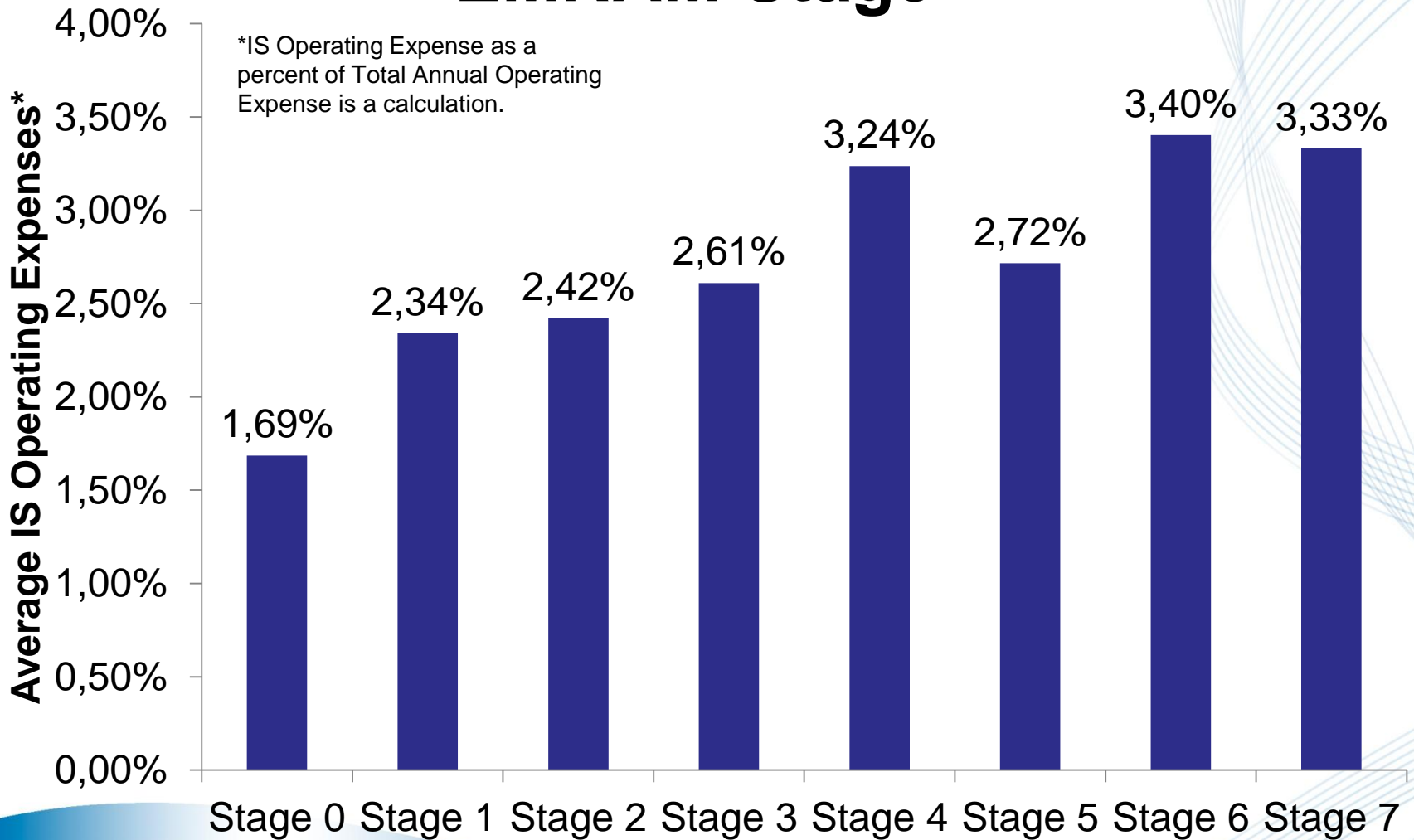


Numbers in white represent the average annual operating expense.

Number in gray represent one standard deviation from the calculated mean average.

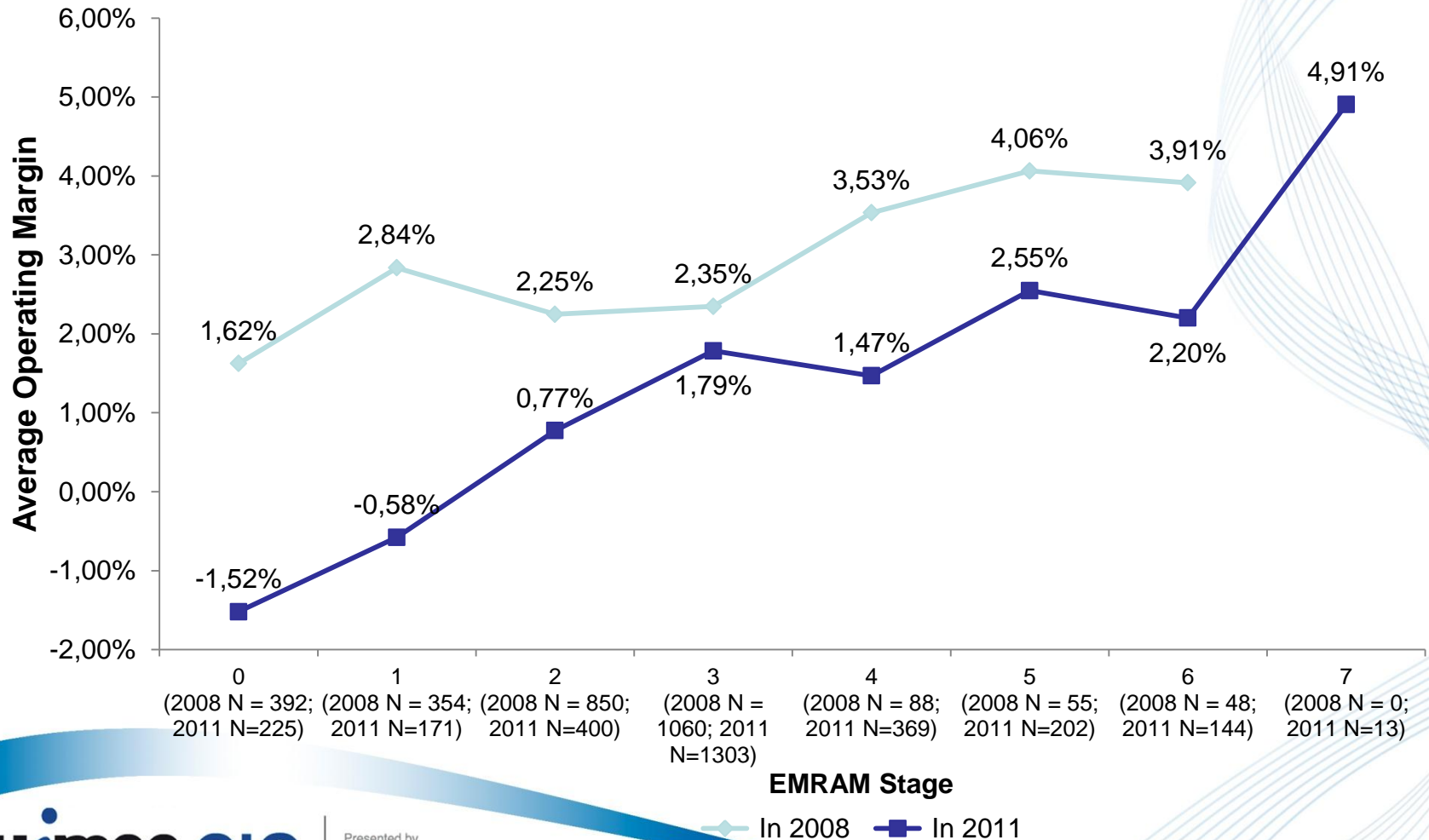
■ Average % of Operating Expense Spent on IT

# Average IS Operating Expense by EMRAM Stage\*

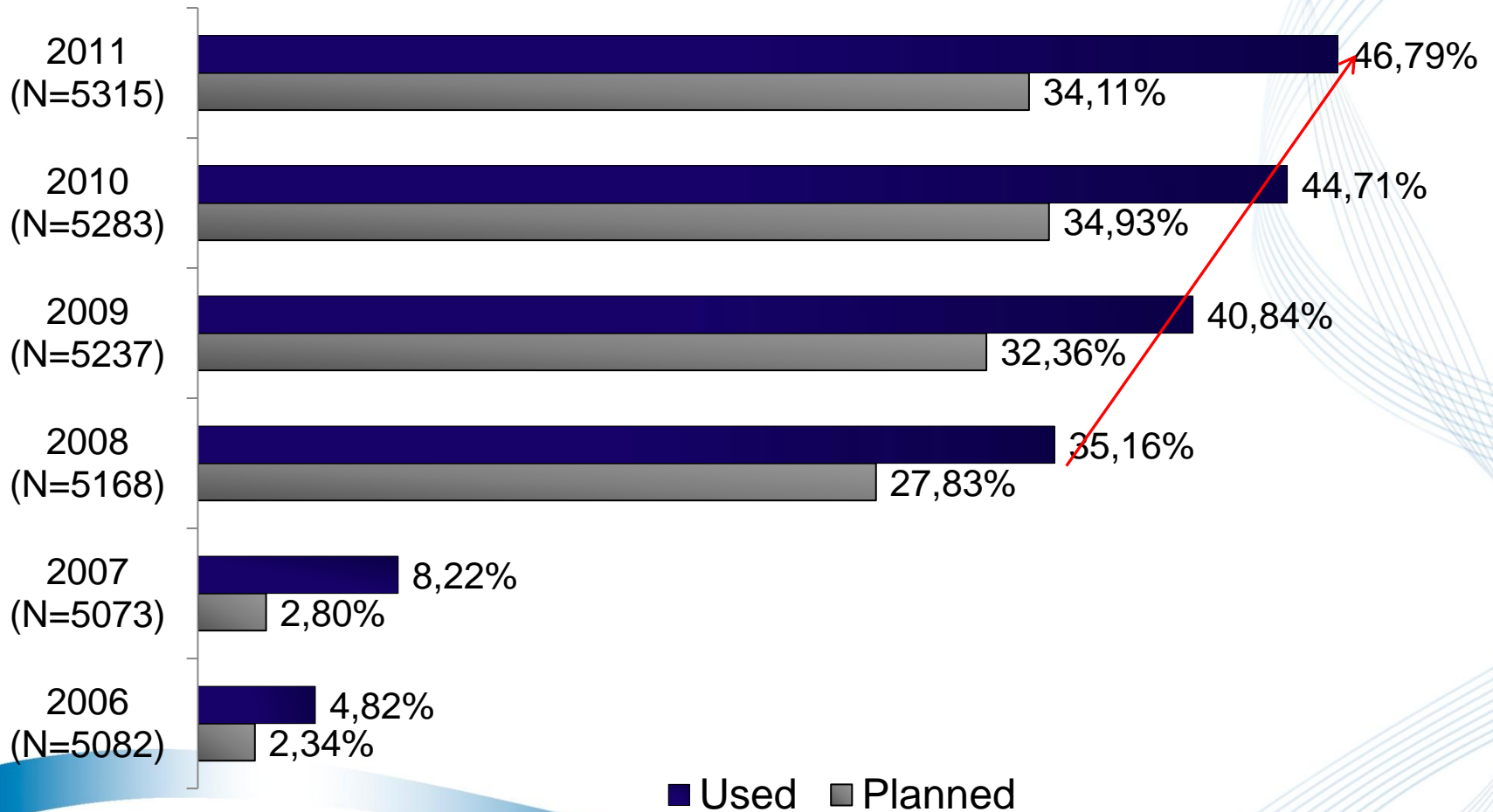


# Operating Margin by EMRAM Stage

## 2008 and 2011



# Bar Coding for Medication Administration



# RETURN ON INVESTMENT FOR CLINICAL SYSTEMS

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



# First, A Few Research Notes

From the Literature

# The Business Case for Health IT Investment



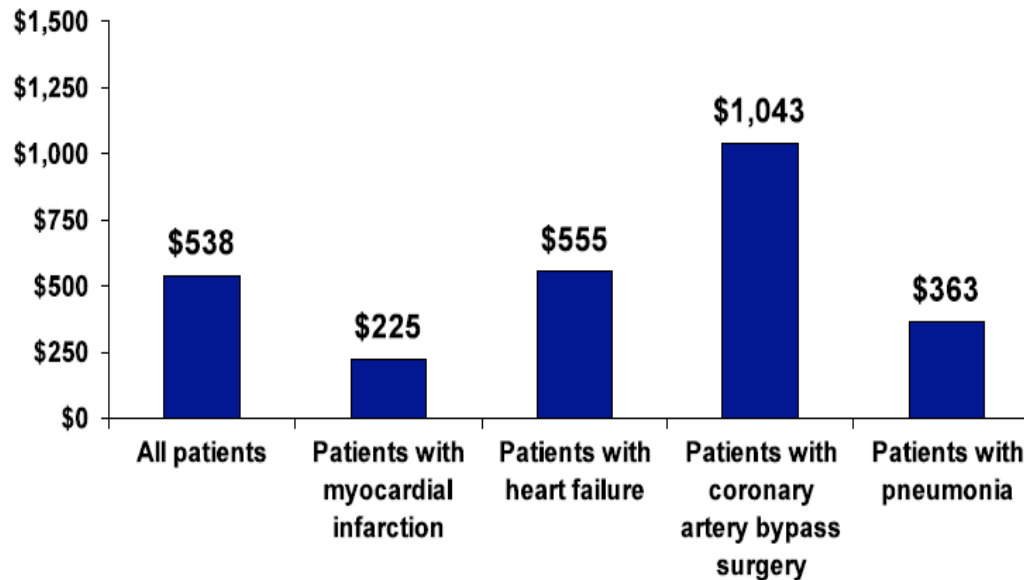
- Justification of the massive capital investment has been a major impediment to IT adoption.
- Historically, amongst those hospitals that have made the investment, there were few definitive studies of the post-implementation economic impact in the literature.
- This is changing – and the wave is forming
  - The IT business case experiences in other industries suggests that ROI turns dramatically upwards for incremental investments once a “critical mass” is achieved
  - In 2008 HIMSS Analytics published a White Paper showing that Stage 6 is where ROI pay off can begin
  - <http://www.himssanalytics.org/docs/stage6whitepaper.pdf>
  - Currently HA is conducting research on benefits with the 256 Stage 6 & 7 hospitals

# Several 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.

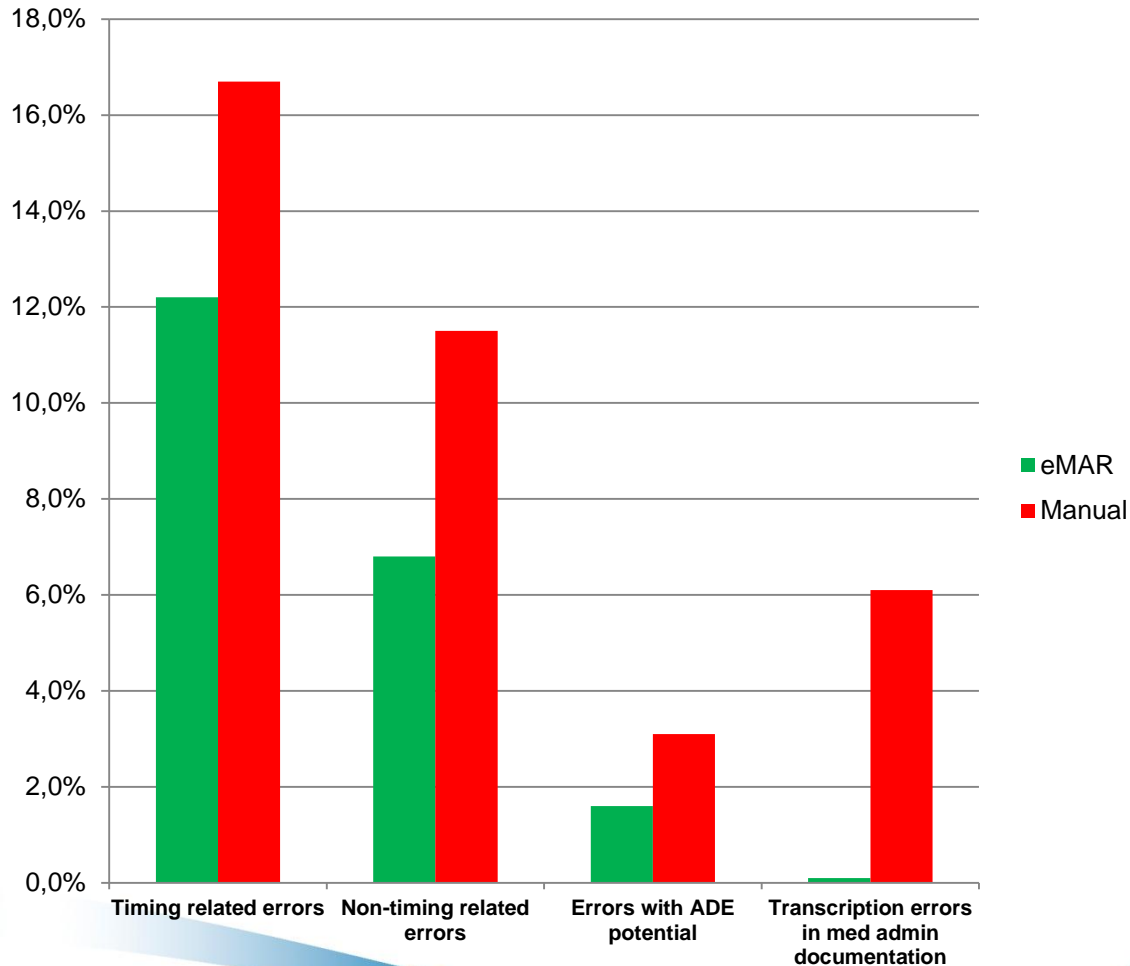
# Cleveland Clinic Study of Quality of Diabetes Care With or w/o EMR

- Between July 2009 and June 2010, 50.9% of patients at EHR sites, as compared with 6.6% of patients at paper-based sites, received care for diabetes that met all four standards of care
- 43.7% of patients at EHR sites vs. 15.7% of those at paper-based sites had outcomes that met at least four of the five standards
  - Achievement was higher for EHR sites on all but one outcome standard.

<http://www.nejm.org/doi/full/10.1056/NEJMsa1102519#Top=&t=articleTop>

# Closed Loop Medication Administration With Bar Coding is A Key Element of Patient Safety Improvement

## Study 2: A Comparison of Medication Administration Error Rates With and Without an e-MAR at Partners Healthcare <sup>(1)</sup>



# Real Numbers for Return on Investment



# Getting ROI out of Clinical Systems

- “Hard costs”
  - Reduction of duplicate medical orders
  - Reduction in paper based costs
  - Reduction of Adverse Drug Events (ADEs)
  - Reduction in length of stay, preventable readmissions
  - Shift to outpatient and Home Care
  - Health Plan savings
- “Soft costs and benefits”
  - Reduction in errors, reduces potential losses
    - Will eventually reduce liability insurance costs, including Medical Staff’s
  - Increase in employee staff satisfaction reduces turnover costs
    - Increase in direct patient care time is a staff “satisfier”
  - Increase in medical staff satisfaction
    - Ease of internal referrals results in more internal referrals, patient retention
  - “ED exit cycle time” improvement
  - Increase in family and patient satisfaction with CLMA
    - Hard to quantify “confidence”

# 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



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# 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

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

## Summary

Total cost of ownership:

Less Physician subscription fees:

Less cost of replacing non-supported systems:

Net cost of ownership:

Annual benefits once fully implemented:

- Hospitals: \$ 30.0 M
- Post-Acute: \$ 2.7 M
- Health Plan: \$ 2.8 M
- Total: \$ 35.5 M

## Costs/Benefits

\$ 237 M

(\$ 20 M)

(\$ 80 M)

\$ 137 M

Phased-in 10 year value of benefits:

\$ 253 M

Net Costs/Benefits:

\$ 116 M

Internal Rate of Return (IRR):

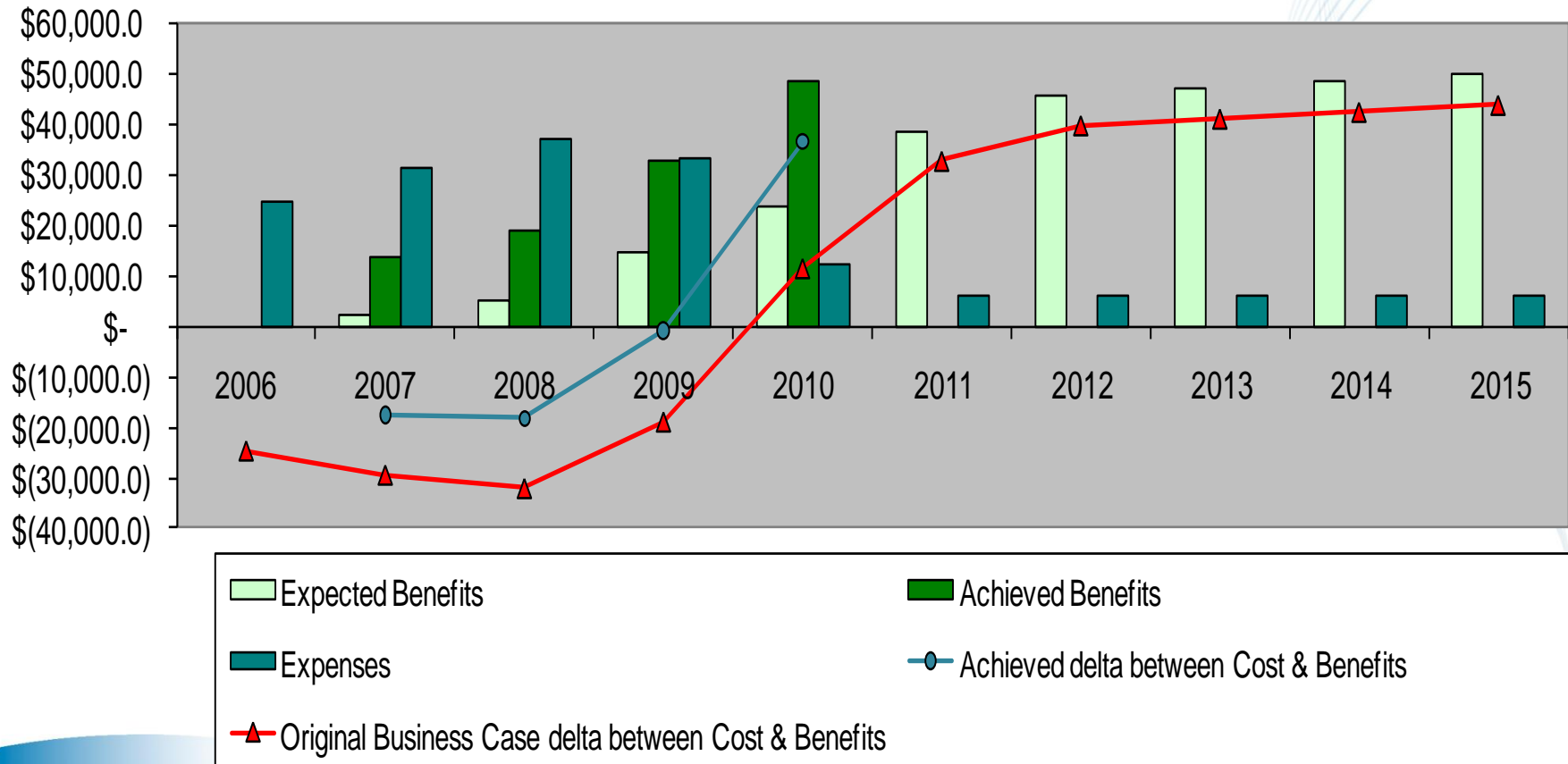
12.3 %

# Actual ROI Business Case Benefits

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

<b>eCare® Benefit Category</b>	<b>Benefit (Millions)*</b>
- 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>

# Costs and Benefits by Year



# Nursing Time Study

- Consultants conducted time/motion studies pre & post go-live on four nursing units:
  - Measure direct versus indirect patient care activities
  - Identify work flow changes and/or other opportunities for enhancement
- Collected over 31,000 data points
  - Included “in room” activities to capture work moved to the bedside
- Significant findings: a 22% increase in nurse bedside time



# Pre and Post Closed Loop Medication Administration

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

	<b>Baseline</b>	<b>Post-EMR</b>	<b>% Change</b>
Time from order written to order available to act on	59.0 minutes	4.5 minutes	-92.3%
Time from order written to med administration	132.0 minutes	38.4 minutes	-71.9%

**Thank You for this  
opportunity!**

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