



# Sustainable Business Model For Health Information Exchange



**Inland Northwest Health Services  
Spokane, WA**

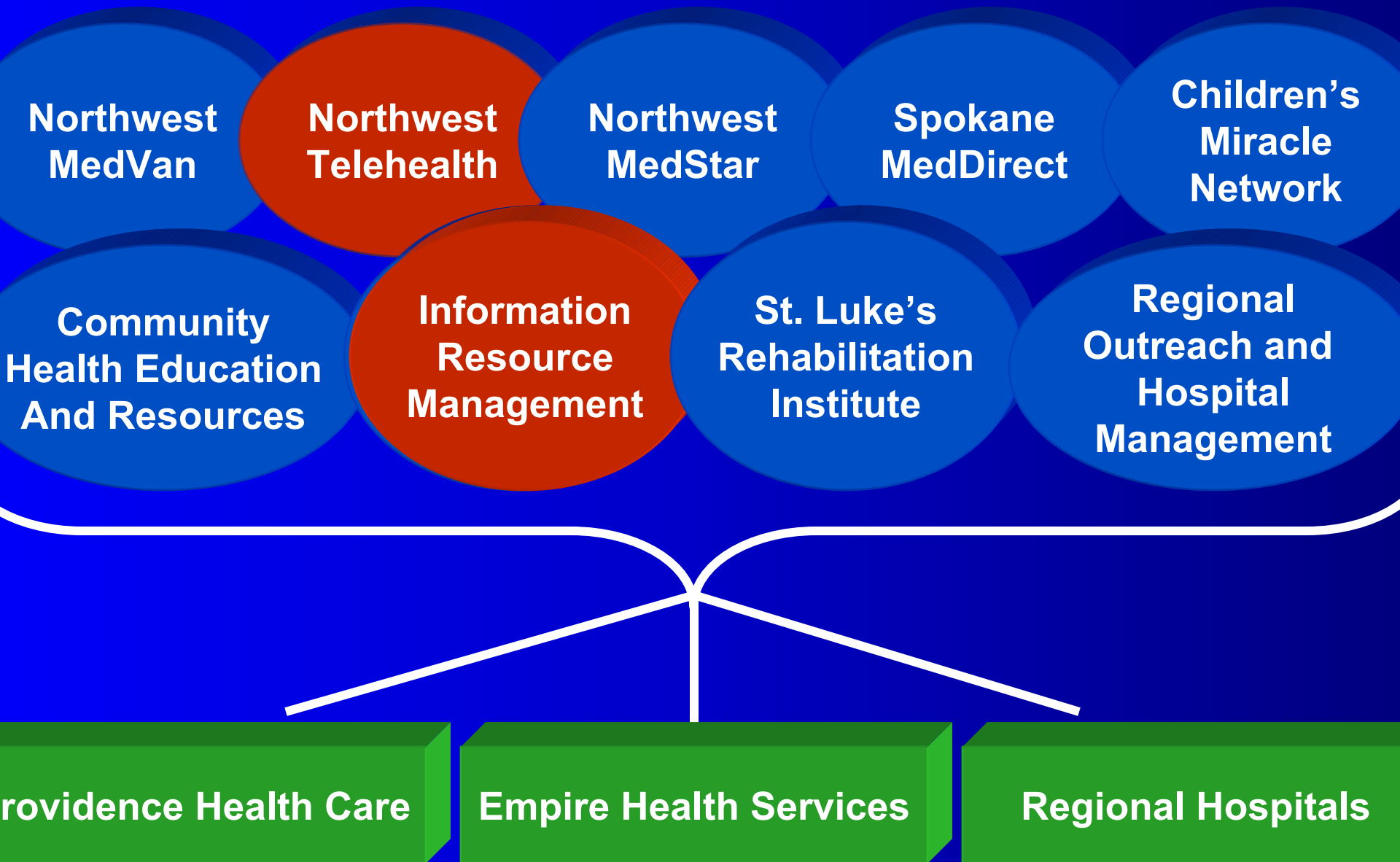
# The INHS Mission

INHS is a not for profit 501 (c) 3 corporation, owned by the hospitals in Spokane, WA

Our regional purpose included:

- Facilitate **appropriateness of care** between rural hospitals and the tertiary care centers in Spokane by providing information and clinical support systems
- Address the lack of **continuity of care**
- Address physician and patient concerns about **fragmented services**
- **Address duplication of services** – lack of clinical data being shared

# Inland Northwest Health Services



# Inland Northwest Health Services

At the beginning 1998: All hospitals in Spokane and the surrounding region were fragmented and there was no connectivity or data exchange with physicians or any other care provider.

# Inland Northwest Health Services

Today:

44 hospitals, with over 3200 beds, participating in the integrated information system sharing a single client identifier

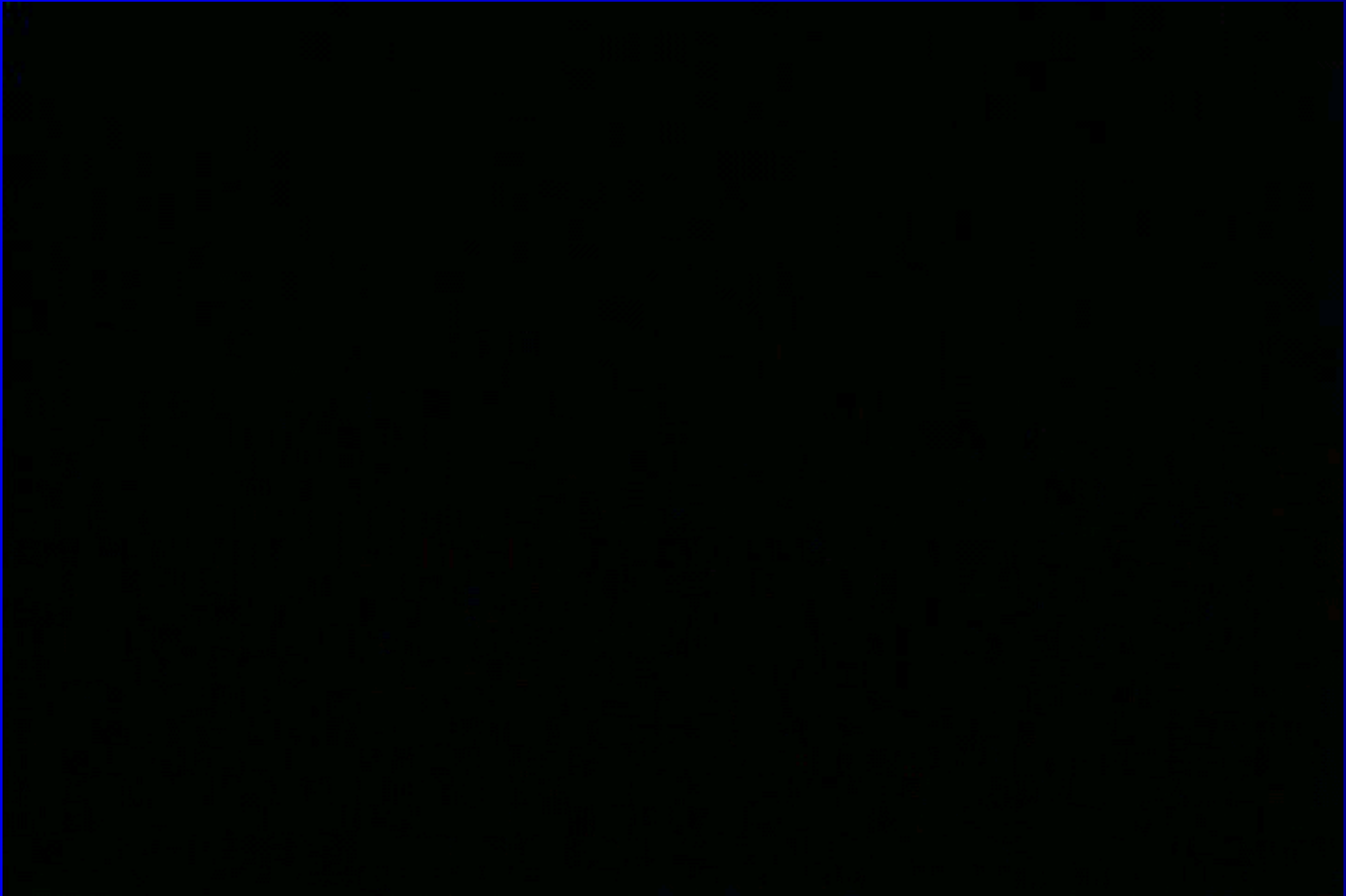
More than 50 clinics and 400+ physician offices (1000+) able to view hospital, laboratory and imaging data

More than 800 physicians accessing patient records wirelessly in hospitals via personal digital assistants (PDA's)

12 hospitals, clinics and public health agencies connected to the region's telehealth network

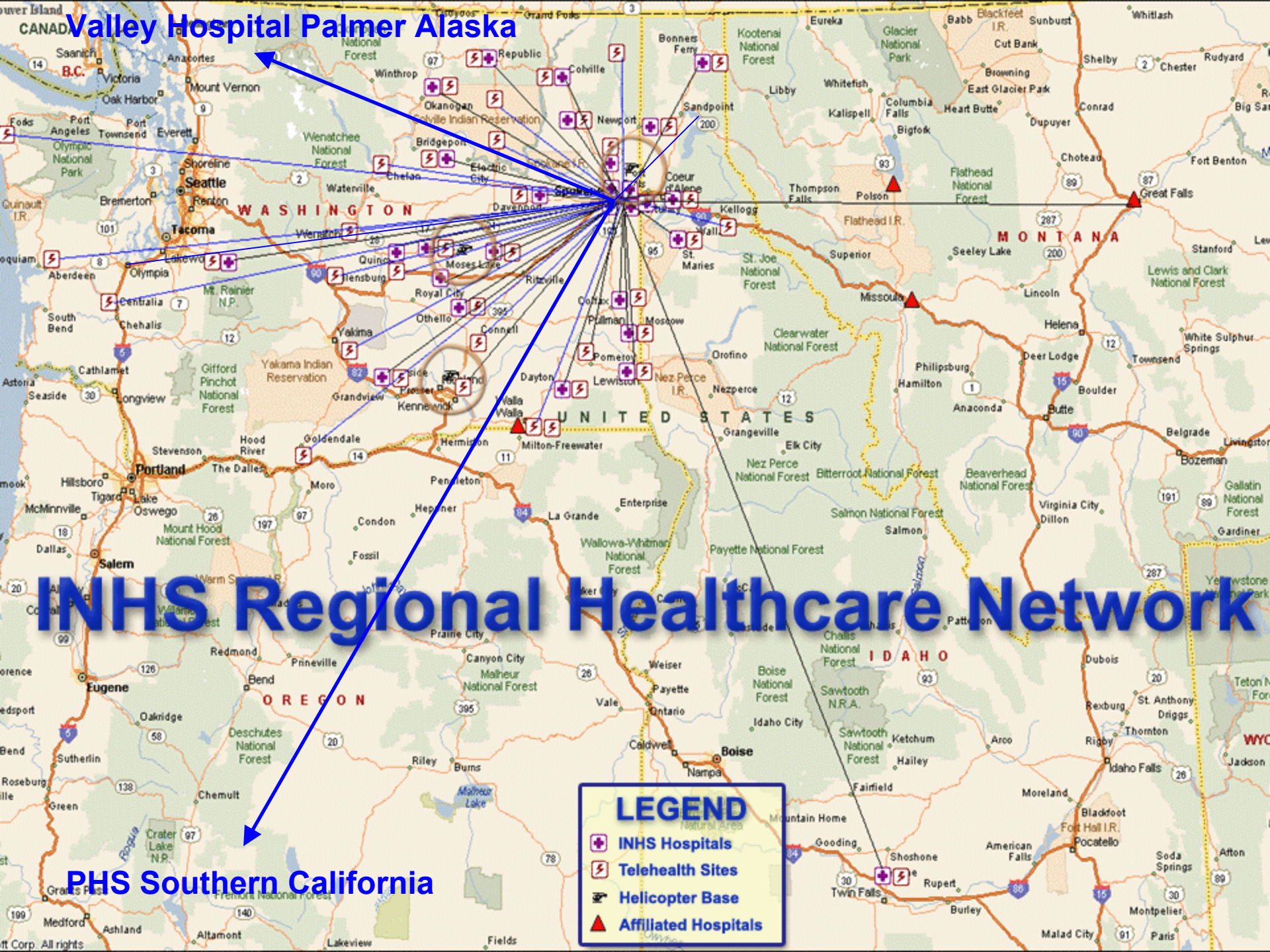
10,000+ network users supported with a staff of 215 FTE's

# Regional Collaboration



Source: INHS/IRM – INHS Collaboration

Valley Hospital Palmer Alaska



# INHS Regional Healthcare Network

**LEGEND**

-  INHS Hospitals
-  Telehealth Sites
-  Helicopter Base
-  Affiliated Hospitals

PHS Southern California

# Inland Northwest Community Health Information Project

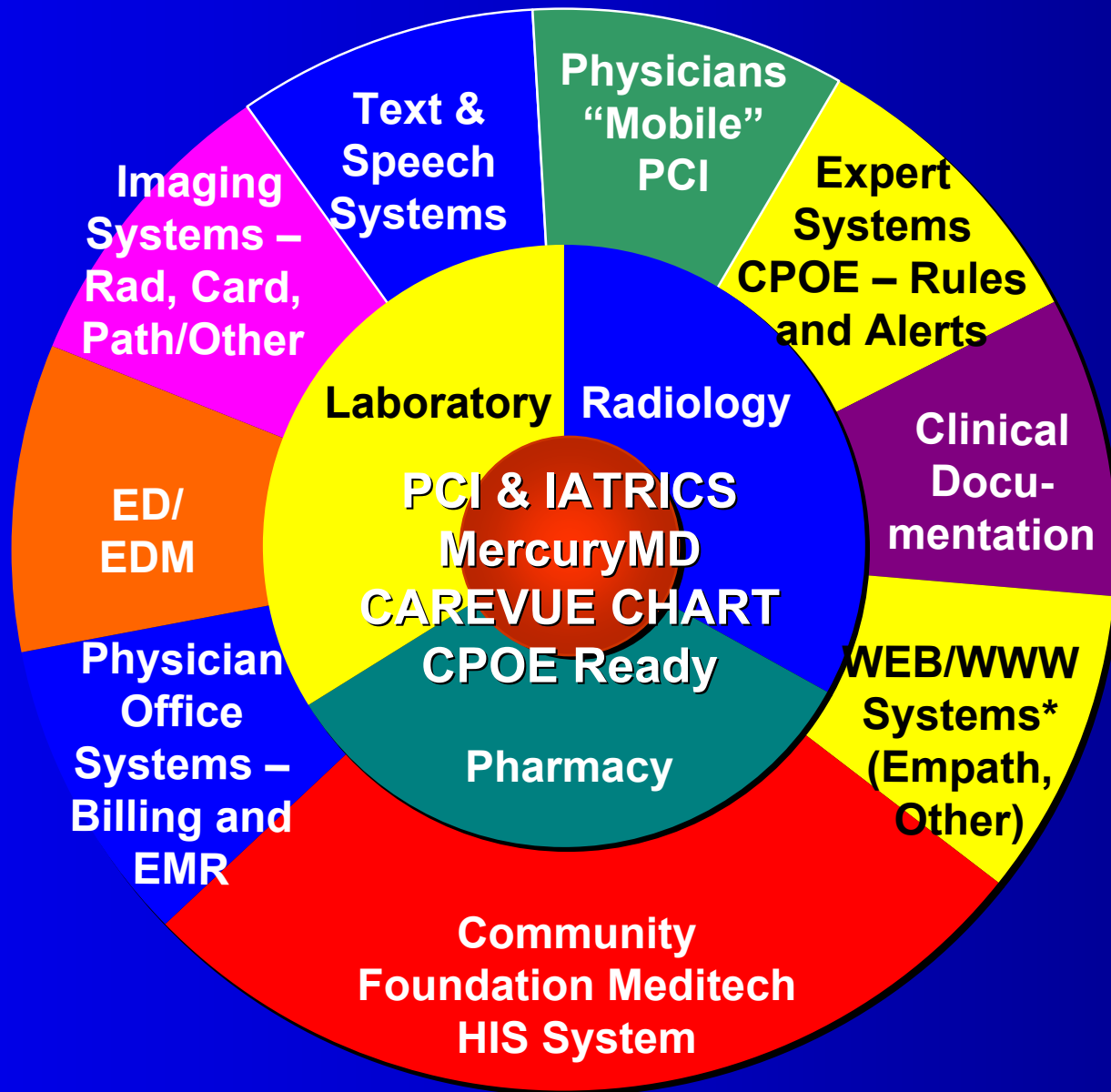
- Created by INHS
- All providers, health plans, labs, imaging centers, pharmacies, universities, public health, consumer advocates and representatives were invited
- Equal board standing
- Mission developed and the creation of 501c(3)
- Results and data quality focused
- Evolved into the Northwest RHIO

# Community-wide EMR

## Electronic Clinical Data

- Longitudinal inpatient record for 34 hospitals
- 2.6 million unique patient records
- Community digital image store
- Inpatient and outpatient lab results available
- Electronic data availability (Hospital, Office, Home...)
- More complete clinical data improves clinical results
- Fully interfaced with Physician office EMR

# Solid Clinical System Usage & Strategy



# EMR/CPOE - Readiness

## Knowledge Based Systems - EBM

CPOE-Patient Safety

Evidence Based Medicine

Rules and Alerts

## Structured Data/Paperless Chart

Clinical Documentation

Document Imaging

Document Archiving

## Integrated Foundation System

Business

Clinical (EMR)

Managed Care

Financial

## Stable IT infrastructure

Desktop

LAN/WAN

Internet

Disaster Recovery

EMR Building Blocks

# Mobile Chart using Decision Support



## Handheld Chart Mercury MD Clinical Usage

Physicians Users = 300  
Time Savings = 10 - 20 min.

Complete Chart

Lab results

Pharmacy Orders

Radiology Reports

Nursing Notes

Vitals & I/O

Expert System Alerts

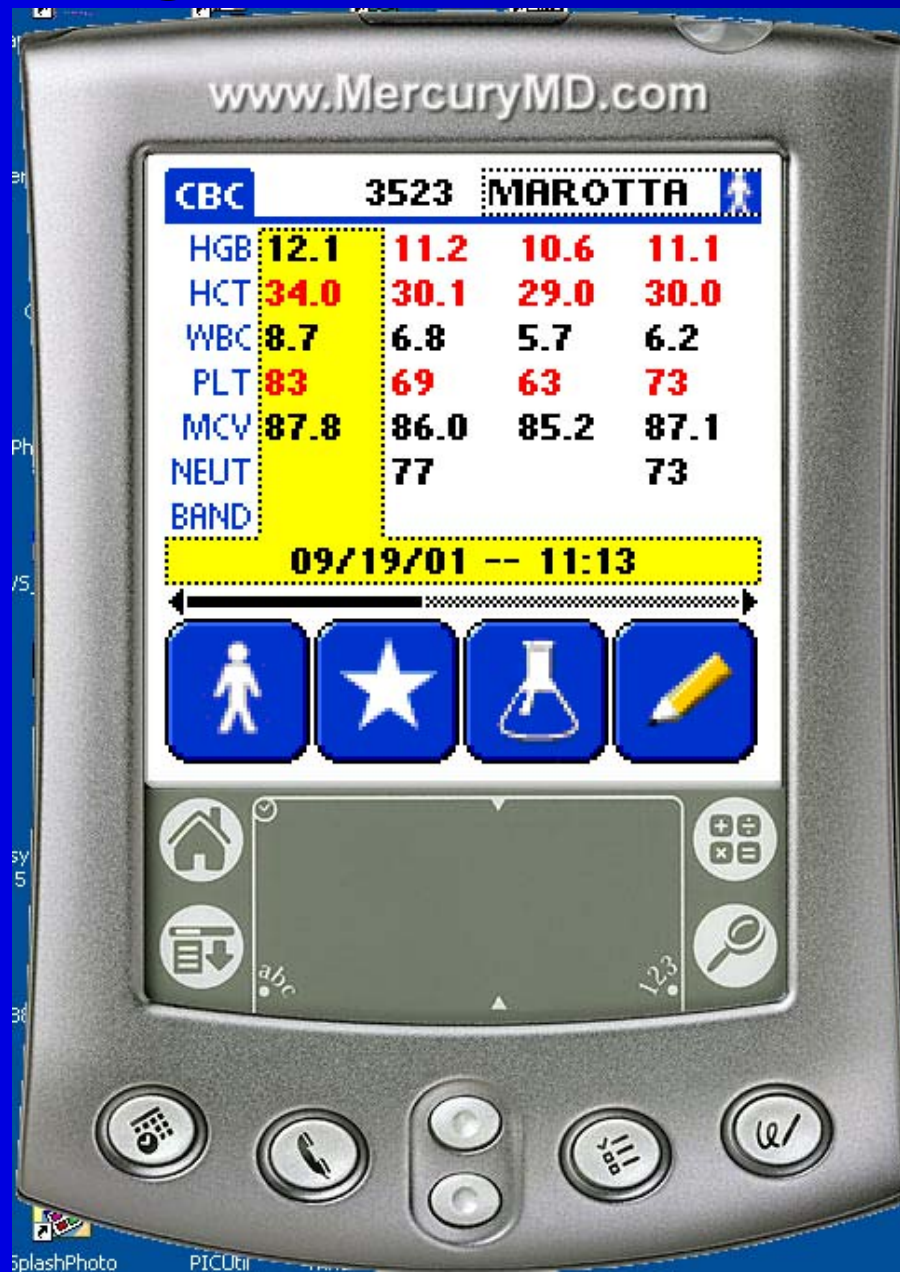
Physician notes

*(Value, Productivity, Outcomes)*

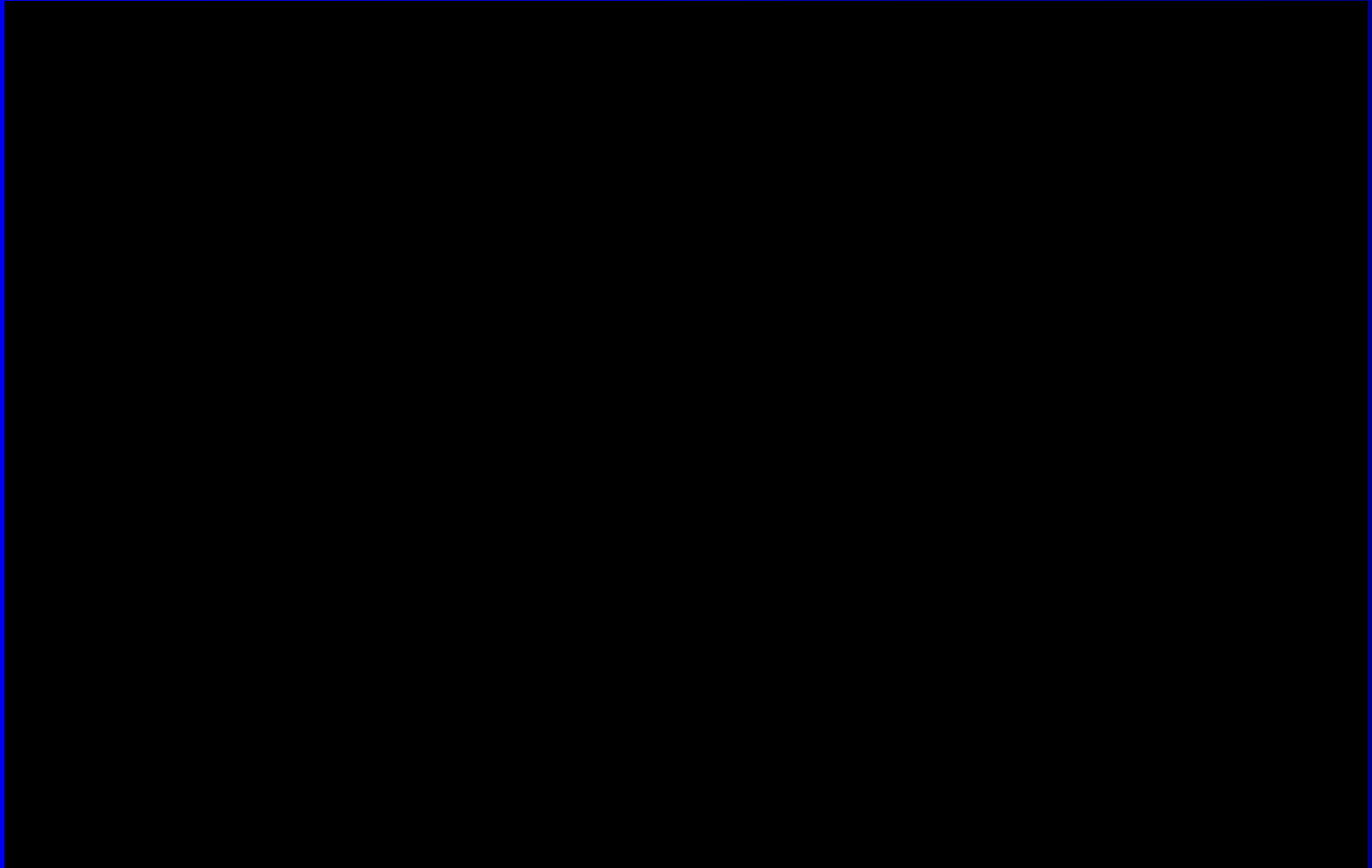
# MercuryMD – Mobile EMR

Ims &  
 /PCP- 2003  
 Wireless – 2004  
 All Phone - 05

Clinical  
 Laboratory Data  
 Summary Details



# Physician/Clinical Connectivity



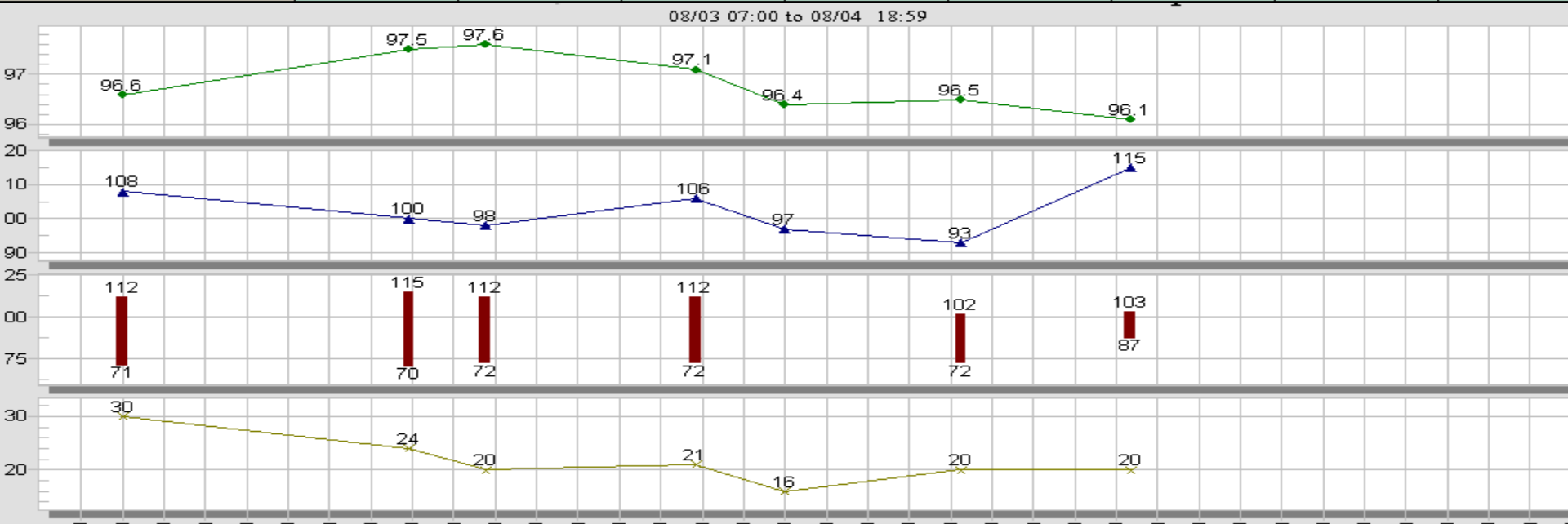
Source: INHS/IRM – Dr. John Lee, SHMC Childrens Hospital

# New Advanced Clinical Displays

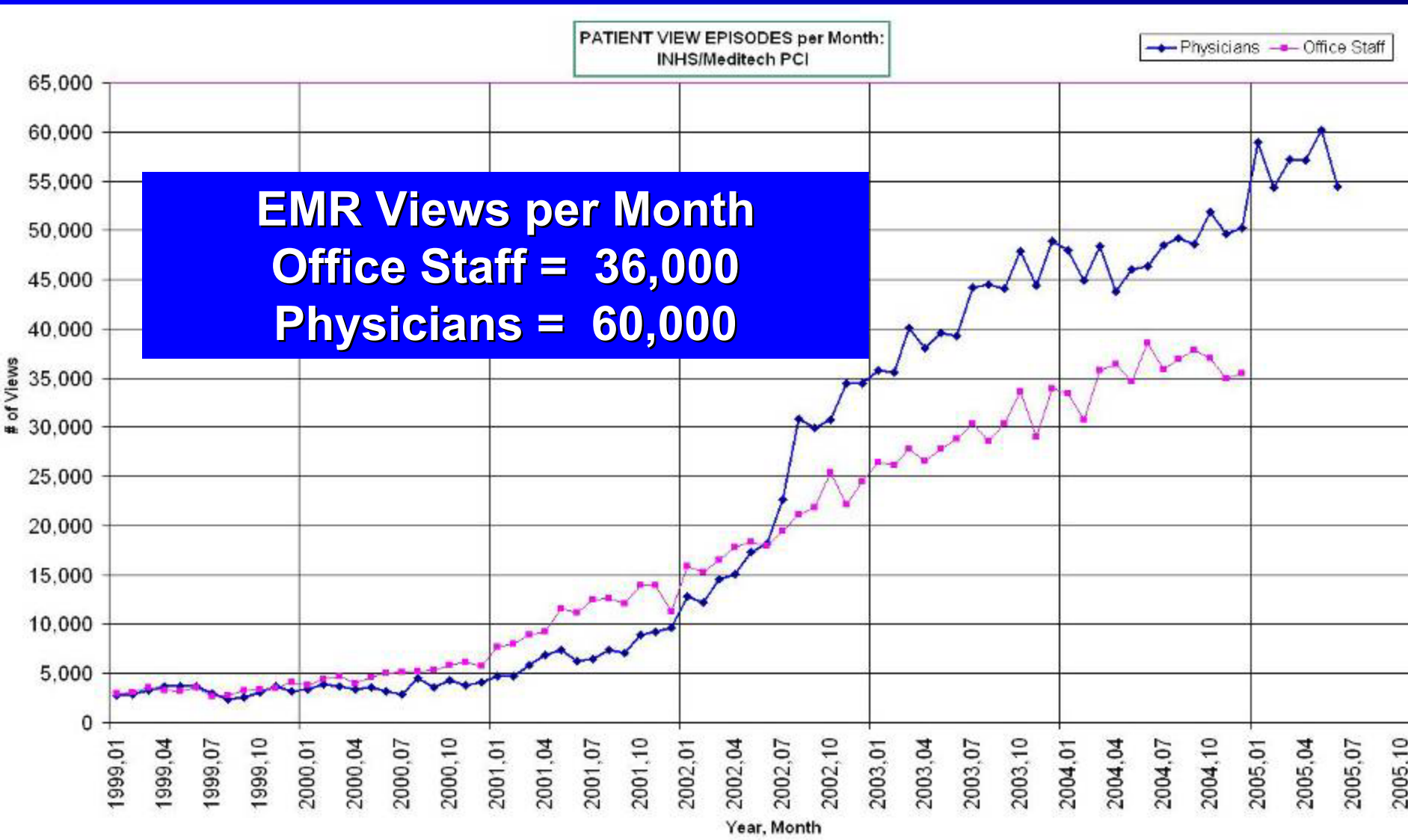
Print Graph New Val Edit Cell Split PCI CR Peds PSR - Peds Admit Sum Notes-View Adjust Autosize Refresh

VS Graph Vital Signs IV Fluids I&O Totals IV I&O Weight Shift Assessment RT Treatments Lab Results Pt. Notes Link to Bridge

	08/03 05:00 - 05:59	08/03 07:00 - 07:59	08/03 14:00 - 14:59	08/03 16:00 - 16:59	08/03 21:00 - 21:59	08/04 00:00 - 00:59	08/04 04:00 - 04:59	08/04 08:00 - 08:59
<b>==PICU VITAL SIGNS==</b>								
Pulse	118	108	100	98	106	97	93	115
Resp	18	30	24	20	21	16	20	20
B/P	119/73	112/71	115/70	112/72	112/72		102/72	103/72
B/P Site	Left Leg	Left Arm	Left Arm		Left Leg		Left Arm	Left Arm
Temp	97.1	96.6	97.5	97.6	97.1	96.4	96.5	96.5
Temp Method	Axillary	Axillary	Axillary	Axillary	Axillary	Axillary	Axillary	Axillary
O2 Sat	+ 98	97	99		96	95	97	97
FI02	RA	RA			RA	RA	RA	RA
<b>VENTILATION</b>								
FI02	RA	RA			RA	RA	RA	RA
ACTUAL Resp Rate	18	30	24	20	21	16	20	20
( SpO2 ) O2 Sat	+ 98	97	99		96	95	97	97



# Physician EMR Views per Month



# Clinical - BMV – Patient Safety

Provides real time automated checking starting with the “Five Rights” ...

- Right patient
- Right drug
- Right dose
- Right time
- Right Route of Administration



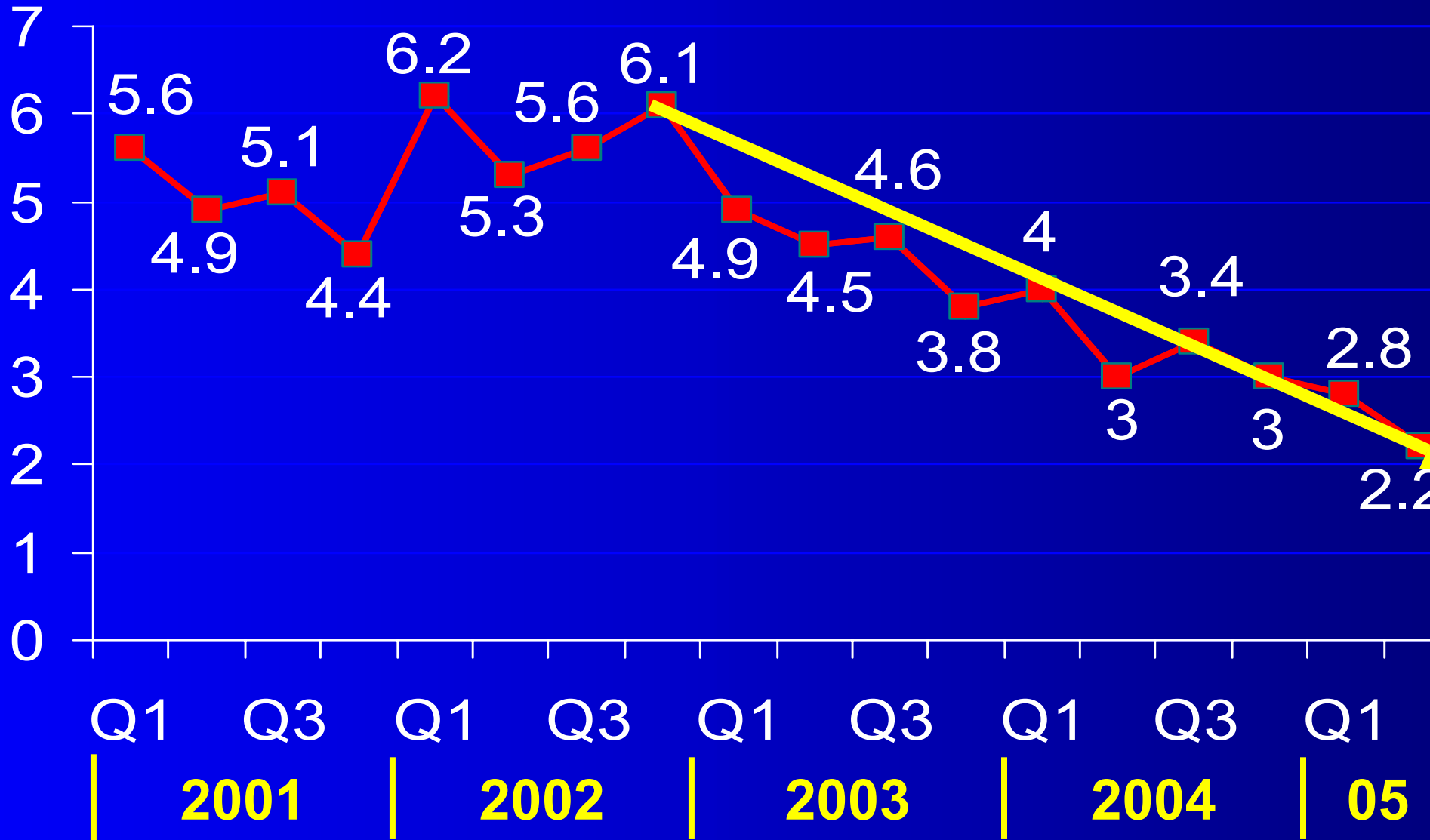
# NEW – E-MAR -Readable

## Medication Administration Record

Initials	Name	Initials	Name
SJM	Sue J. Matthews, RN	MSB	Mark S. Birnbaum, RN
JB	Jason A. Bjelkengren, RN	KGC	Kim G. Cummings, RN
JLR	Jeff L. Ramirez, RN	RDB	Robin D. Bettis, RN

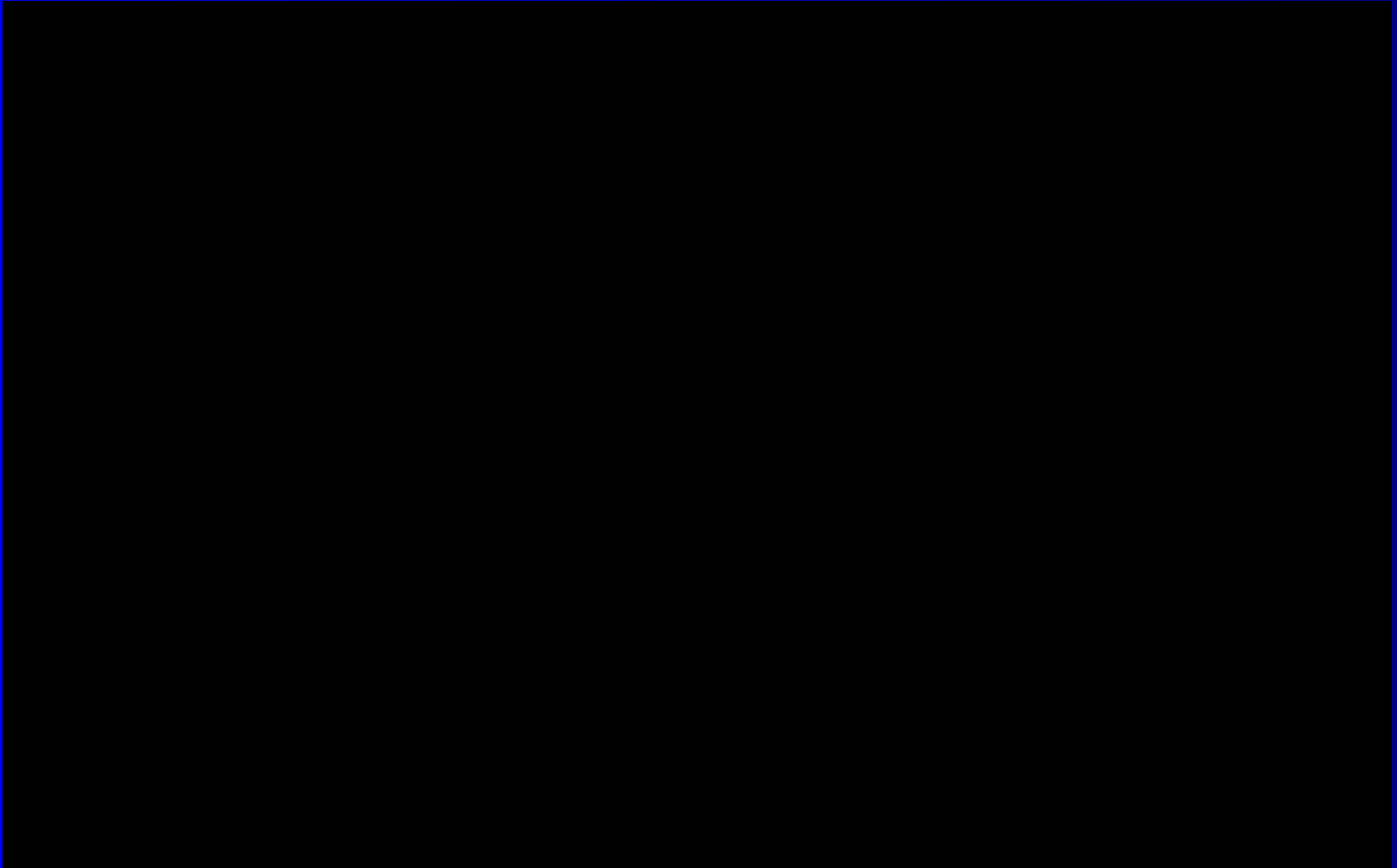
For 24 hours 05/05/2002		Medication Administration Times		
Ord #	Scheduled Medications	0030-0729	0730-1529	1530-0029
Ckd by				
Z00514167 05/04 1500 JB	<b>Aspirin</b> 325 mg PO QD@0900 WITH FOOD/SNACK Start: 05/04/2002 1430 Stop: 08/11/2002 1429		1104 RDB	
Z00514166 05/04 1500 JB	<b>Atenolol (Tenormin)</b> 50 mg PO QD@0900 MAY MASK HYPOGLYCEMIA SYMPT Start: 05/04/2002 1430 Stop: 05/05/2002 1042		1 (1103) RDB	
Z00514166 05/05 1101 RDB	<i>update to above order.</i> DISCONTINUE AT 05/05/2002 1042 RDB Start: 05/05/2002 1042			1 At 1107 RDB recorded "Not given reason" as [Physician order];
Z00514168 05/04 1501 JB	<b>Atenolol (Tenormin)</b> 50 mg PO QD@0900 MAY MASK HYPOGLYCEMIA SYMPT Start: 05/04/2002 1430 Stop: 08/11/2002 1429		1 (1102) RDB	
Z00514172	<b>Atorvastatin (Lipitor)</b>			1 At 1107 RDB recorded "Not given reason" as [Physician order];

# Reported Med Error Rate





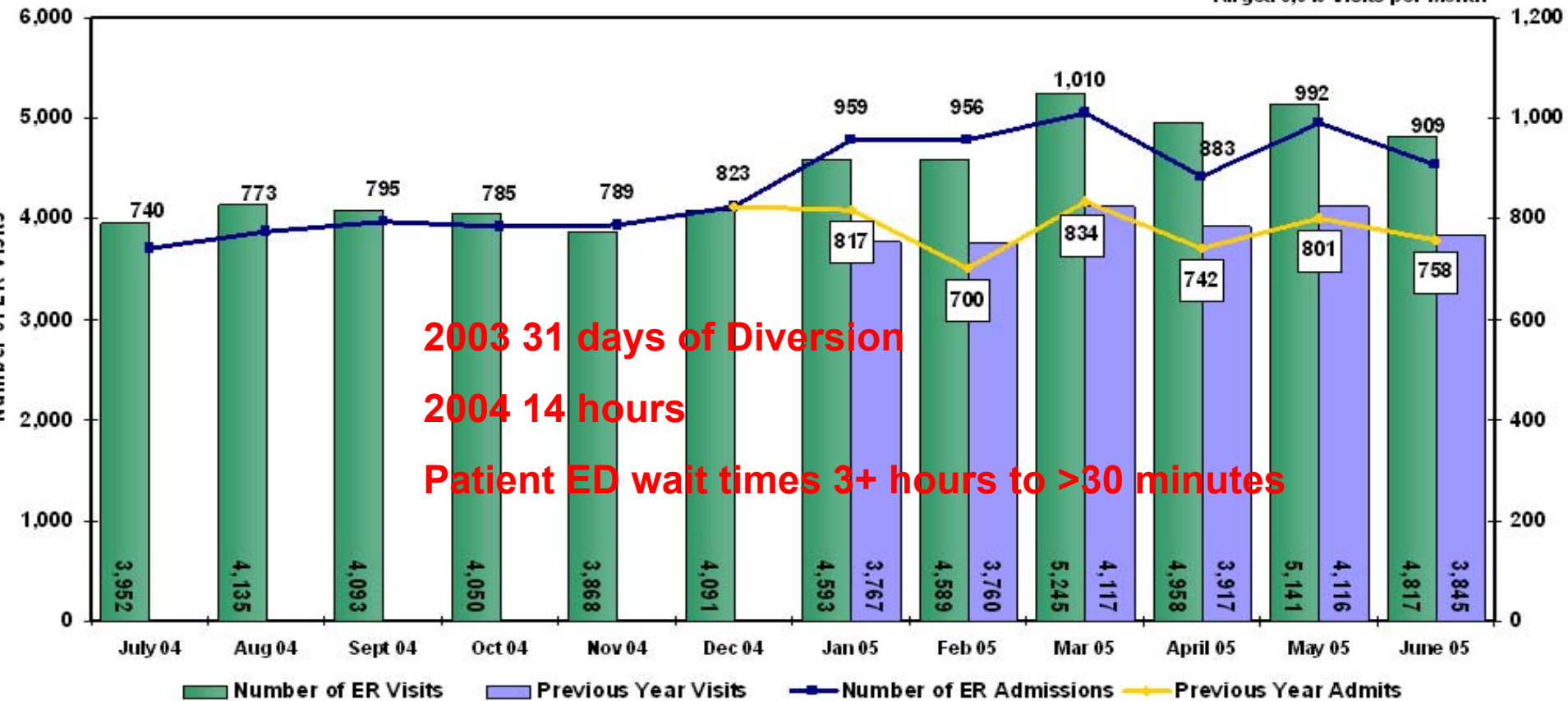
# Real-Time Monitoring Systems



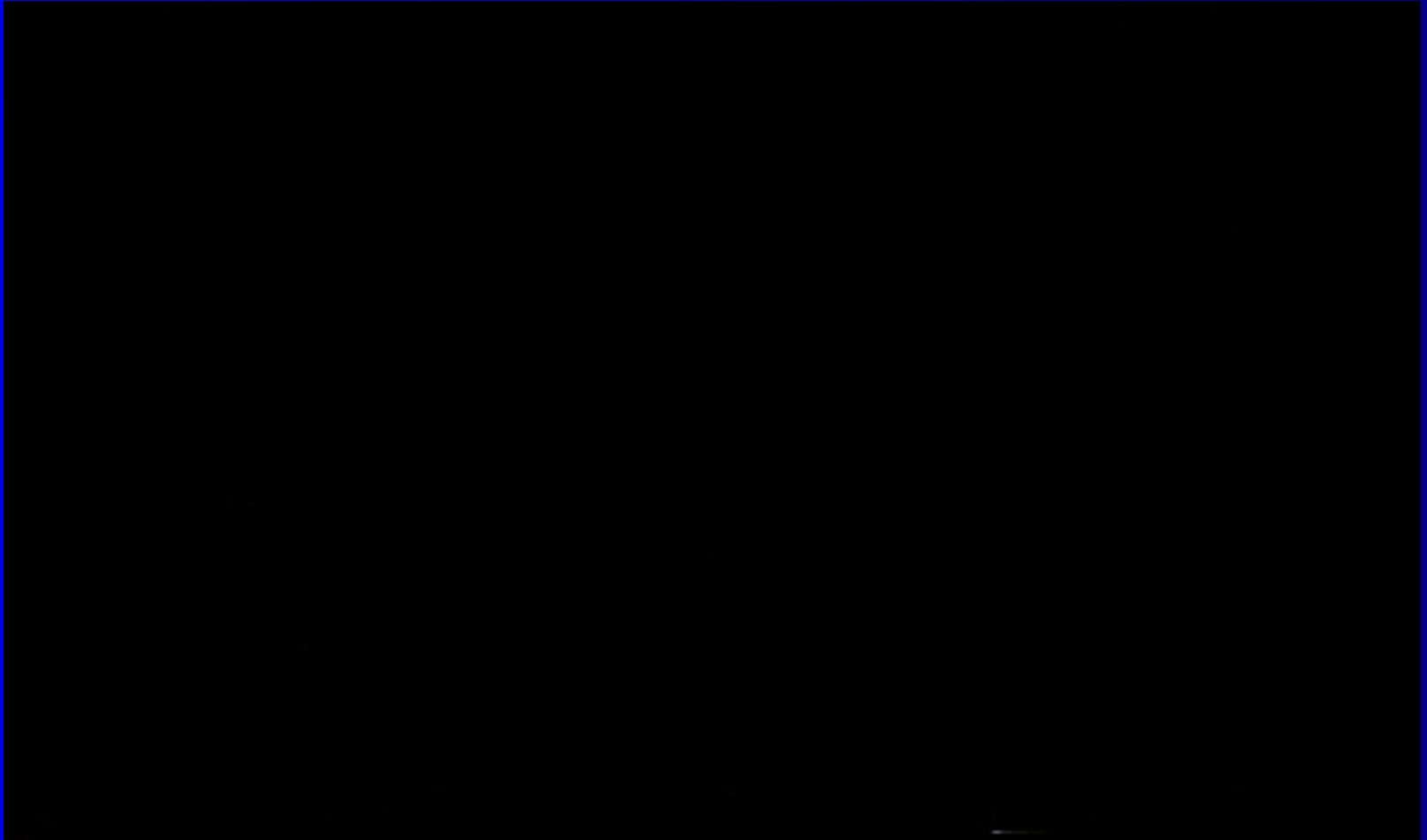
# Emergency Room Dashboard

## Emergency Room Visits vs. Emergency Room Admissions

Target: 3,640 Visits per Month



# Physician/Clinical Connectivity

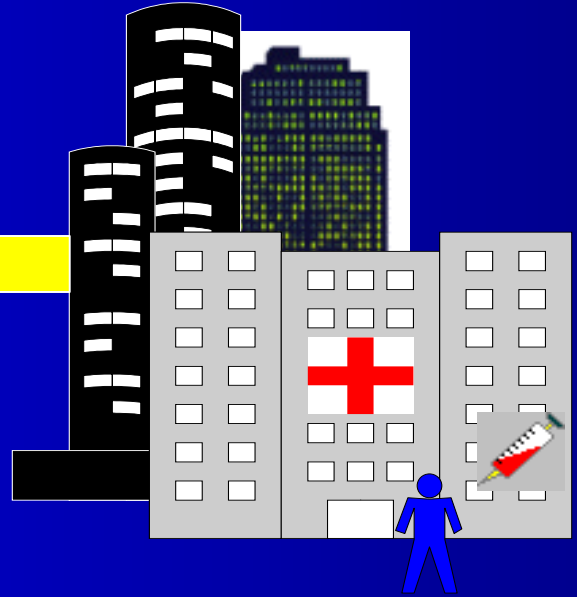


Source: INHS/IRM – Tom Carli Mgr, Spokane Internal Medicine



2.

Data



1.

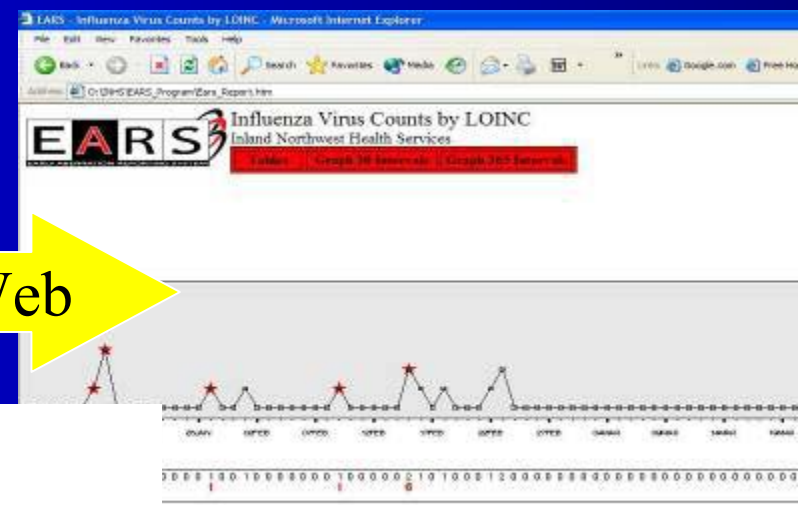
3.

Sweep databases

1	Ordered				
A1	B	C	D	E	
Created	LOINC		Date	Database	Lab
2	6351.000	17015-9	INFLUENZA B AB, IGG	3/16/2004	LAB INHS HJE
3	6351.000	17015-9	INFLUENZA B AB, IGG	3/16/2004	LAB KMC KMC
4	6351.000	17015-9	INFLUENZA B AB, IGG	4/12/2004	LAB INHS HJE
5	6351.000	17015-9	INFLUENZA B AB, IGG	4/12/2004	LAB KMC KMC
6	6351.000	17015-9	INFLUENZA B AB, IGG	8/13/2004	LAB OV SHM SHW
7	6351.000	17015-9	INFLUENZA B AB, IGG	9/27/2004	LAB INHS HJE
8	6351.000	17015-9	INFLUENZA B AB, IGG	10/1/2004	LAB INHS HJE
9	6351.000	17015-9	INFLUENZA B AB, IGG	10/22/2004	LAB BDU BDU
10	6351.000	17015-9	INFLUENZA B AB, IGG	10/22/2004	LAB INHS HJE
11	6351.000	17015-9	INFLUENZA B AB, IGG	10/29/2004	LAB CMK CMK
12	6351.000	17015-9	INFLUENZA B AB, IGG	12/20/2004	LAB OV SHM SHW
13	6351.000	17015-9	INFLUENZA B AB, IGG	1/21/2005	LAB INHS HJE
14	6351.000	17015-9	INFLUENZA B AB, IGG	1/21/2005	LAB KMC KMC
15	6351.000	17015-9	INFLUENZA B AB, IGG	3/1/2005	LAB INHS PAWL
16	6351.000	17015-9	INFLUENZA B AB, IGG	3/10/2005	LAB OV SHM HFH
17	6351.000	17015-9	INFLUENZA B AB, IGG	3/29/2005	LAB INHS HJE
18	6351.000	17015-9	INFLUENZA B AB, IGG	3/29/2005	LAB KMC KMC
19	6351.000	17015-9	INFLUENZA B AB, IGG	4/17/2005	LAB INHS HJE
20	6351.000	17015-9	INFLUENZA B AB, IGG	4/17/2005	LAB KMC KMC
21	6351.000	17015-9	INFLUENZA B AB, IGG	4/20/2005	LAB INHS HJE
22	6351.000	17015-9	INFLUENZA B AB, IGG	4/20/2005	LAB KMC KMC
23	6351.000	17015-9	INFLUENZA B AB, IGG	5/23/2005	LAB INHS HJE
24	6351.000	17015-9	INFLUENZA B AB, IGG	5/23/2005	LAB KMC KMC
25	6351.000	17015-9	INFLUENZA B AB, IGG	5/29/2005	LAB INHS HJE
26	6351.000	17015-9	INFLUENZA B AB, IGG	5/29/2005	LAB KMC KMC
27	6350.800	5862-8	INFLUENZA A AG, EIA	1/3/2004	LAB BAW BAW
28	6350.800	5862-8	INFLUENZA A AG, EIA	1/4/2004	LAB BAW BAW
29	6350.800	5862-8	INFLUENZA A AG, EIA	1/6/2004	LAB OV SHM SHW
30	6350.800	5862-8	INFLUENZA A AG, EIA	1/21/2004	LAB OV SHM SHW
31	6350.800	5862-8	INFLUENZA A AG, EIA	1/26/2004	LAB OV SHM SHW

5.

View on the Web



# Information for Decision-Making

## Center of Occupational Health and Education

St. Luke's Rehabilitation Institute  
Center of Occupational Health & Education

11/25/2003 11:31 am

Striving for Excellence | About COHE Project | Community Involvement | The COHE Team | Education CME | FAQs | Links

Employee  
Employer  
Provides

NAME: Michael Dunn | Claim #: Y999999 | DOI: 07/03/2003 | LOGIN: Health Services Coordinator  
Employer: Inland Northwest Health Services | Att. Phys: Dan Hansen | STAFFID: 2  
Job Title: Web Developer | HSC Assigned: | Profile View: Remove

General Claim Information | Clinical Information Management | Work Status | RTW | Case Overview Summary

**COHE Quality Indicators**

CASE MANAGEMENT  
Work Status  
Time Loss

ROA Submitted  
● < 48 hrs.  
● > 48 hrs.

Physician Contact  
● w/in 24 hrs.  
● > 24 hrs.  
● Not Done

Act Rx Form  
● Form Complete  
● Not done > 1 wk.  
● NOT DONE > 2 wks

Comm Report | Referral | Act. RX | RTW Referral

MEMO

-- Physician --  
COHE Administrator  
Employee --  
COHE Employee  
-- Employer --

Save | Send

*Demonstrated a 75% decrease, from 1.29 to 0.31, in time loss days per claim for patients of physicians enrolled in the program*

# Evidence Based Order-sets & Rules

Links ComoW WM WM - Int WHelp OHelp TechB IBM Ceiva PTest PT PTS Harris Delta Excite Google MData URL

Address <http://www.zynx.com/Products/products-oekm.htm> Go

## ZYNXHEALTH Patient Safety - CPOE

**Executable Knowledge Manager™ (EKM™)** is an Internet-based solution that contains standardized order sets and rules, and the clinical evidence upon which the order sets and rules are based. The **EKM™** comprises the following conditions:

- Acute Myocardial Infarction
- Asthma - Adult
- Asthma - Pediatric
- Atrial Fibrillation
- Bronchiolitis - Pediatric
- Cancer - Breast, Screening
- Cardiac Surgery - Pediatric
- Carotid Endarterectomy
- Cesarean Section
- Chest Pain - Low Risk
- Chronic Obstructive Pulmonary Disease
- Congestive Heart Failure
- Coronary Artery Bypass Graft Surgery
- Craniotomy - Adult
- Cystic Fibrosis - Pediatric
- Diabetes Mellitus - Adult
- Diabetes Mellitus - Pediatric
- DKA/HHS - Adult
- DKA/HHS - Pediatric
- Fracture - Hip
- Pneumonia - Nosocomial
- Prematurity - Neonatal
- Renal Failure - Acute
- Resection - Appendix (Appendectomy), Pediatric
- Resection - Bowel
- Resection - Breast (Mastectomy)
- Resection - Gall Bladder (Cholecystectomy)
- Resection - Lung (Pneumonectomy)
- Resection - Thyroid (Thyroidectomy)
- Resection - Uterus (Hysterectomy), Abdominal
- Stroke - Ischemic
- Stroke - Ischemic, Elevated ICP
- Stroke - Ischemic, Thrombolysis
- Surgical Antimicrobial Prophylaxis
- Term Pregnancy
- Total Hip/Knee Replacement
- Transient Ischemic Attack

Done Internet

# Business Issues

- Master Patient Index
- Shared Services
- MD Customer Service
- Value Added - Inclusion Model
- Clinical Data Must be Shared
- Replication
- Efficiency and Lower Costs
- Neutral/Trusted Party

# What we have learned

- Creating a sustainable business model:
  - Create multi-stakeholder buy-in
  - Protect individual & corporate investments
  - Create small wins to create value-added information
  - Assure value-added services
  - Assure quality of services
  - Get lowest cost from vendors
  - Create the “trusted party”
  - Develop an interdependence upon reliance of data availability

# What we have learned

- Creating a sustainable business model:
  - Leverage assets
  - Provide an efficient cost plus model
  - Create standardization
  - Assure value-added services
  - Assure quality of services
  - Get lowest cost from vendors



***THANK YOU!***