

# Transforming Healthcare Through Open Source



**Medsphere**<sup>®</sup>  
*Transforming Healthcare Through Open Source*

*Ben Mehling*  
*Director, Ecosystem*

# Medsphere Overview

<b>Founded:</b>	2002
<b>Headquarters:</b>	Carlsbad, CA
<b>Venture:</b>	Azure Capital Partners Thomas Weisel Venture Partners EPIC Ventures (formerly Wasatch Venture Fund)
<b>Team Members:</b>	~70 employees, plus contractors
<b>Customers:</b>	13 Hospitals ~200 facilities throughout IHS
<b>Objective:</b>	<i>Transform Healthcare Through Open Source</i>

# Executive Team

**Michael J. Doyle**

*President and Chief Executive Officer*

Former CEO: AHS, Salesnet, Standish Care/Carematrix

Former Executive: VHA, NME/Tenet, NVHS

**Edmund Billings, MD**

*Chief Medical Officer*

Formerly Voice of the Physician

Clients: Microsoft, Pfizer, SureScripts, Athenahealth,

Co-founder Oceania

**Walter Groszewski**

*VP, Business Development*

Formerly IBM

**Janine Powell**

*Senior Director of Client Services*

Formerly Bridge Software

**Rick Jung**

*Chief Operating Officer*

Formerly MD Everywhere, Athenahealth,

US Health Care

**Irv Lichtenwald**

*CFO*

Formerly Advent Software

**John Danahy**

*VP, Sales*

Formerly, McKesson, ALI Technologies,

CEMAX ICON, Picker International

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## Board of Directors includes:

### Ken Kizer, MD (healthcare expertise)

Formerly VA Under Secretary for Health (deployed VistA at VA); former Director of Health Services, State of California; founding President and CEO, National Quality Forum

### Larry Augustin (Open Source expertise)

VA Linux, SourceForge Director Compiere, Fonality, Hyperic, Pentaho Sugar CRM, Xen Source

# Our Current Market

- **Domestic hospital IT market:**

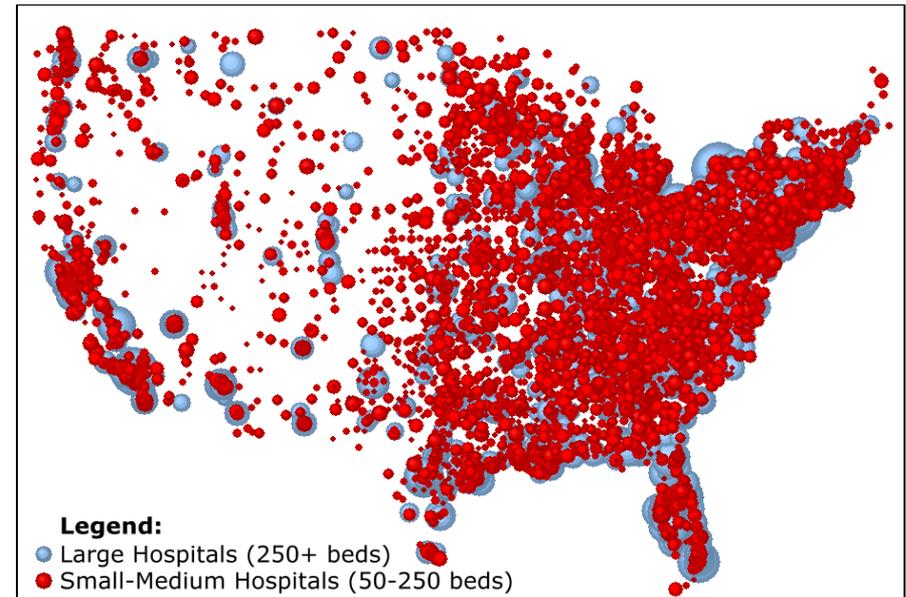
- Includes >5,000 hospitals
- Large multi-billion dollar market
- Growing 15% per year
- 85% + un-penetrated

- **Current target market:**

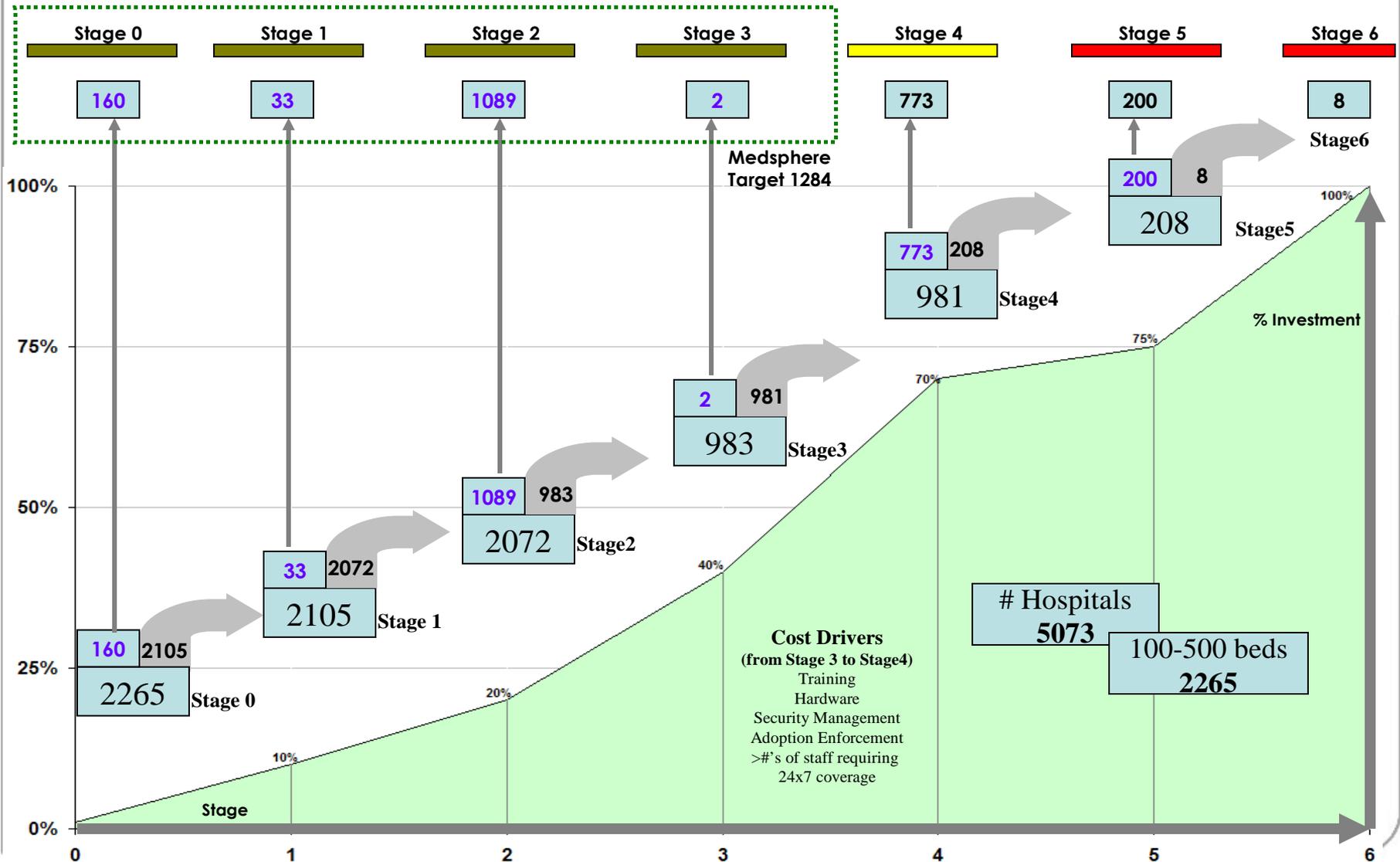
- 100-500 bed hospitals
- State healthcare systems
- 2265 potential hospitals
- International developing

- **What are the market drivers?**

- Proprietary solutions are not affordable
- Low customer satisfaction
- Rejection of "vendor lock"
- Pay for performance is coming fast exp., ***"Aetna launches P4P for 2 hospitals in Washington State, a national model for P4P programs from the Leapfrog Group."***



# Market Segmentation by EMR Adoption Model Stage



# EMR Adoption Model - Description

Stage	Description
7	<ul style="list-style-type: none"> <li>Clinical information can be readily shared via electronic transactions or exchange of electronic records with all entities within a regional health network (i.e., other hospitals, ambulatory clinics, sub-acute environments, employers, payers and patients).</li> </ul>
6	<ul style="list-style-type: none"> <li>Full physician documentation/charting (structured templates) are implemented for at least one patient care service area.</li> <li>A full complement of radiology PACS systems is implemented (i.e. all images, both digital and film-based, are available to physicians via an intranet or other secure network.)</li> </ul>
5	<ul style="list-style-type: none"> <li>The closed loop medication administration environment is fully implemented in at least one patient care service area. The eMAR and bar coding or other auto-identification technology, such as radio frequency identification (RFID), are implemented and integrated with CPOE and pharmacy to maximize point-of-care patient safety processes for medication administration.</li> </ul>
4	<ul style="list-style-type: none"> <li>Computerized practitioner/physician order entry (CPOE) for use by any clinician added to nursing and CDR environment.</li> <li>Second-level of clinical decision support related to evidence-based medicine protocols implemented.</li> <li>If one patient service area has implemented CPOE and completed previous stages, this stage has been achieved.</li> </ul>
3	<ul style="list-style-type: none"> <li>Clinical documentation installed (e.g. vital signs, flow sheets, nursing notes, care plan charting, and/or the electronic medication administration record (eMAR) system are scored with extra points and are implemented and integrated with the CDR for at least one service in the hospital.)</li> <li>First level of clinician decision support is implemented to conduct error checking with order entry (i.e. drug/drug, drug/food, drug/lab, conflict checking normally found in the pharmacy).</li> <li>Some level of medical image access from picture archive and communication systems (PACS) is available for access by physicians via the organization's intranet or other secure networks.</li> </ul>
2	<ul style="list-style-type: none"> <li>Major ancillary clinical systems feed data to clinical data repository (CDR) that provides physician access for retrieving and reviewing results.</li> <li>CDR contains a controlled medical vocabulary (CMV) and the clinical decision support system and rules engine for rudimentary conflict checking.</li> <li>Optional for extra points: information from document imaging systems may be linked to the CDR.</li> </ul>
1	<ul style="list-style-type: none"> <li>Laboratory, pharmacy and radiology installed.</li> </ul>
0	<ul style="list-style-type: none"> <li>Some clinical automation may exist.</li> <li>Laboratory and/or pharmacy and/or radiology not installed.</li> </ul>

Investment distribution to achieve Stage 6

100%

75%

70%

**Cost Drivers**  
(from Stage 3 to Stage4)  
Training  
Hardware  
Security Management  
Adoption Enforcement  
>#’s of staff requiring  
24x7 coverage

40%

**Medsphere Target**

20%

10%

3%

# Industry Recognition

## HIMSS\* Analytics

- Originally named thirteen facilities "Stage 6" for EMR adoption leading to documented improvements:
  - Reduction of medication errors
  - Reduced nursing overtime costs
  - Shorter length of stay
  - Fewer errors in billing & coding
  - Fewer claim denials
  - Improved physician and nursing recruitment
  - More competitive marketing
- Medsphere customer Midland Memorial Hospital is one of the thirteen Stage 6 facilities.
- Midland spent 6M dollars to achieve Stage 6, or roughly 40% of next lowest investment (15M)
- The most invested was 50M (8x Midland)

## CHIME\*\* 2008

- Told an audience of CIO's to watch Medsphere and their "completely disruptive open source healthcare IT solution."

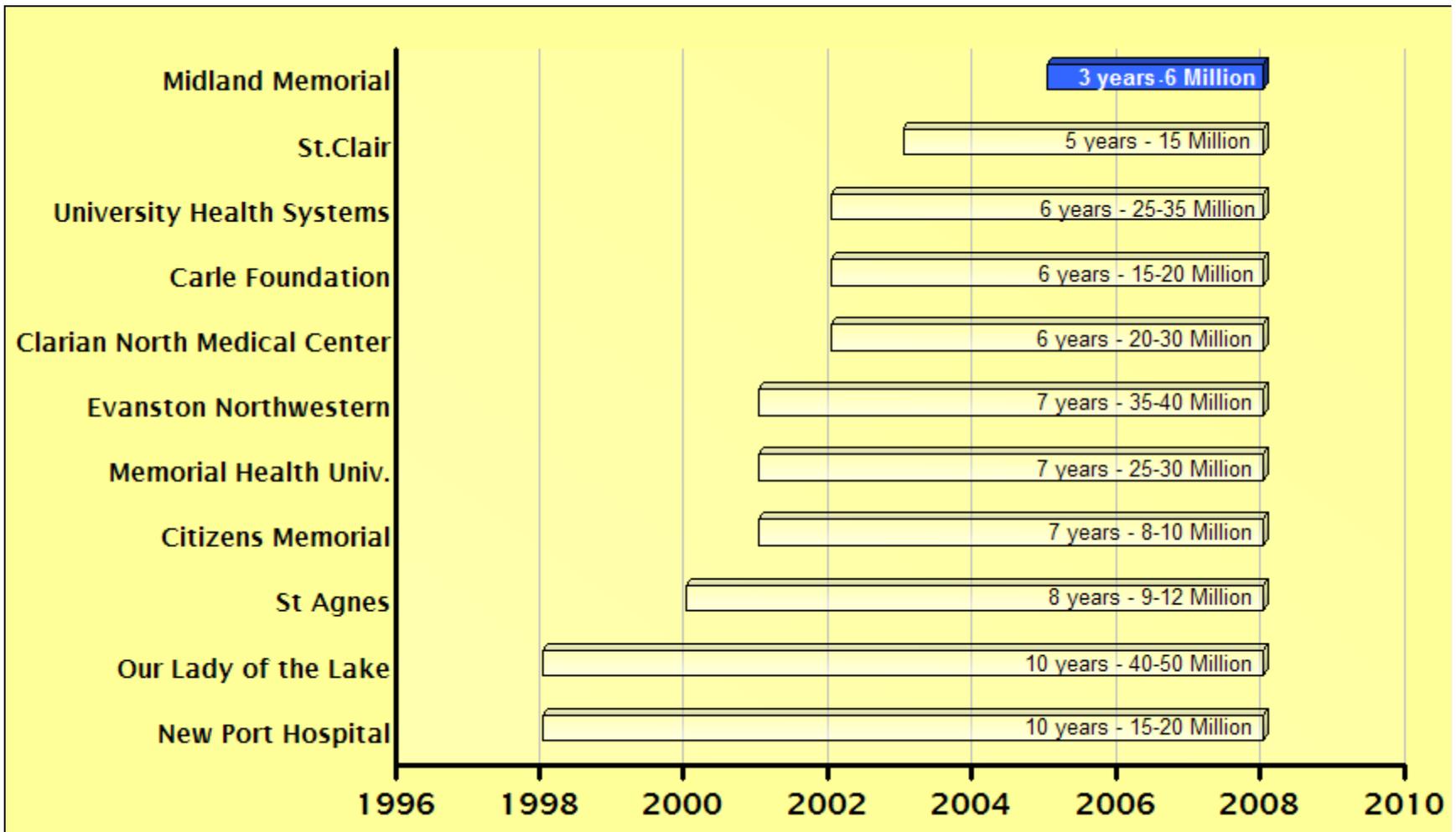
\* Health Information and Management Systems Society

\*\* College of Healthcare Information Management Executives

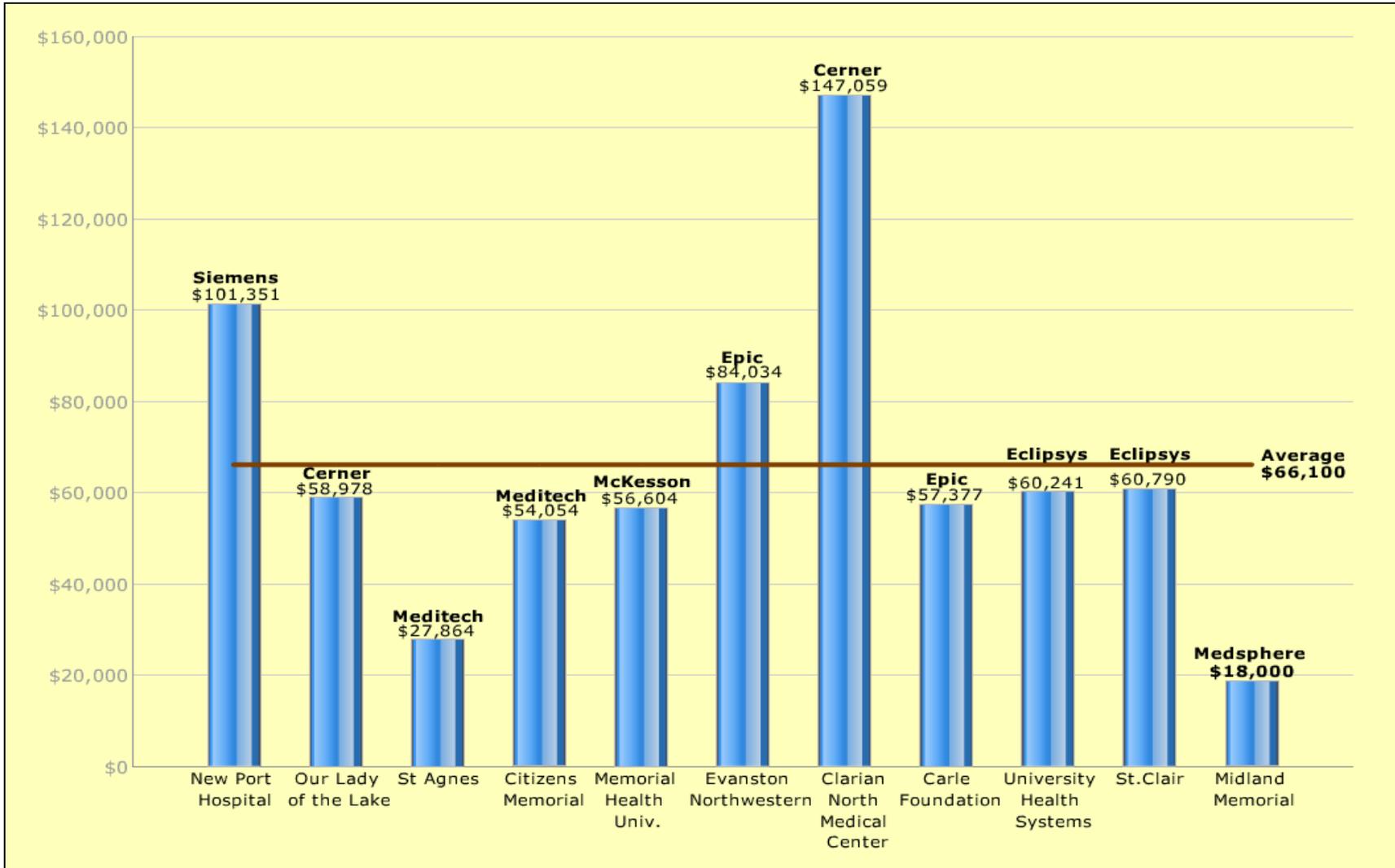
EMR Adoption Model <sup>SM</sup>		
Stage	Cumulative Capabilities	% of US Hospitals
Stage 7	Medical record fully electronic; CDO able to contribute to EHR as byproduct of EMR	0.0%
Stage 6	Physician documentation (structured templates), full CDSS (variance & compliance), full PACS	0.8%
Stage 5	Closed loop medication administration	1.4%
Stage 4	CPOE, CDSS (clinical protocols)	2.2%
Stage 3	Clinical documentation (flow sheets), CDSS (error checking), PACS available outside Radiology	25.1%
Stage 2	Clinical Data Repository, Controlled Medical Vocabulary, Clinical Decision Support System (CDSS) Capability	37.2%
Stage 1	Ancillaries – Lab, Rad, Pharmacy	14.0%
Stage 0	All three Ancillaries not installed	19.3%

Source: HIMSS Analytics™ Database (derived from the Dorenfest IHDS+ Database™). N = 5,073

# HIMSS Analytics – Stage 6 (Time and Cost)



# HIMSS Analytics – Stage 6 (Cost per bed)



# What is an Ecosystem?

***Collaboration on a community governed roadmap that drives innovation, advancement and knowledge of clinical best practices into IT solutions for all***

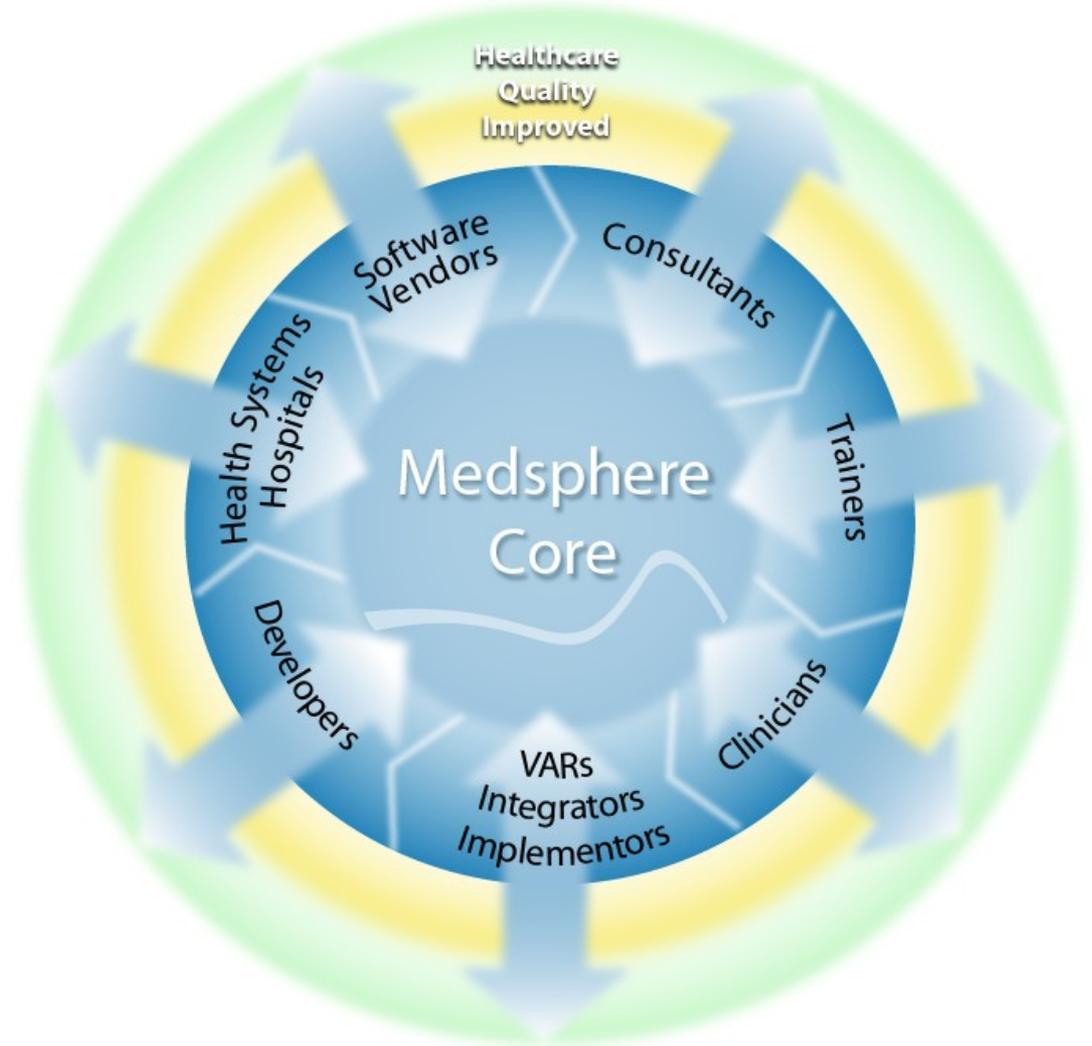


## Why an Ecosystem?

- ❑ **Freedom** from vendor lock
- ❑ Focus on **knowledge** and services
- ❑ Competitive **advantage** for the community
- ❑ Encourages **contributions** from Ecosystem members
- ❑ Fosters **governance** of the collaborative contribution process
- ❑ Promotes a mechanism to **review & reuse** contributions
- ❑ Assures **quality** control of mainline - **trusted** for use in live healthcare environment
- ❑ Provides
  - ❑ Multifaceted **value proposition** to ecosystem members
  - ❑ **Open access** for subscribers & community to create and contribute

# Medsphere Vision

How is  
Medsphere  
cultivating the  
largest  
collaborative  
ecosystem in  
healthcare?





# 3 Transformation Steps

## 1. Implement > Adoption

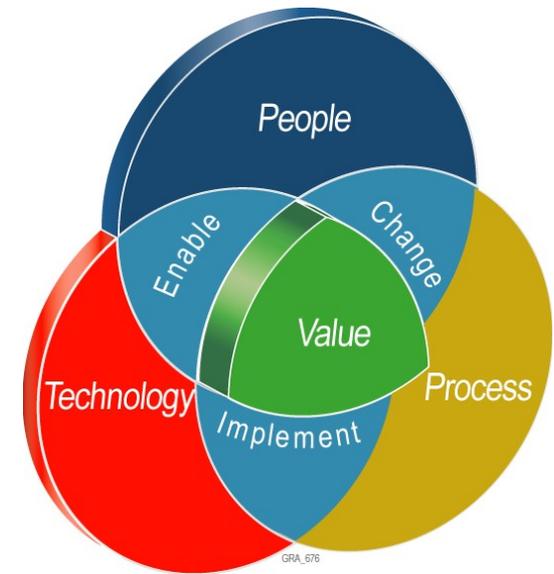
1. Departmental automation - orders management - CPOE
2. Clinical usage
3. Necessary but not sufficient

## 1. Enable > Operational Transformation

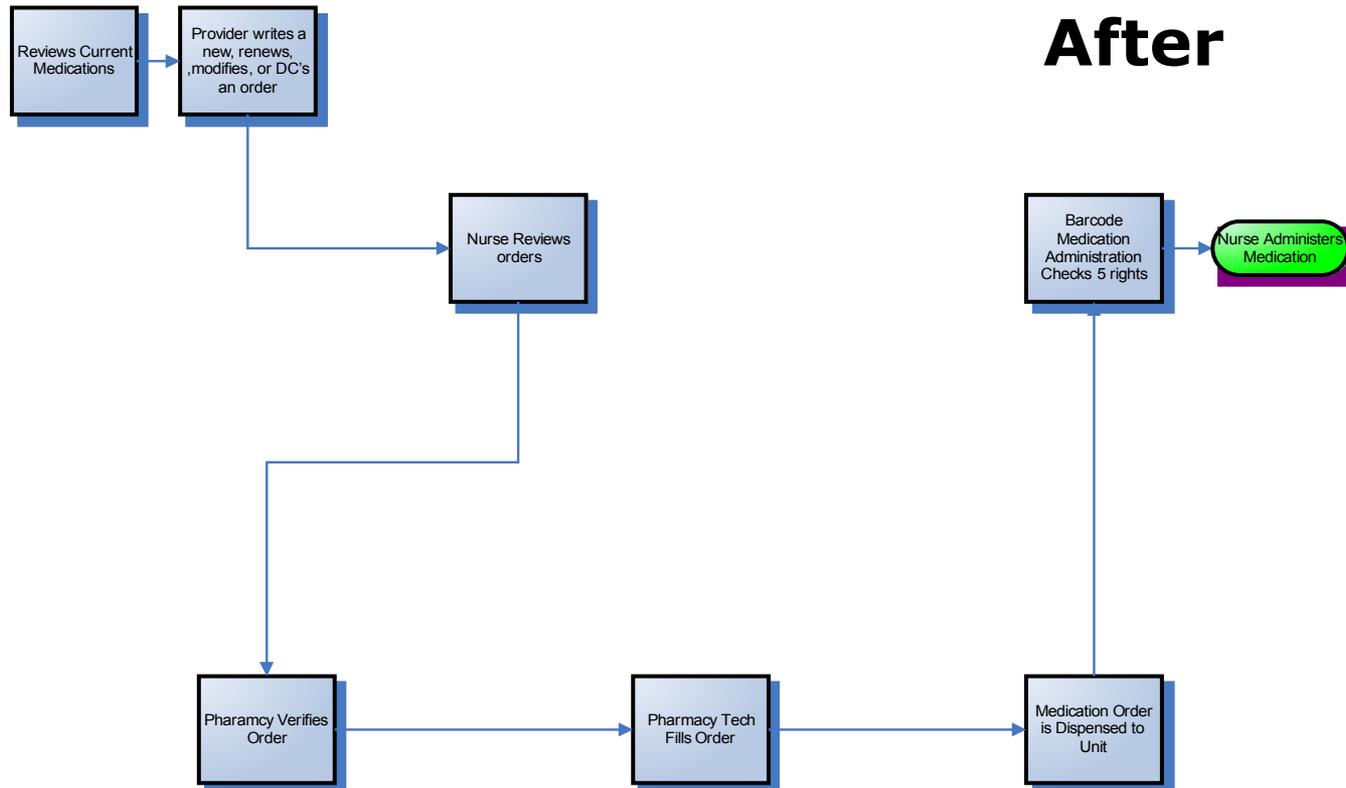
1. System itself is closed loop and fills holes
2. Efficiencies, information access and accountabilities

## 1. Change > Clinical Transformation

1. Use clinical content to address specific patient safety and clinical guidelines
2. Target specific outcomes with order sets, templates, clinical reminders



# Medication Administration: CPOE & BCMA



# Establish your clinical goals

- ❑ Insurance providers estimate the cost of a saved life to a provider is **\$45,000**
- ❑ An adverse drug event can cost between **\$16,000-\$24,000** per instance
- ❑ Ventilator Acquired Pneumonia can cost a provider **\$25,000** per instance
- ❑ A single vent day eliminated saves approximately **\$750**
- ❑ A preventable surgical infection saves more than **\$27,000**
- ❑ Pressure ulcers cost approximately **\$10,000**
- ❑ Eliminating bloodstream infections can eliminate **\$25,000** in unnecessary cost
- ❑ Simply automating paper based forms can save close to **\$1 million!**

\* Reference material provided on request

# Transformation Outcomes

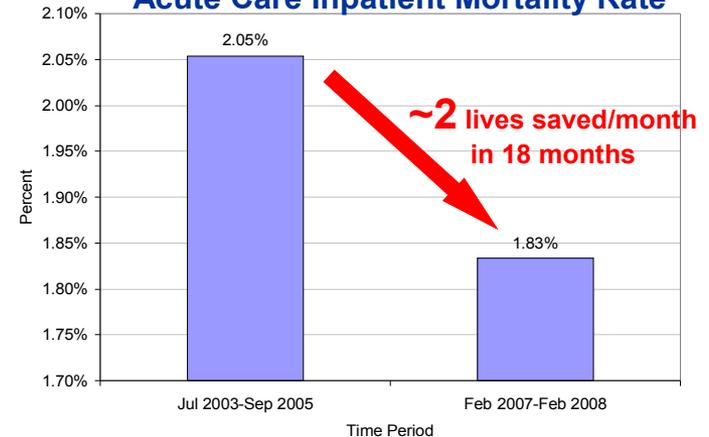
## Care

- Decrease time from Rx dispensing: 15-20 minutes, not hours
- Decrease Dx report turnaround: to minutes, not hours
- Decrease Rx order errors
- Decrease in duplicate tests (Lab/Rad)
- Shift of RN time from documentation to pt. Care
- Decrease in RN overtime hours
- Dec worked hours per unit of service by dept
- Decrease length of stay

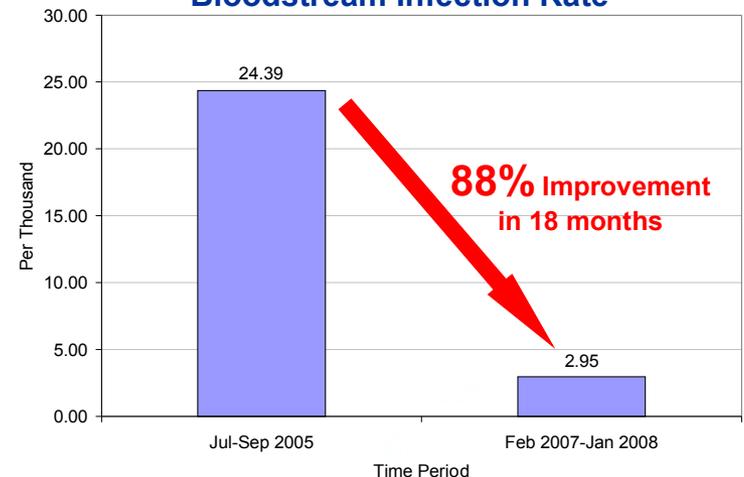
## Charge Capture & Claims

- Increase in charge capture
- Inc coding compliance (CMI appropriateness)
- Reduction in un-coded account days
- Improved Case mix index improvement
- Discharged-Not-Final-Billed (DNFB)
- Dec AR days
- Decrease coding denials
- Increased compliance with HIPAA Attachments

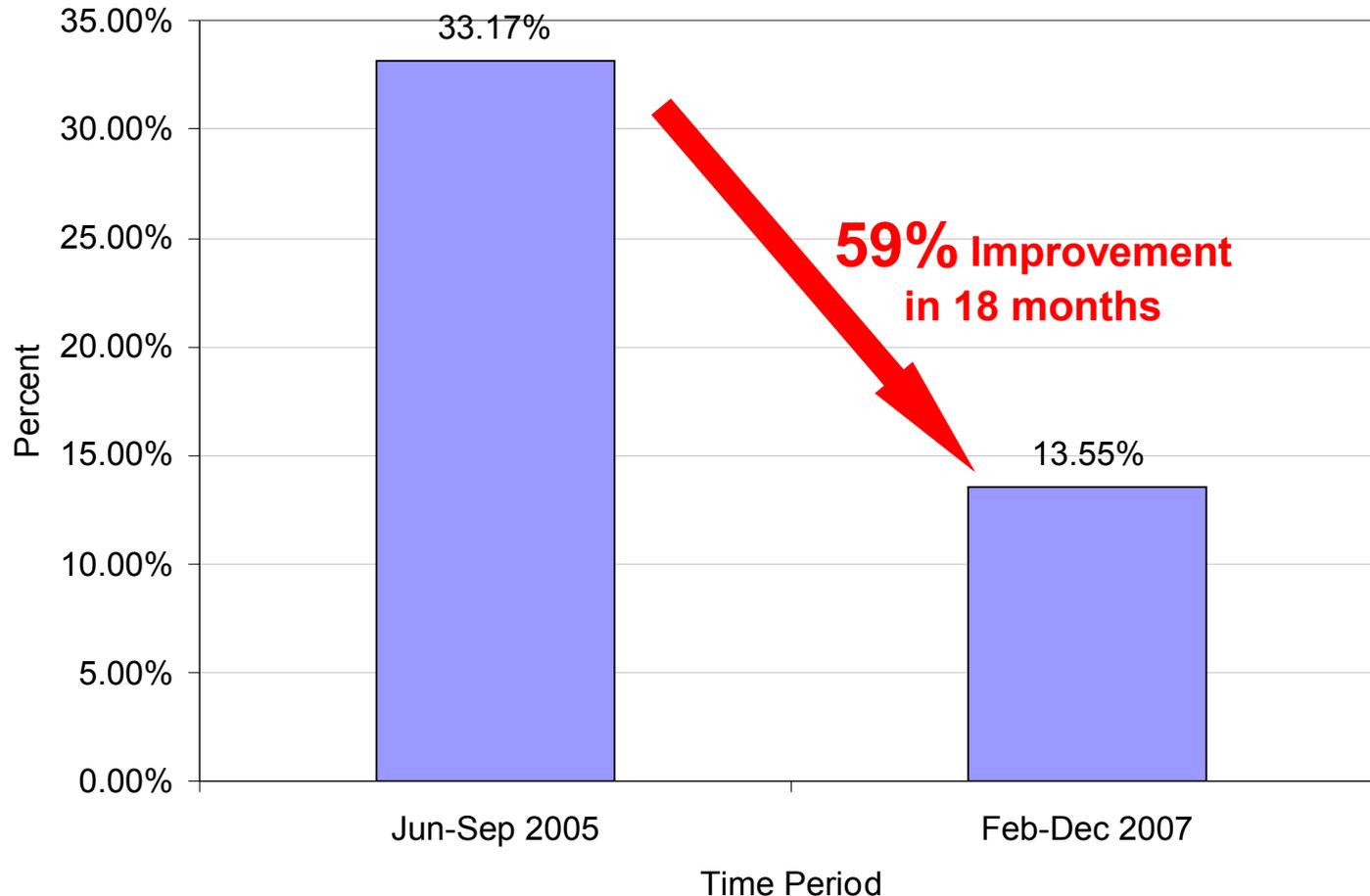
### Acute Care Inpatient Mortality Rate



### Central Line-Associated Primary Bloodstream Infection Rate

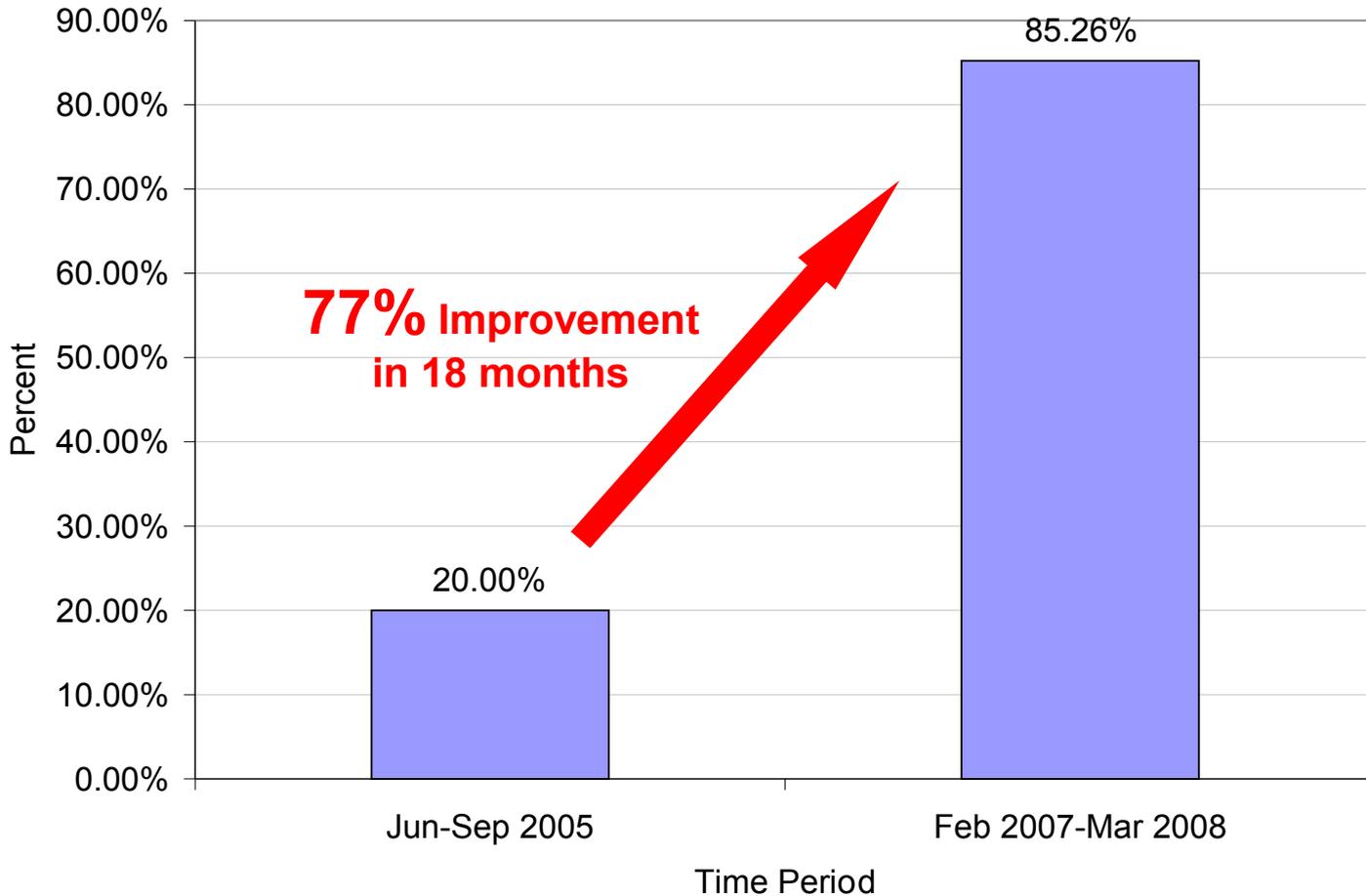


# Percent of Unreconciled Medications



Medication Reconciliation has been endorsed as an effective strategy at reducing Adverse Drug Events. The Percent of Unreconciled Medications improved from a mean of 33.17% (276 of 832 Jun-Sep 2005) to 13.55% (302 of 2,229 Feb-Dec 2007).

# Ventilator Associated Pneumonia (VAP) Bundle Compliance



The percentage of intensive care patients on mechanical ventilation for whom all four elements of the ventilator bundle are implemented and documented on the daily goals sheet and/or elsewhere in medical record improved from a mean of 20.00% (13 of 65 Jun-Sep 2005) to 85.26% (81 of 95 Feb 2007-Mar 2008).

## Midland Benefits Assessment: In Summary

- Reduction in patient deaths
- Reduction in infection rates
- Reduction in hospital acquired pressure ulcers (bed sores)
- Increase in compliance with ventilator care support, which can lead to reduced hospital acquired pneumonia
- Reduction in sepsis related to central venous access, which can lead to reduced length of stay and death
- Improved medication reconciliation compliance, which can lead to reduction in medication errors
- Over 50% overall compliance with CPOE and 100% of physician CPOE compliance
- Remote MD access is up to 433 users in offices and homes
- Improved documentation compliance
- Improved overall productivity and communication across departments

# Get on the Bus!

