Computing Support for the Enterprise

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Partners HealthCare System

Partners IS Operating Budget Growth FY99-FY03

dollars in thousands

Category	FY99 Actual	FY00 Actual	FY01 Actual	FY02 Forecast	FY03 Budget	FY02/FY03 Growth	Compound Annual
Salaries	34,217	40,135	45,109	56,133	62,741	12%	16%
Fringes	7,807	9,274	10,322	12,836	15,049	17%	18%
Total Salaries and Fringes	42,024	49,409	55,431	68,969	77,791	13%	17%
Supplies	1,306	1,791	1,476	2,161	1,560	-28%	5%
Direct Rent and Utilities	5,274	5,233	6,057	6,027	7,464	24%	9%
Consulting	5,296	5,057	7,182	5,284	5,790	10%	2%
Outside Services	12,443	10,229	16,703	19,352	20,073	4%	13%
Other	1,745	2,181	1,276	2,359	1,695	-28%	-2%
Subtotal (w/o Depreciation)	68,089	73,899	88,127	104,153	114,373	10%	14%
Depreciation	47,914	48,485	55,541	57,338	56,608	-1%	4%
Total	116,003	122,385	143,668	161,491	170,981	6%	10%

Defining The Nature of "Support"

- ◆ **Derived IT response from goals and strategies**

- ◆ **Assessment of strategic trajectories**

- ◆ **Continuous focus and improvement of core activities**

- ◆ **Technology applied to core processes/activities**

How Should We Support Our Disease Management Initiative?

◆ Develop and publish best practices

◆ Monitor costs, quality and care activity of a cohort

◆ Guide documentation

◆ Remind providers and patients of steps to be taken

◆ Critique specific care decisions

◆ Monitor and manage a specific patient

IS Support of Partners Goals

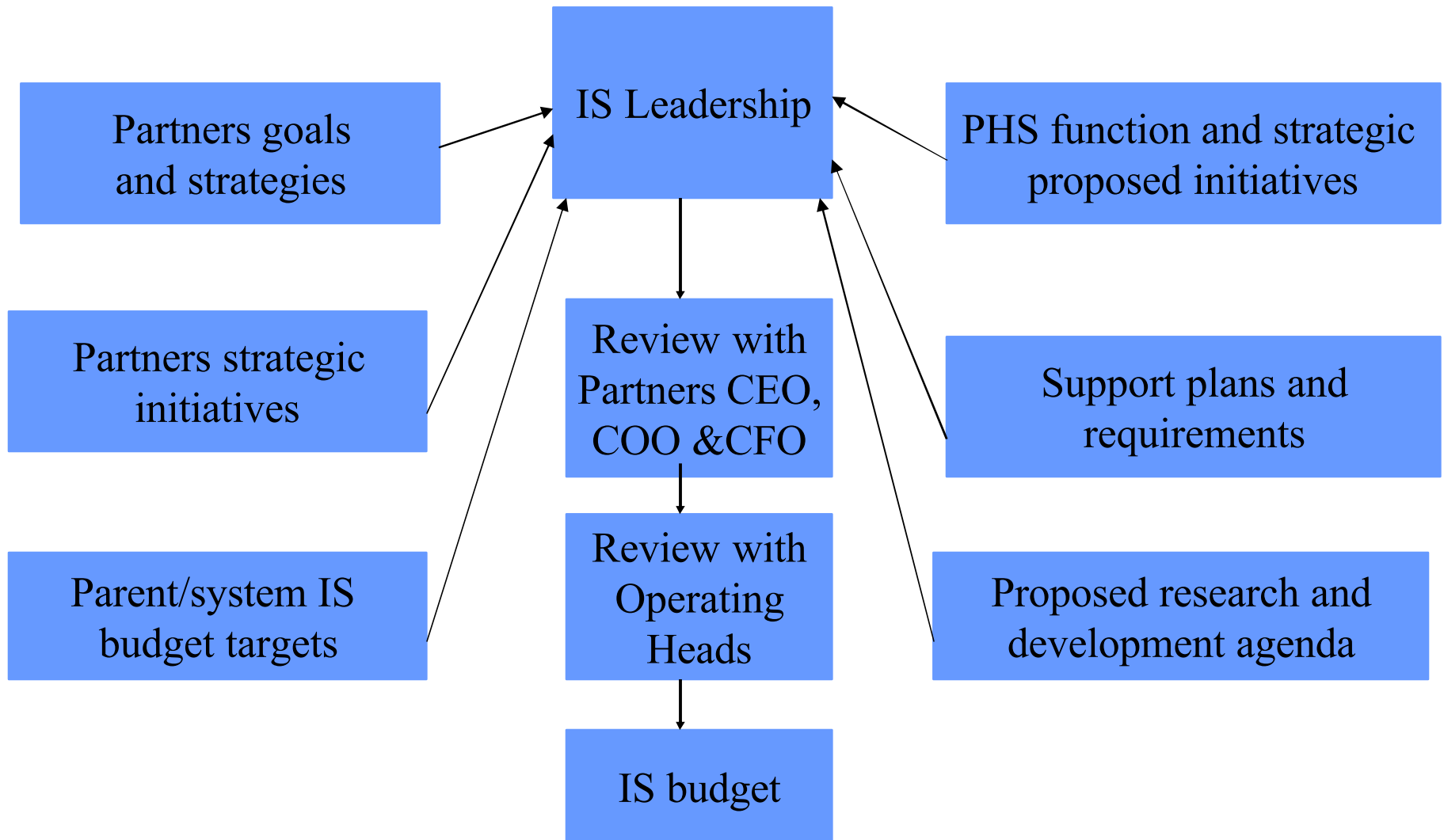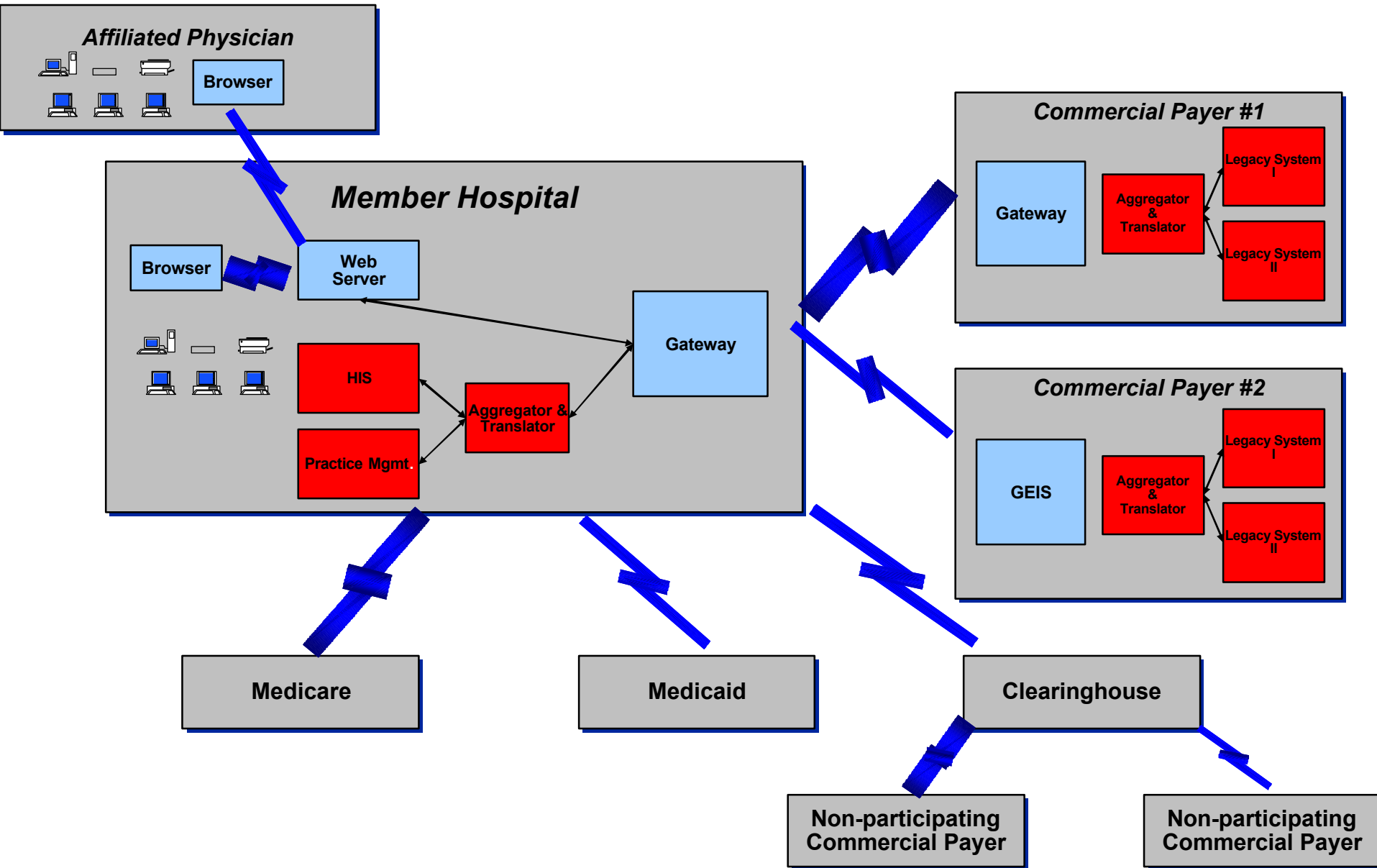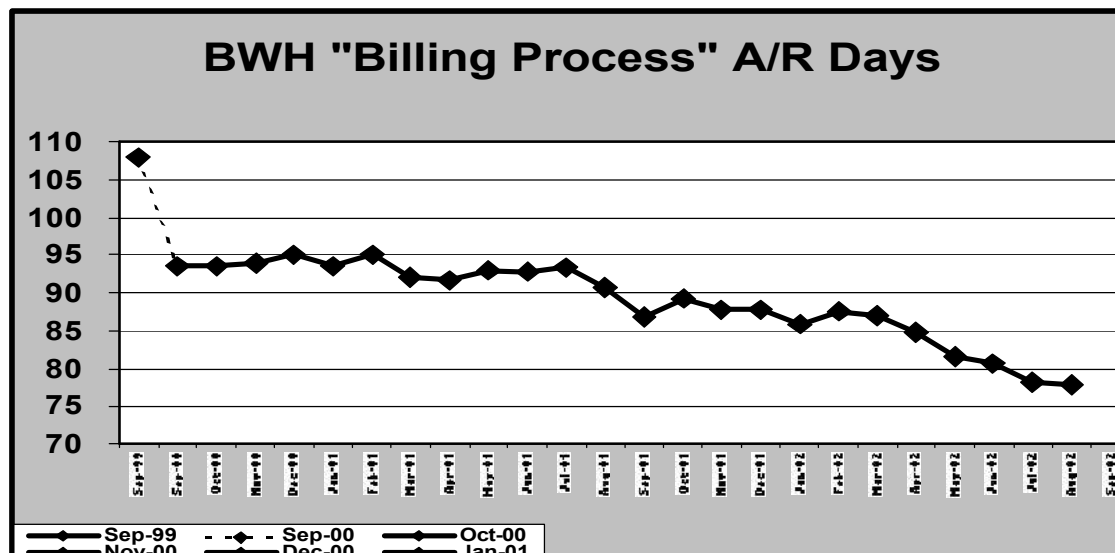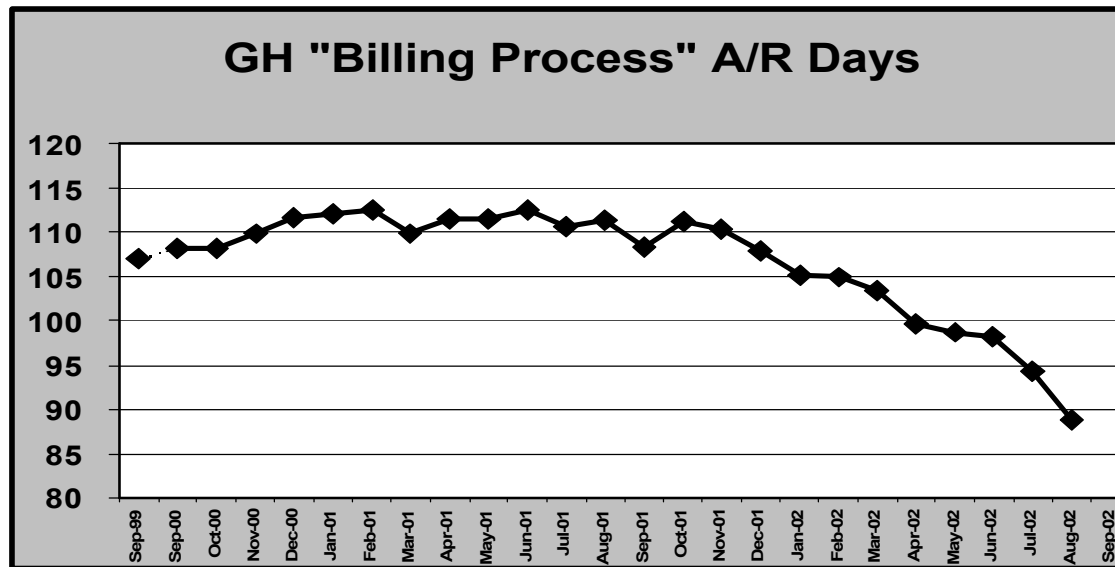| Goal	IS Initiatives
Research and education	- Research patient data registry - Genetics and Genomics platform - Grants management
Patient care: Quality improvement	- Quality measurement databases - Order entry - Longitudinal medical record (LMR)
Patient care: Sharing data across the system	- Enterprise master person index (EMPI) - Clinical data repository (CDR) - Common infrastructure
Patient care: Non-Acute care services	- Nursing documentation (InSync) - 4-Next
Financial stability	- Revenue enhancements - PeopleSoft - Cost accounting (TSI)
PCHI	- Longitudinal medical record (LMR) - PCHInet - Data warehouse

Budget Decision Making Process

Partners goals and strategies

Partners strategic initiatives

Parent/system IS budget targets

IS Leadership

PHS function and strategic proposed initiatives

Support plans and requirements

Proposed research and development agenda

Review with Partners CEO, COO &CFO

Review with Operating Heads

IS budget

NEHEN Architecture

Days A/R Outstanding has Shown Steady Improvement

GH "Billing Process" A/R Days

BWH "Billing Process" A/R Days

Outpatient Registration Reconciliation

Member #	Demographics	Percent
Y	Y	87%
Y	N	3%
N	Y	7%
N	N	3%

Payer-Provider Shared Business Logic

Payer Systems

Provider Systems

Payer A Claim Rules

Payer B Claim Rules

Payer C Claim Rules

Provider copies of Payer Claim Rules

Registration

Scheduling

CPOE

Computerized Medical Record

Accounts Receivables/Billing
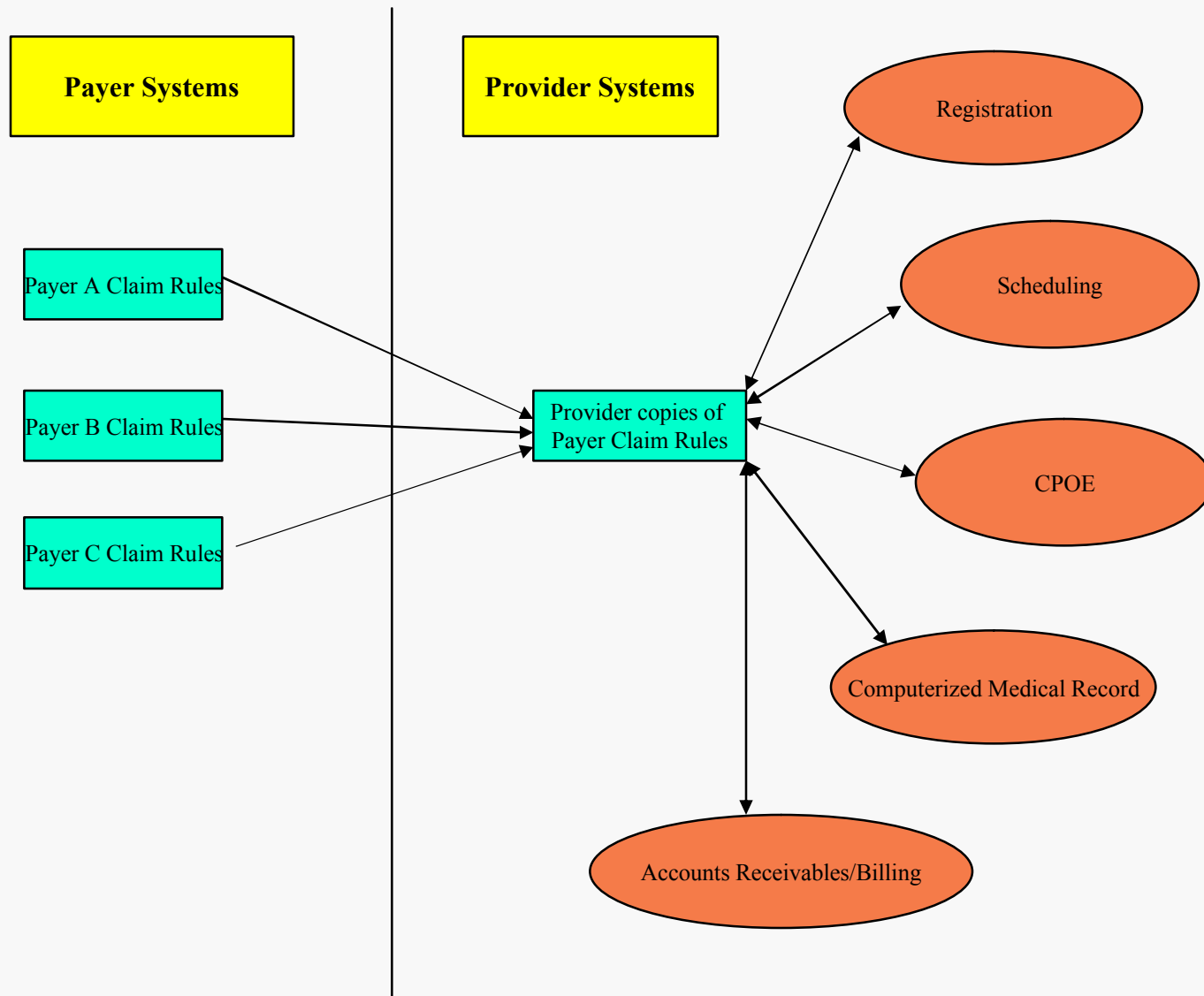
Synchronization of Subscriber and Master Patient Index Databases

Payer Systems

Provider Systems

Batch Reconciliation

Subscriber DB

EMPI DB

Real-time Reconciliation

Subscriber DB

EMPI DB

Shared Database

Shared Subscriber/
EMPI DB
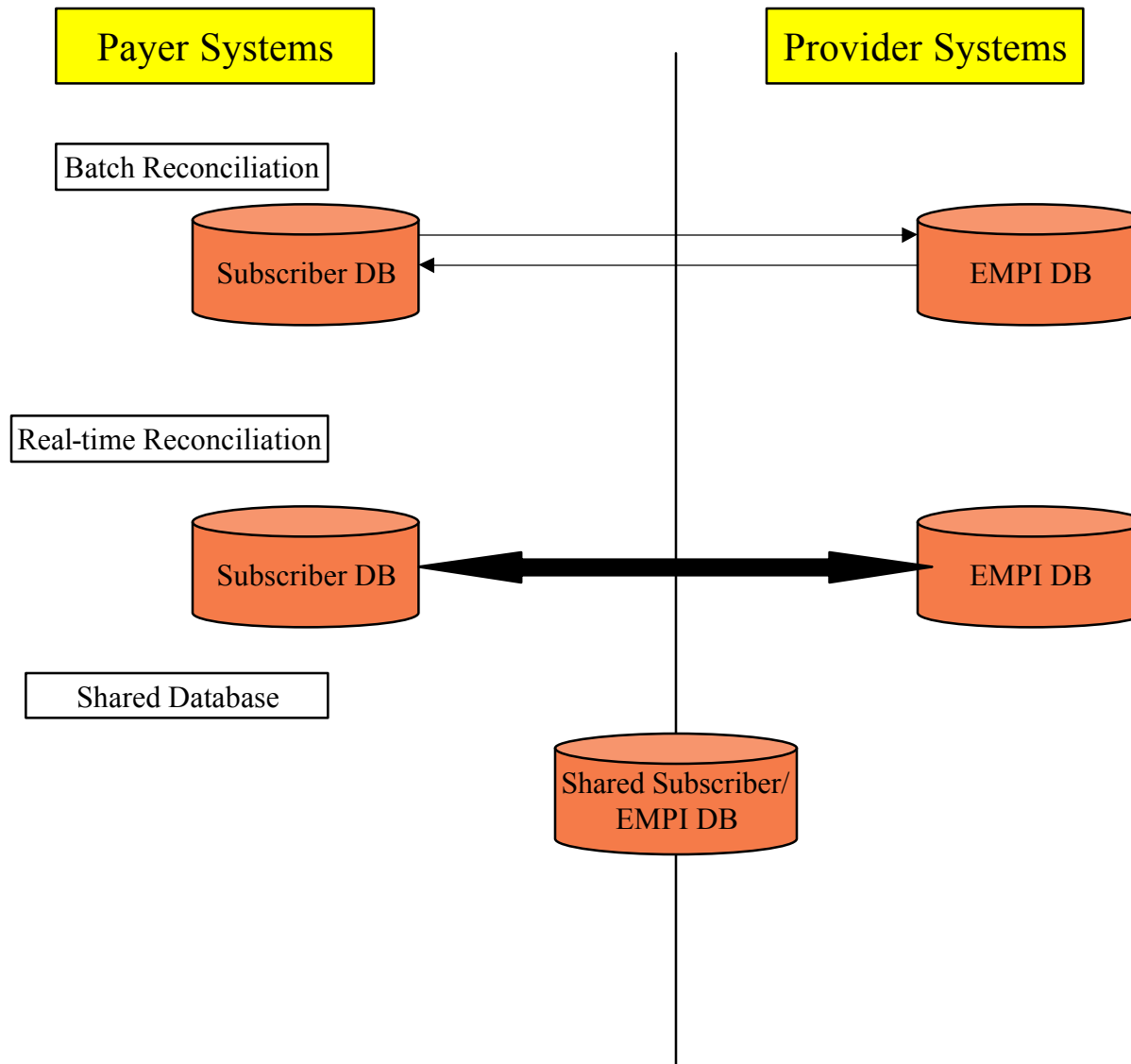
A Broad Look at Partners Clinical Systems

- ◆ **Provider order entry**
- ◆ **Computerized medical record**
- ◆ **Knowledge repositories**
- ◆ **Physician-to-physician consultation**
- ◆ **Patient-provider communication/monitoring**
- ◆ **Care analysis**

Claus, Santa C, Jr. ➤	Longitudinal	Steven Flammini
01/26/1910 (160 yrs.) M	Medical Record	MGH BMG -
0000004 (MGH)		Medications

Select | Desktop | Patient Chart ~ Medications | Custom | Reports | Signature | Results | Help

COUMADIN (WARFARIN SODIUM)   Route: PO

History
Change Dose
Discontinue

Strength/Form [1MG TABLET ▼]

Dose [1 ▼] [Tablet(s) ▼]   Freq [QD ▼]

x [   ] day(s)   PRN [   ]

Dispense [30] [TABLET(S) ▼]   Refills [   ]

Start Date T [03/15/2001] >>   End Date T [   ] >>

☑ Prescription ☐ Patient Educated   ☐ No Substututes ☐ Don't Expire

Directions   Comments (This will not print on prescription)

[Take as directed   ] [   ]

Add to Favorites for: ☐ My List ☐ Practice   **Ok**   **Renew**   **Cancel**

Claus, Santa C, Jr. ▶
01/26/1910 (160 yrs.)   M
0000004 (MGH)

Longitudinal
Medical Record

Steven Flammini
MGH BMG -
Medications ▼

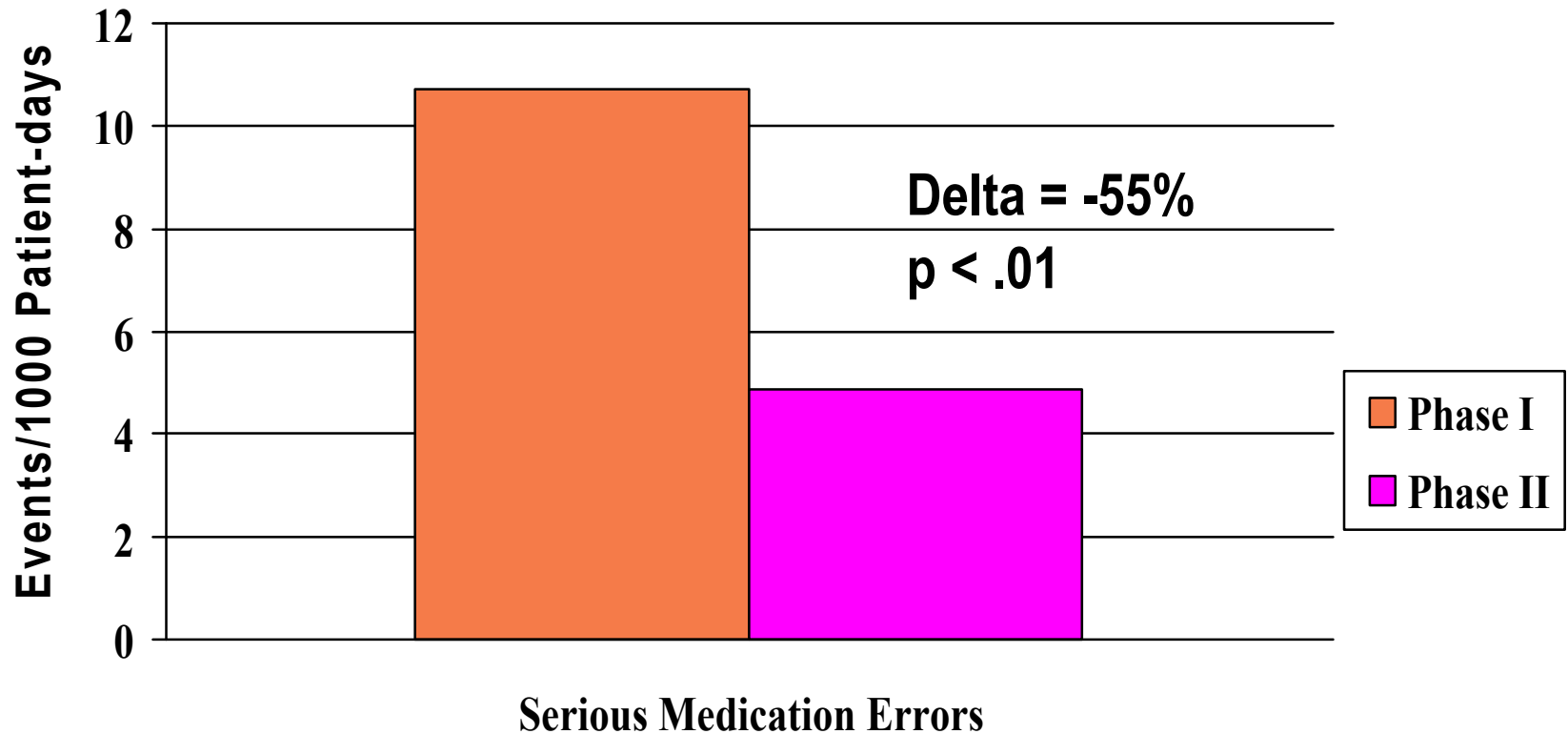| Select | Desktop | Patient Chart ~ Medications | Custom | Reports | Signature | Results | Help |

W a r n i n g

You are ordering **SULFADIAZINE.**

Drug allergy interaction warning - the patient has a documented allergy to **Aspirin** (reaction: Anaphylaxis)

Enter anyway   Cancel Order

Serious Medication Error Rates Before and After OE

Bates et al, JAMA, 1998

Impact of BWH Inpatient Provider Order Entry

- ◆ **Nizatidine use, for all oral H2 blocker orders, increased from 12% to 81%**

- ◆ **The percent of doses over the suggested maximum decreased from 2% to .6%**

- ◆ **The percent of orders for Ondansetron, with a frequency of 3 times daily, increased from 6% to 75%**

- ◆ **The percent of bed rest orders with a consequent order of heparin increased from 24% to 54%**

Sticky Notes   Family and Social History

VITAL SIGNS: 08/17/2000
BP 120/80 **PULSE** 77 **RESP** 20 **TEMP** 98.4 **Height** N/A **Weight** 147

Reminders
- Patient has coronary artery disease on problem list and aspirin is not on the medication list. Recommend aspirin.
- Patient is overdue for Mammogram (rec: q 1 year).
- Patient has CAD and/or CHD risk equivalent and is overdue for total cholesterol and/or LDL cholesterol (rec: q 1 year)

Medications	Problems	Procedures	Allergies
Synthroid 100 QD [N]	Coronary artery disease	Hysterectomy	Codeine
Inderal 20 TID [N]	Congestive heart failure	Appendectomy	Sulfa
Lisinopril 20 QD [N]	Hypothyroidism [N]	Ptca	
	Sinusitis		
	Hypertension [N]		
	Gerd [N]		

Summary of the Scope of the Outpatient Care Problem

(1) Gandhi T et al. Adverse drug events in primary care, under review, NEJM. (2) Gandhi T et al. Drug complications in outpatient settings J Gen Int Med 2000. (3) Gandhi TK et al. Adverse drug events in primary care, under review, NEJM. (4) Poon E, et. al. Failure to follow mammographers recommendations on marginally abnormal mammograms: determination of associated factors [abstract]. J Gen Intern Med 2001. (5) Gandhi T et. al. Communication breakdown in the outpatient referral process J Gen Intern Med 2000. (6) Maviglia SM, et.al. Using an electronic medical record to identify opportunities to improve compliance with cholesterol guidelines J Gen Intern Med 2001

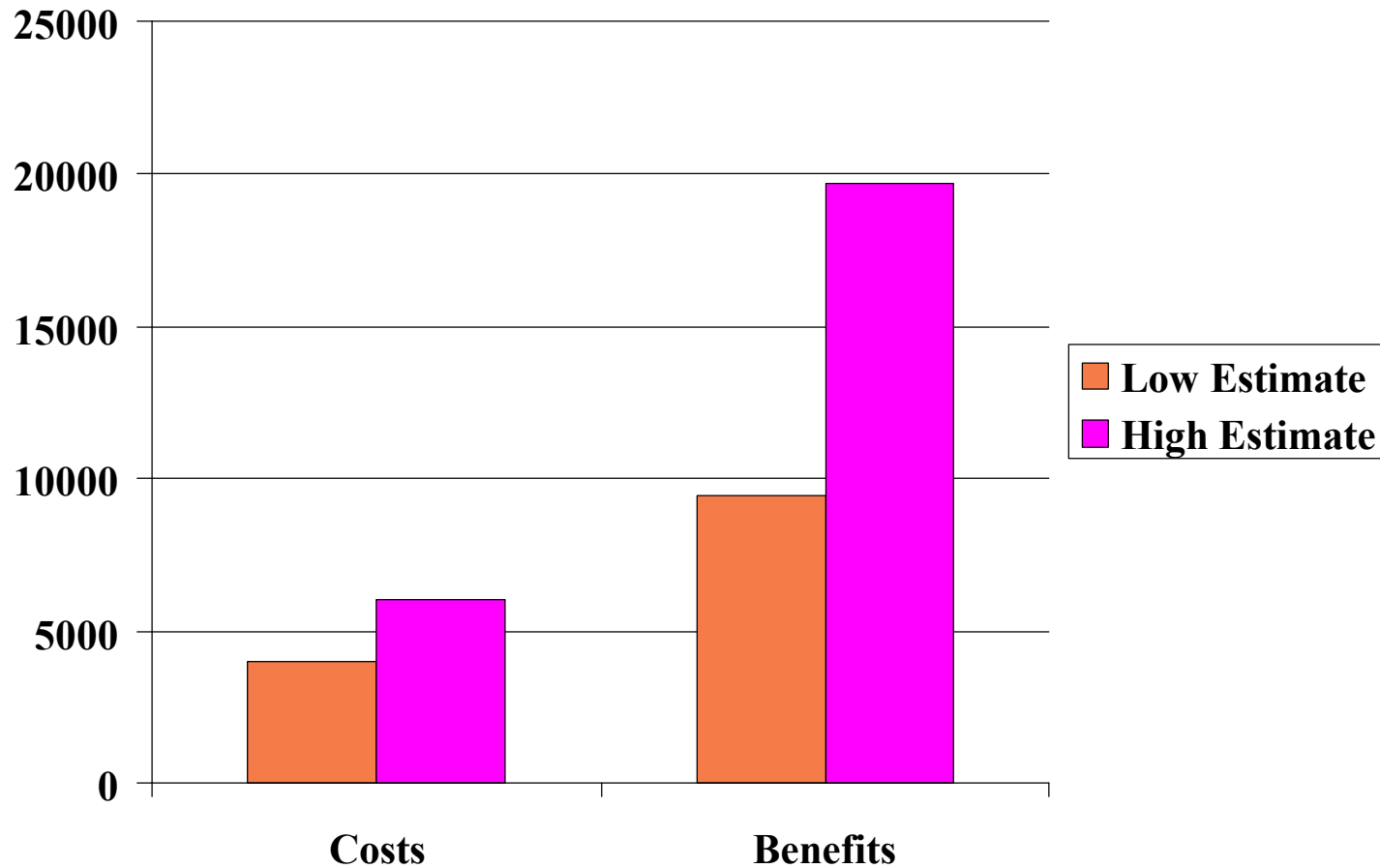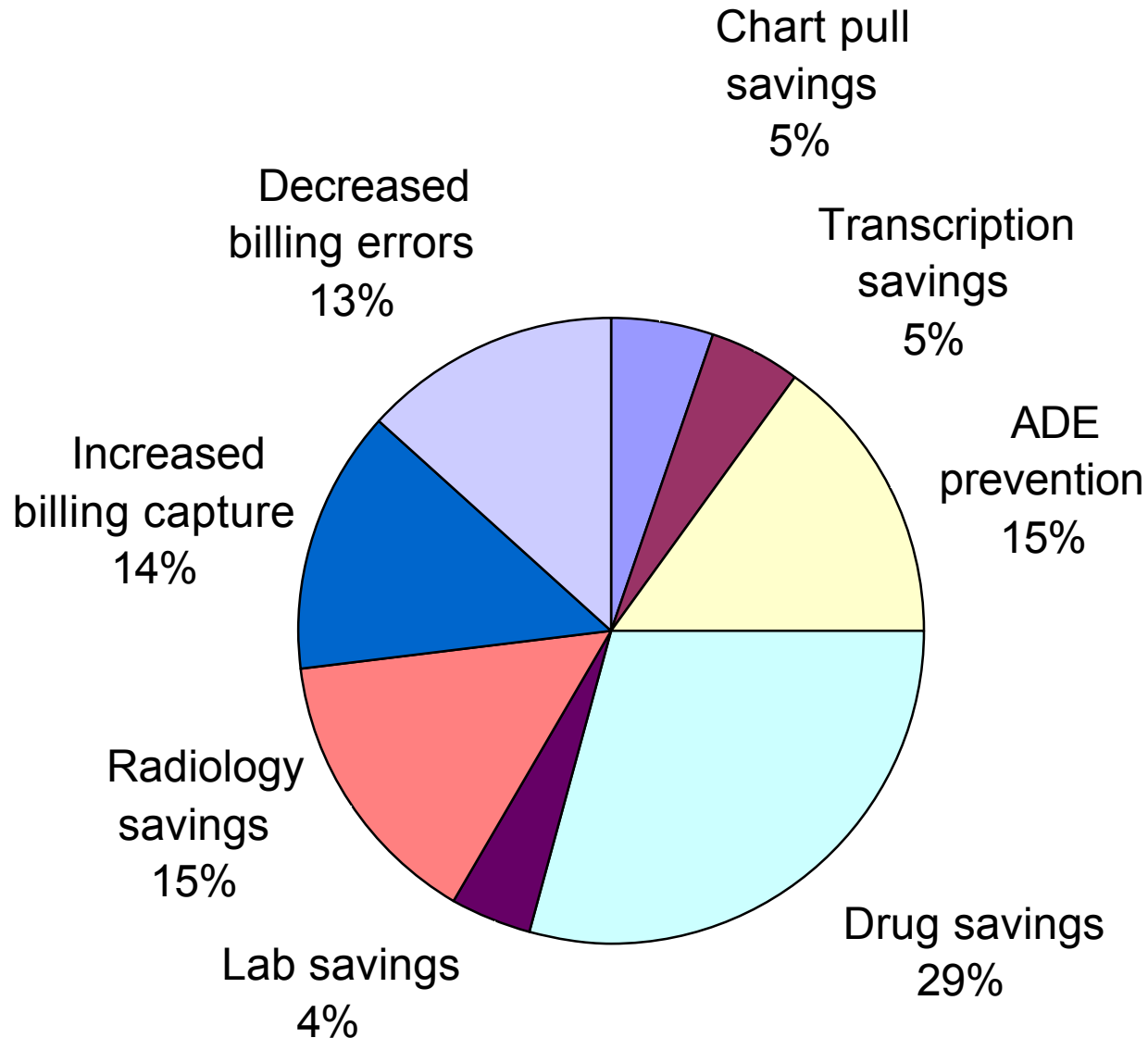| For Every:	There Appear to Be:
1000 patients coming in for outpatient care (1)	14 patients with life-threatening or serious ADEs
1000 outpatients who are taking a prescription drug (2)	90 who seek medical attention because of drug complications
1000 prescriptions written (3)	40 with medical errors
1000 women with a marginally abnormal mammogram (4)	360 who will not receive appropriate follow-up care
1000 referrals (5)	250 referring physicians who have not received follow-up information 4 weeks later
1000 patients who qualified for secondary prevention of high cholesterol (6)	380 will not have a LDL-C, within 3 years, on record

Costs of LMR vs. Benefits

LMR Benefits

Chart pull savings 5%

Transcription savings 5%

ADE prevention 15%

Decreased billing errors 13%

Increased billing capture 14%

Radiology savings 15%

Lab savings 4%

Drug savings 29%

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ess http://healthcare.partners.org/pchinet/references/index.htm   Go   Links »

PCHInet

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March 18, 2001

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? Questions

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Journals and References

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American College of OB/Gyn (ACOG) ▾   Go

References:

Harrison's Principles of Internal Medicine
The Merck Manual of Diagnosis and Therapy
MicroMedex
Physicians Desk Reference(PDR)

Primary Care Online *which includes:*

- Lippincotts Manual of Nursing Practice
- Nursing Care Plans
- Lippincotts Nursing Drug Guide
- Laboratory and Diagnostic Tests
- Primary Care Medicine
- Textbook of Internal Medicine
- Interpretation of Diagnostic Tests
- Washington Manual of Medical Therapeutics
- Facts and Comparisons Pocket Drug Guide
- Griffiths 5-Minute Clinical Consult

MicroMedex Drug Summary

Scientific American Medicine
Scientific American Surgery
*
StatRef

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Handbook PARTNERS.
HEALTHCARE SYSTEM

Cervical Cancer Screening Recommendations

eTextbooks | Medical Lit. | Clin Topics | Guidelines | Manuals | Forms & Documents | Software | Partners Sites | Ext. Sites |

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Cervical Cancer

Screening Recommendations

The goal of this guide is to provide physicians with clear guidelines for cervical cancer screening.

The recommendations presented herein are designed to provide women with optimal and personalized care. They are based on a comprehensive assessment of recent literature on cervical cancer screening. This guide is not intended to convey rigid standards. Instead, it should be tailored to the needs of each individual woman.

Medical Impact of Cervical Cancer

Scope of Knowledge in Medicine

- ◆ **10,000 diseases/problems/syndromes**
- ◆ **3,000 medications**
- ◆ **1,100 laboratory tests**
- ◆ **300 radiology procedures**
- ◆ **460,000 articles indexed annually by MEDLINE**

PCHInet Impact: Access to Knowledge Resources
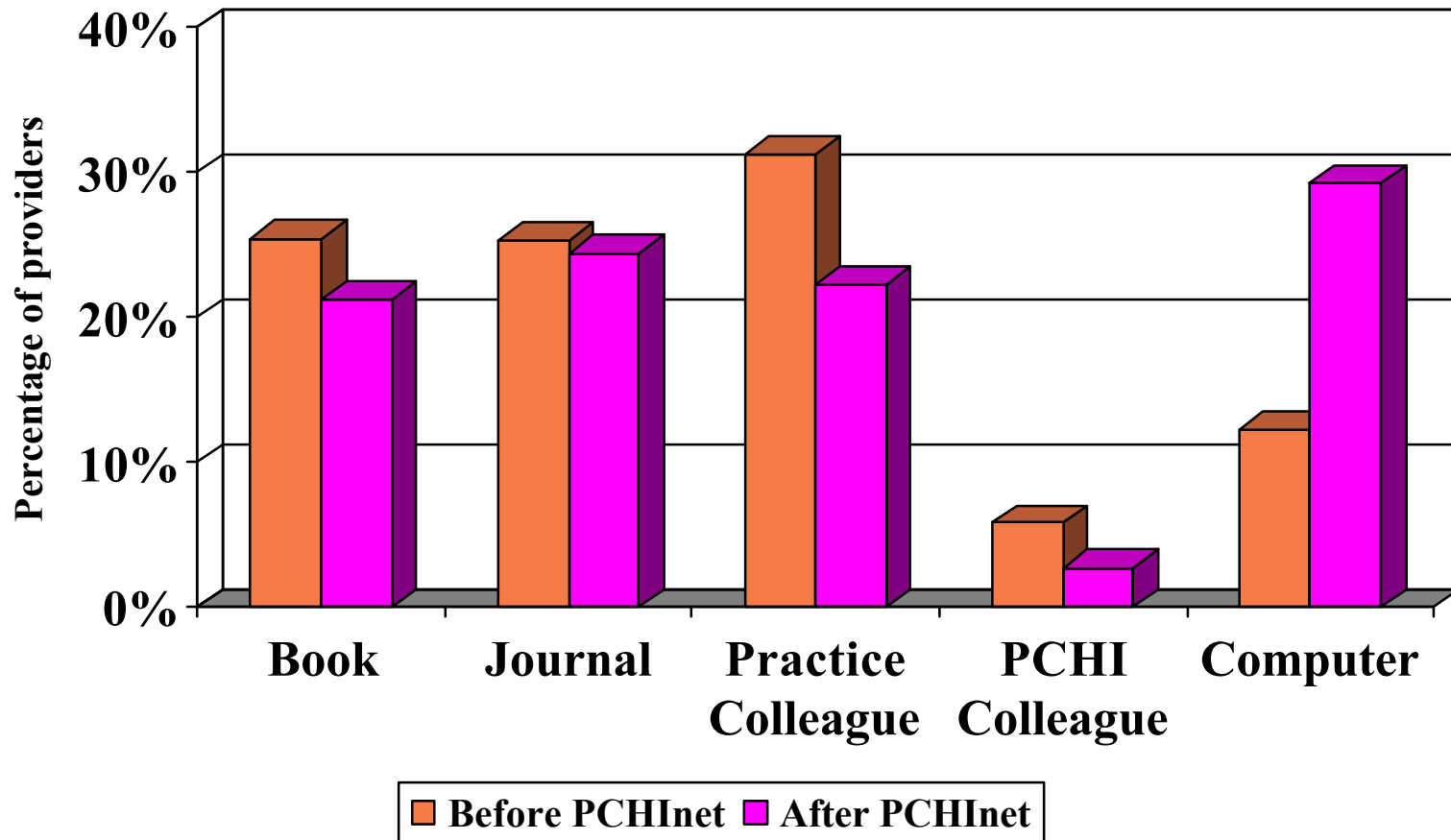
Survey of Physician's Experience Using a Handheld Reference Guide <small>Rothschild AMIA Proc 2000</small>

- ◆ **60% used qRx more than twice a day**
- ◆ **88% report more than 3/4 of questions addressed**
- ◆ **81% report improved drug-related decisions**
- ◆ **46% report 3 or more drug decisions per week were affected**
- ◆ **50% report 1 or more preventable adverse drug events were avoided per week**
- ◆ **Overall efficiency improved in inpatient (71%) and outpatient (69%) practice**

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Address https://econsults.partners.org/

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Welcome to Partners Online Specialty Consultations.

Partners Online Specialty Consultations is a health care consultation service provided by physicians at Partners hospitals, to physicians in conjunction with their patients. Physicians and patients, nationwide, may arrange remote specialty consultations to support their care by accessing the expertise of our physicians at Massachusetts General Hospital, Brigham and Women's Hospital and Dana-Farber/Partners CancerCare.
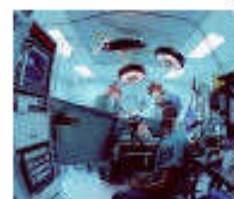
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- **Frequently Asked Questions**
- **How does it work?**
- **Request a Consultation**

Are you a first time visitor?

- **Register as Referring Physician**
- **Register as Patient**

Are you already registered?

Done   Internet

Care Impact of eConsults

Partners Internal Analysis 2002.

◆ **Diagnosis changed in 6% of cases**

◆ **Care plan changes discussed in 85% of cases**

– **New chemotherapy regimen recommended - 67%**

– **Other medical regimen & surgery discussed - 17%**

– **Radiation therapy suggested - 13%**

– **Termination of drugs recommended - 3%**

– **Drug dosage change suggested- 3%**

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Mail   Requests   Health Record   Health Library   **Practice**   My Profile   Help

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Services
Professional Staff
Contact Us

Welcome

Welcome Bilbo Oetest

You have no new messages in your Inbox.

THE BRIGHAM AND WOMEN'S PHYSICIAN GROUP
provides comprehensive adult medical care, from routine
health screening to complex diagnostic evaluations. Our
10-physician general medicine practice includes a
nephrologist, endocrinologist and cardiologist. All of these
physicians are affiliated with Brigham and Women's
Hospital and are faculty of Harvard Medical School.

Done   Internet

The Kaiser Experience

◆ **KP-Online supports:**
  – **Ask a question**
  – **Review guidelines and consumer information**
  – **Review benefits**

◆ **Piloted with 100,000 members**

◆ **Resulting in:**
  – **11% fewer office visits**
  – **14% treated their illness at home**
  – **46% fewer calls to nurses**
  – **42% improved perception of Kaiser**
  – **59% reported understanding their disease better**

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Clinical records

Disease management programs

Patient education

Specialty consultations

Date: 02/27/98 11:04:57 AM
Medical Record #3596964

Report Type: Summary

| Date	Type	Pulse	Systolic	Diastolic	Oximetry	Weight
02/20/98 09:27:00 AM	VSS	57	105	66	97	162.0
02/21/98 08:49:00 AM	VSS	57	109	62	97	162.0
02/23/98 04:13:00 PM	VSS	67	124	73	97	165.0
02/24/98 09:01:00 AM	VSS	59	122	75	98	163.0
	Average:	*60.00*	*115.00*	*69.00*	*97.25*	*163.00*
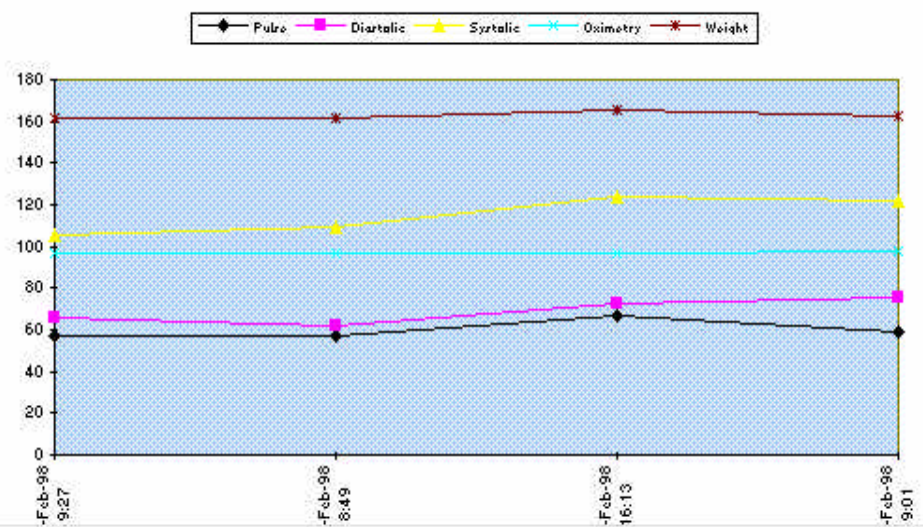
The Mercy General Experience

◆ **Health Buddy (for CHF) supports:**

– **Patient reporting of status**

– **Analyses of patient condition**

– **Email between providers and patients**

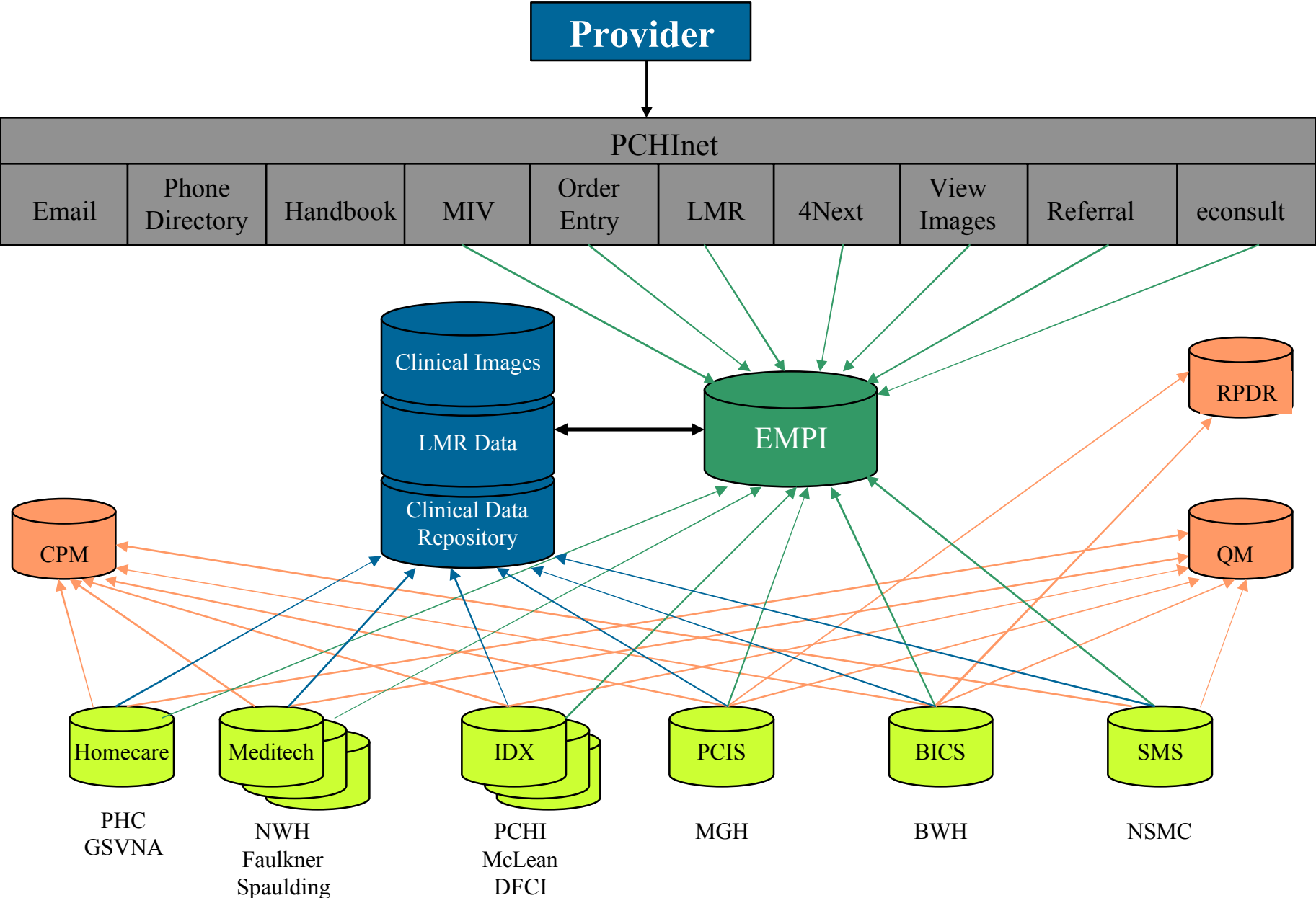◆ **Impact (compared to phone-based system):**

– **RN case load increased from 130 to 250 patients**

– **Average days between change in symptoms and care access improved from 5 days to 1 day**

– **Annual readmission costs per patient decrease from $81,900 to $58,500**

Comparison of Site Scores on Five Quality Domains
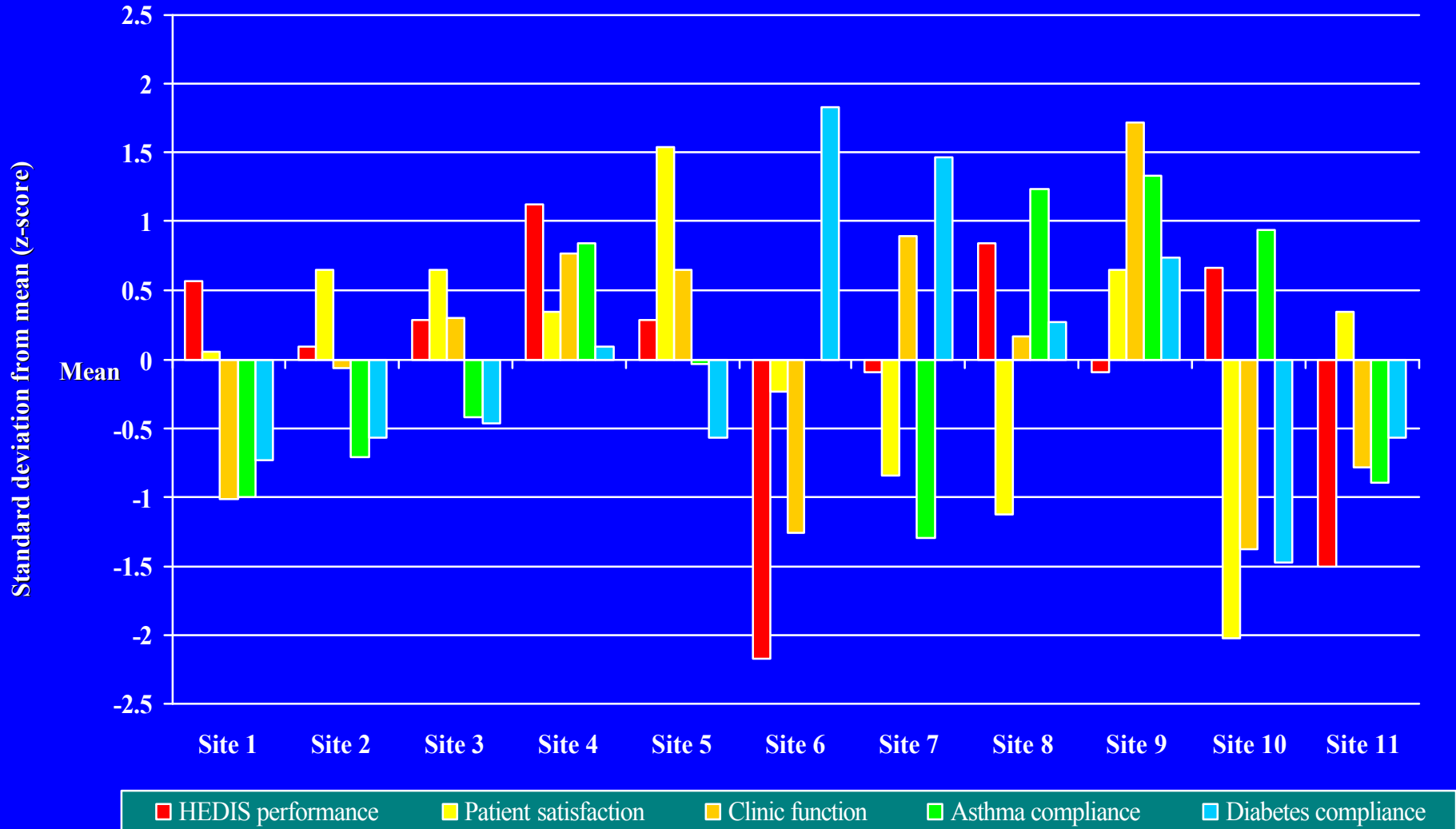
Partners HealthCare System
Systems Integration Components

Quality Measure	Status Hospital B	Status Hospital B
Death: Inpatient by diag/proc	x/m	x
Infection, acquisition of specific Organism	na	d/m
LOS, overall	x/m	x
Medication errors	x	m
Readmission: emergent within 28 days	m	x
Sepsis, vascular cath	x	d/m
Complication rates by surgeon	na	d/m
OR time by procedure	x/m	d
ED length of stay	x	d/m

Legend: x = available electronically and used in existing quality measurement reports;
m = manual data collection; d = used in existing quality measurement reports and available in department-specific database; na = not available

Scale of the Integration Effort

◆ **51,000 user accounts**

◆ **55,000 email accounts**

◆ **2,500,000 patients in the Partners Master Patient Index**

◆ **350,000,000 test results in the Clinical Data Repository and growing at a rate of 100,000 transactions per day**

◆ **80,000,000 images archived**

◆ **1,800 physician users of the Computerized Medical Record**

◆ **26,000 inpatient orders entered into CPOE each day**

◆ **720 active projects**

Conclusions

◆ **Information technology can be a critical contributor to the strategies and plans of integrated delivery systems**

◆ **Implementing the technology is difficult and may never be easy; there is nothing looming that will fundamentally ease the challenge**

◆ **The support agenda is developed through four fundamental vectors:**

– **Derived from overall strategy**

– **Assessment of strategic trajectories**

– **Continuous improvement of care activities**

– **Technology lens**