THE INDIAN HEALTH SERVICE

Innovations in Clinical Care Using RPMS

RPMS EHR

Electronic Health Record

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Superior Health Information Management
Now and for the Future

VistA Community Leadership Meeting
November 7, 2006

Objectives

- Contrast IHS-VHA, RPMS-VistA
- Describe several examples of clinical and public health development in RPMS beyond VistA-derived capabilities

RPMS EHR

Indian Health Service

- Provides comprehensive care to over 1.8 million American Indians / Alaska Natives
- Nearly 600 health care facilities

	Federal	Tribal
Hospitals	36	13
Health Centers	61	158
Health Stations	49	76
Residential treatment centers	5	28
Alaska village clinics		170
Urban programs	34	

RPMS EHR

Indian Health Service

- Over 50% of programs are operated by tribes through tribally run compacted or contracted facilities
- 34 urban programs are contracted to provide care to AI/AN populations in metropolitan areas
- Remaining care is provided through federally operated ‘direct’ programs (majority of the user population still receives care in direct programs)

RPMS EHR

IHS is not VHA

- Cradle to grave care
  - Pediatrics
  - Prenatal and obstetrical care
- Smaller facilities, more rurally located
- Decentralized administration
- Tribal autonomy
- Community and population-based mission
- Very modest IT staffing & budget

RPMS EHR

The EHR Challenge for IHS

- Produce or acquire an Electronic Health Record system that:
  - Meets clinical and business needs of both Tribally and Federally operated facilities
  - Is scalable to the needs of facilities ranging from small rural clinics to medium-sized hospitals
  - Is affordable to facilities with no resource cushion or ability to borrow
  - Is sustainable into the future

RPMS EHR

RPMS – Elements of an EMR for over 20 Years

Existing elements

- Registration
- Scheduling
- Pharmacy
- Radiology
- Laboratory
- Immunizations
- Reminders (passive)
- Problem List
- Health Summary
- Other PCC functions
- Billing
- More . . .

Lacking elements

- Provider order entry
- Note authoring
- Point of care data entry
- GUI usability
- Active reminders & notifications

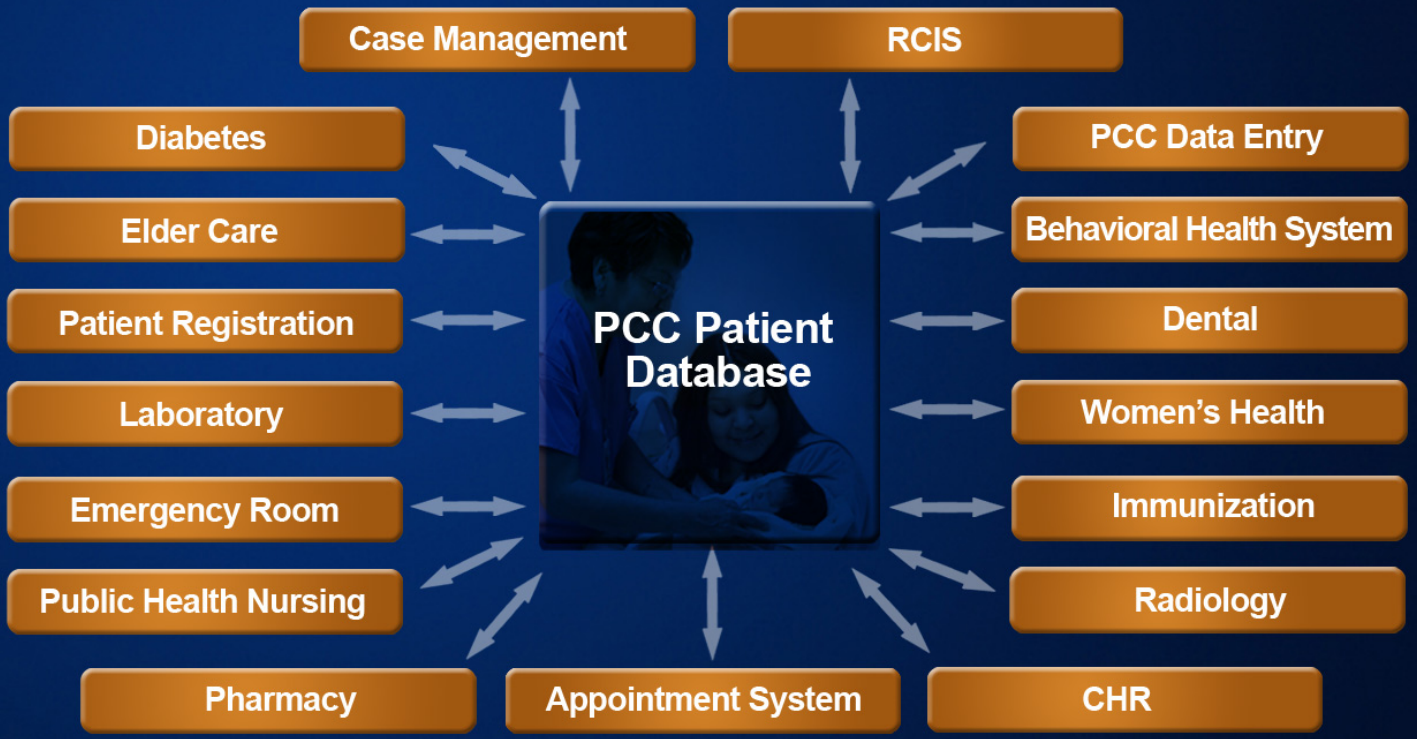
RPMS EHR

IHS Philosophy in Health IT

- Leverage work of VHA and others where it is relevant to IHS mission
  - Pharmacy, Laboratory, Radiology, etc.
- Co-develop where possible to meet common needs
  - FileMan, MailMan, current enhancements (Rad, BCMA)
- Develop as needed to address unique IHS/Tribal imperatives
  - PCC, Immunization, Women's Health, Third Party Billing, Pharmacy POS, iCare, CRS

RPMS EHR

RPMS Integrates Multiple Clinical Systems



RPMS EHR

VistA and RPMS

- Common programming/database architecture
- Applications shared by VHA and IHS
- Most developed for use in VHA and adapted for IHS
- Some developed for use in IHS and adapted for VHA
- RPMS focused around Visit data contained in Patient Care Component (PCC)
- IHS uses HRN instead of SSN

RPMS EHR

VistA and RPMS

- VHA-developed apps:
  - Pharmacy
  - Radiology
  - Laboratory
  - Dietary
  - PIMS
  - Reminders
  - Mental Health Assistant
  - Care Management
  - Health e-Vet Vista
  - Etc.
- IHS-developed apps
  - Women's Health
  - Immunization
  - Pharmacy POS
  - 3rd Party Billing
  - Behavioral Health
  - PCC, PCC+
  - Diabetes Management
  - Integrated Case Mgmt
  - CRS
  - Etc.

RPMS EHR

RPMS Innovations in Care

- PCC-Plus (PCC+)
- Well Child Care
- Immunization Data Exchange
- Prenatal Care
- Behavioral Health System
- RPMS EHR
- Diabetes Management System
- Asthma Register System
- Integrated Case Management System
- Clinical Reporting System

RPMS EHR

PCC-Plus (PCC+)

- Real-time generation of encounter forms populated with PCC data
- Uses mail merge features of MS Word
- Nearly 3500 merge fields
- Display of demographic-specific tables and code sets (ICD and CPT/HCPCS)
- Pediatric growth charts and guidance
- Prenatal flow sheets (in development)

RPMS EHR

Well Child Care

- CDC Growth Charts – in PCC+ and EHR GUI
- Infant birthweight & feeding choices
- Ages & Stages Questionnaire (ASQ)
  - Age-specific screening in 5 dimensions
  - Print form, record score in EHR or PCC
  - Guidance for abnormal screens
- Well Child Knowledgebase
  - Thousands of age-specific reminders, education, developmental & medical screening, etc.
  - Nationally deployed set with local management
- Additional screening tools (DDST milestones)

RPMS EHR

Immunization Data Exchange

- IHS and Tribes share many patients with private sector
  - Shot records often incomplete due to patient mobility
  - Risk for under- and over-immunization
- Data exchange system for pediatric immunizations developed
  - HL-7 data files exported to and imported from State immunization registries
  - Currently active with five states, millions of records exchanged to date

RPMS EHR

Prenatal Care (in development)

- Data collection and entry for:
  - First Prenatal Visit
  - Interim Prenatal Visits
  - Postpartum Visit
- Over 600 data points
- Flowchart presentation where appropriate
- Data carries over to future pregnancies
- Multiple GUI components planned
- Flowchart infrastructure extensible to other types of data

RPMS EHR

Reference Lab Interface

- Released for Laboratory v5.2 (IHS patch 1021)
- Uni- or Bi-directional interface with contracted reference laboratories
  - Unidirectional receives lab results into PCC
  - Bidirectional sends orders to reference lab and receives results into lab package (EHR)
- Implementation is fairly labor-intensive

RPMS EHR

RPMS Behavioral Health System

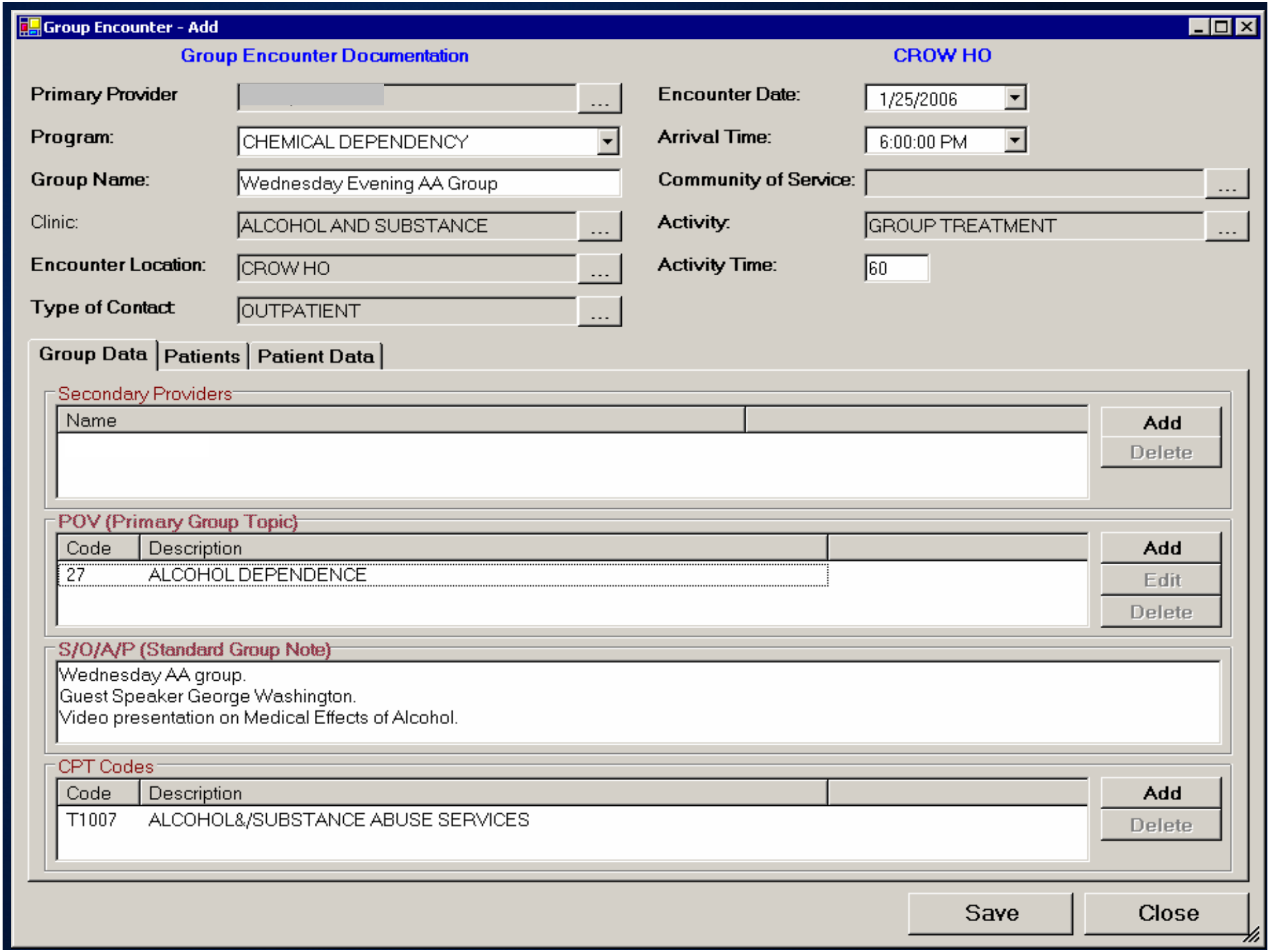
- MH/SS developed in early 1990's
  - The first complete electronic record in IHS
  - All data could be directly entered by providers
- BHS released 2003
  - Combined MH, SS, and A/SA functionality
  - BH GUI released 2004
  - BHS and BH GUI are in use at ~250 I/T/U sites

RPMS EHR

Behavioral Health System

- Ability to document:
  - 1:1 patient encounters
  - Group encounters
  - Wellness Activity: Patient Ed, Health Factors and DV, DEP and ETOH screening
  - Treatment Plans and Treatment Plan reviews
  - Case Management Information
  - Incidences of Suicidal Behavior
- Integrated with RPMS medical information
- BH Components for EHR in development

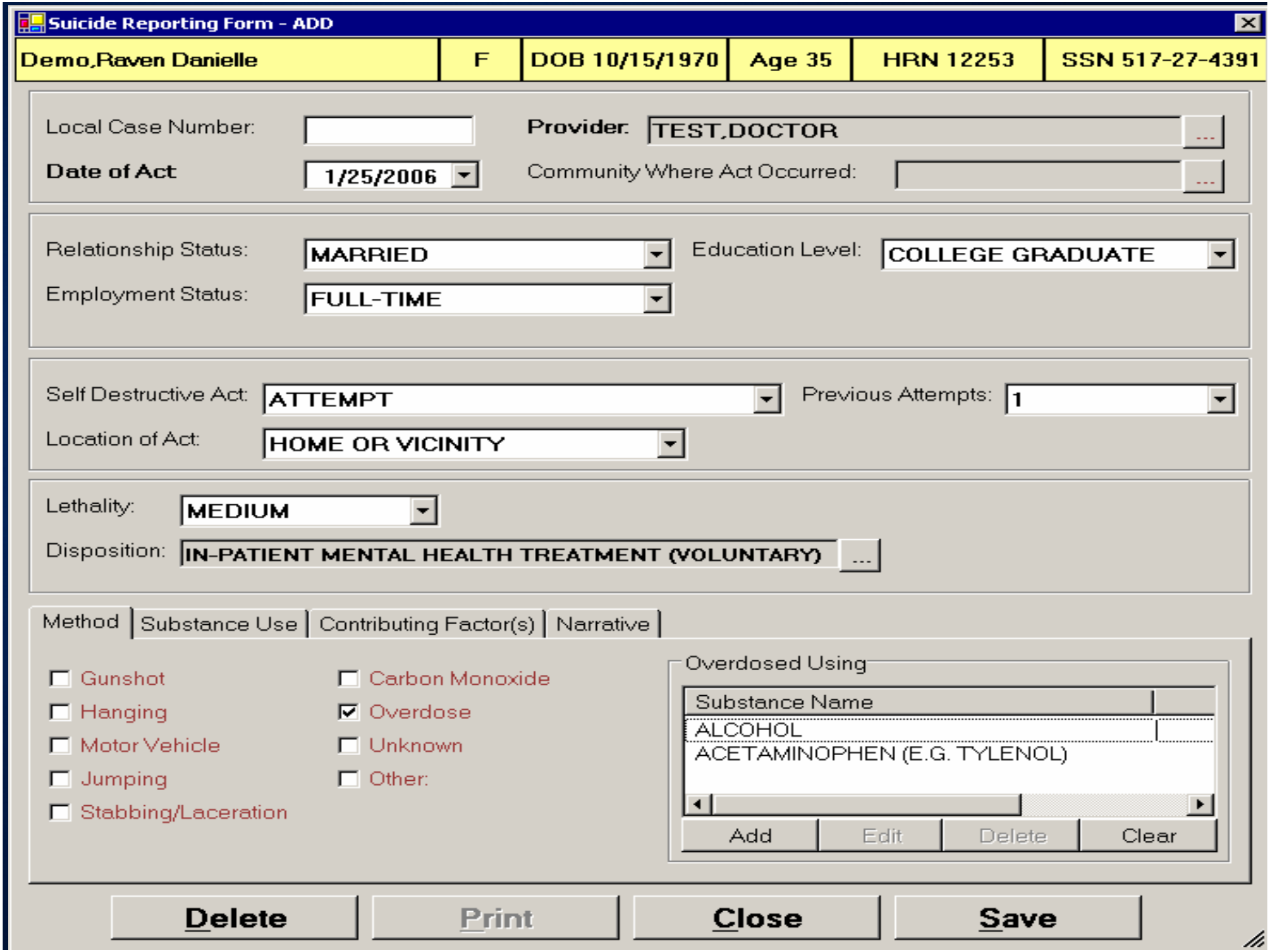
RPMS EHR


Group Encounter - Add
Group Encounter Documentation
CROW HO
Primary Provider
Program:
CHEMICAL DEPENDENCY
Group Name:
Wednesday Evening AA Group
Clinic:
ALCOHOL AND SUBSTANCE
Encounter Location:
CROW HO
Type of Contact:
OUTPATIENT
Encounter Date:
1/25/2006
Arrival Time:
6:00:00 PM
Community of Service:
Activity:
GROUP TREATMENT
Activity Time:
60
Group Data
Patients
Patient Data
Secondary Providers
Name
Add
Delete
POV (Primary Group Topic)
Code
Description
27
ALCOHOL DEPENDENCE
Add
Edit
Delete
S/O/A/P (Standard Group Note)
Wednesday AA group.
Guest Speaker George Washington.
Video presentation on Medical Effects of Alcohol.
CPT Codes
Code
Description
T1007
ALCOHOL&/SUBSTANCE ABUSE SERVICES
Add
Delete
Save
Close

Suicide Reporting Form

- Agency initiative to reduce suicide
- 2006 GPRA performance indicator
  - Establish baseline data using SRF
- Data collection form for suicide & suicide related events
  - Completions, attempts, serious ideation
- Suicide form available vis RPMS menu, Patient Chart, and now EHR
- Data exports via AMH

RPMS EHR

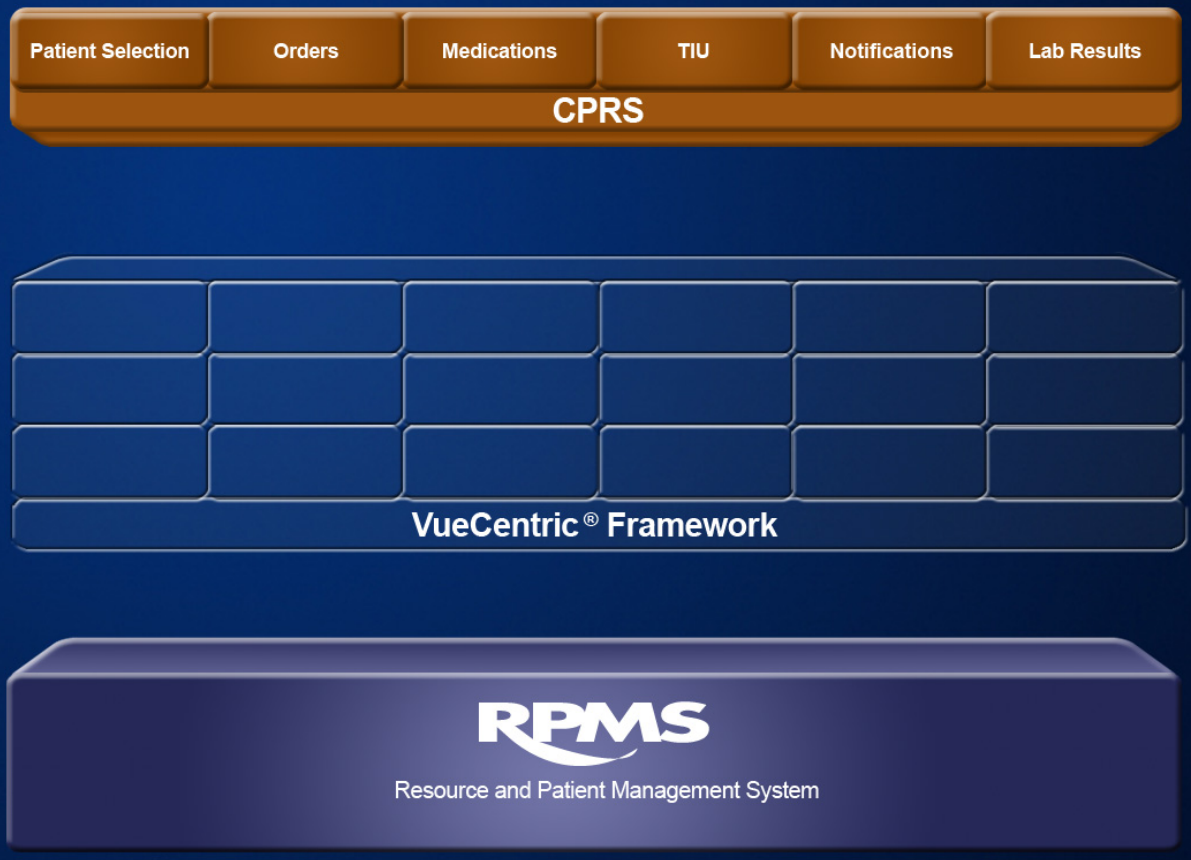

Suicide Reporting Form - ADD
Demo,Raven Danielle
F
DOB 10/15/1970
Age 35
HRN 12253
SSN 517-27-4391
Local Case Number:
Provider:
TEST,DOCTOR
Date of Act
1/25/2006
Community Where Act Occurred:
Relationship Status:
MARRIED
Education Level:
COLLEGE GRADUATE
Employment Status:
FULL-TIME
Self Destructive Act:
ATTEMPT
Previous Attempts:
1
Location of Act:
HOME OR VICINITY
Lethality:
MEDIUM
Disposition:
IN-PATIENT MENTAL HEALTH TREATMENT (VOLUNTARY)
Method
Substance Use
Contributing Factor(s)
Narrative
Gunshot
Hanging
Motor Vehicle
Jumping
Stabbing/Laceration
Carbon Monoxide
Overdose
Unknown
Other:
Overdosed Using
Substance Name
ALCOHOL
ACETAMINOPHEN (E.G. TYLENOL)
Add
Edit
Delete
Clear
Delete
Print
Close
Save

RPMS Electronic Health Record

- Graphical User Interface to RPMS
  - User-friendly and intuitive access to RPMS database for clinicians and other staff
  - Componentized to allow incorporation of CPRS functionality as well as new capabilities developed within IHS
  - Proprietary “framework” for presentation of various GUI components
    - Licensed from Medsphere Systems

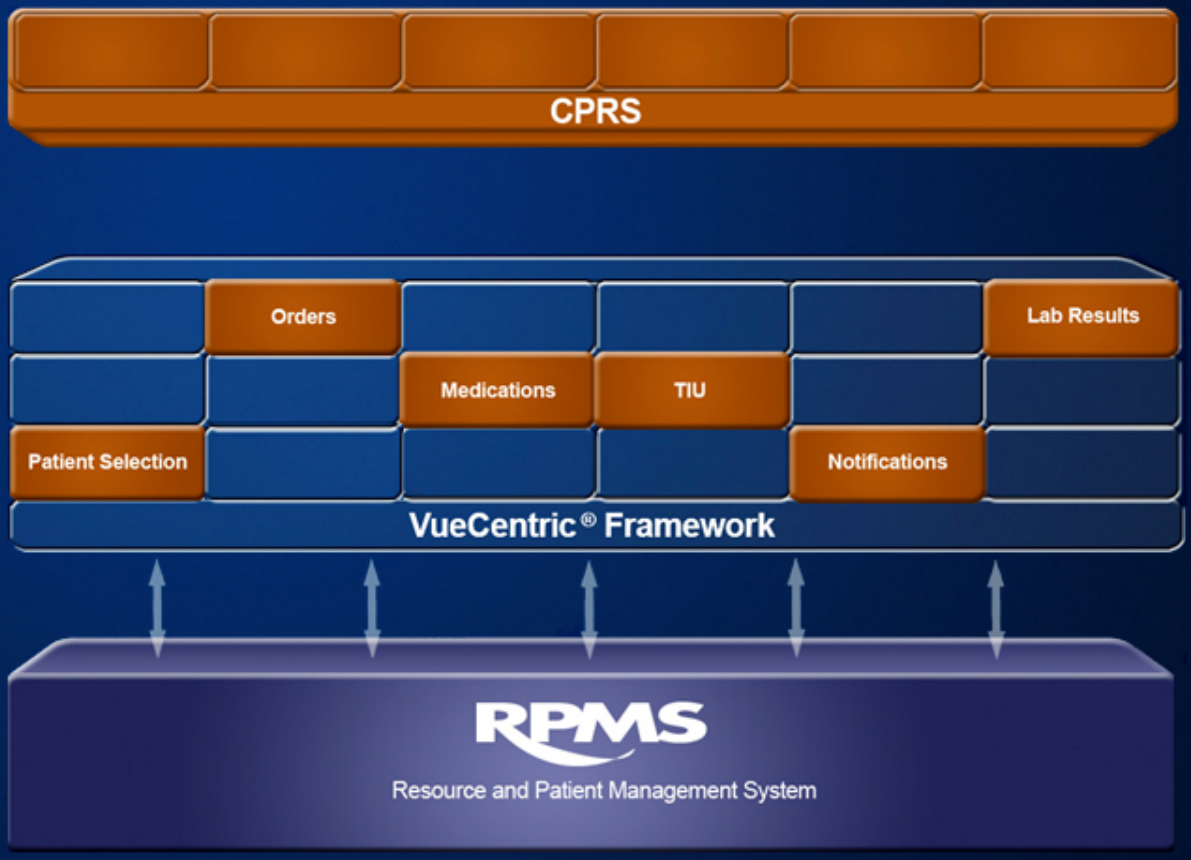
RPMS EHR

The EHR Componentized Framework



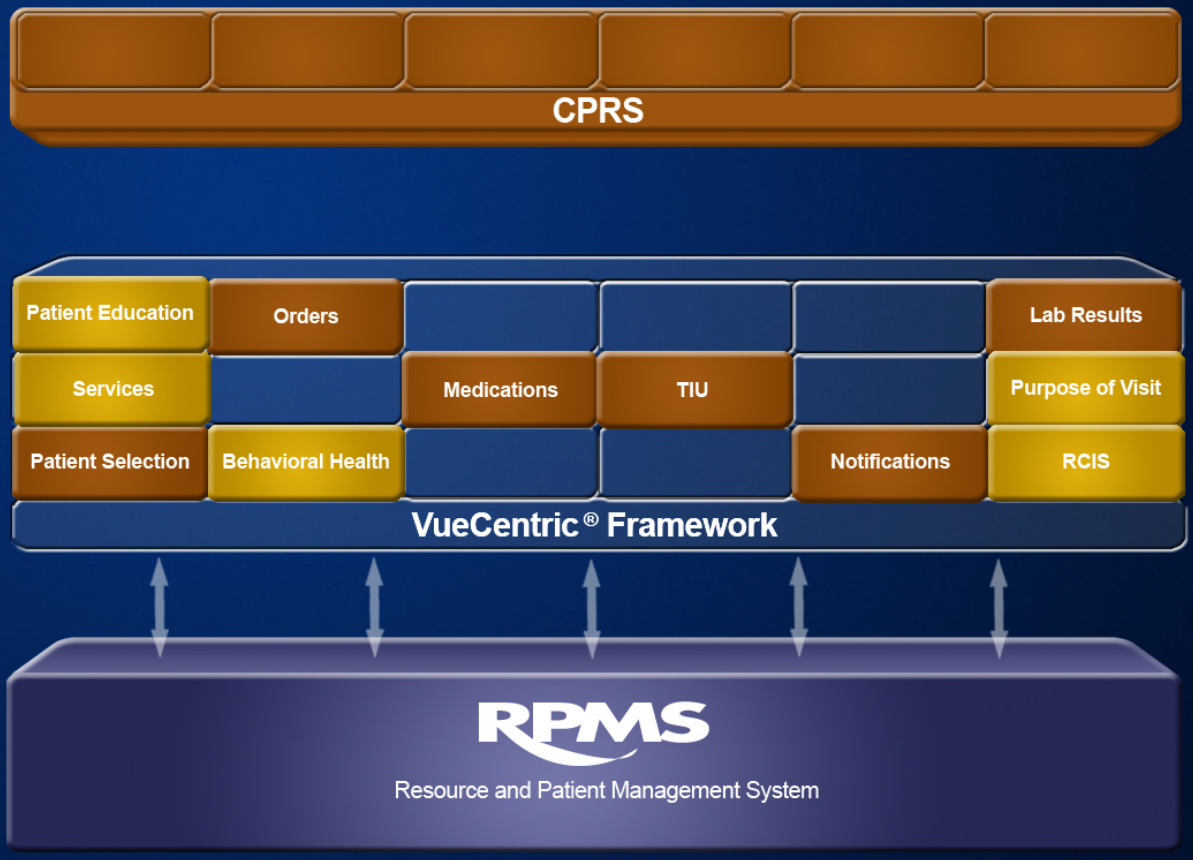
RPMS EHR

The EHR Componentized Framework

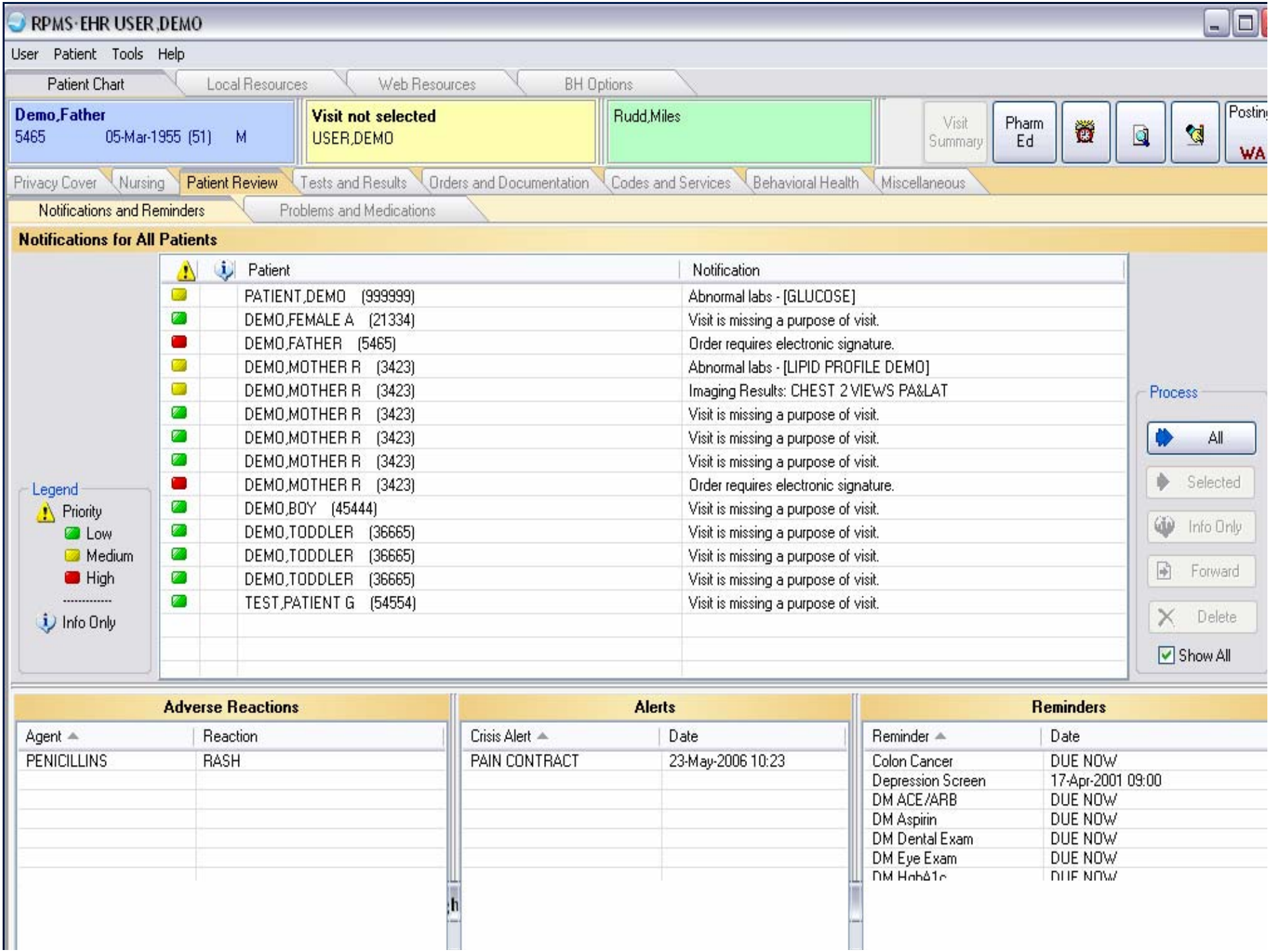


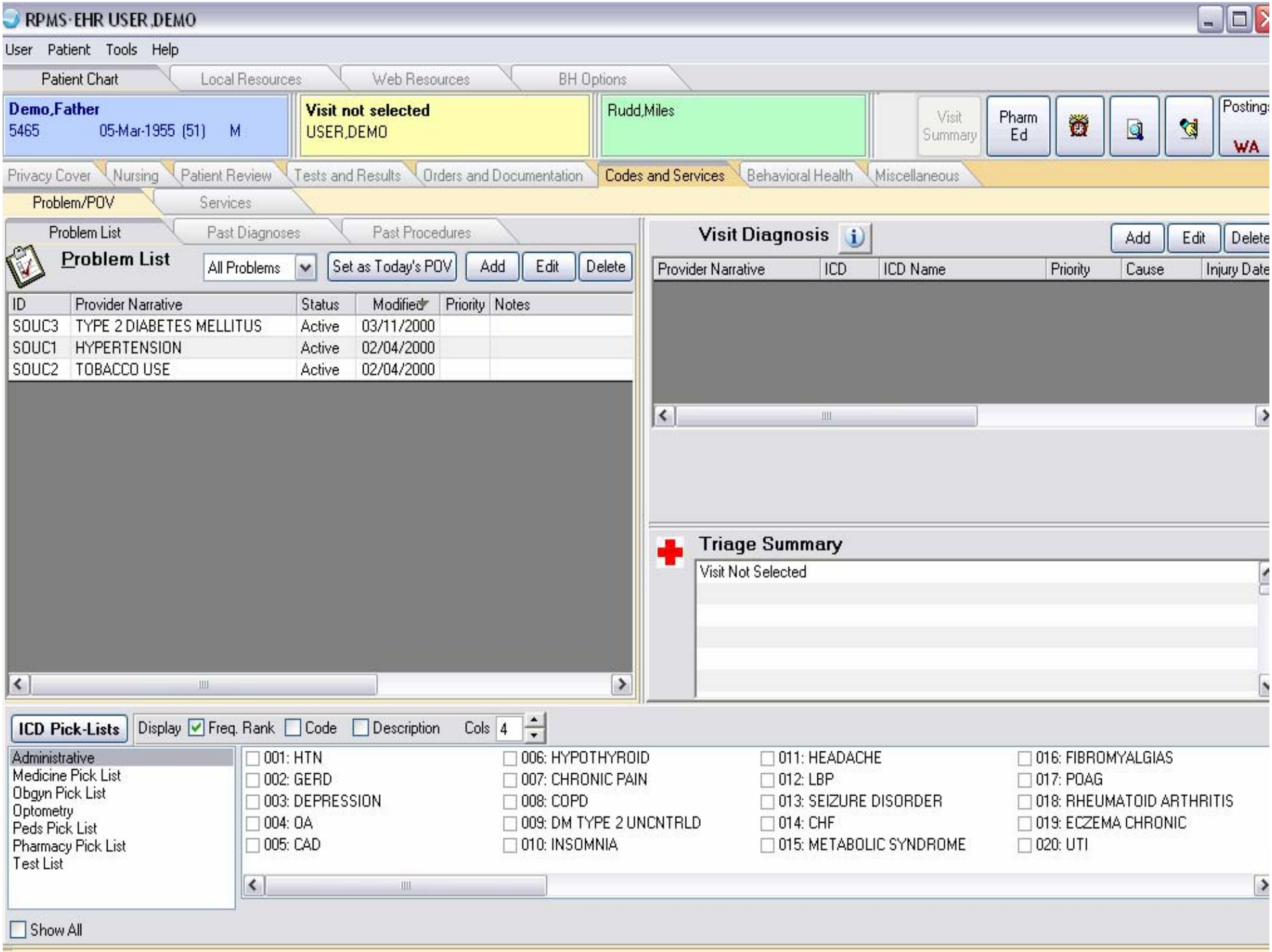
RPMS EHR

The EHR Componentized Framework



RPMS EHR


RPMS·EHR USER,DEMO
User Patient Tools Help
Patient Chart
Local Resources
Web Resources
BH Options
Demo,Father
5465 05-Mar-1955 (51) M
Visit not selected
USER,DEMO
Rudd,Miles
Visit Summary
Pharm Ed
Privacy Cover
Nursing
Patient Review
Tests and Results
Orders and Documentation
Codes and Services
Behavioral Health
Miscellaneous
Notifications and Reminders
Problems and Medications
Notifications for All Patients
Patient
Notification
PATIENT,DEMO (999999) Abnormal labs - [GLUCOSE]
DEMO,FEMALE A (21334) Visit is missing a purpose of visit.
DEMO,FATHER (5465) Order requires electronic signature.
DEMO,MOTHER R (3423) Abnormal labs - [LIPID PROFILE DEMO]
DEMO,MOTHER R (3423) Imaging Results: CHEST 2 VIEWS PA&LAT
DEMO,MOTHER R (3423) Visit is missing a purpose of visit.
DEMO,MOTHER R (3423) Visit is missing a purpose of visit.
DEMO,MOTHER R (3423) Visit is missing a purpose of visit.
DEMO,MOTHER R (3423) Order requires electronic signature.
DEMO,BOY (45444) Visit is missing a purpose of visit.
DEMO,TODDLER (36665) Visit is missing a purpose of visit.
DEMO,TODDLER (36665) Visit is missing a purpose of visit.
DEMO,TODDLER (36665) Visit is missing a purpose of visit.
TEST,PATIENT G (54554) Visit is missing a purpose of visit.
Legend
Priority
Low
Medium
High
Info Only
Process
All
Selected
Info Only
Forward
Delete
Show All
Adverse Reactions
Agent
Reaction
PENICILLINS RASH
Alerts
Crisis Alert
Date
PAIN CONTRACT 23-May-2006 10:23
Reminders
Reminder
Date
Colon Cancer DUE NOW
Depression Screen 17-Apr-2001 09:00
DM ACE/ARB DUE NOW
DM Aspirin DUE NOW
DM Dental Exam DUE NOW
DM Eye Exam DUE NOW


RPMS·EHR USER,DEMO
User Patient Tools Help
Patient Chart Local Resources Web Resources BH Options
Demo,Father
5465 05-Mar-1955 (51) M
Visit not selected
USER,DEMO
Rudd,Miles
Visit Summary
Pharm Ed
Posting:
WA
Privacy Cover Nursing Patient Review Tests and Results Orders and Documentation Codes and Services Behavioral Health Miscellaneous
Problem/POV Services
Problem List Past Diagnoses Past Procedures
Problem List
All Problems
Set as Today's POV
Add Edit Delete
ID Provider Narrative Status Modified Priority Notes
SOUC3 TYPE 2 DIABETES MELLITUS Active 03/11/2000
SOUC1 HYPERTENSION Active 02/04/2000
SOUC2 TOBACCO USE Active 02/04/2000
Visit Diagnosis
Add Edit Delete
Provider Narrative ICD ICD Name Priority Cause Injury Date
Triage Summary
Visit Not Selected
ICD Pick-Lists
Display Freq. Rank Code Description Cols 4
Administrative
Medicine Pick List
Obgyn Pick List
Optometry
Peds Pick List
Pharmacy Pick List
Test List
001: HTN
002: GERD
003: DEPRESSION
004: OA
005: CAD
006: HYPOTHYROID
007: CHRONIC PAIN
008: COPD
009: DM TYPE 2 UNCNTRLD
010: INSOMNIA
011: HEADACHE
012: LBP
013: SEIZURE DISORDER
014: CHF
015: METABOLIC SYNDROME
016: FIBROMYALGIAS
017: POAG
018: RHEUMATOID ARTHRITIS
019: ECZEMA CHRONIC
020: UTI
Show All

RPMS Electronic Health Record

- Presently running at 69 facilities
- Positive effects on medication errors, GPRA measures, collections reported
- Variable, usually transient, effects on provider productivity
- EHR v1.1 is in testing

RPMS EHR

Public Health Activities System

- CPHAD – Computerized Public Health Activities Data System
- Providers & other staff document time spent in community and public health activities
- Better reporting of provider workload
- Increased visibility of public health role
- In test, release expected in November

RPMS EHR

Case Management in RPMS

RPMS EHR

Diabetes Management System

- Case Management for diabetic patients
- Automated additions to registry
- Reminders and performance indicators
- Automated periodic diabetes audits
- Reports

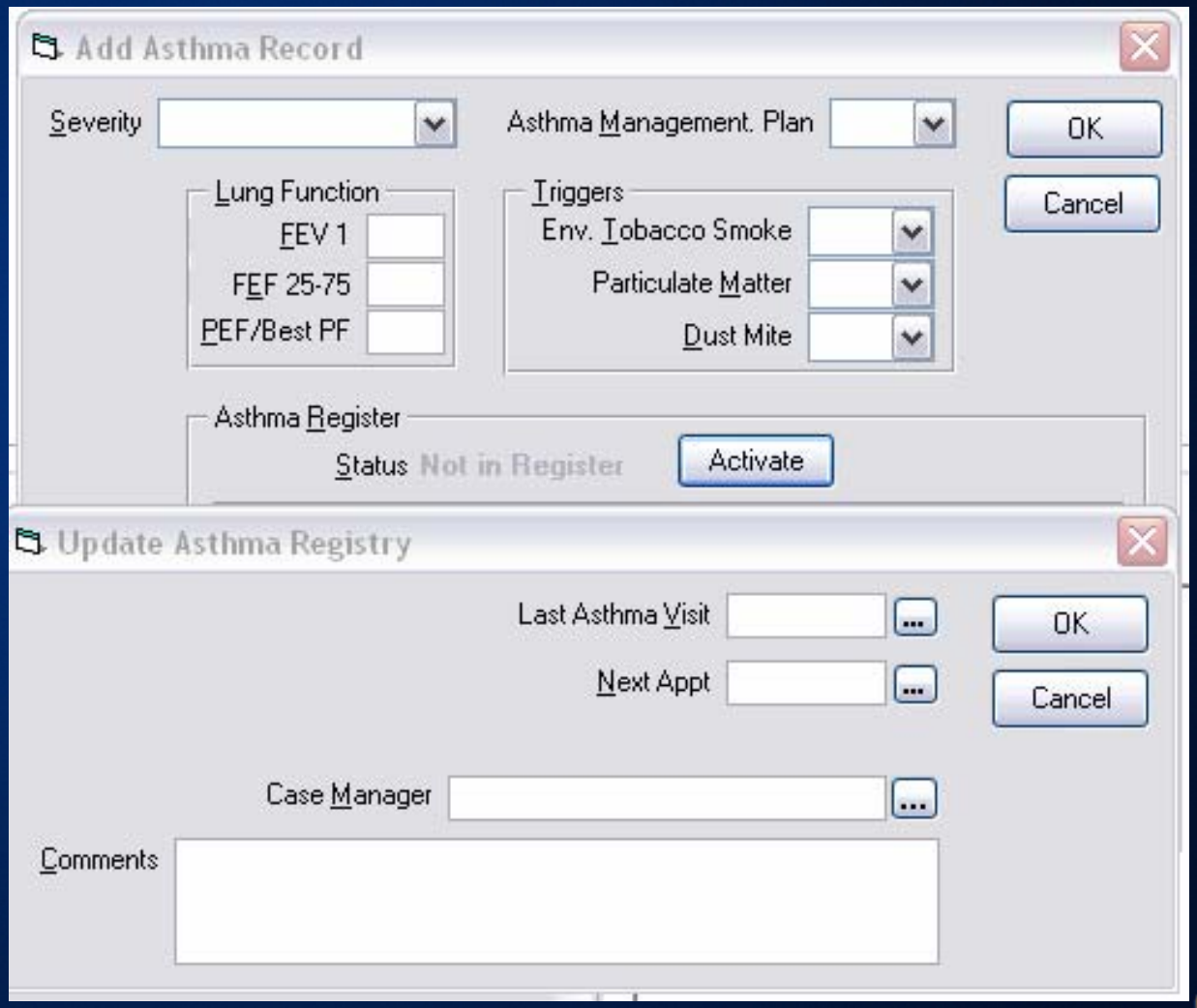
RPMS EHR

Asthma Management System

- Collect data on Asthma severity and triggers
- Case management & registry functions
- Reminders based on severity and medication taxonomies
- Reports

RPMS EHR

Asthma Documentation in EHR



RPMS EHR

Integrated Case Management (iCare)

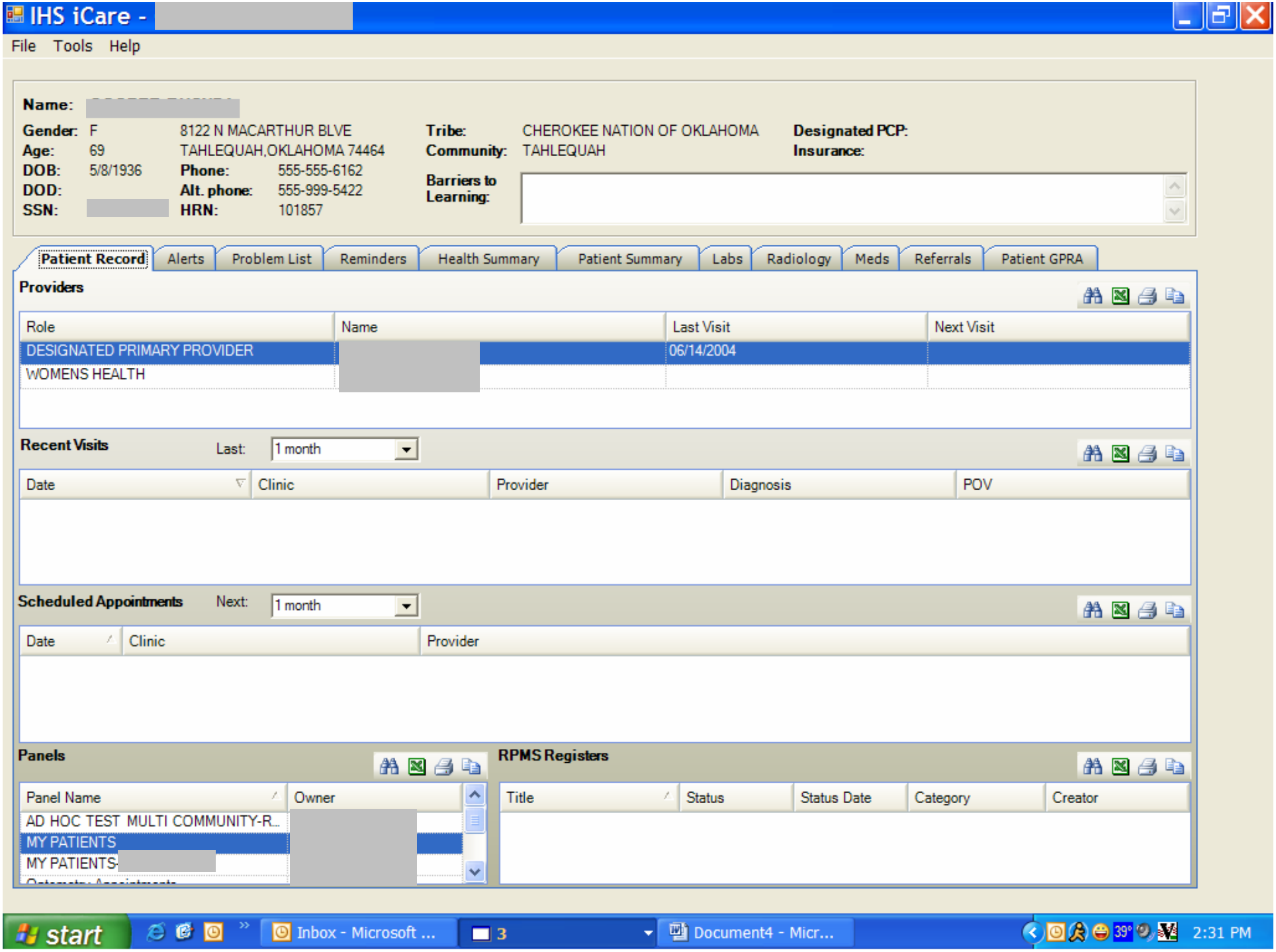
- Graphical user interface (GUI) for a fully integrated case management system
- Wrapper for current and future disease-specific register systems (DM, Asthma, HIV/STD, CVD, WH, etc.)
- Integrated decision support and patient management for multiple chronic conditions
- “Tag” individuals who have predefined diagnoses or health factors
- “Flag” care management triggers such as abnormal labs, ER visits, etc.

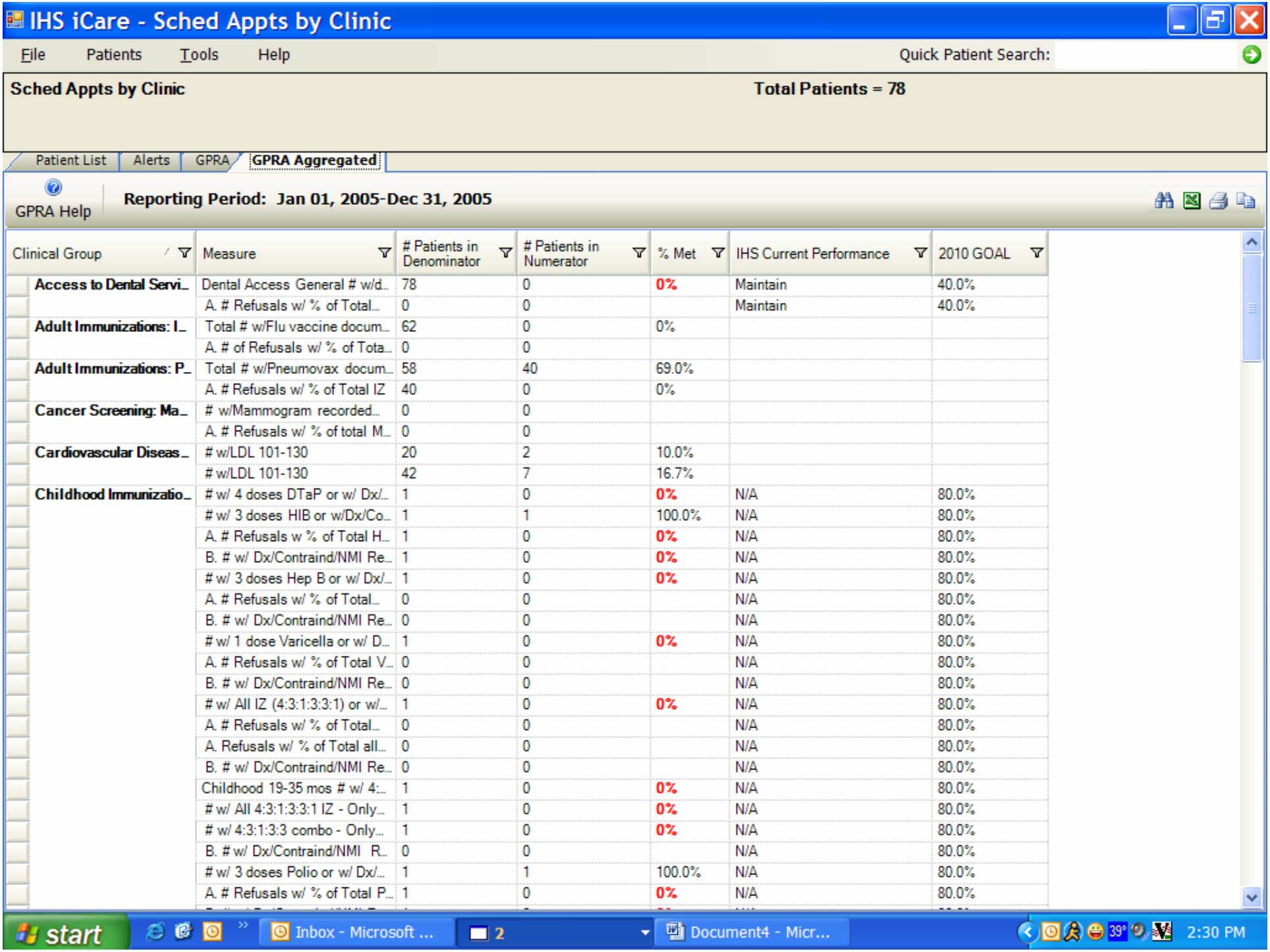
RPMS EHR

iCare (cont'd)

- Nationally defined preventive and disease-specific healthcare reminders
- Customizable patient panels – sharable, with ability to assign surrogate managers
- Quick performance views using CRS/GPRA logic for any patient or group of patients
- Information includes household and community perspectives
- iCare v1.0 release planned early CY2007

RPMS EHR


IHS iCare -
File Tools Help
Name:
Gender: F
Age: 69
DOB: 5/8/1936
DOD:
SSN:
8122 N MACARTHUR BLVE
TAHLEQUAH,OKLAHOMA 74464
Phone: 555-555-6162
Alt. phone: 555-999-5422
HRN: 101857
Tribe: CHEROKEE NATION OF OKLAHOMA
Community: TAHLEQUAH
Designated PCP:
Insurance:
Barriers to Learning:
Patient Record
Alerts
Problem List
Reminders
Health Summary
Patient Summary
Labs
Radiology
Meds
Referrals
Patient GPRA
Providers
Role
Name
Last Visit
Next Visit
DESIGNATED PRIMARY PROVIDER
06/14/2004
WOMENS HEALTH
Recent Visits
Last:
1 month
Date
Clinic
Provider
Diagnosis
POV
Scheduled Appointments
Next:
1 month
Date
Clinic
Provider
Panels
Panel Name
Owner
AD HOC TEST MULTI COMMUNITY-R...
MY PATIENTS
MY PATIENTS-
RPMS Registers
Title
Status
Status Date
Category
Creator
start
Inbox - Microsoft ...
3
Document4 - Micr...
2:31 PM



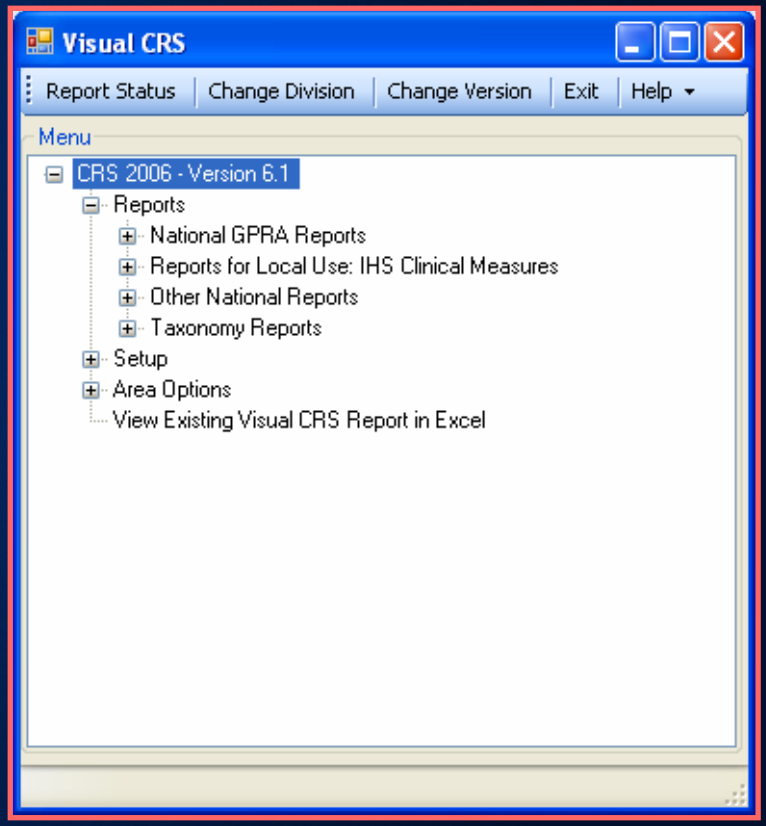
Clinical Group	Measure	# Patients in Denominator	# Patients in Numerator	% Met	IHS Current Performance	2010 GOAL
Access to Dental Servi_	Dental Access General # w/d..	78	0	0%	Maintain	40.0%
	A. # Refusals w/ % of Total...	0	0		Maintain	40.0%
Adult Immunizations: I_	Total # w/Flu vaccine docum...	62	0	0%		
	A. # of Refusals w/ % of Tota...	0	0			
Adult Immunizations: P_	Total # w/Pneumovax docum...	58	40	69.0%		
	A. # Refusals w/ % of Total IZ	40	0	0%		
Cancer Screening: Ma_	# w/Mammogram recorded...	0	0			
	A. # Refusals w/ % of total M...	0	0			
Cardiovascular Diseas_	# w/LDL 101-130	20	2	10.0%		
	# w/LDL 101-130	42	7	16.7%		
Childhood Immunizatio_	# w/ 4 doses DTaP or w/ Dx/...	1	0	0%	N/A	80.0%
	# w/ 3 doses HIB or w/Dx/Co...	1	1	100.0%	N/A	80.0%
	A. # Refusals w % of Total H...	1	0	0%	N/A	80.0%
	B. # w/ Dx/Contraind/NMI Re...	1	0	0%	N/A	80.0%
	# w/ 3 doses Hep B or w/ Dx/...	1	0	0%	N/A	80.0%
	A. # Refusals w/ % of Total...	0	0		N/A	80.0%
	B. # w/ Dx/Contraind/NMI Re...	0	0		N/A	80.0%
	# w/ 1 dose Varicella or w/ D...	1	0	0%	N/A	80.0%
	A. # Refusals w/ % of Total V...	0	0		N/A	80.0%
	B. # w/ Dx/Contraind/NMI Re...	0	0		N/A	80.0%
	# w/ All IZ (4:3:1:3:3:1) or w/...	1	0	0%	N/A	80.0%
	A. # Refusals w/ % of Total...	0	0		N/A	80.0%
	A. Refusals w/ % of Total all...	0	0		N/A	80.0%
	B. # w/ Dx/Contraind/NMI Re...	0	0		N/A	80.0%
	Childhood 19-35 mos # w/ 4:...	1	0	0%	N/A	80.0%
	# w/ All 4:3:1:3:3:1 IZ - Only...	1	0	0%	N/A	80.0%
	# w/ 4:3:1:3:3 combo - Only...	1	0	0%	N/A	80.0%
	B. # w/ Dx/Contraind/NMI R..	0	0		N/A	80.0%
	# w/ 3 doses Polio or w/ Dx/...	1	1	100.0%	N/A	80.0%
	A. # Refusals w/ % of Total P...	1	0	0%	N/A	80.0%

Performance Assessment in RPMS

RPMS EHR

Clinical Reporting System (CRS)

- Tracks GPRA & other clinical measures for local use as well as national reporting
- Performance assessment without manual chart audits
- Available in both GUI and roll-and-scroll versions



RPMS EHR

CRS 2006 Clinical Measures

- 21 **GPRA** treatment and prevention measures
- 23 **other key clinical measures** Examples:
  - Diabetes Comprehensive Care
  - Osteoporosis Screening
  - Comprehensive CVD-Related Assessment
- 21 **HEDIS** measures
- 23 **Elder Care** measures (patients 55+)
- 17 **CMS** (hospital) measures

RPMS EHR

CRS

- Identical logic ensures ***comparable*** performance data across all facilities
- Updated annually to reflect changes in the logic descriptions and to add new measures
- Local facilities can choose to transmit data for National GPRA, Elder Care and HEDIS performance reporting to their Area
- Area Offices can produce aggregated Area performance reports

RPMS EHR

Sample Performance Summary

SK May 03, 2006 Page 1

*** IHS 2006 National GPRA Clinical Performance Measure Report ***

DEMO HOSPITAL

Report Period: Jul 01, 2005 to Jun 30, 2006

Previous Year Period: Jul 01, 2004 to Jun 30, 2005

Baseline Period: Jul 01, 1999 to Jun 30, 2000

CLINICAL PERFORMANCE SUMMARY

	Site Current	Site Previous	Site Baseline	GPRA06 Goal	Nat'l 2005	2010 Goal
DIABETES						
*Diabetes DX Ever	10.1%	9.6%	8.5%	N/A	11.0%	N/A
*Documented A1c	83.2%	73.2%	84.2%	N/A	78.0%	50.0%
Poor Glycemic Control >9.5	23.9%	14.8%	25.4%	Maintain	15.0%	TBD
Ideal Glycemic Control <7	27.7%	12.8%	23.7%	32.0%	30.0%	40.0%
*BP Assessed	98.1%	91.3%	93.9%	N/A	89.0%	N/A
Controlled BP <130/80	37.4%	32.9%	35.1%	Maintain	37.0%	50.0%
LDL Assessed	39.4%	0.7%	10.5%	56.0%	53.0%	70.0%
Nephropathy Assessed	58.1%	14.1%	0.9%	50.0%	47.0%	70.0%
Retinopathy Exam	57.4%	61.7%	53.5%	@ BASELINE	@50.0%	70.0%
				# Maintain	#50.0%	70.0%
*Depression Assessed	3.9%	4.0%	3.5%	N/A	N/A	N/A
*Influenza Vaccine	76.1%	65.8%	65.8%	N/A	N/A	N/A
*Pneumovax Vaccine Ever	86.5%	84.6%	87.7%	N/A	N/A	N/A
DENTAL						
Dental Access General	16.9%	19.6%	20.1%	Maintain	24.0%	40.0%
Sealants	145	469	420	Maintain	249,882	TBD
Topical Fluoride						
*# Applications	158	157	64	N/A	113,324	N/A
# Patients	120	135	61	Maintain	85,318	TBD
IMMUNIZATIONS						
Influenza 65+	77.4%	67.5%	68.4%	Maintain	59.0%	90.0%

EHR

Clinical Logic Repository

- Currently reminders and performance logic reside in various stovepiped applications
- Logic for similar interventions (e.g. lipid management) may differ depending on disease state – confusing for clinicians
- If guidelines or performance indicators change, reprogramming in multiple packages
- Solution – single logic repository callable from various packages through APIs
- Presently in conceptual phase

RPMS EHR

Discussion

- RPMS: www.ihs.gov/cio/rpms
- EHR: www.ihs.gov/cio/ehr
- RPMS Clinical: www.ihs.gov/cio/ca
- CRS: www.ihs.gov/cio/crs
- GPRA: http://www.ihs.gov/cio/crs/crs_gpra_reporting.asp