VA's VistA, New Advances of a Full-Featured Electronic Health Record

Clinical Data Used to Improve Care

Ross D. Fletcher, MD Chief of Staff, Emeritus Washington, DC VAMC

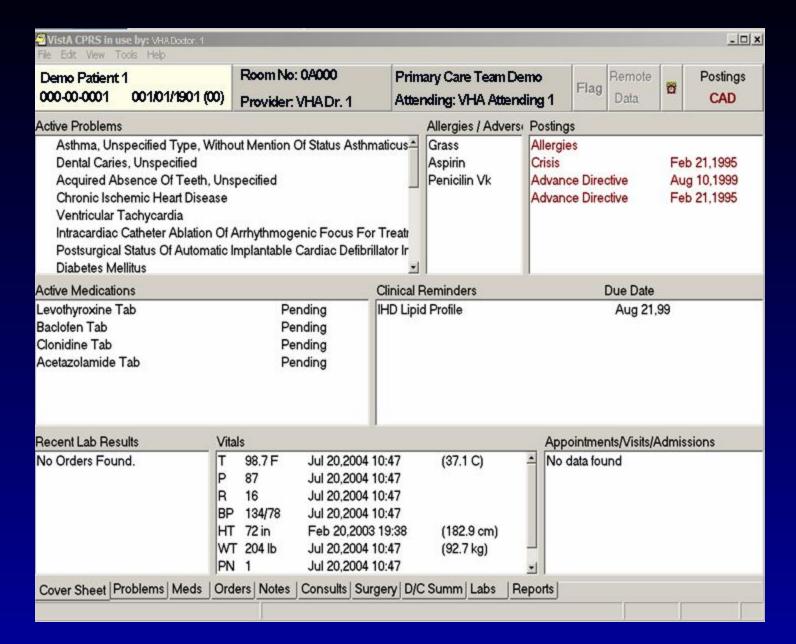
Features of VA's VistA

- **♦** One Record for Inpatient, Outpatient and Home
- **♦** User Friendly Configure Provider Preferences
- **♦** View Images with Text
- **♦** Remote Text and Image View VAs and DoD
- **♦** Searchable Database with Reports
- **♦** Reminders for Improved Patient Care
- **♦** Personal Health Record
- **♦** Mobile Platforms extended Telehealth

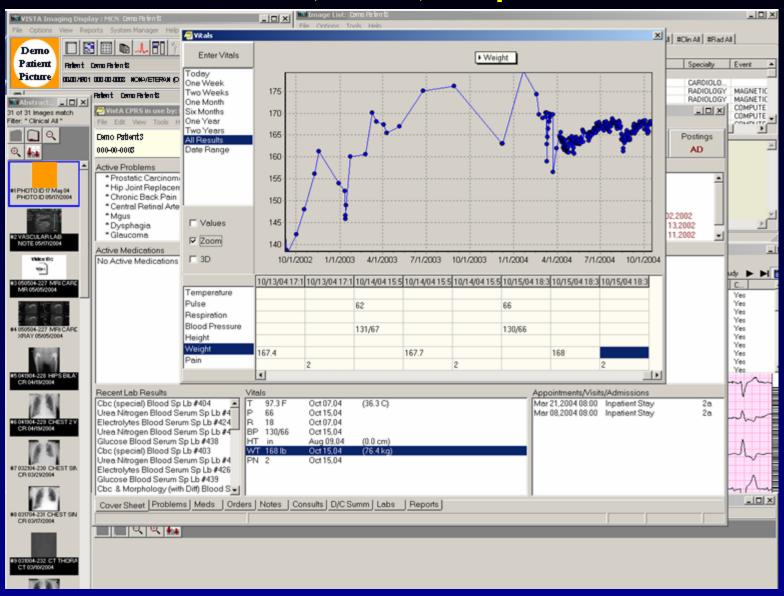
Implementing EHR (VistA)

- Use expert and non-expert clinician advisors.
- ◆ Local ownership -- Customize templates, reminders and overall organization.
- Package popular (discharge summaries, labs, images) with unpopular (order entry, notes) components
- ◆ Maintain hybrid status until 60-70% use is achieved. ("Tipping point")
- Keep software intuitive and user friendly for rapid adoption by new providers
- Provide real improvement in patient care

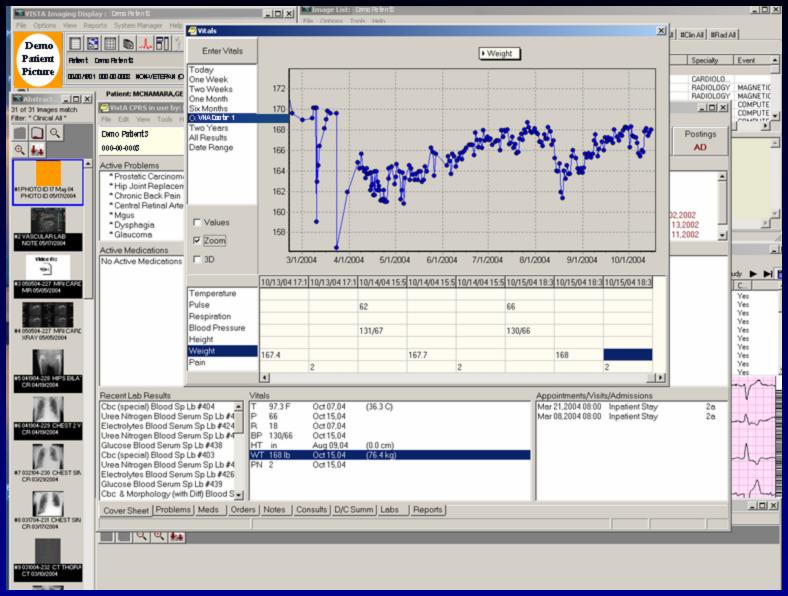
Cover Sheet



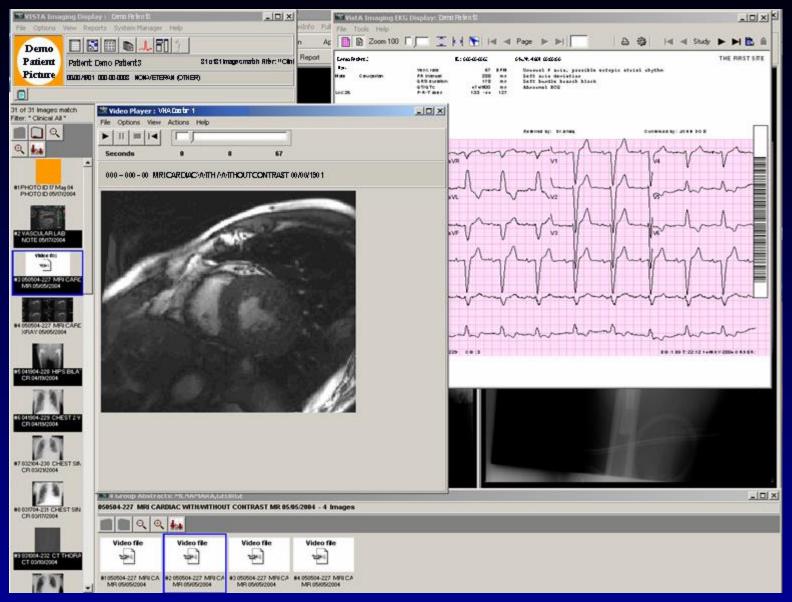
Vital Signs – Weights Home, Clinic, Hospital



Vital Signs – Weights Home, Clinic, Hospital

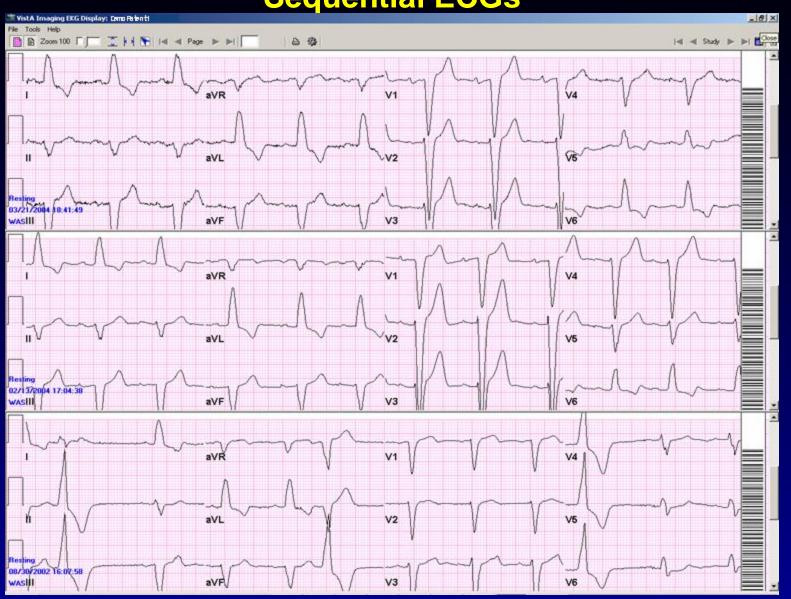


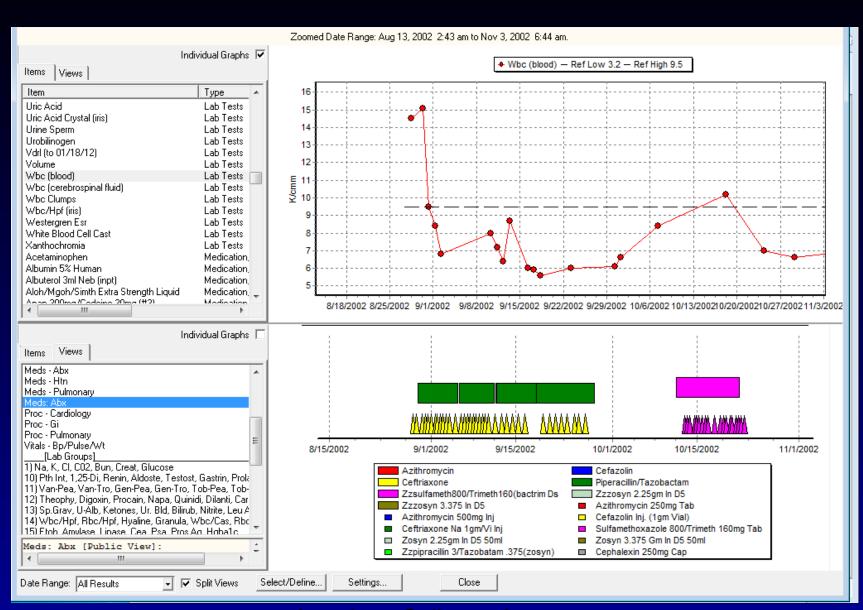
Images – MRI Video loop LBBB on ECG



Septum moves paradoxically away from left ventricle

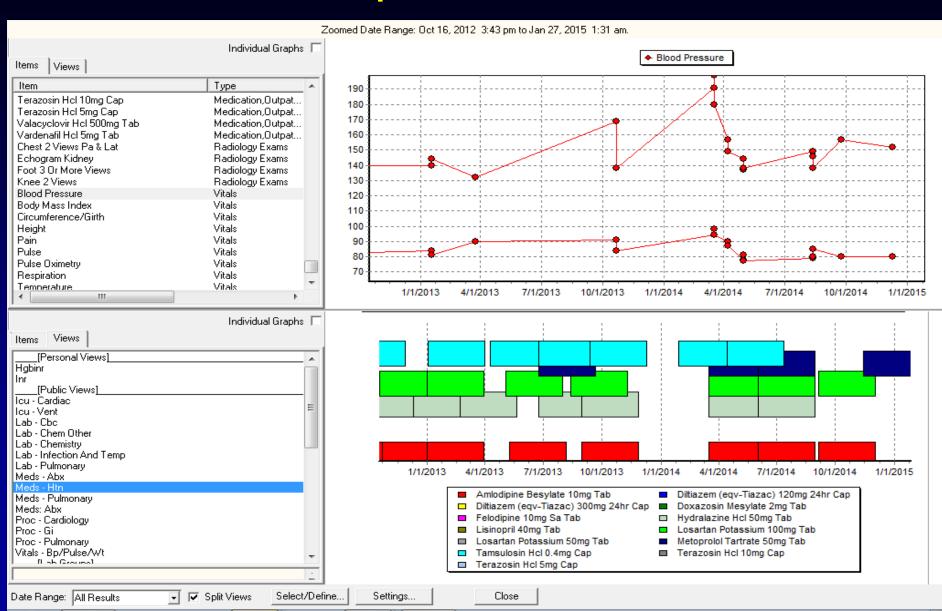
Images –Widening LBBB Sequential ECGs



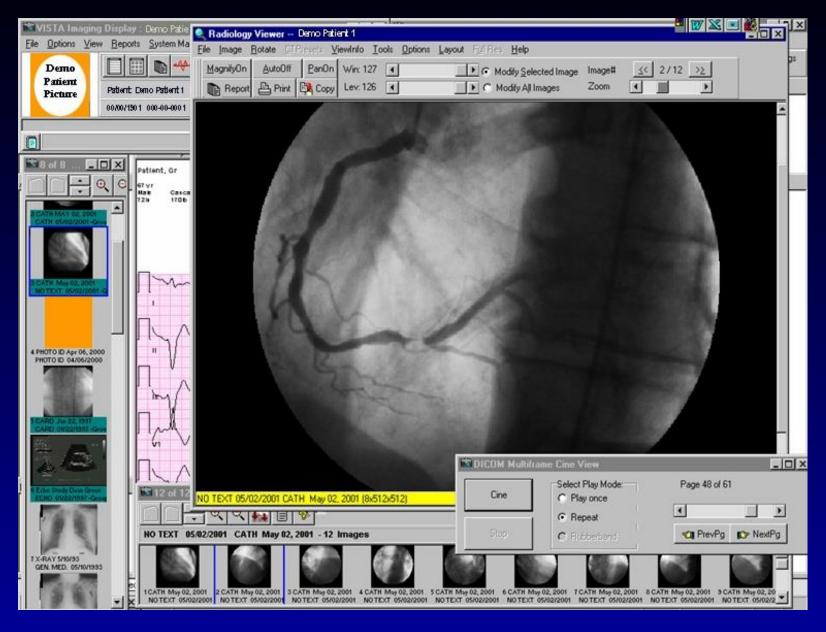


American College of Healthcare Executives

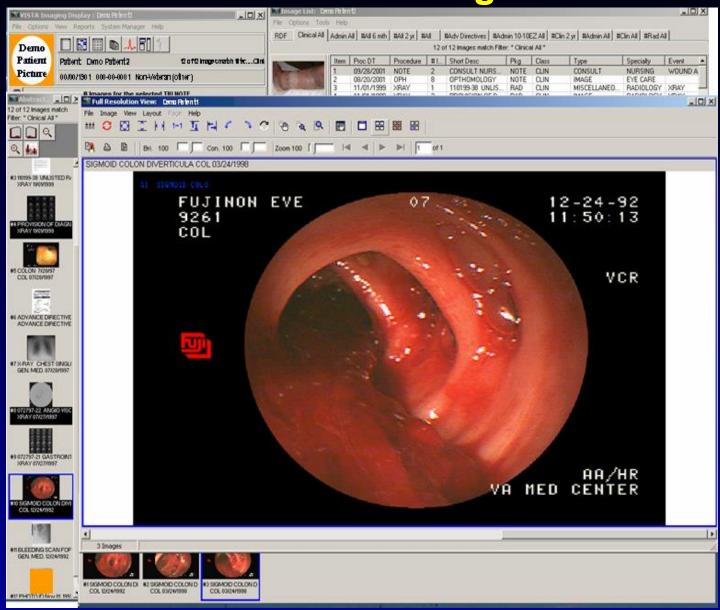
Gap in Medication



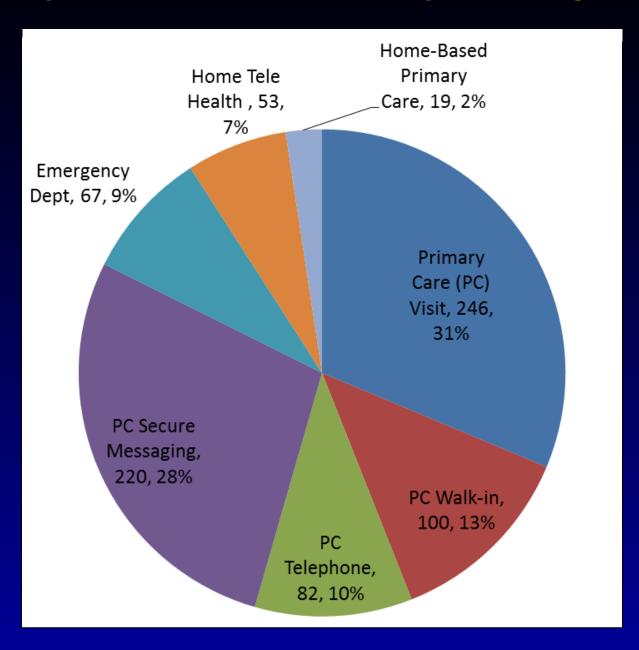
Images - Cineangiogram



Images – Colonoscopy Acute bleeding



Primary Care Access - Daily Average (2015)



The Virtual Hospital

The Best Care Anywhere (Phillip Longman)

Everywhere!

Improving Access



Improving Access



VA has been a leader in Virtual Access

In FY 2015

- Transactions:
 - 1 million+ prescriptions refilled online per month
- Communications:
 - 1.6 million patients using VA secure email with providers
- Expert Care:
 - More than 2.14 million Telehealth visits
 - 156,000 patients case-managed by home telehealth (HT)
 - 282,000 patients used clinical video telehealth (CVT) between VA clinics; 6,300+ received CVT visits directly into their homes
 - 298,000 used Store-and-Forward Telehealth (SFT) technology
 - 395,000 eConsults
- Information Sharing:
 - 1 million+ patients using Blue Button to download EHR data

VA Telehealth Services: Outcomes

- In FY15, VA specific Telehealth Applications (CVT, HT and SFT) provided care from 150 VA Medical Centers (VAMCs) and over 750 Community Based Outpatient Clinics (CBOCs) to more than 677,000 patients (over 11% of Veterans receiving VHA care). This amounted to more than 2.14 million Telehealth episodes of care.
- Forty-five percent (<u>45%</u>) of these patients lived in rural areas, and may otherwise have had limited access to VA healthcare. The number of Veterans receiving care via VA's Telehealth Services <u>grew</u> <u>approximately 6%</u> in FY15.
- A total of 156,016 Veterans received Home Telehealth services in VA during FY15.
- Of the 89,651 Veterans in the FY15 year-end HT census, <u>36,785 (41%)</u>
 <u>Veterans were being supported by HT to live independently</u> in their own homes, patients who otherwise may have needed long-term institutional care.

VA Telehealth Services: Outcomes (cont.)

Reductions in Utilization FY 2015

- Home Telehealth reduced bed days of care 58%
- Home Telehealth reduced hospital admissions 32%
- Clinical Video TeleMental health reduced Acute Psychiatric bed days of care – 35%

Patient Satisfaction

- Home Telehealth 89%
- Store-and-Forward Telehealth 96%
- Clinical Video Telehealth 94%

Patient Centered Care thru Informatics

- DHCP 1982
- CPRS GUI interface 1995
- VistA
- My Healthevet 2003 available to all Veterans

Patient Record – Blue Button

Medications – Refill

Track Health -- Weight and Blood Pressure

Appointments -- Patient request

Secure Messaging

Clinical Reminders

Health Information

Share VA record with DoD (VLER) and Private Sector



My Health, My Care: 24/7 Access to VA

My Healthe Vet

A personal My HealtheVet account provides Veterans with a variety of online tools to manage their health care.



Communicate
with Participating
Patient Aligned
Care Team
Members

View Medical Appointments Refill Prescriptions

Download and Share Personal Health Information

My HealtheVet: VA Personal Health Portal

- My HealtheVet has 10+ years of awardwinning and proven success
 - An established brand with public and private partners and innovative functionality, including Secure Messaging, VA Prescriptions, VA Appointments and VA Blue Button (Open Notes)
 - Nearly 45 percent of VA patients have registered for My HealtheVet



142 million+

3.5 million+ registered users

1.6 million+
opted-in to use
Secure Messaging

VA Blue Button

- Veteran patients with a Premium My
 HealtheVet account can use the VA Blue
 Button to:
 - Create a single electronic file with their available personal health information
 - Manage their health care at VA medical facilities.
- Enhances Access to Personal Health Information
- Fosters Patient Engagement
- Supports Patient-Centered Care



FY 15, 1 million+ Veteran patients using VA Blue Button to download EHR data

Today...





VA Mobile





Stand Alone Mental Health Apps



Apps are regularly used as part of VA treatment.

Apps are also available to any interested clinicians & patients.

Expanding on the Go Resources

The PTSD Coach mobile app is one of the first in a series of VA and DoD jointly-designed resources to help Service members and Veterans manage their readjustment challenges and get anonymous assistance.



Examples of Apps for Veterans in Development that Connect to VA's EHR



- Annie for Veterans
 - Promotes self-care for Veterans enrolled in VA health care;
 Veterans receive automated messages that prompt them to track their own health. Annie also can send you reminders and messages from your local VA facility
- Mobile Blue Button
 - Allows Veterans to access, print, download and store information from VA's HER
- Summary of Care
 - Allows Veterans to view VA medical information including lab results, medications and allergies
- Veterans Appointment Request
 - Allows Veterans to request primary care and mental health appointments at VA facilities where you already receive care, and to schedule and cancel selected primary care appointments directly through the app

Future of VA Mobile Health

 Focus on Apps that allow Veterans enrolled in VA healthcare to enter Patient-Generated Data (PGD) and share that health information with their VA care teams



- My VA Health
 - Helps Veterans track their health data, record their life and health goals over time, and share information about their health with their VA care team
- Sync My Data
 - Allows Veterans to transfer data stored in Apple HealthKit to the VA PGD database. Uploading data to the PGD will make it available to other VA health care apps and allow Veterans and their health care team to maintain a consolidated health care record

Mobile Health Provider Program

- Distribute to Centers
- Distribute tablets to more than 12,000 VA clinicians at 40+ VA Medical Evaluate the potential for mobile technologies to improve the efficiency and personalization of health care delivery by clinical staff

Phase 1:

February 2014 - Ongoing

Tablets will include:

- VA email
- Access to commercially available mobile health Apps that have passed VA security reviews
- Access to other capabilities to assist providers with accessing information in the medical center as well as off-site

Phase 2:

Winter 2016 (Target Date)

Tablets will be loaded with VAdeveloped apps that will:

- Allow for quick access to real-time information to inform clinical decisions
- Assist Veterans and Caregivers with self-management
- Allow providers to write progress notes, enter a subset of orders, and complete other clinical tasks

VA Connected Care

Connected Health Technologies	Year Started	Veterans Served in 2015
Virtual Care Modality Totals (Telehealth, Secure Messaging, SCAN-ECHO only)		2,297,473 (40% VHA patients)
Veteran Point of Service Kiosks	2010	>4M transactions
My HealtheVet	2003	~3,500,000
Blue Button	2010	~1,300,000
Secure Messaging	2008	~1,600,000
Store & Forward Telehealth	2000	298,802
eConsults	2010	395,178
Clinical Video Telehealth	2002	282,319
Home Telehealth	2003	156,016
SCAN-ECHO	2011	1,878
Veteran Mobile Apps	2013	15 + many in field testing and development
Staff Mobile Apps	2013	6 + many in field testing and development

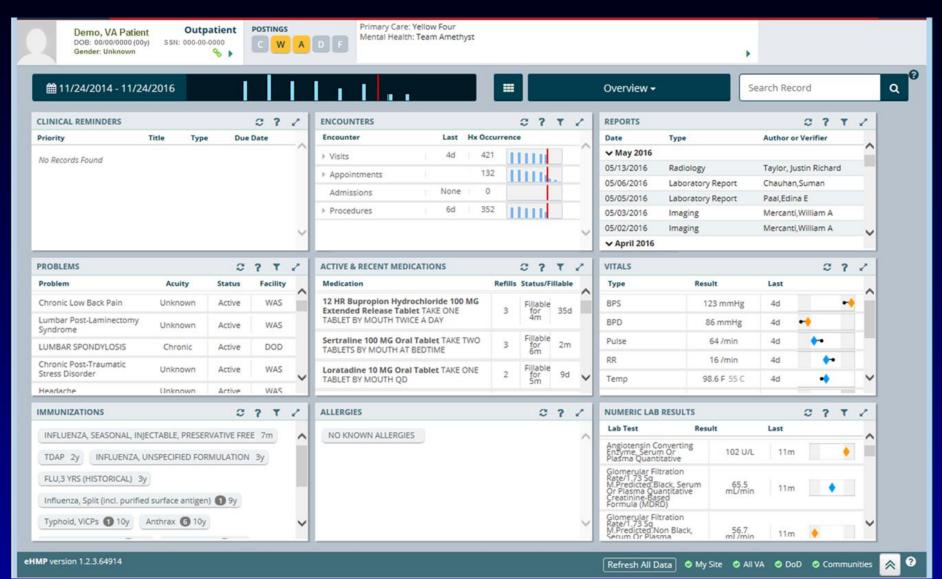
New Advances in Informatics

- Mobile devices Patient facing. Provider Facing
 VA App Store
- Scheduling Changes Graphic View, Today no longer default
 Use Clinically indicated date (CID)
- Enterprise Registration June 2017
- VistA Evolution eHMP progression from Janus Legacy Viewer
 Organizes all VA, DoD, and Non VA data sets
 Will have Notes and orders in a year

VistA Evolution – Vista 4 – Enterprise Health Management Platform

- Web based Allow remote access
- Combines all sources of Health data chronologically
 - Local VA, All other VAs, All DoD and All Community sites on eHMS
- Modular components for variable and customizable layouts
- Searchable across data elements
- Sortable by
- Detail with Graphics on Lab and Vital Signs
- Detail of all Documents
- Global timeline of all events
- OSEHRA compatible

VA Enterprise Health Management Platform (eHMP) Overview



VA eHMP - Lab results

















VA eHMP - Lab with Reference

- Blue normal, Orange abnormal

NUMERIC LAB RESULTS			2	?	τ	2
Chloride, Serum Or Plasma Quantitative	100 mmol/L	10m		•		_
Creatinine, Serum Or Plasma Quantitative	1.39 mg/dL	10m			•	
Potassium, Serum Or Plasma Quantitative	4.6 mmol/L	10m		(
Calcium.lonized, Serum Or Plasma Quantitative	5.1 mg/dL	10m		•		
GLUCOSE	90 mg/dl	20m		•		
UREA NITROGEN	16 mg/dl	20m		•	•	~













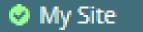


VA eHMP - Lab with Reference

- Blue normal, Orange abnormal

NUMERIC LAB RESULTS			0	?	۲	2
i 🖹 👁 lim Or titative	100 mmol/L	10m		•		
Creatinine, Serum Or Plasma Quantitative	1.39 mg/dL	10m			•	
Potassium, Serum Or Plasma Quantitative	4.6 mmol/L	10m			•	
Calcium.lonized, Serum Or Plasma Quantitative	5.1 mg/dL	10m		•		
GLUCOSE	90 mg/dl	20m		•		
UREA NITROGEN	16 mg/dl	20m		1	-	·







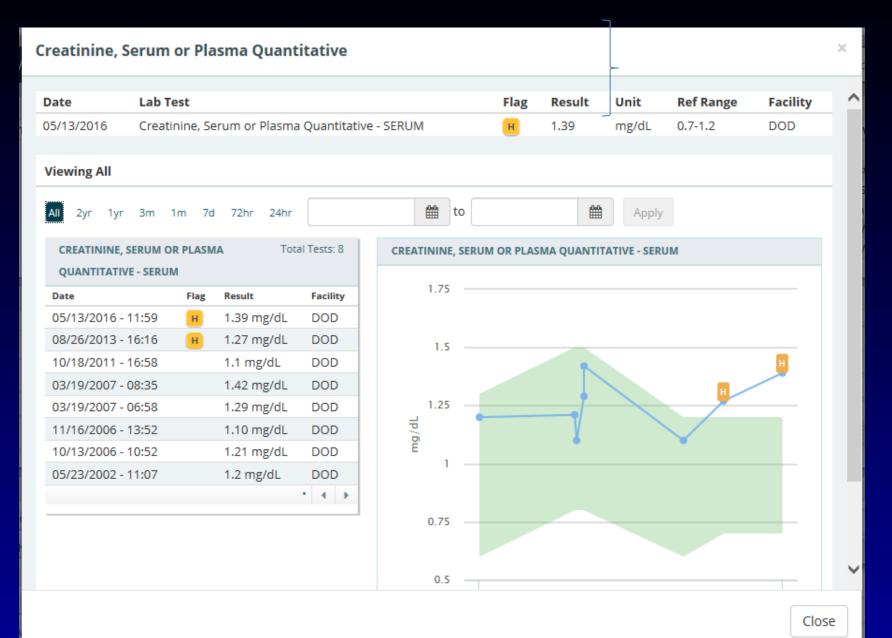




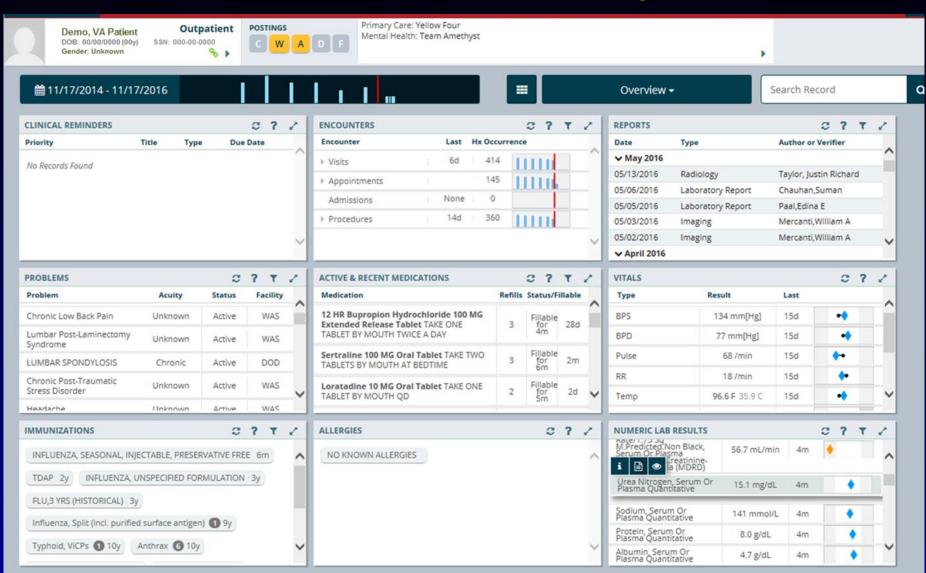




VA eHMP - Detail of Lab S. Creatinine



VA eHMP – Overview Layout



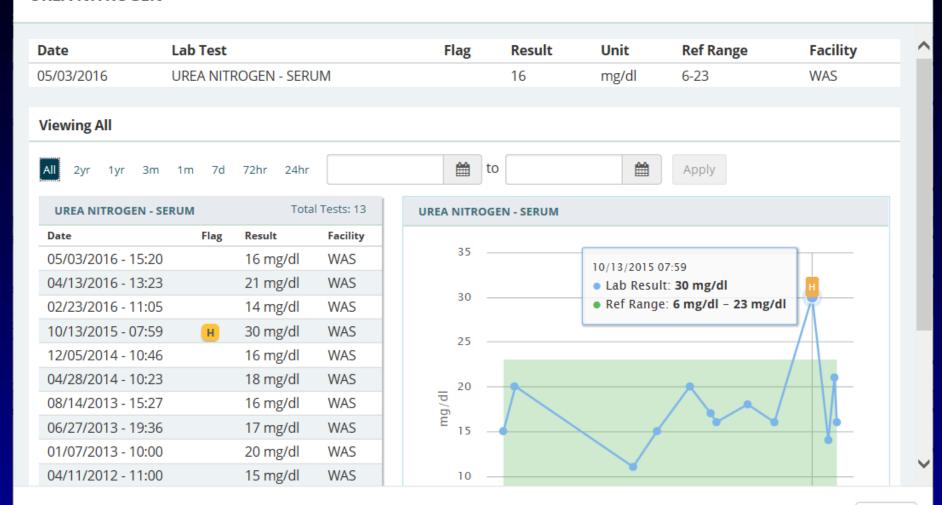
VA eHMP – BUN Detail

UREA NITROGEN

Date	Lab Test			Flag	Result	Unit	Ref Range	Facility	_
5/03/2016	UREA NITI	ROGEN - SERI	JM		16	mg/dl	6-23	WAS	
iewing All									
All 2yr 1yr 3	m 1m 7d	72hr 24hr		⊞ to			Apply		
UREA NITROGEN	- SERUM	Tota	al Tests: 13	UREA NITROG	EN - SERUM				
Date	Flag	Result	Facility						1
05/03/2016 - 15:	20	16 mg/dl	WAS	35 -					
04/13/2016 - 13:	23	21 mg/dl	WAS					н	
02/23/2016 - 11:0	05	14 mg/dl	WAS	30 -				⊼	
10/13/2015 - 07:	59 H	30 mg/dl	WAS	25 -				/\	
12/05/2014 - 10:4	46	16 mg/dl	WAS	23 -					
04/28/2014 - 10:	23	18 mg/dl	WAS	_ 20 -				/ \ ?	
08/14/2013 - 15:	27	16 mg/dl	WAS	lb/gm				/ \/	
06/27/2013 - 19:	36	17 mg/dl	WAS	E 15 –				V.	
01/07/2013 - 10:	00	20 mg/dl	WAS					•	
04/11/2012 - 11:0	00	15 mg/dl	WAS	10 -		~			
09/27/2011 - 10:	24	11 mg/dl	WAS						
01/29/2009 - 14:	11	20 mg/dl	WAS	5 –					
10/23/2008 - 12:	16	15 mg/dl	WAS						
		_		0 -					

VA eHMP – BUN Detail

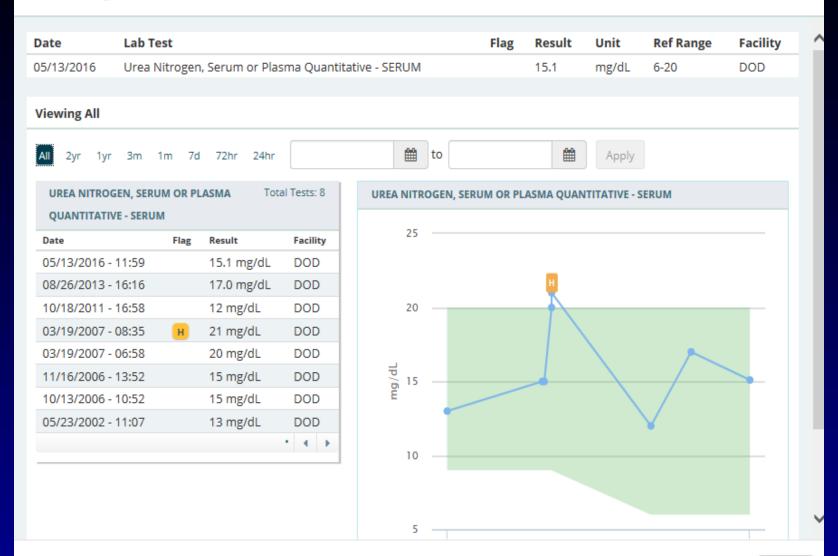
UREA NITROGEN



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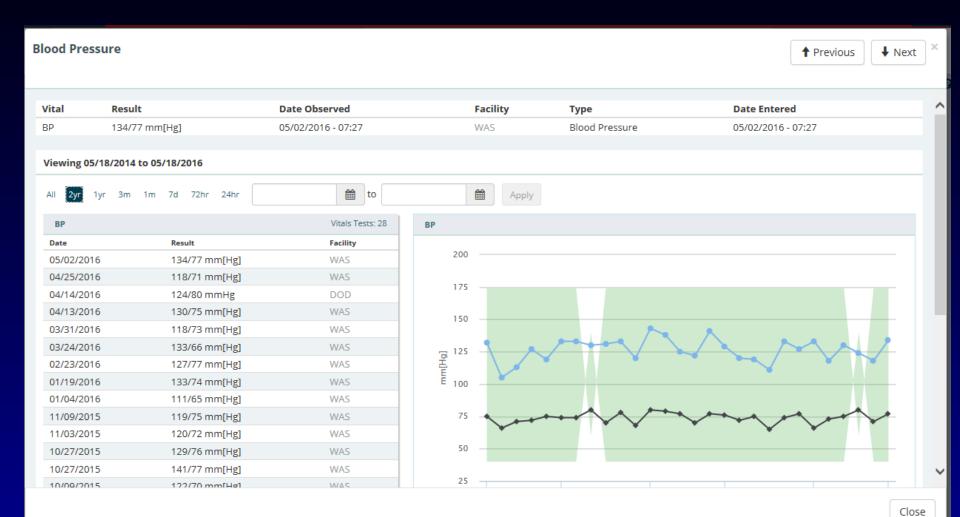
VA eHMP – BUN Detail

Urea Nitrogen, Serum or Plasma Quantitative

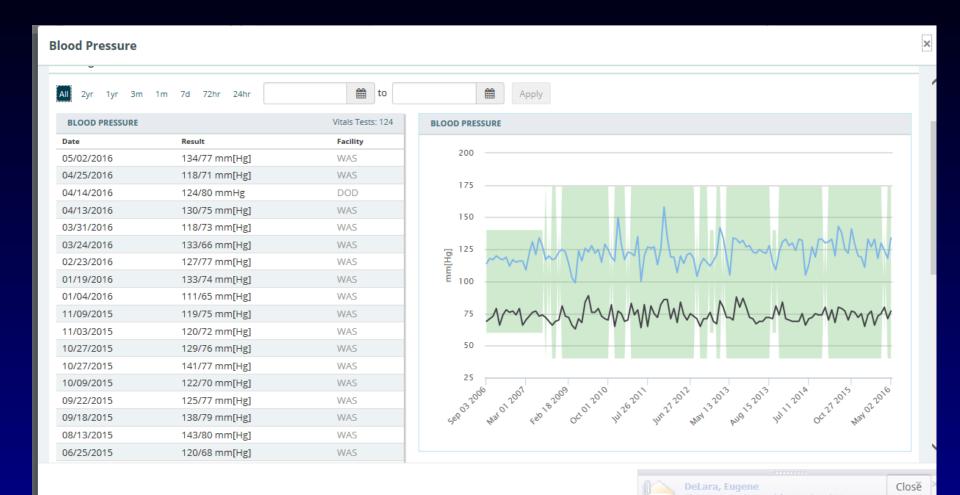


Close

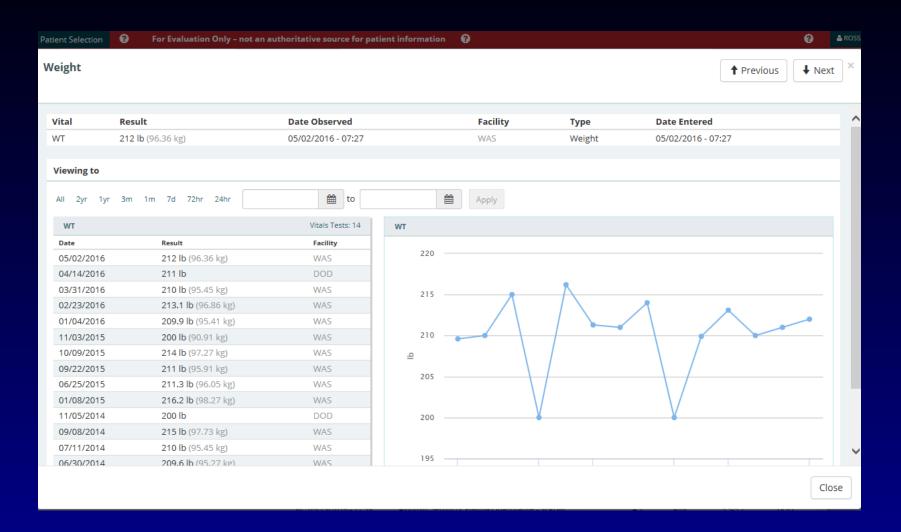
VA eHMP – Blood Pressure Detail



VA eHMP - Detail of All Blood Pressures



VA eHMP - Detail of Weight



VA eHMP – Choices of Layouts

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DOCUMENTS			(Filter workspace by keyword	2 ? T	×
Date	Description	Туре	Coversheet	Facility	
∨ May 2016			Timeline		^
05/13/2016	RADIOLOGIC EXAMINATIONChest, PA/Lat	Radiology	☆ Overview	DOD	
05/11/2016	POLYTRAUMA TELEPHONE NOTE	Progress Note	7	WASHINGTON	
05/11/2016	PULMONARY TELEPHONE NOTE	Progress Note	Meds Review	WASHINGTON	
05/06/2016	LR SURGICAL PATHOLOGY REPORT	Laboratory Report	Documents	WASHINGTON	
05/05/2016	LR CYTOPATHOLOGY REPORT	Laboratory Report	Depression	WASHINGTON	
05/03/2016	PULMONARY OUTPATIENT PROGRESS NOTE	Progress Note	Diabetes Mellitus	WASHINGTON	
05/03/2016	RADIOLOGIC EXAMINATION, CHEST, 2 VIEWS, FRONTAL AND LATERAL;	Imaging		WASHINGTON	
05/02/2016	CYTOPATHOLOGY INTRAPROCEDURAL CONSULTATION NOTE	Progress Note	Hypertension	WASHINGTON	
05/02/2016	PACU NURSING DOCUMENTATION	Progress Note	Pre-Procedure	WASHINGTON	
05/02/2016	PRIMARY CARE SECURE MESSAGING	Progress Note	Rohatgi,Juhi Gupta	WASHINGTON	
05/02/2016	POSTANESTHETIC VISIT NOTE	Progress Note	Yin,David	WASHINGTON	
05/02/2016	RADIOLOGIC EXAMINATION, CHEST; SINGLE VIEW, FRONTAL	Imaging	Mercanti,William A	WASHINGTON	
05/02/2016	PULMONARY PROCEDURE DISCHARGE FORM	Progress Note	Al-Helou,Georges	WASHINGTON	
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05/02/2016	UNIVERSAL PROTOCOL NOTE-TIME OUT	Progress Note	Al-Helou,Georges	WASHINGTON	
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05/02/2016	Pulmonary-BRIEF	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	SCAN: ANESTHESIA RECORD	Progress Note	Thompson,Ronald V Sr	WASHINGTON	
✓ April 2016					
04/29/2016	PERI-PROC: SAME DAY SURGERY TREATMENT NOTE	Progress Note	Hughes,Cindy H	WASHINGTON	
04/29/2016	SCAN: AMBULATORY PROCEDURE NOTE	Progress Note	Thompson,Ronald V Sr	WASHINGTON	
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04/26/2016	NEUROLOGY TELEPHONE CONTACT	Progress Note	Sonkey,Hanna Nchang	WASHINGTON	~

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Refresh All Data My Site All VA DoD Communities



VA eHMP – Radiological Exam Detail

radiologic examination, chest, 2 views, frontal and lateral; Details

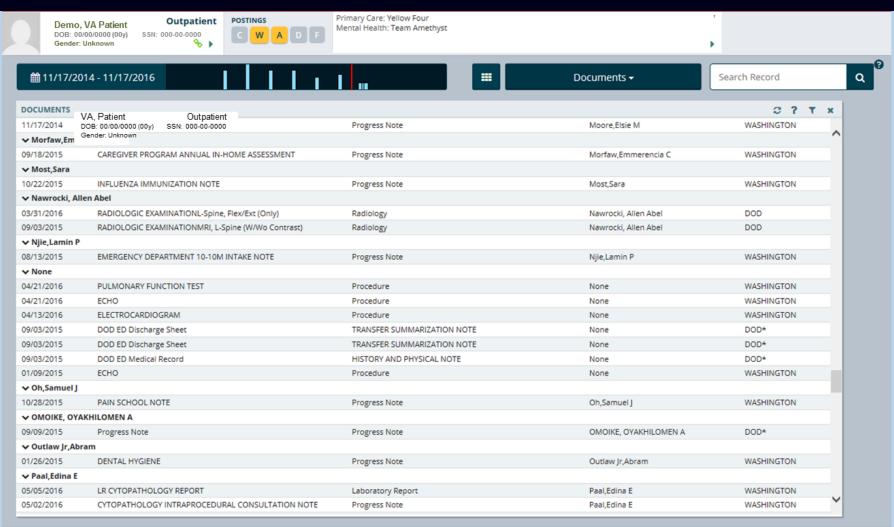
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(Case
                     COMPLETE) CHEST 2 VIEWS PA & LAT
                                                             (RAD Detailed) CPT:71020
     Reason for Study: shortness of breath and chest pain s/p
                      bronchoscopy
   Clinical History:
   Report Status: Verified
                                              Date Reported: MAY 03, 2016
                                              Date Verified: MAY 03, 2016
    Verifier E-Sig:/ES/William A Mercanti
    Report:
     PA and lateral chest compared to 5/2/16 and in
      There is hazy infiltrative process in the left upper lung. No
      pneumothorax or pleural effusions are present. Cardiomediastinal
     silhouette and is grossly unremarkable.
    Impression:
     Stable exam with hazy left upper lobe infiltrate, remainder of
     the chest is stable in this was present on a 3/31/16 exam as
     well.
    Primary Diagnostic Code: MINOR ABNORMALITY
Primary Interpreting Staff:
 William A Mercanti, RADIOLOGIST (Verifier)
/WAM
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VA eHMP – Sort by Note Title

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DOCUMENTS	Detailed title for document type			27	r x
Date	Description 🛦	Туре	Author or Verifier	Facility	
✓ CARDIOLOGY	ECHO-AS OUTPATIENT Cons				^
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12/22/2014	CARDIOLOGY ECHO-AS OUTPATIENT Cons	Consult	Katari,Sreelatha M D	WASHINGTON	
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✓ CAREGIVER PR	ROGRAM SUPPORT NOTE				
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◆ CONSENT: I.V.	CONTRAST ADMINISTRATION				
12/07/2014	CONSENT: I.V. CONTRAST ADMINISTRATION	Progress Note	Spencer,Sheldon H	WASHINGTON	
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✓ DENTAL EXAM	IINATION, FOCUSED				
08/24/2015	DENTAL EXAMINATION, FOCUSED	Progress Note	Huynh,Anh Duc	WASHINGTON	
✓ DENTAL HYGI	ENE				~
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VA-eHMP – Documents Sorted by Author



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VA eHMP – Choices of Layouts

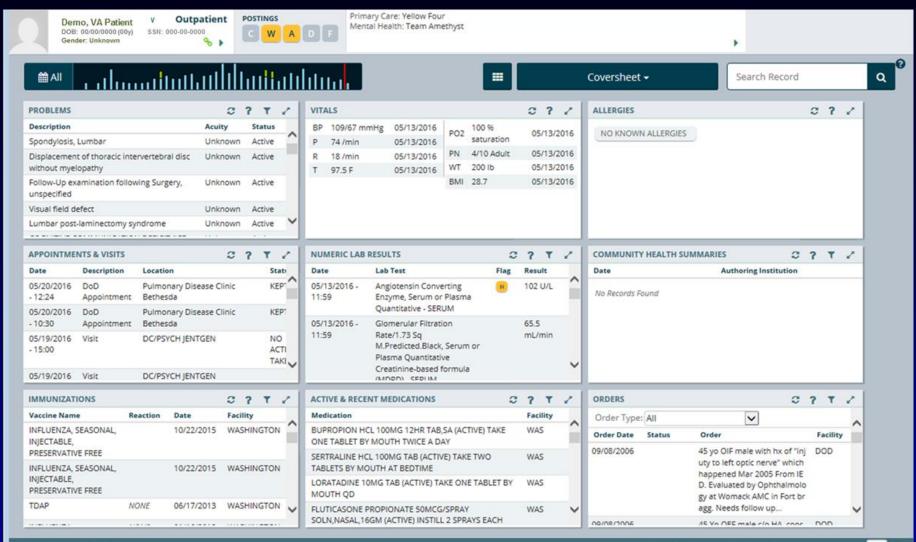
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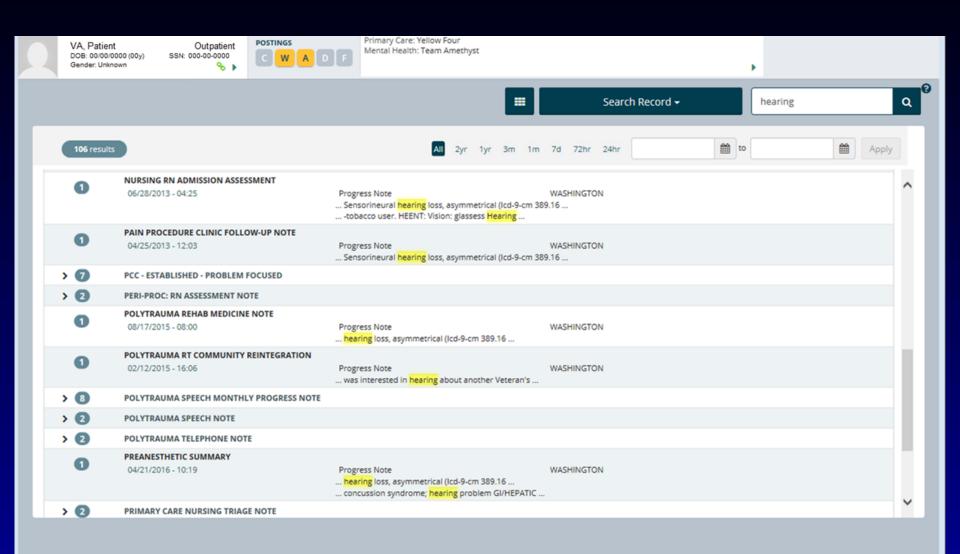
Refresh All Data My Site All VA DoD Communities



VA eHMP – Coversheet Layout



VA eHMP – Search by "hearing"



VA eHMP – Choices of Layouts

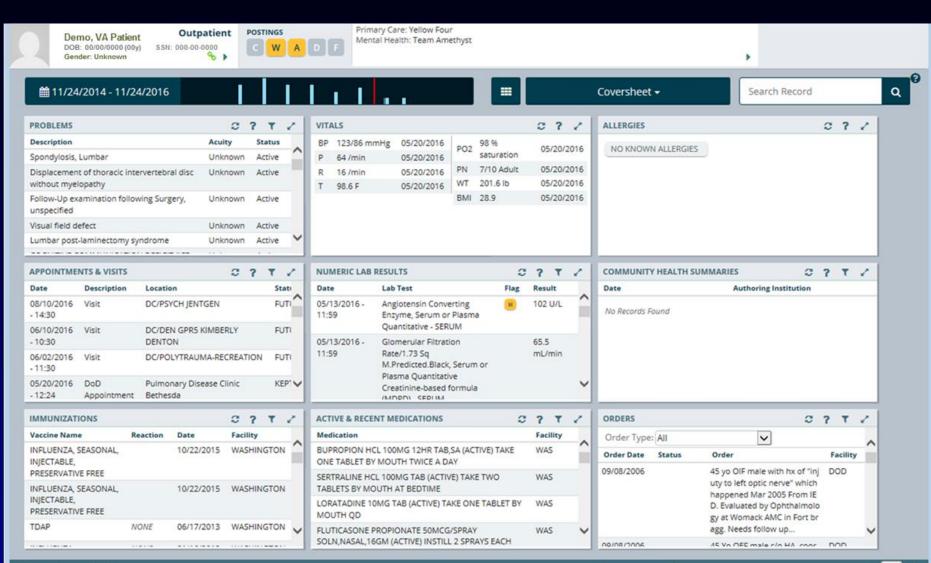
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05/13/2016	RADIOLOGIC EXAMINATIONChest, PA/Lat	Radiology	☆ Overview	DOD	
05/11/2016	POLYTRAUMA TELEPHONE NOTE	Progress Note	7	WASHINGTON	
05/11/2016	PULMONARY TELEPHONE NOTE	Progress Note	Meds Review	WASHINGTON	
05/06/2016	LR SURGICAL PATHOLOGY REPORT	Laboratory Report	Documents	WASHINGTON	
05/05/2016	LR CYTOPATHOLOGY REPORT	Laboratory Report	Depression	WASHINGTON	
05/03/2016	PULMONARY OUTPATIENT PROGRESS NOTE	Progress Note	Diabetes Mellitus	WASHINGTON	
05/03/2016	RADIOLOGIC EXAMINATION, CHEST, 2 VIEWS, FRONTAL AND LATERAL;	Imaging		WASHINGTON	
05/02/2016	CYTOPATHOLOGY INTRAPROCEDURAL CONSULTATION NOTE	Progress Note	Hypertension	WASHINGTON	
05/02/2016	PACU NURSING DOCUMENTATION	Progress Note	Pre-Procedure	WASHINGTON	
05/02/2016	PRIMARY CARE SECURE MESSAGING	Progress Note	Rohatgi,Juhi Gupta	WASHINGTON	
05/02/2016	POSTANESTHETIC VISIT NOTE	Progress Note	Yin,David	WASHINGTON	
05/02/2016	RADIOLOGIC EXAMINATION, CHEST; SINGLE VIEW, FRONTAL	Imaging	Mercanti,William A	WASHINGTON	
05/02/2016	PULMONARY PROCEDURE DISCHARGE FORM	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	PULMONARY PROCEDURES	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	UNIVERSAL PROTOCOL NOTE-TIME OUT	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	UNIVERSAL PROTOCOL NOTE PRE-PROCEDURE CHECKLIST-OUTPATIENT	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	UNIVERSAL PROTOCOL NOTE-PHYSICIAN	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	Pulmonary-BRIEF	Progress Note	Al-Helou,Georges	WASHINGTON	
05/02/2016	SCAN: ANESTHESIA RECORD	Progress Note	Thompson,Ronald V Sr	WASHINGTON	
✓ April 2016					
04/29/2016	PERI-PROC: SAME DAY SURGERY TREATMENT NOTE	Progress Note	Hughes,Cindy H	WASHINGTON	
04/29/2016	SCAN: AMBULATORY PROCEDURE NOTE	Progress Note	Thompson,Ronald V Sr	WASHINGTON	
04/28/2016	PRIMARY CARE SECURE MESSAGING	Progress Note	Powell, Michelle Loving	WASHINGTON	
04/27/2016	MENTAL HEALTH SECURE MESSAGING	Progress Note	Jentgen,Catherine D	WASHINGTON	
04/26/2016	NEUROLOGY TELEPHONE CONTACT	Progress Note	Sonkey,Hanna Nchang	WASHINGTON	~

eHMP version 1.2.3.64914

Refresh All Data My Site All VA DoD Communities



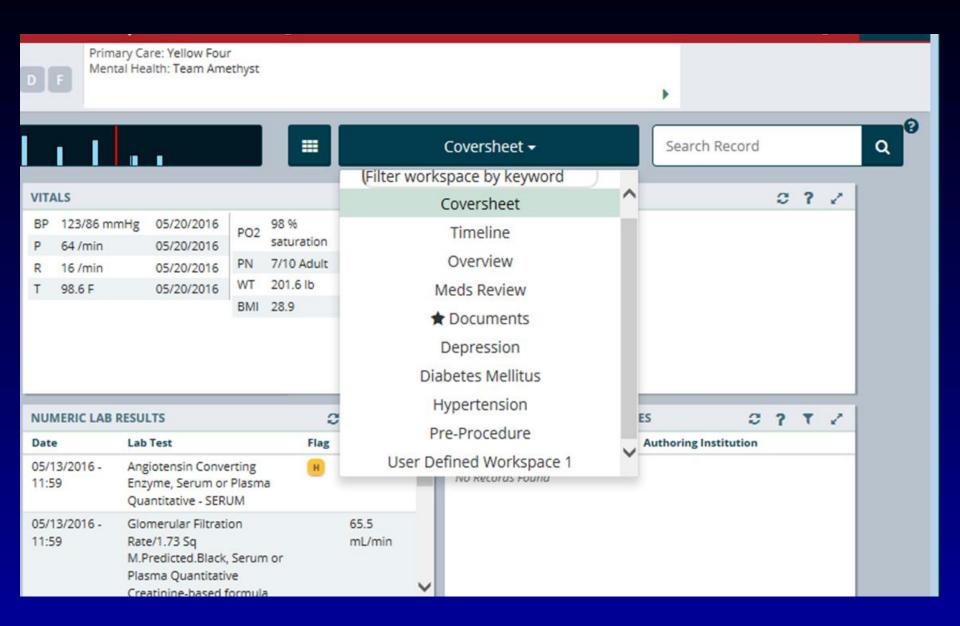
VA eHMP – Coversheet



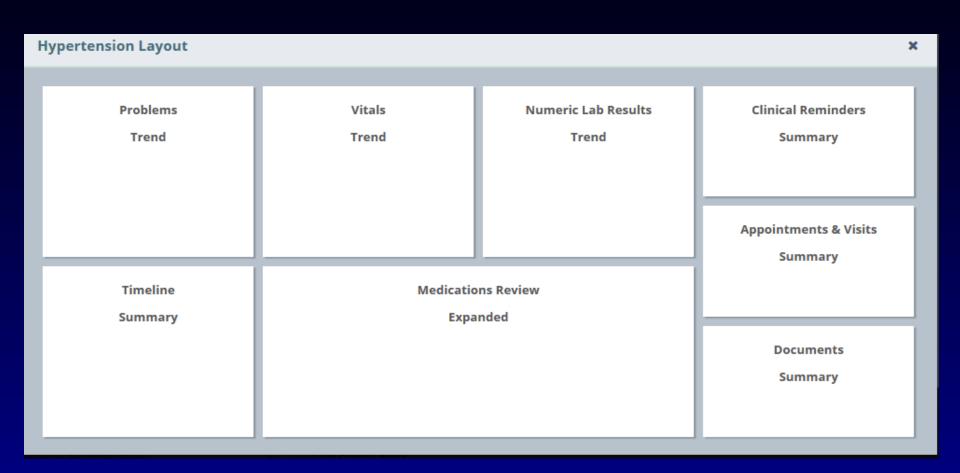
VA eHMP - Coversheet Layout

Coversheet Layout		×
Problems Summary	Vitals Summary	Allergies Trend
Appointments & Visits Summary	Numeric Lab Results Summary	Community Health Summaries Summary
Immunizations Summary	Active & Recent Medications Summary	Orders Summary

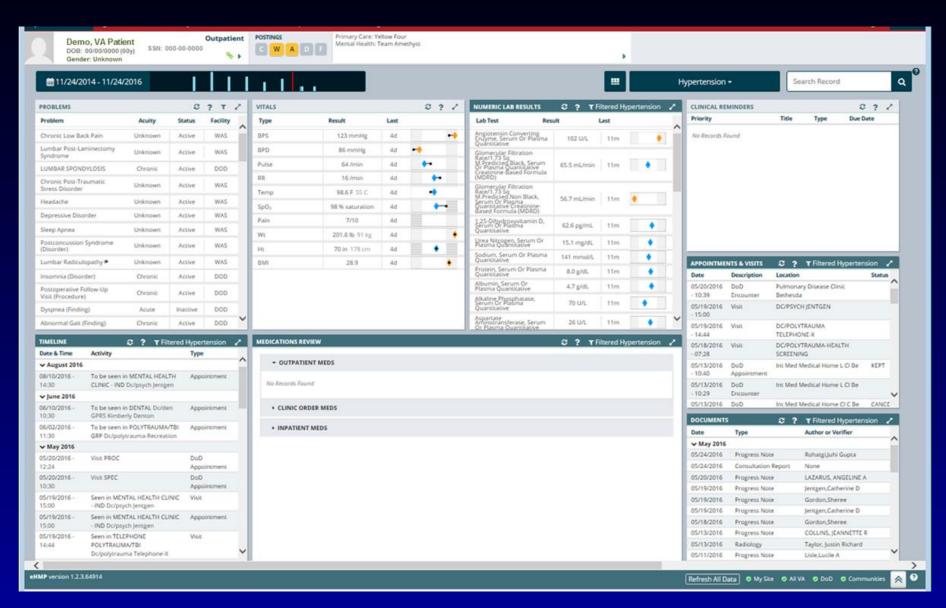
VA eHMP – Choices of Layouts



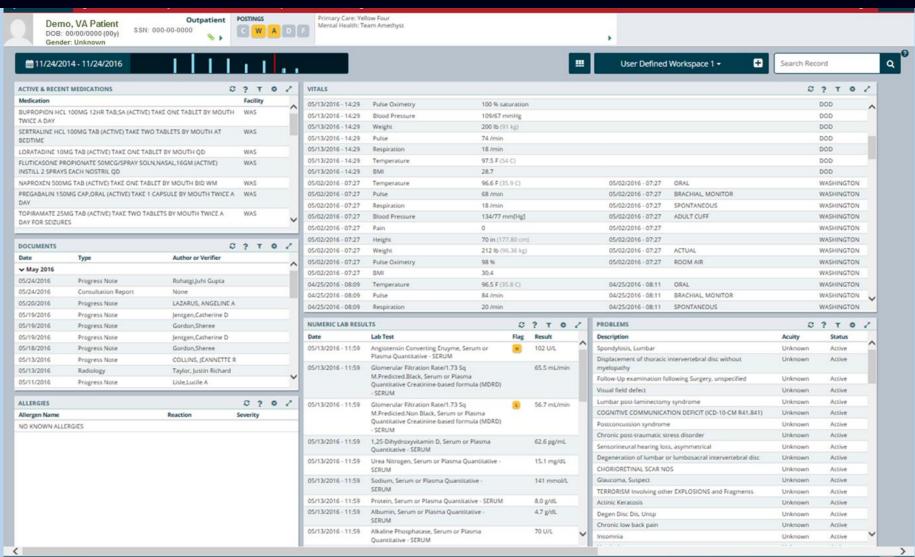
VA eHMP – Hypertension Layout



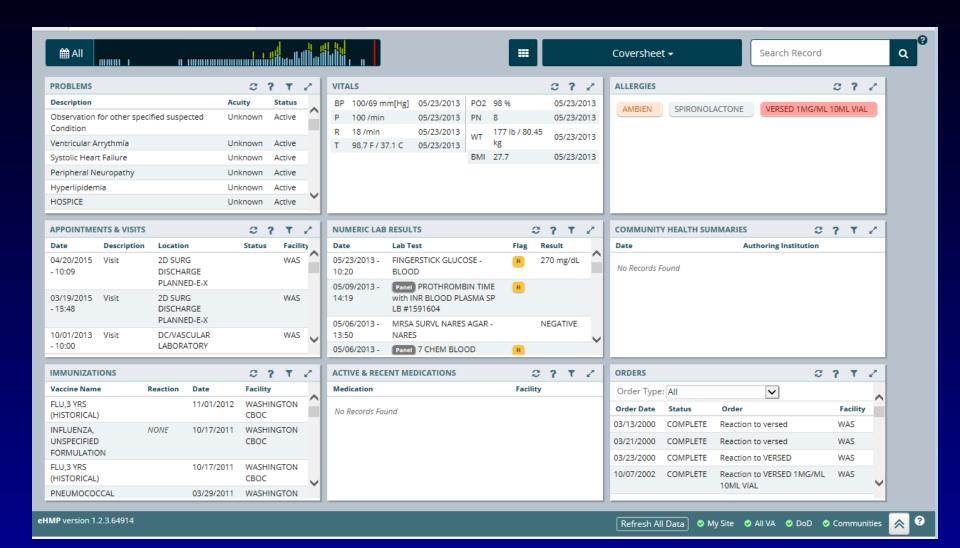
VA eHMP – Hypertension Layout



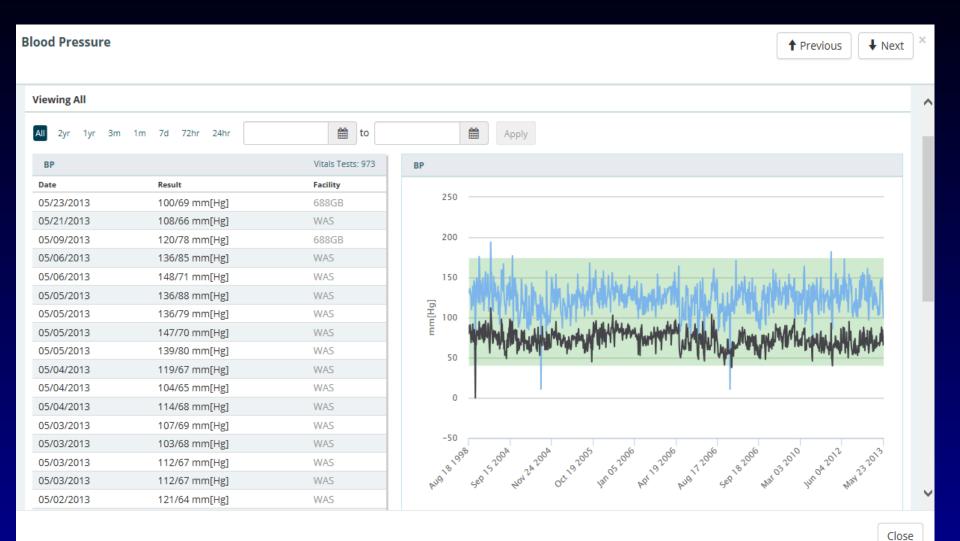
VA eHMP – User Defined Layout



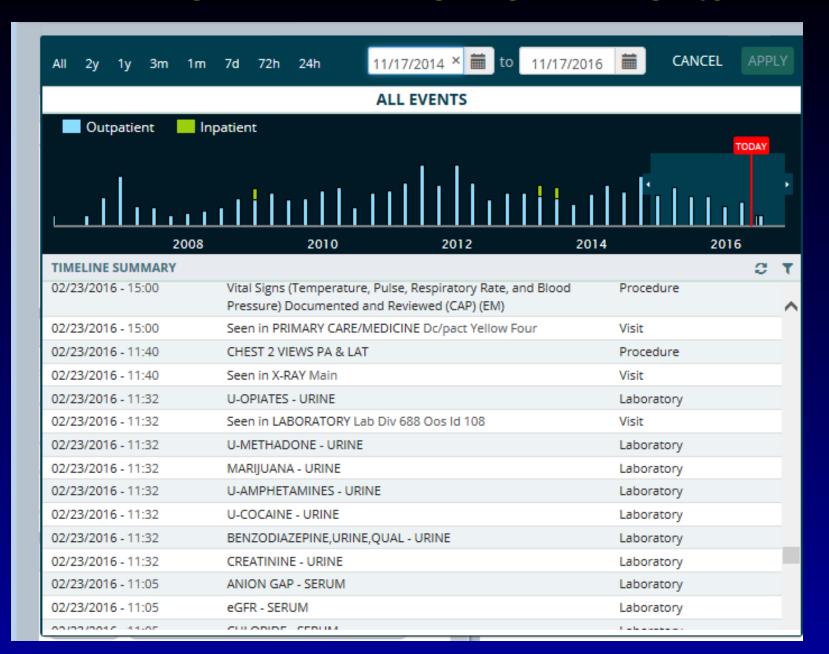
VA eHMP – Coversheet Layout



VA eHMP - Blood Pressure



VA eHMP – Timeline All Events



Home Care with Devices

- **♦** Blood Pressure and Pulse rate
- **◆** Oximetry O2 Sat and respiratory rate
- ♦ Ventilation Tidal Volume and Respiratory Rate
- **◆** ECG with interpretation Alive Cor
 - **◆** Arrhythmia Atrial Fibrillation
- ◆ Fit Bit, Apple Watch etc. upload to EHR
 - **♦** Simple Steps/day Exercise, Sleep

Subclinical Atrial Fibrillation

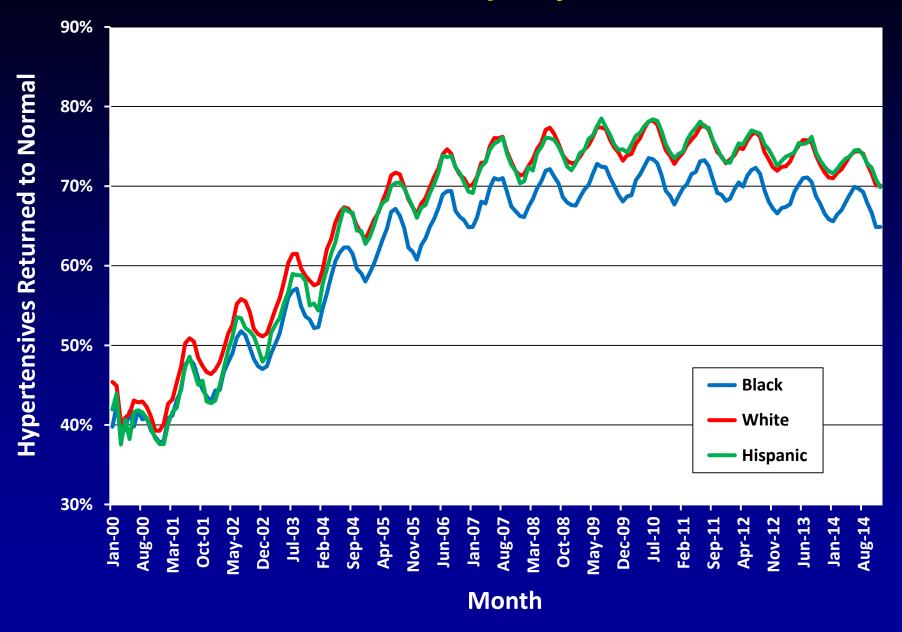
- ◆ Patients with pacemakers recording atrial events > 190 bpm > 6minutes
- ◆ In three months 18% had atrial tachy with median rate of 480 bpm
- **♦ Quartiles Duration Stroke Risk**
 - ♦ 1 < .86 hours 1.23
 - 2 .87 3.63 hours 0
 - ◆ 3 3.64 -17.72 hours 1.18
 - ♦ 4 >17 hours 4.89

How VA Care Compares: Quality Measures

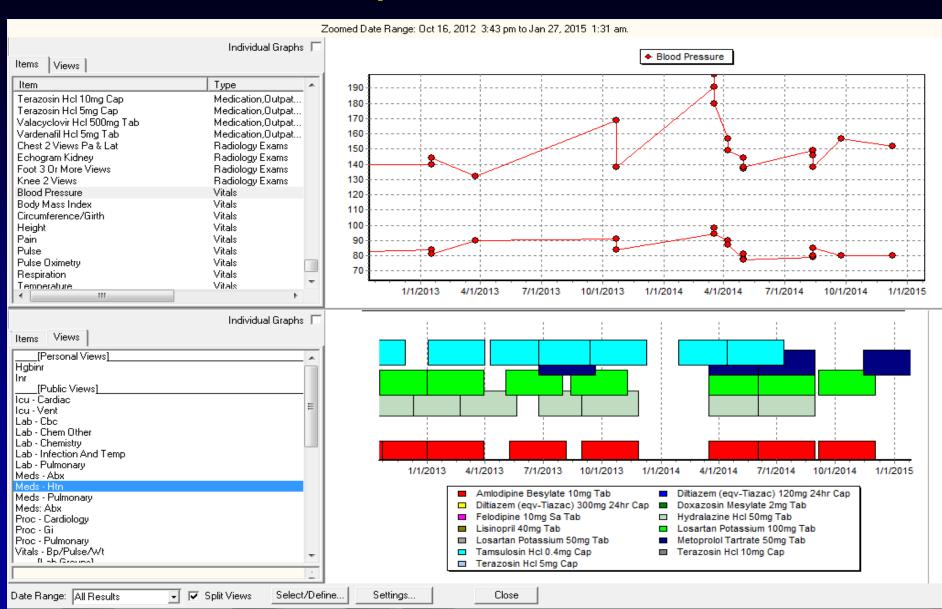
Clinical Indictor	VA 2010	VA 2009	Commercial 2009*	Medicare 2009*	Medicaid 2009*
Breast cancer screening	88%	87%	71%	69%	52%
Cervical cancer screening	93%	92%	77%	n/a	66%
Colorectal cancer screening	82%	80%	61%	55%	n/a
LDL-Cholesterol < 100 mg/dL after AMI, PTCA, CABG	69%	67%	59%	56%	41%
Diabetes: DM control HbA1c <9.0%	98%	98%	89%	90%	81%
Diabetes: LDL-C < 100 mg/dL	70%	69%	47%	50%	34%
Diabetes: Eye Exams	90%	88%	57%	64%	53%
Diabetes: Renal Exam	96%	95%	83%	89%	77%
Diabetes: BP <140/90)	82%	80%	65%	61%	60%
Smoking Cessation Counseling	97%	96%	80%	78%	74%
Smoking: Medications offered	94%	90%	53%	n/a	43%
Smoking: Referral / Strategies	97%	96%	50%	n/a	39%
Immunizations: Influenza	81%	83%	66%	n/a	n/a
Immunizations: Pneumococcal	94%	95%	61%	n/a	n/a

^{*} Healthcare Effectiveness Data and Information Set (HEDIS)

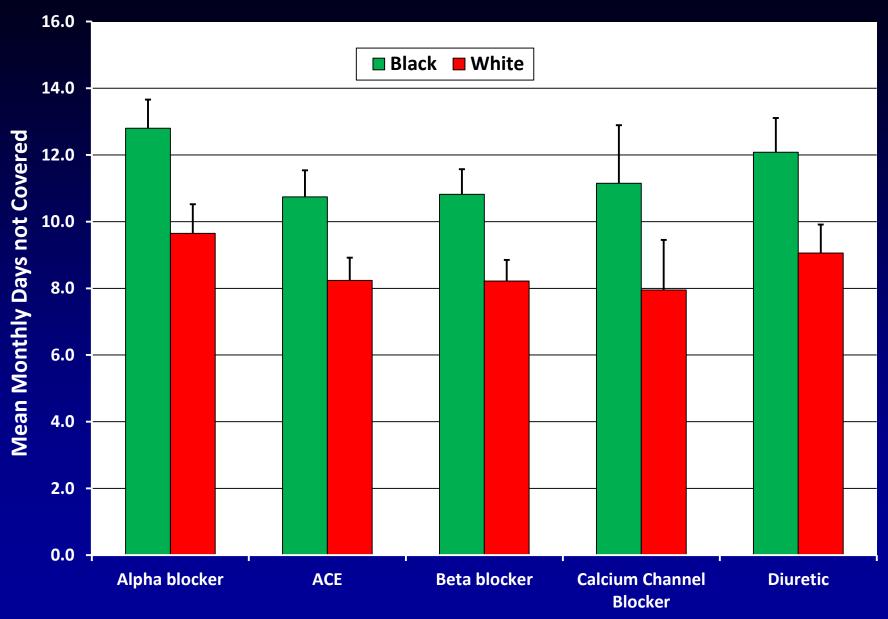
Racial Disparity



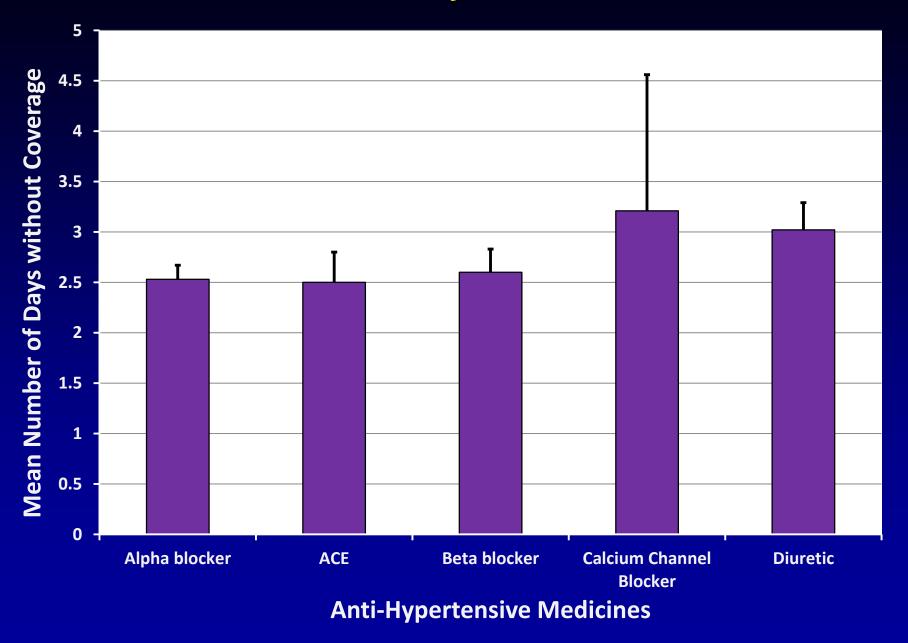
Gap in Medication

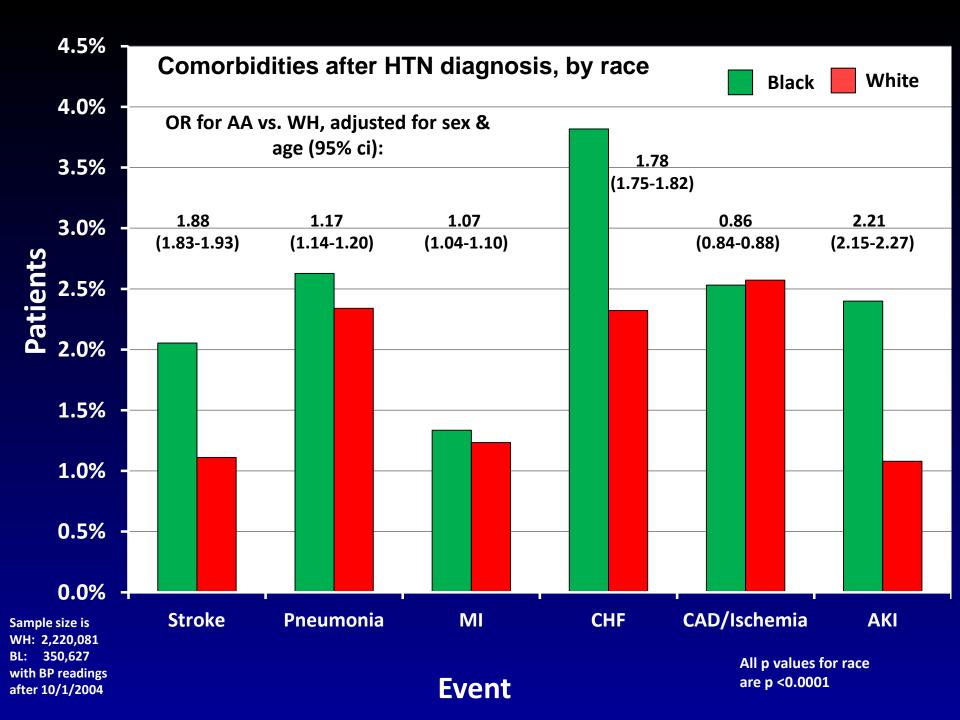


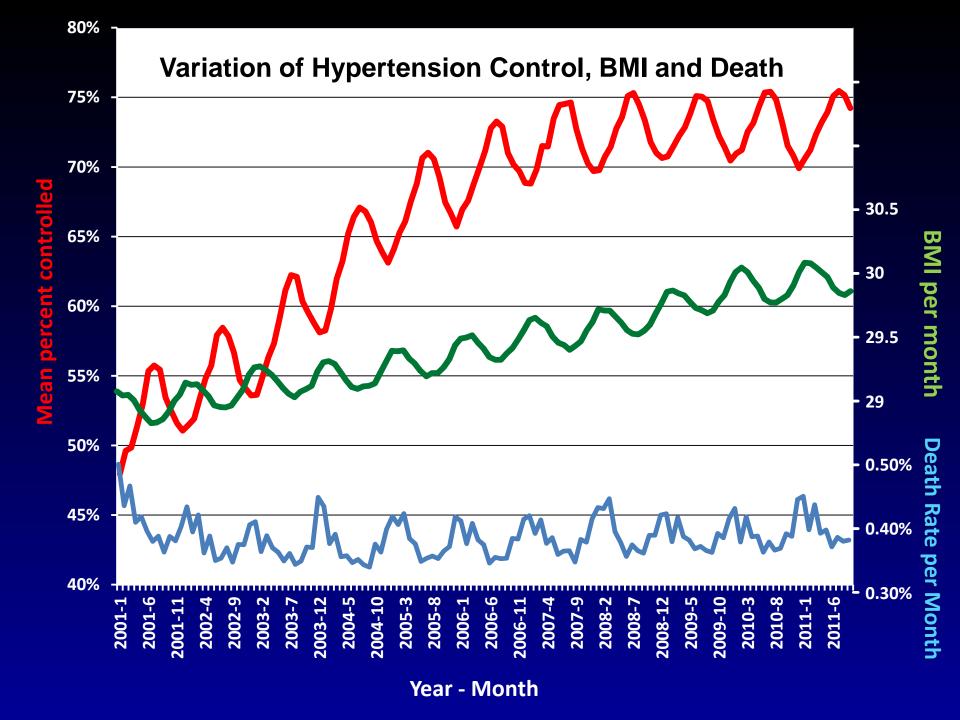
Mean Monthly Days not Covered



Difference in Days not Covered







END