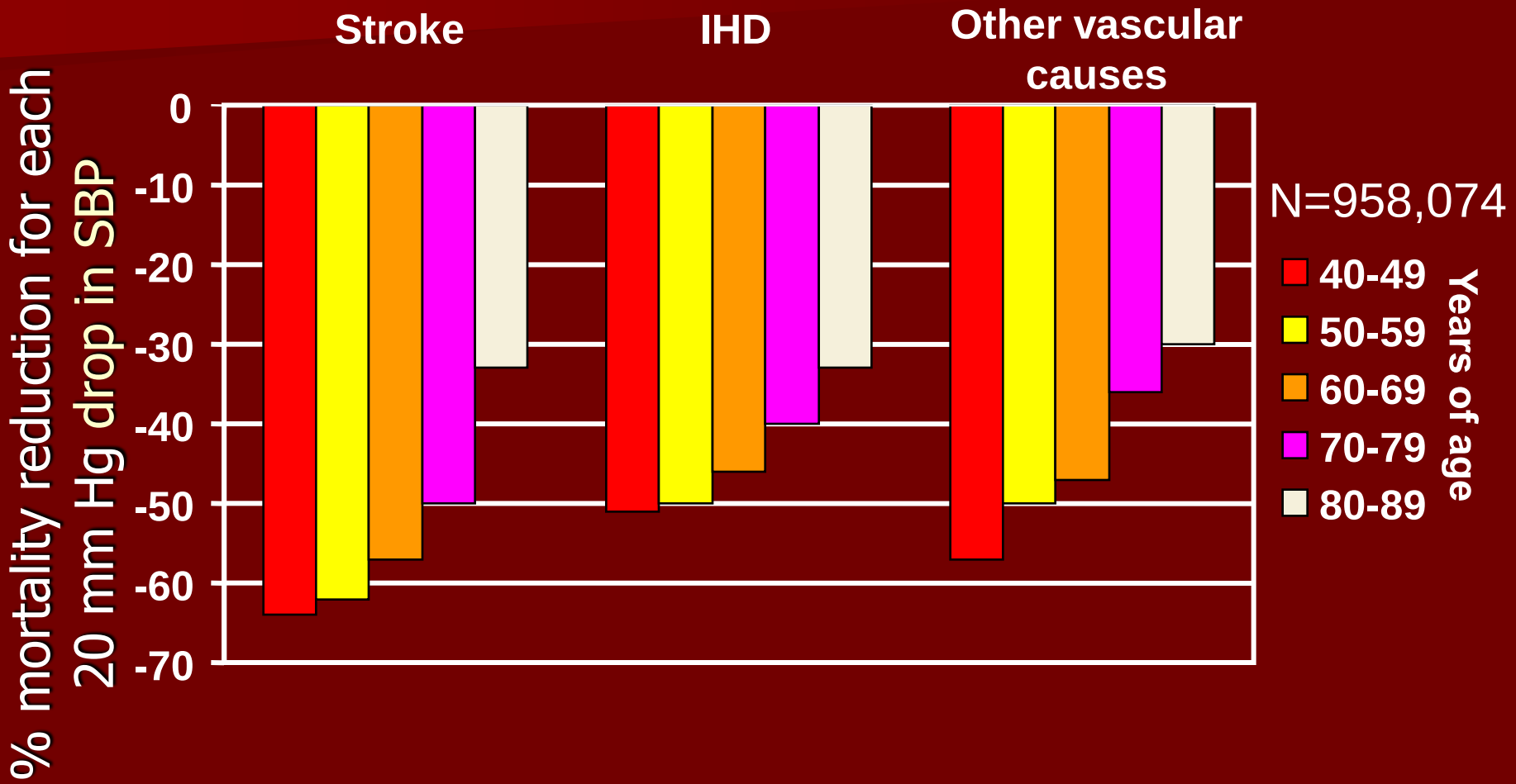
Blood Pressure Control at The Department of Veterans Affairs

Vasilios Papademetriou, MD
Professor of Medicine
Georgetown University
Chief Hypertension Veterans Affairs Medical Center
Washington DC

Blood Pressure Control and CV Outcomes

- In clinical trials small reductions in diastolic BP (5-6 mmHg) resulted in:
  - 42% reduction in stroke
  - 52% reduction in HF
  - 21% reduction in cardiac death
  - 16% reduction in non-fatal MI

Lowering SBP by 20 or DBP by 10 mmHg Reduces Cardiovascular Risk by Half

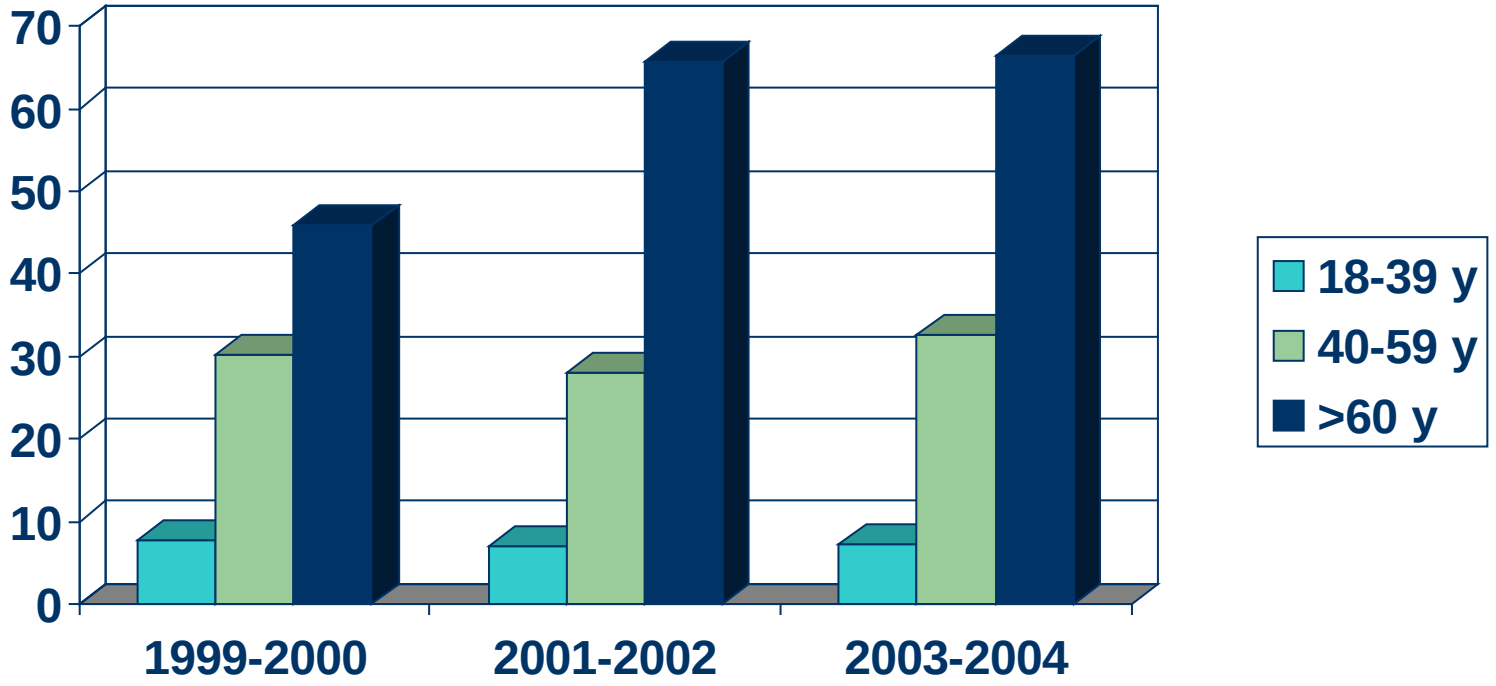


*Data from a meta-analysis of 1 million adults in 61 prospective studies who had no prior vascular disease.
Lewington S et al. *Lancet.* 2002;360:1903-1913.

Benefit of Blood Pressure Control

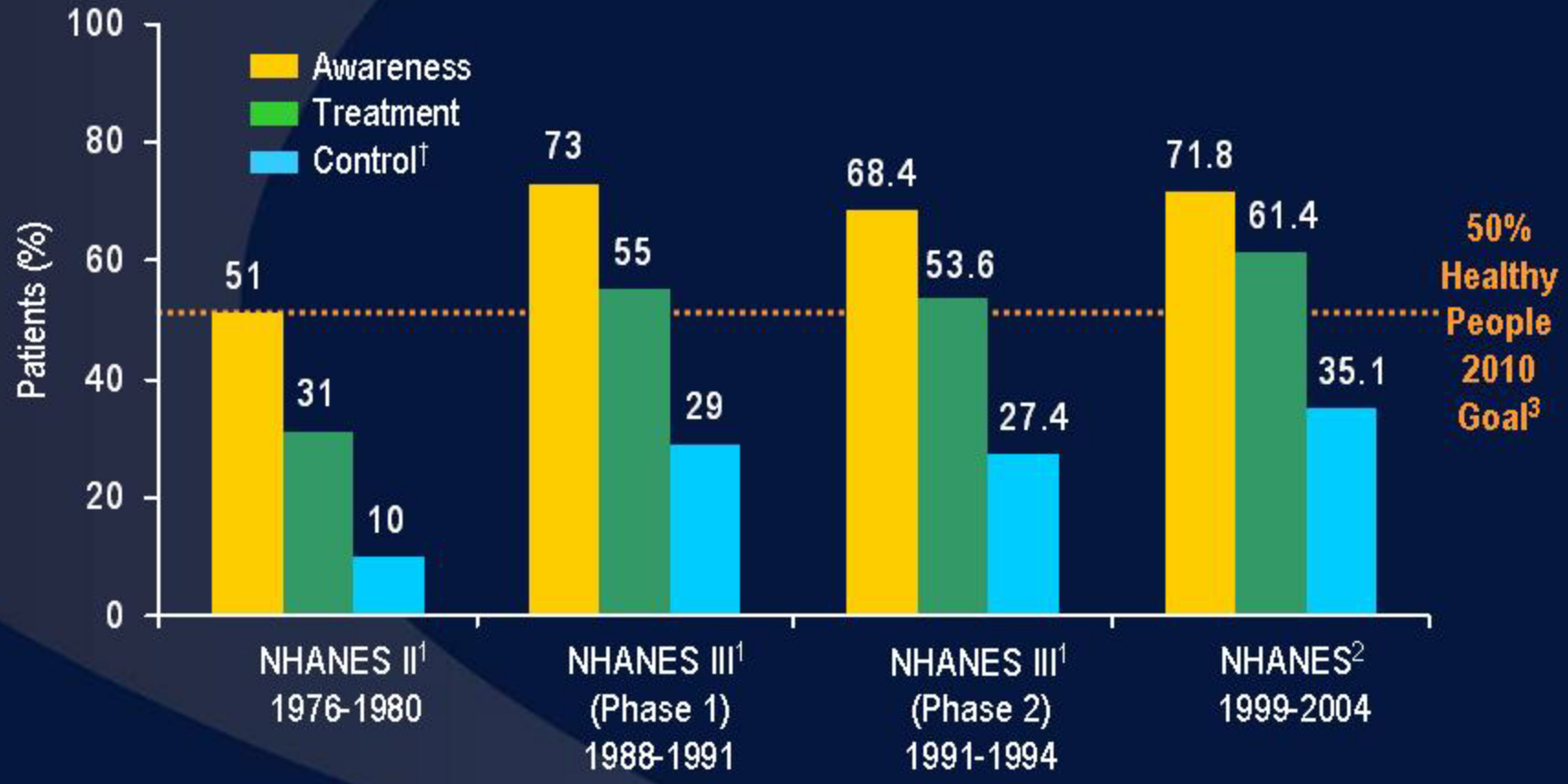
- Most of the benefit is due to blood pressure reduction
- Specific drug effects- may improve outcomes in special populations; DM, HF, nephropathy
- Personalized Medicine pharmacogenetics and pharmacogenomics may sharpen and tailor therapies
- In recent years massive efforts have been put forward by many health care organizations for improvement of BP control

Prevalence of Hypertension in the US



Hypertension 2007;49;69-75

Awareness, Treatment, and Control of High Blood Pressure in Adults*



*Adults aged 18 to 74 years with SBP ≥140 mm Hg or DBP ≥90 mm Hg or who are taking antihypertensive medication.
†SBP <140 mm Hg and DBP <90 mm Hg. NHANES=National Health and Nutrition Examination Survey.

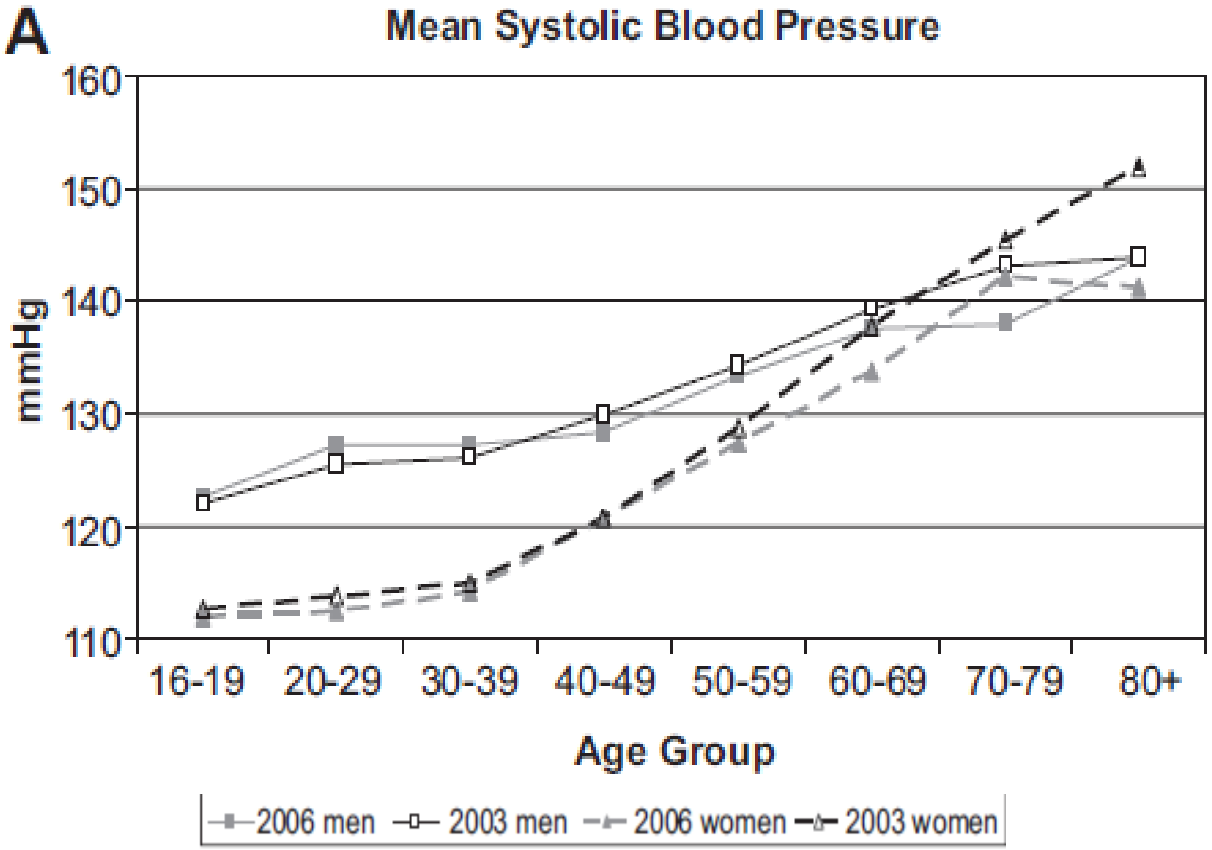
1. Chobanian AV et al. JAMA. 2003;289:2560-2572.
2. Rosamond W et al. *Circulation*. 2007;115:e69-e171.
3. US Department of Health and Human Services. *Health People 2010: Understanding and Improving Health*. 2nd ed. Washington, DC: US Government Priynting Office, November 2000.

Continued Improvement in Hypertension Management in England.

- This study evaluate blood pressure control in England between 2003 and 2006,
- Cross-sectional, nationally representative, random samples of 8834 (in 2003) and 7478 (in 2006). All non institutionalized patients
- Adults of mean age 46 y (in 2003) and 47 y (in 2006).
- Overall mean blood pressure levels in 2006 were
  men: **130.8/74.2** mm Hg
  women **124.0/72.4** mm Hg

(*Hypertension*. 2009;53:480-486.)

Continued Improvement in Hypertension Management in England.



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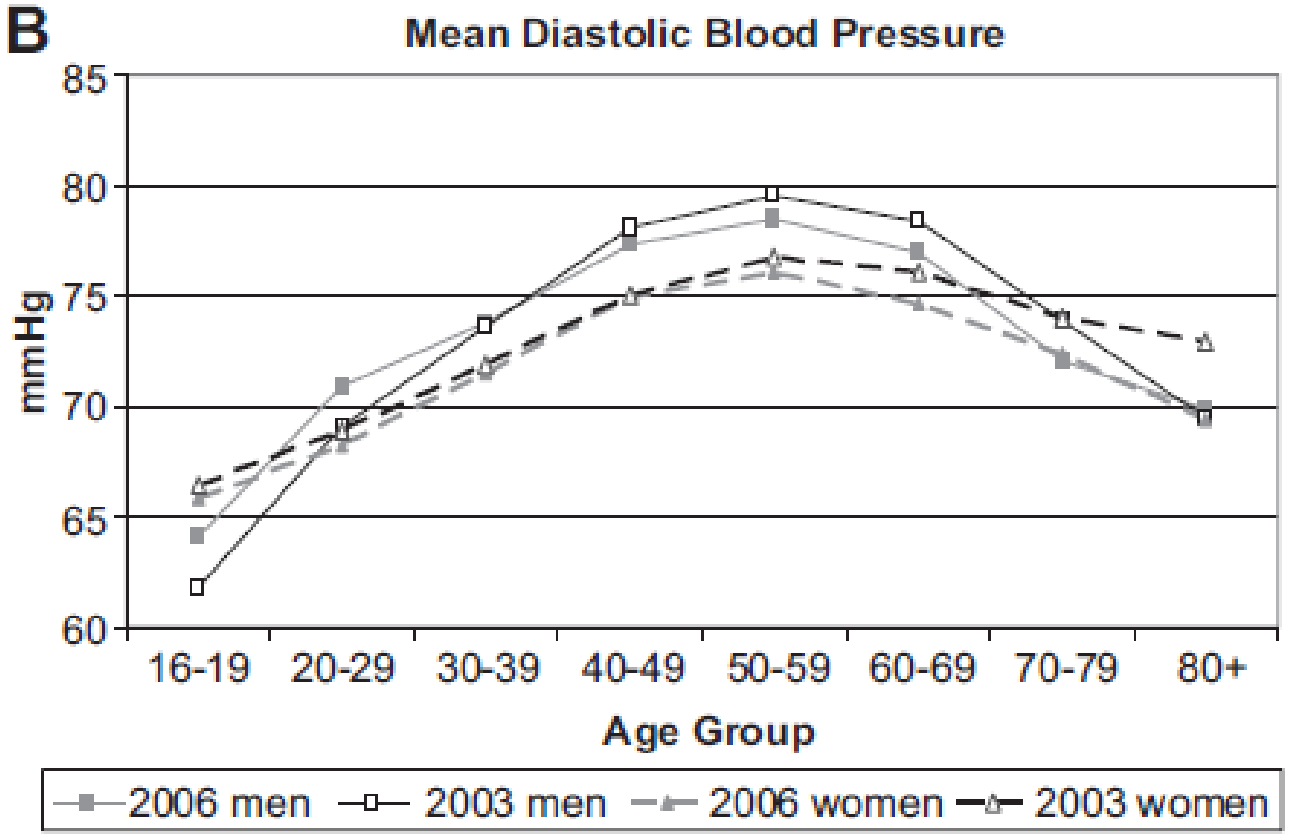
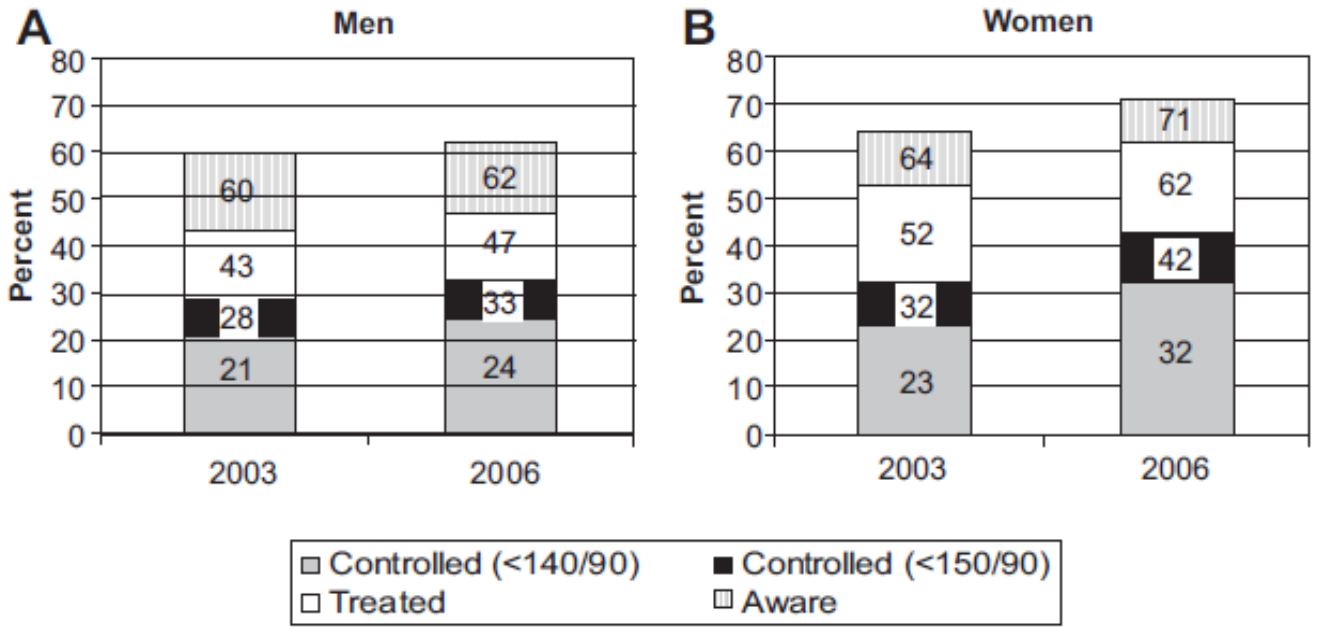


(*Hypertension*. 2009;53:480-486.)

Continued Improvement in Hypertension Management in England



(*Hypertension*. 2009;53:480-486.)

Antihypertensive Prescriptions and Reduction in CV Events in Canada

Hypertension
JOURNAL OF THE AMERICAN HEART ASSOCIATION

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February 2009

Increases in Antihypertensive Prescriptions and Reductions in Cardiovascular Events in Canada

Norm R.C. Campbell, Rollin Brant, Helen Johansen, Robin L. Walker, Andreas Wielgosz, Jay Onysko, Ru-Nie Gao, Christie Sambell, Stephen Phillips, Finlay A. McAlister and for the Canadian Hypertension Education Program Outcomes Research Task Force

Hypertension 2009;53;128-134; originally published online Dec 29, 2008;
DOI: 10.1161/HYPERTENSIONAHA.108.119784
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Antihypertensive Prescriptions and Reduction in CV Events in Canada

- The Canadian Hypertension Education Program - CHEP- was started in 1999
- Between 1998 and 2003 a total of 280 million prescriptions were written in Ontario alone
- All prescriptions increased by 58% annually
- Time series analysis confirmed an increase in annual rates of prescriptions for diuretics, beta blockers and calcium channel blockers
- The impact of this practice was assessed in the present study

30-Day Prescriptions per person-year in Canada from 1996 to 2003

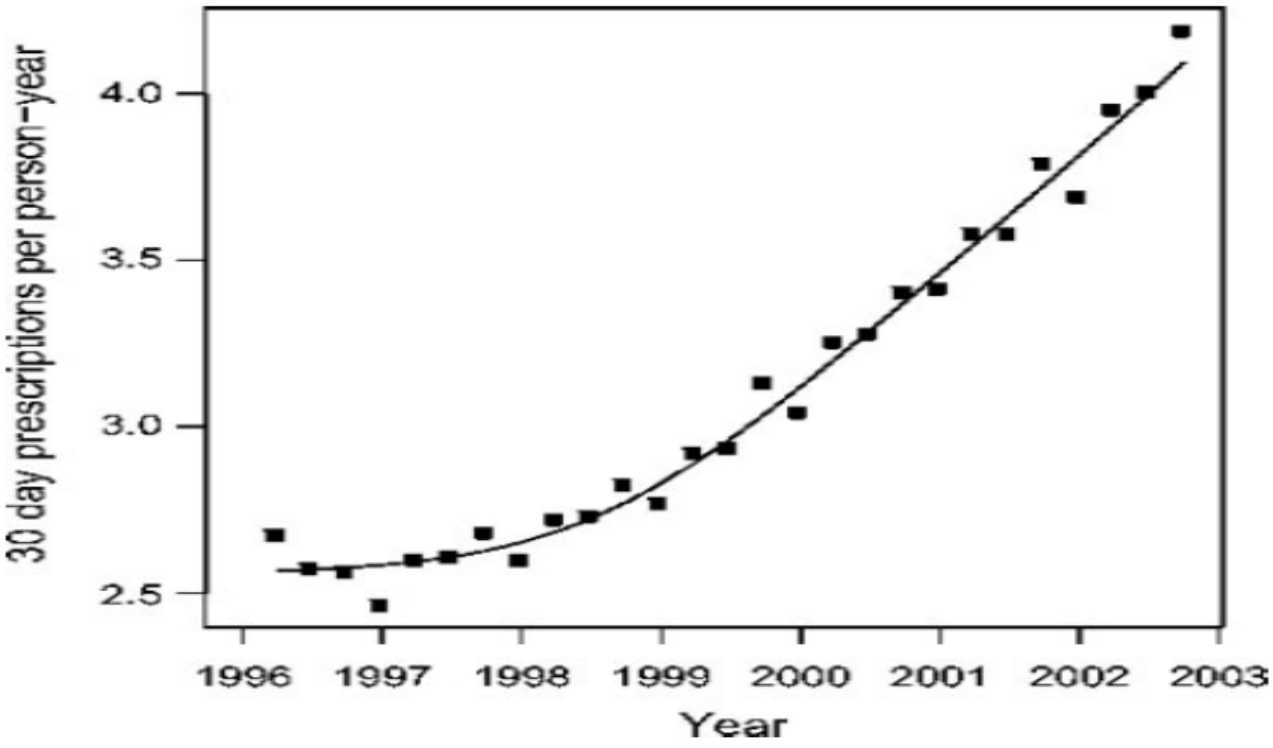


Figure 1. Total antihypertensive prescription sales (IMS Health-Canada) in Canada from 1996 to 2003. The prescription rates for 30-day prescriptions per person-year. The line is a nonpara-

Mortality Rates from Stroke, HF and Acute MI in Canada from 1992 to 2004

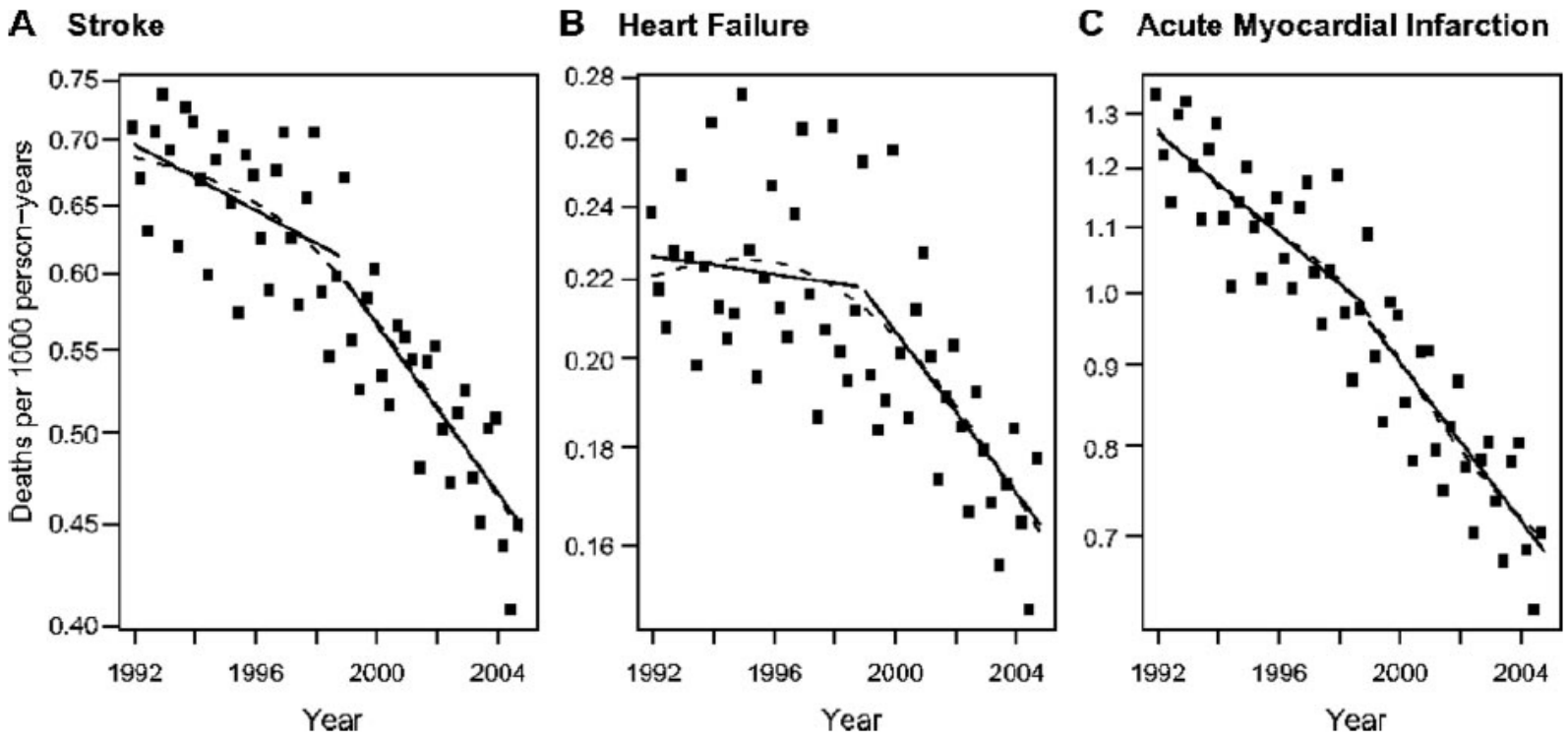


Figure 2. Mortality rates from stroke (A), HF (B), and AMI (C) in Canada from 1992 to 2003. The squares are quarterly rates adjusted for age and gender per 1000 population. The dark line is linear modeling for 1992–1998 and 1999–2003, and the dotted line is a nonparametrically modeled line.

(*Hypertension*. 2009;53:128-134.)

Hospitalization Rates from Stroke, HF and Acute MI in Canada from 1992 to 2004

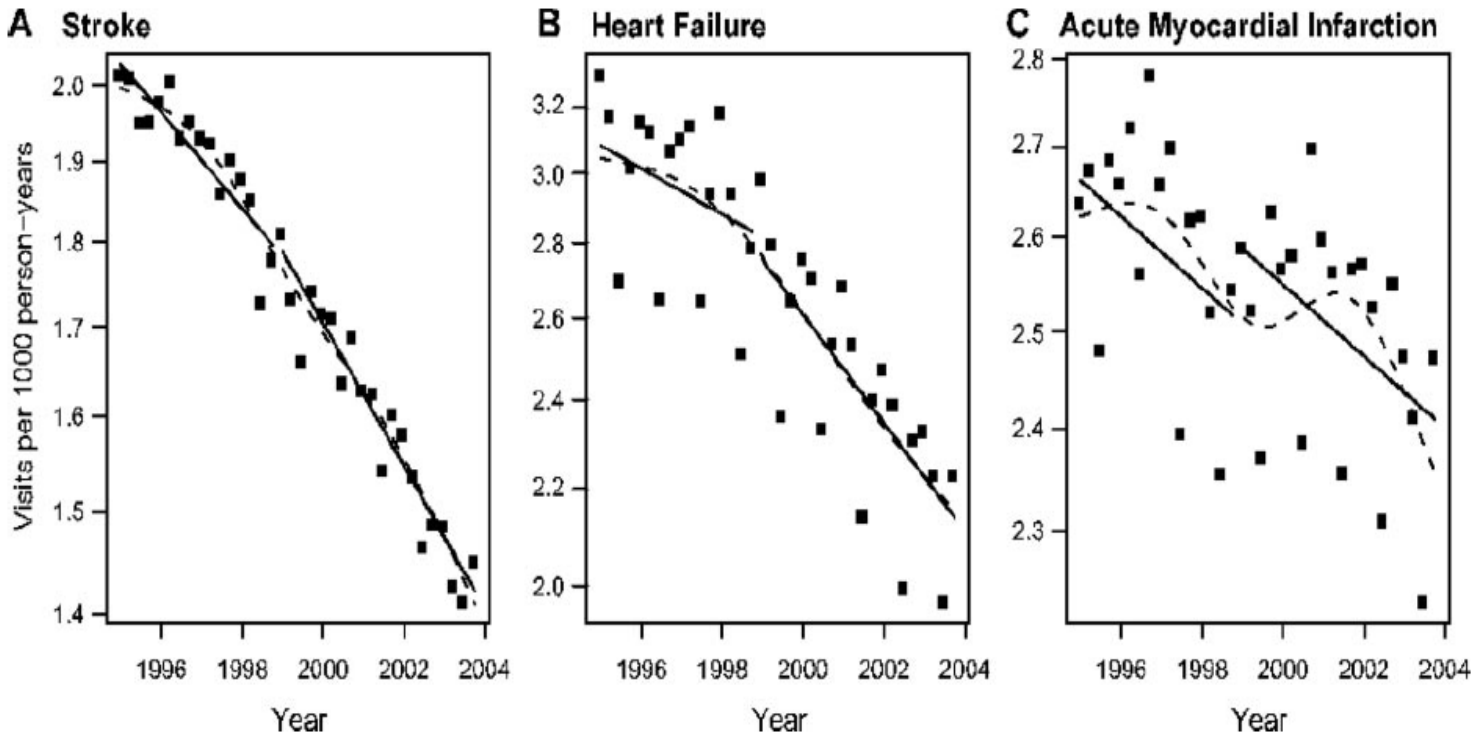


Figure 4. Hospitalization rates from stroke (A), HF (B), and AMI (C) in Canada from 1996 to 2003. The squares are quarterly rates adjusted for age and gender per 1000 population. The dark line is linear modeling for 1996–1998 and 1999–2003, and the dotted line is a nonparametrically modeled line.

Treatment and Control of Hypertension at the Department of Veterans Affairs

- Washington DC
- 15 Cities
- National data

Transformation of the Department of Veterans Affairs

- How the system was transformed from a mediocre health care facility to a First rate institution

What is the Department of Veterans Affairs

- 173 hospitals
- ~ 7.7 million patients,
- 1,400 Sites-of-Care,
- >$31 Billion budget
- 198,500 Employees (~14,500 MD , 59,000 Nurses, 33,000 AHP)
- Affiliations with 107 Academic Health Systems
- ~ 150,000 volunteers
- ~ $1.7B Research: Rehab, Health Services, Clinical, Basic

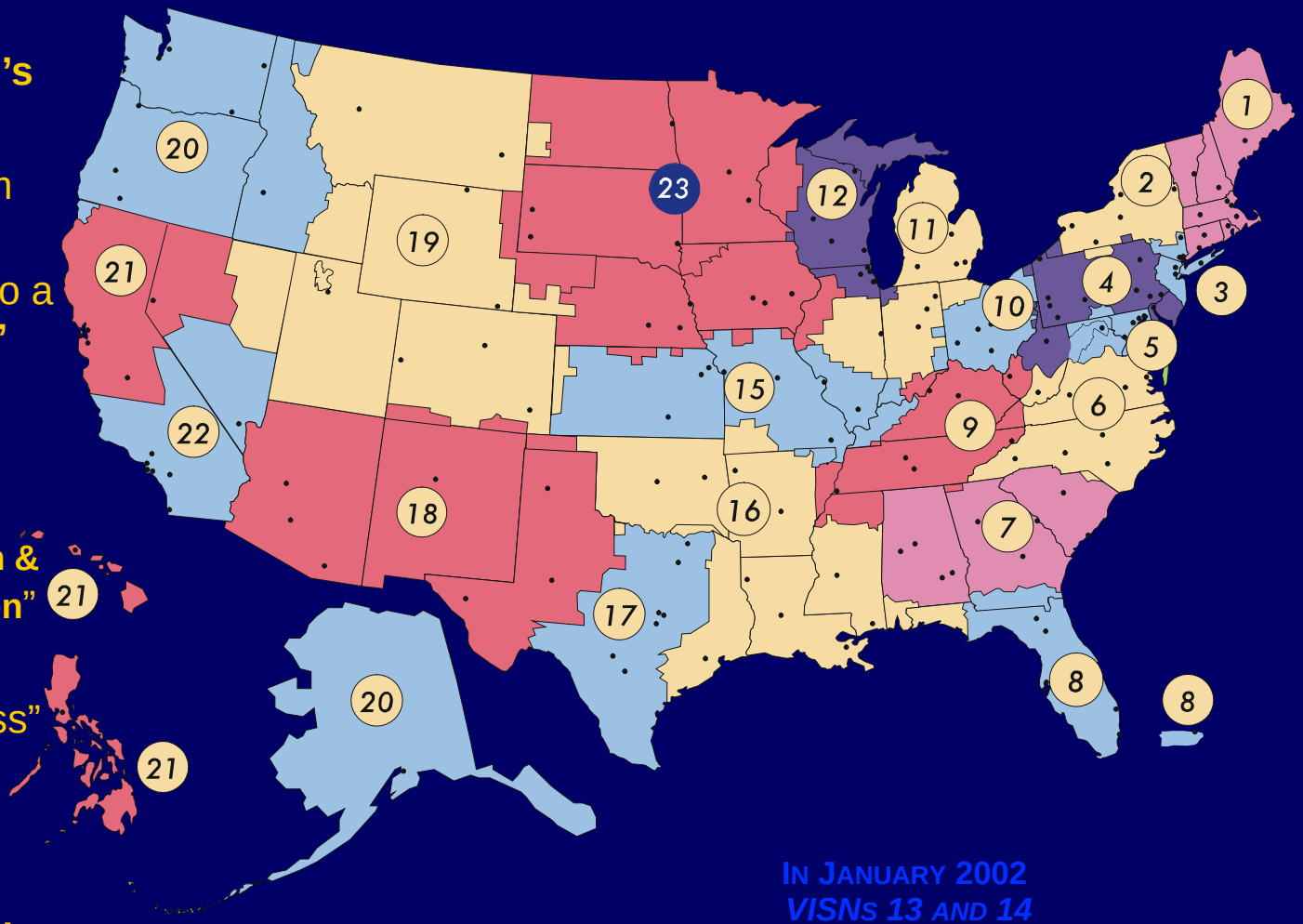
VA – 1995

- Paper Chart (available 60%)
- Hospitals Operated “Independently”
- No Performance Measures
- No Electronic Records
- VISNs introduced
- Reconstruction initiated

21 Veterans Integrated Service Networks

VISNs are the Funding & Accountability Unit in VA

- **1995: Creating VISN's**
- Objective to transform from :
  - **VA "Hospitals"** to a **"Health System"**
- From
  - **"Safety Net"** to **"Health Promotion & Disease Prevention"**
- Creating "System-ness"
  - **VISN Funding**
  - **Performance Measures**
  - **Electronic Health Records**



IN JANUARY 2002 *VISNS 13 AND 14* WERE INTEGRATED AND RENAMED *VISN 23*

Main Objective 1995 -2005

- Improvement in Patient care
- Decrease in cost
- Improvement in outcomes

Goals: 2005 – 2015

To Establish:

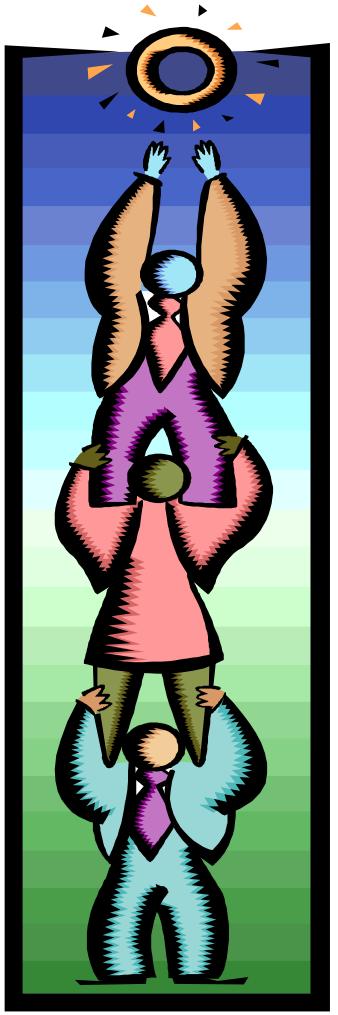
Safe,
Effective,
Efficient and
Compassionate Health Care

Using Performance Measurement to Create an Organizational Culture of Quality

Lynnette Nilan, RN MN EdD(c)
Director, Performance Management
Office of Quality and Performance
Veterans Health Administration

Goals of Performance Measurement

- **Decrease variation in practices**
- **Achieve consistent outcomes**
- **IMPROVE quality and efficacy of care delivery**
- **Assure continuous Improvement**



1. QUALITY: RAND Study - Asch, McGlynn *et al*

Annals of Internal Medicine 2004;141:938-945

"VHA scored significantly higher… on 294 quality metrics"

Table 4. **Adjusted Adherence to Indicators by Category***

Indicator Category	VHA Sample				National Sample				Difference (95% CI), *percentage points*
	Indicators, *n*†	Patients, *n*	Eligible Events, *n*‡	Mean Score, %	Indicators, *n*†	Patients, *n*	Eligible Events, *n*‡	Mean Score, %	
Overall	294	596	11 449	67	330	992	18 961	51	16 (14 to 18)
Chronic care	202	561	5924	72	222	824	7396	59	13 (10 to 17)
COPD	17	103	465	69	19	62	668	59	10 (−2 to 23)
Coronary artery disease	31	93	557	73	37	179	1117	70	3 (−3 to 16)
Depression	14	96	266	80	14	131	497	62	18 (11 to 26)
Diabetes	13	232	1309	70	13	186	1683	57	13 (8 to 18)
Hyperlipidemia	7	169	256	64	7	204	346	53	11 (1 to 21)
Hypertension	24	405	1147	78	24	468	1681	65	13 (8 to 20)
Osteoarthritis	3	173	216	65	3	154	236	57	8 (−1 to 18)
Preventive care	27	596	4721	64	32	991	9169	44	20 (12 to 28)
Acute care	60	153	804	53	76	334	2396	55	−2 (−9 to 4)
Screening	15	597	2254	68	16	991	5598	46	22 (20 to 26)
Diagnosis	145	594	3762	73	139	992	6502	61	12 (8 to 16)
Treatment	103	596	3155	56	126	992	4845	41	15 (12 to 18)
Follow-up	37	477	2016	72	43	524	2278	58	14 (10 to 18)
VHA performance measures	26	596	3976	67	26	992	6699	43	24 (21 to 26)
VHA performance conditions	144	596	5875	70	152	992	8590	58	12 (10 to 15)
Non-VHA performance conditions	124	394	1598	55	152	579	3672	50	5 (0 to 10)

* Adjusted for age, number of chronic conditions, number of acute conditions, and number of outpatient visits. COPD = chronic obstructive pulmonary disease; VHA = Veterans Health Administration.
† Number of unique indicators in category with at least 1 eligible patient.
‡ The number of eligible events is the number of times indicators in the category were triggered.

Annals of Internal Medicine
Established in 1927 by the American College of Physicians

"*. . . Overall, VHA patients receive better care than patients in other settings*"

IMPROVING PATIENT CARE

Improving Patient Care is a special section within *Annals* supported in part by the U.S. Department of Health and Human Services (HH
Agency for Healthcare Research and Quality (AHRQ). The opinions expressed in this article are those of the authors and do not repres
the position or endorsement of AHRQ or HHS.

Comparison of Quality of Care for Patients in the Veterans Health Administration and Patients in a National Sample

Steven M. Asch, MD, MPH; Elizabeth A. McGlynn, PhD; Mary M. Hogan, PhD; Rodney A. Hayward, MD; Paul Shekelle, MD, MPH; Lisa Rubenstein, MD; Joan Keesey, BA; John Adams, PhD; and Eve A. Kerr, MD, MPH

21 December 2004 | Volume 141 Issue 12 | Pages 938-945

Background: The Veterans Health Administration (VHA) has introduced an integrated electronic medical record, performance measurement, and other system changes directed at improving care. Recent comparisons with other delivery systems have been limited to a small set of indicators.

Objective: To compare the quality of VHA care with that of care in a national sample by using a comprehensive quality-of-care measure.

Design: Cross-sectional comparison.

Setting: 12 VHA health care systems and 12 communities.

Patients: 596 VHA patients and 992 patients identified through random-digit dialing. All were men

Measurements: Between 1997 and 2000, quality was measured by using a chart-based quality i
were adjusted for clustering, age, number of visits, and medical conditions.

Results: Patients from the VHA scored significantly higher for adjusted overall quality (67% vs. 51
chronic disease care (72% vs. 59%; difference, 13 percentage points [CI, 10 to 17 percentage poi
[CI, 12 to 28 percentage points]), but not for acute care. The VHA advantage was most prominent

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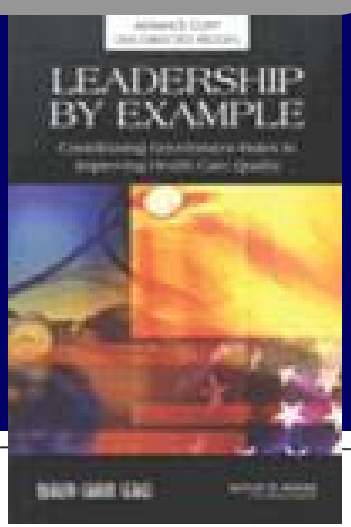


EDITORIAL

Creating a Culture of Quality: The Remarkable Transformation of the Department of Veterans Affairs Health Care System

For decades, fairly or unfairly, the Department of Veterans Affairs (VA) health care system had a suboptimal image in the quality of care it provided and in the evaluation of that care. About 10 years ago, the VA leadership

come, diabetes severity, and other comorbid conditions) uniformly across systems and used these measures to adjust for differences other than sex between the VA and com-

The Veterans Health Administration
Quality, Value, Accountability, and Inform
Transforming Strategies for Patient-Center

Jonathan B. Perlin, MD, PhD, MSHA; Robert M. Kolodne
and Robert H. Roswell, MD

IMPROVING PATIENT CARE

Diabetes Care Quality in the Veterans Affairs Health Care System and Commercial Managed Care: The TRIAD Study

Eve A. Kerr, MD, MPH; Robert B. Gerzoff, MS; Sarah L. Krein, PhD, RN; Joseph V. Selby, MD, MPH; John D. Piette, PhD; J. David Curb, MD, MPH; William H. Herman, MD, MPH; David G. Marrero, PhD; K.M. Venkat Narayan, MD, MSc, MBA; Monika M. Safford, MD; Theodore Thompson, MS; and Carol M. Mangione, MD, MSPH

Background: **No studies have compared care in the Department of Veterans Affairs (VA) with that delivered in commercial managed care organizations, nor have studies focused in depth on care comparisons for chronic, outpatient conditions.**

Results: **Patients in the VA system had better scores than patients in commercial managed care on all process measures (for example, 93% vs. 83% for annual hemoglobin A_{1c}; $P = 0.006$; 91% vs. 75% for annual eve examination: $P < 0.001$). Blood**

VA's Performance Compared to Non VA

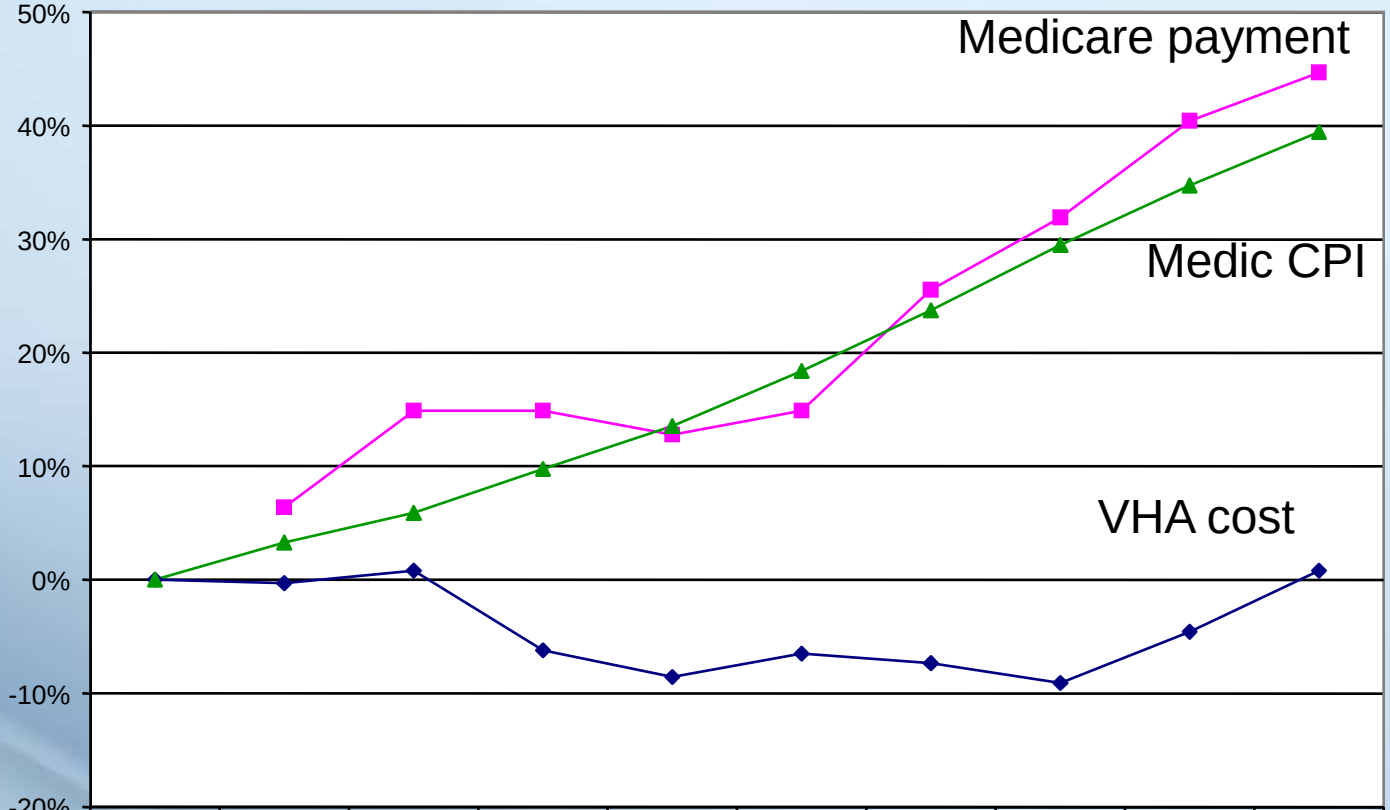
From Closing the Gap . . .
To Leading the Pack

CLINICAL PERFORMANCE INDICATOR	VA FY 2004 Qtr4 [1]	HEDIS [2] Commercial 2003	HEDIS [2] Medicare 2003	HEDIS [2] Medicaid 2003
Breast cancer screening	84%	75%	74%	56%
Cervical cancer screening	90%	82%	Not Reported	64%
Colorectal cancer screening	74%	47%	50%	Not Reported
LDL Cholesterol < 100 after AMI, PTCA, CABG	Not Reported [3]	48%	50%	27%
LDL Cholesterol < 130 after AMI, PTCA, CABG	Not Reported [3]	65%	67%	39%
Beta blocker on discharge after AMI	98%	94%	93%	84%
Diabetes: HgbA1c done past year	95%	85%	88%	75%
Diabetes: Poor control HbA1c > 9.0% (lower is better)	16%	32%	24%	49%
Diabetes: Cholesterol (LDL-C) Screening	96%	88%	91%	76%
Diabetes: Cholesterol (LDL-C) controlled (<100)	55%	35%	42%	28%
Diabetes: Cholesterol (LDL-C) controlled (<130)	80%	60%	68%	48%
Diabetes: Eye Exam	76%	49%	65%	45%
Diabetes: Renal Exam	69%	48%	54%	44%
Hypertension: BP <= 140/90 most recent visit	76%	62%	61%	59%
Follow-up after Hospitalization for Mental Illness (30 days)	77% [4]	74%	60%	56%

CLINICAL PERFORMANCE INDICATOR	VA FY 2004	HEDIS [2] Commercial 2003	HEDIS [2] Medicare 2003	BRFSS [5] 2003
Immunizations: influenza, (note patients age groups) [6]	81% (65 and older)	48% (50-64)	75% (65 and older)	70% (65 and older)
Immunizations: pneumococcal, patients 65 and older [6]	92%	Not Reported	Not Reported	65%

Cost Effectiveness:
Ten Year Cumulative Percentage Change in Cost

- **VHA Cost per Patient–Total Medical Care Obligations (including MAMOE) per Total Unique Patients (including non Veterans)**
- **Average Medicare Payment per Enrollee—Medicare Program Benefits per Enrollee (www.cms.hhs.gov/researchers/pubs/datacompendium)**
- **Medical Consumer Price Index-- Bureau of Labor Statistics (household "out of pocket" medical expenses including insurance and co-payments)**



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
VHA Cost Per Patient	-	-0.3%	0.8%	-6.2%	-8.6%	-6.5%	-7.3%	-9.1%	-4.6%	0.8%
Avg. Medicare Payment/Enrollee		6.4%	14.9%	14.9%	12.8%	14.9%	25.5%	31.9%	40.4%	44.7%
Medical CPI	-	3.3%	5.9%	9.8%	13.5%	18.4%	23.7%	29.5%	34.7%	39.4%

VistA Use Through 3/06

- Documents **(Progress Notes, Discharge Summaries, Reports)**
  - **796,000,000**…….. *+586,000* each workday
- Orders
  - **1.55 Billion**……. ... *+916,000* each workday
- Images
  - **454,000,000**…… *+633,000* each workday
- Vital Sign Measurements
  - **977,000,000**…… *+672,000* each workday
    - 1 Billion – Friday, April 14, 2006
- Medications Administered
  with the Bar Code Medication Administration (BCMA) system
  - **776,000,000**…… *+599,000* each workday

VA's Electronic Health Record

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INSIDE POLITICS

Bush calls for electronic medical records

President: 'We're kind of still in the buggy era'

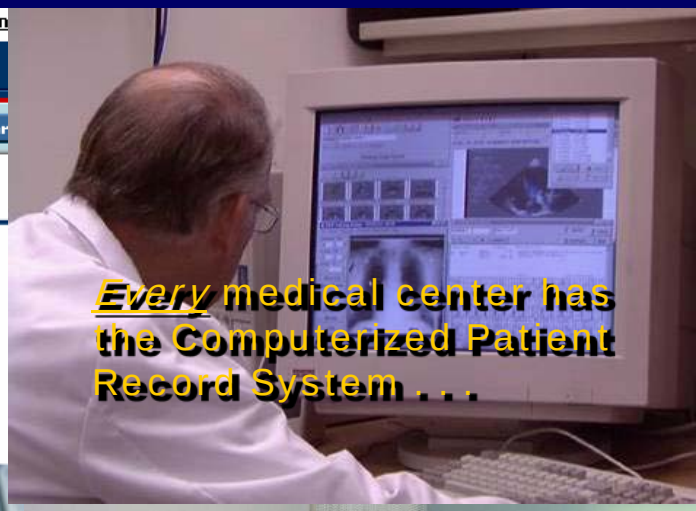
Wednesday, April 28, 2004 Posted: 9:15 AM EDT (1315 GMT)

BALTIMORE, Maryland (AP) -- When it comes to patients' health records, the United States hasn't left the "buggy era," President Bush said Tuesday at a veterans hospital.

"On the research side, we're the best," Bush told about 120 guests, including veterans, health care professionals, doctors from Johns Hopkins Hospital and the staff from the Veterans Affairs Medical Center in Baltimore. "We're coming up with more innovative ways to save lives. ... On the providers' side, we're kind of still in the buggy era."

The president has set a goal of assuring that most Americans have electronic health records within the next

President Bush makes remarks at th Baltimore Veterans Affairs Medical Center on Tuesday.



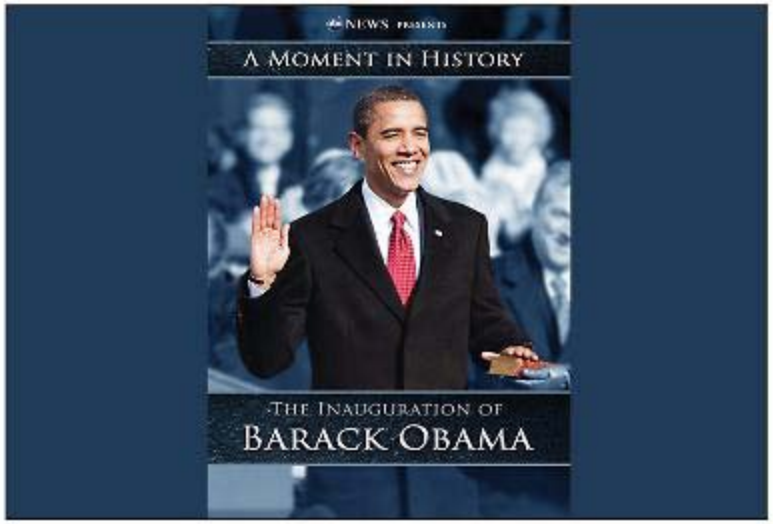
Every **medical center has the Computerized Patient Record System . . .**

Bar-Coded Medication Administration

- **5.85 Sigma Performance**
- **Helped hold per prescription costs virtually constant for 5 years (~2½% / year)**

Obama's big idea: Digital health records for the Nation

- **President Obama Urges Electronic Medical Records for everyone in 5 Years**



Washington DC Veterans Affairs Medical Center

- 171 Bed Tertiary Care Center
- 120 Bed Comprehensive Nursing and Rehabilitation Center (CNRC)
- 4 Community Based Outpatient Clinics
  - Approved for additional CBOC at Andrews AFB
- **74,855 Enrolled Veterans**
- Affiliation with 3 Medical Schools
- 126 Residents / Over 400 Trainees
- Research
  - 16 Funded Projects
  - $27 Million

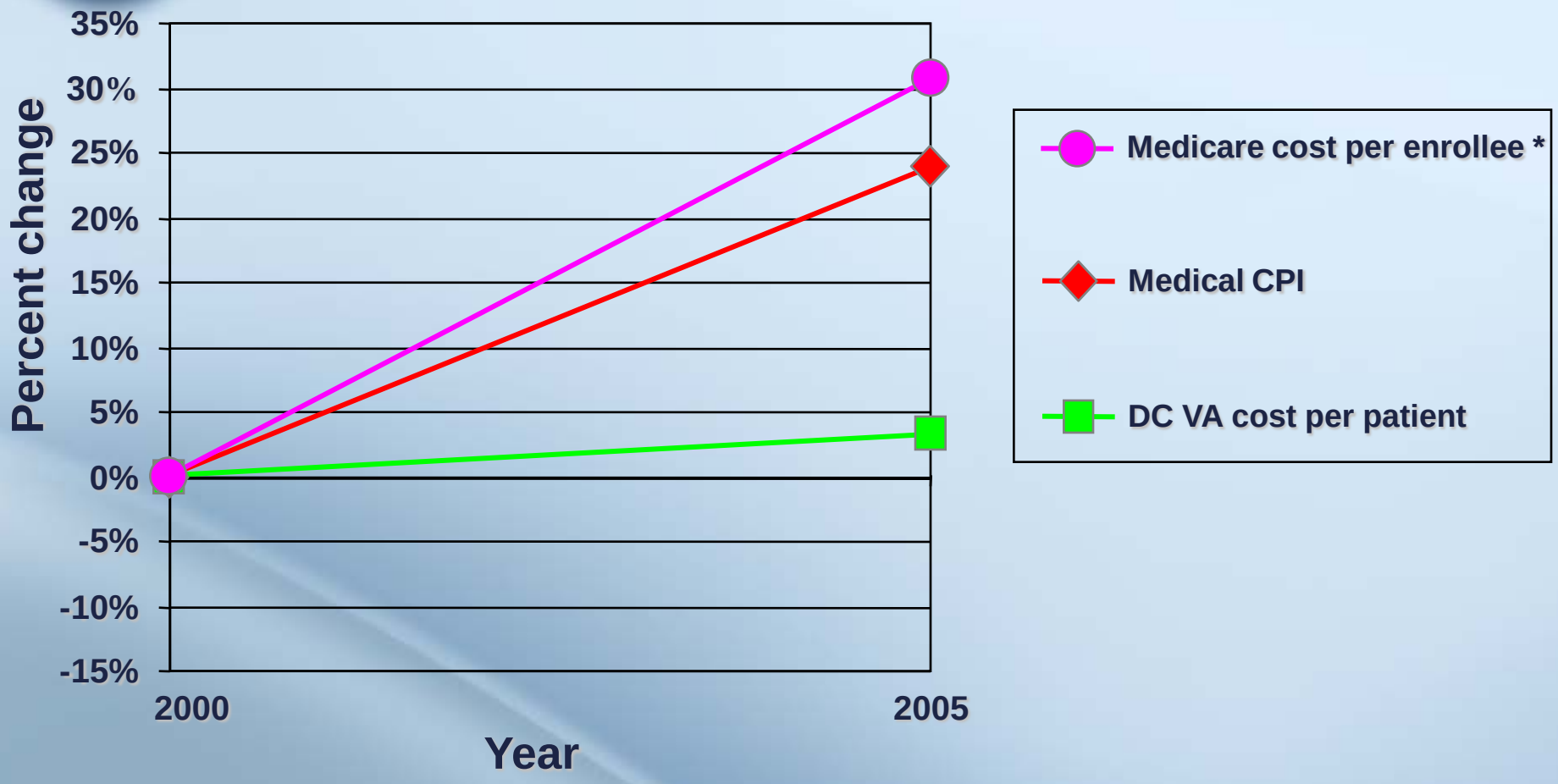
Workload : DC VAMC

	FY2000	FY2005	FY2007 *	%Diff **
Inpatients Treated	**6,349**	**5,071**	**3,292**	**-48%**
Bed Days of Care	**46,429**	**35,185**	**31,864**	**-31%**
Patients Treated	**34,897**	**49,042**	**60,500**	**+73%**
Outpatient Visits	**345,096**	**518,565**	**526,366**	**+53%**

* Projected through the end of FY2007
** % change from FY2000 to FY2007

Change in DC VAMC Costs

2000 – 2005



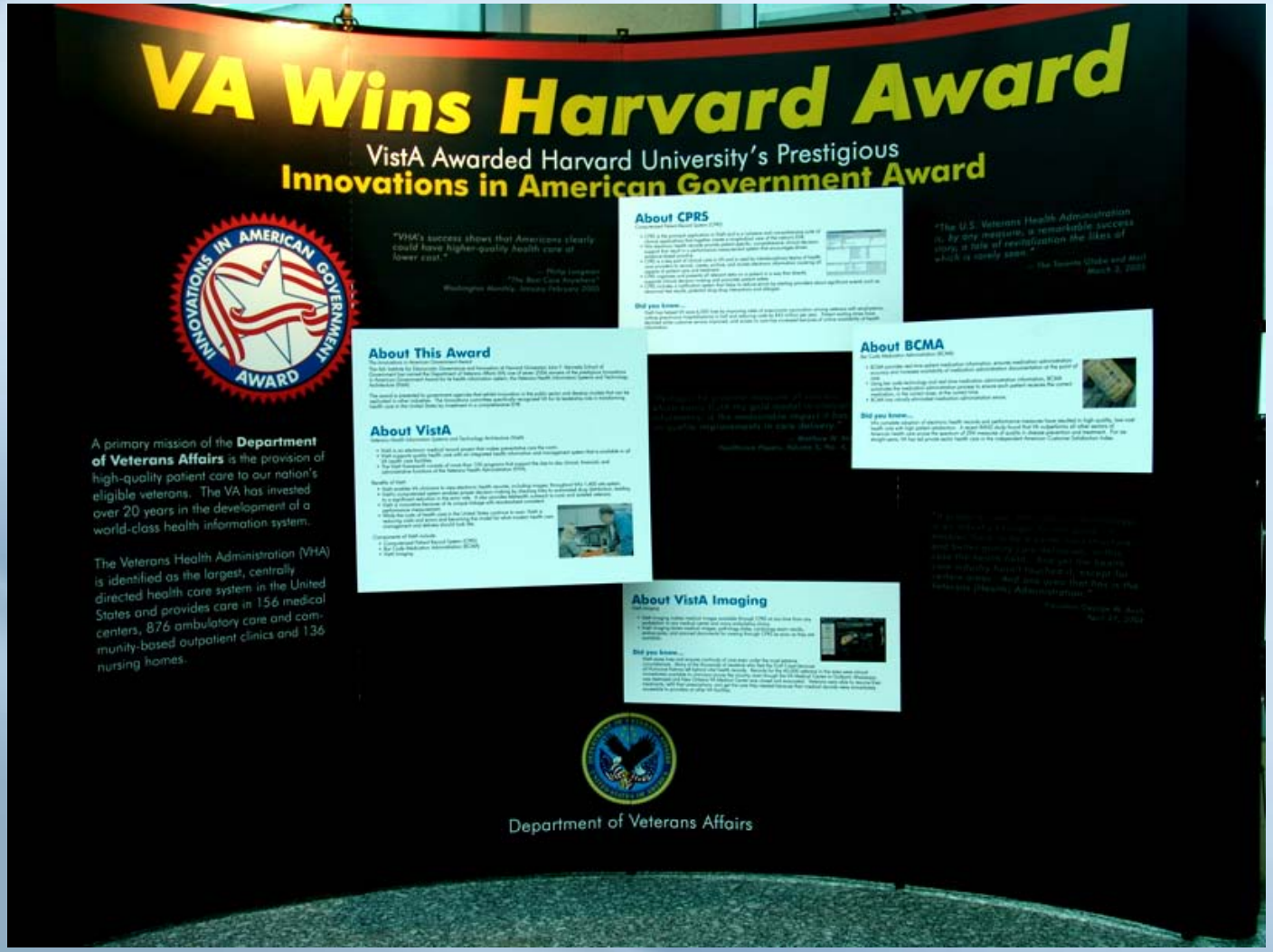
* 2005 values for Medicare were not available, 2004 value used in chart.

How Do We Compare to non-VA Providers?

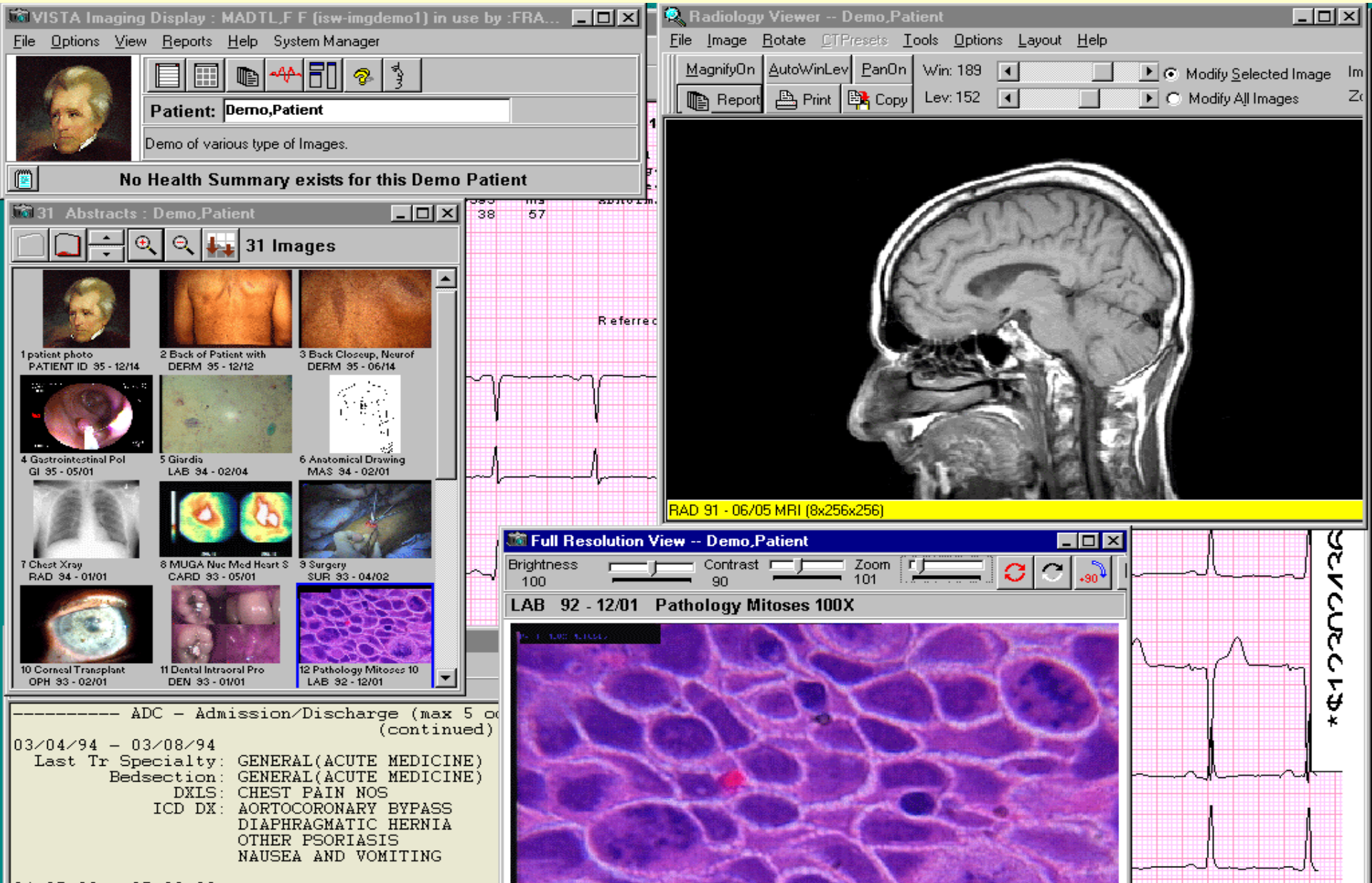
CLINICAL PERFORMANCE INDICATOR	VA FY 05	HEDIS (2) Commercial 2004	HEDIS (2) Medicare 2004	HEDIS (2) Medicaid 2004
Diabetes: HgbA1c done past year	**96%**	87%	89%	76%
Diabetes: Poor control HbA1c > 9.0% (lower is better)	**17%**	31%	23%	49%
Diabetes: Cholesterol (LDL-C) Screening	**95%**	91%	94%	80%
Diabetes: Cholesterol (LDL-C) controlled (<100)	**60%**	40%	48%	31%
Diabetes: Cholesterol (LDL-C) controlled (<130)	**82%**	65%	71%	51%
Diabetes: Eye Exam	**79%**	51%	67%	45%
Diabetes: Renal Exam	**66%**	52%	59%	47%
CLINICAL PERFORMANCE INDICATOR	**VA FY 2005**	**HEDIS Commercial 2004**	**HEDIS Medicare 2004**	**BRFSS 2004***
Immunizations: influenza, (note patients age groups)	**75% (65 and older or high risk)**	39% (50-64)	**75% (65 and older)**	68% (65 and older)
Immunizations: pneumococcal, (note patients age groups)	**89% (all ages at risk)**	Not Reported	Not Reported	65% (65 and older)

*CDC- Behavioral Risk Factor Surveillance System

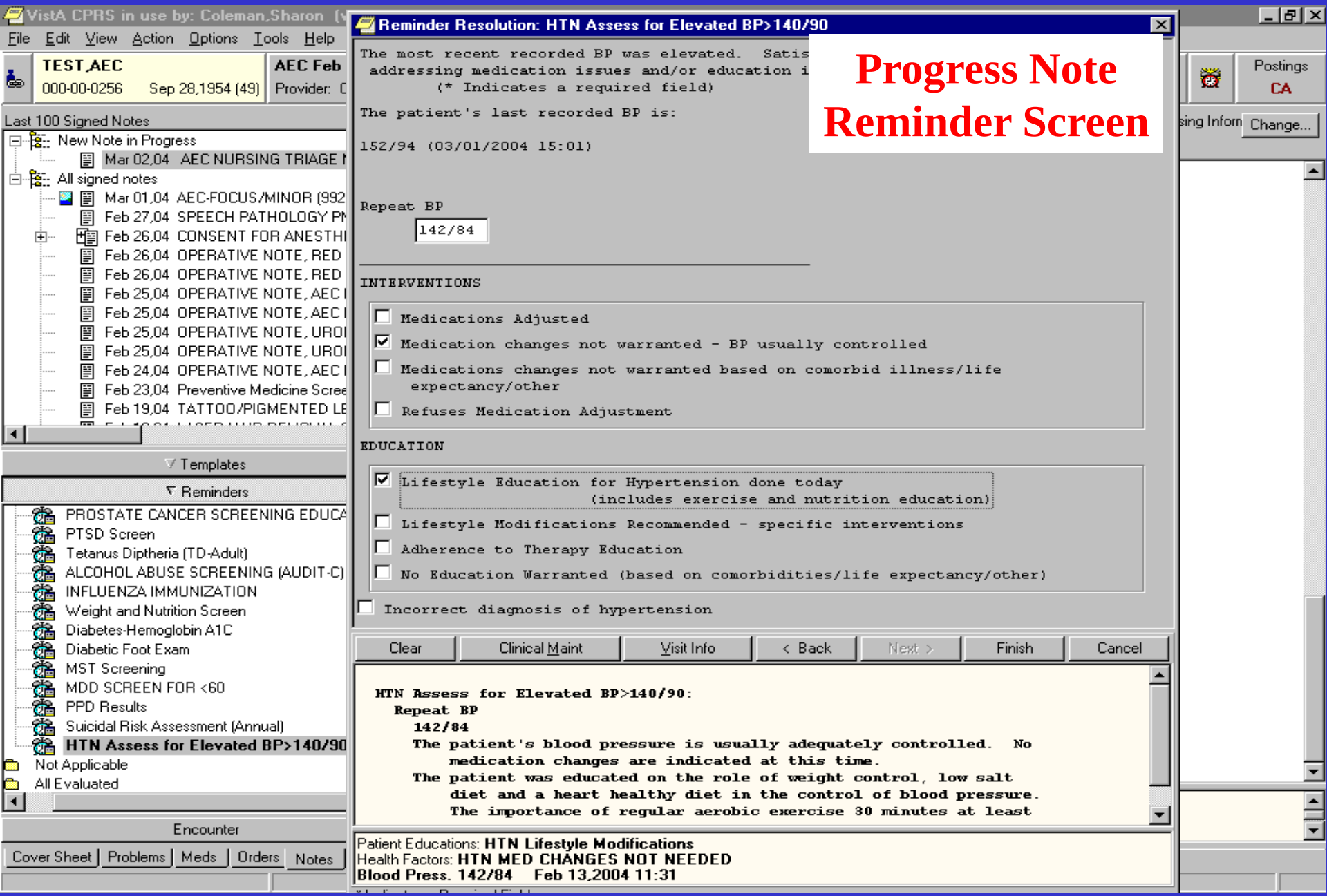
Harvard Award Recipient



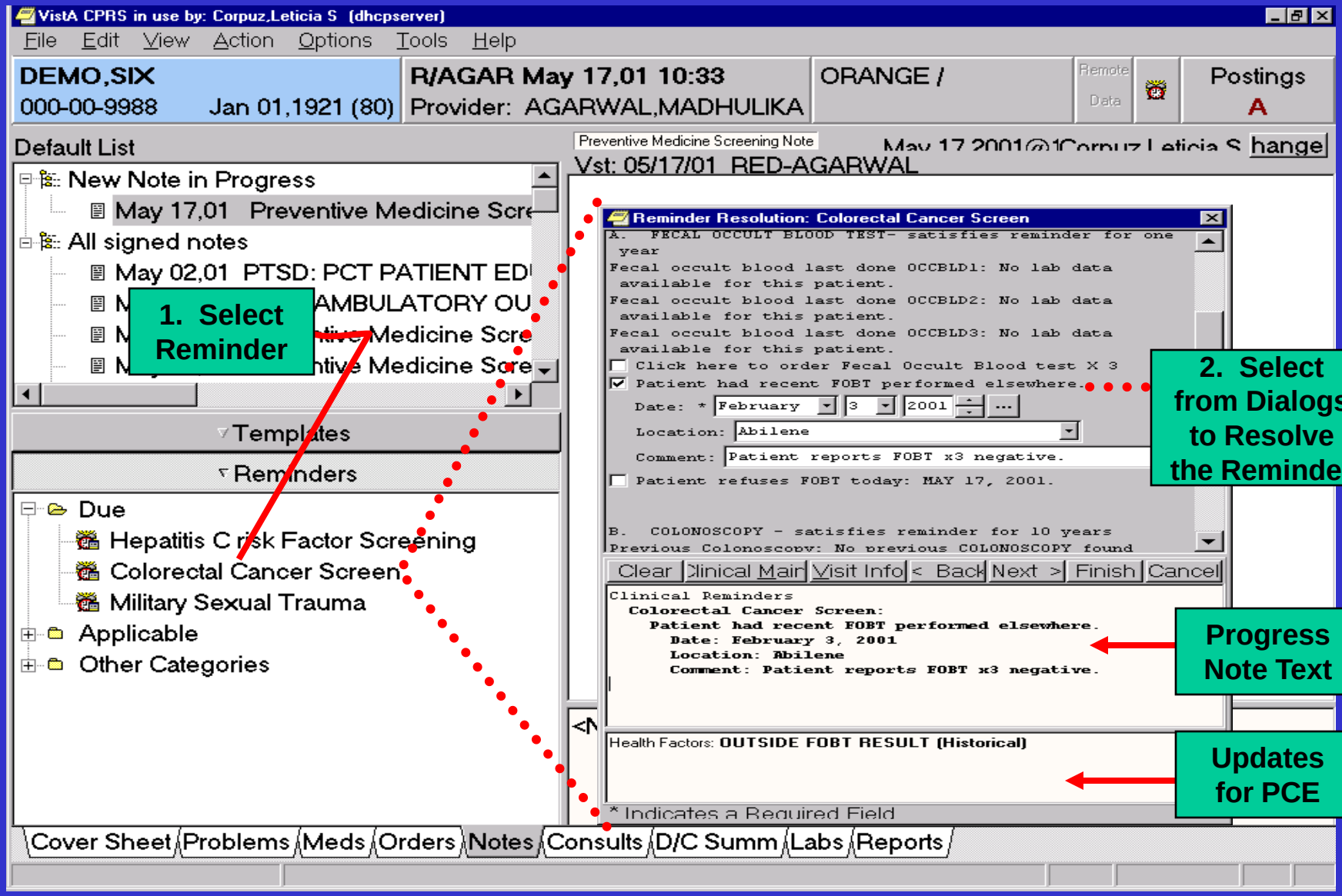
Electronic Medical Records at The Washington VA established since 1995



CPRS: Electronic Reminders



Select Resolution for Reminder



VistA CPRS in use by: Wu,Chiao M (dhcpserver)

File Edit View Tools Help

FLINTSTONE,FREDERICK J
555-55-5555 Nov 30,1944 (56)

3EA MED 3E219-33
Current Provider Not Selected

RED /
Attending: Arcenas,Anthony Onc

Remote Data | Postings D

Active Problems
- Low Back Pain
- Lack Of Housing
- Swelling, mass, or lump in head and nec
- Tobacco Use Disorder * (icd-9-Cm 305.
- Malignant neoplasm of hypopharynx
- Unspecified Psychosocial Circumstance

Allergies / Adverse Reactions
No Known Allergies

Postings
Implementation Of Advance Directive
Implementation Of Advance Directive
Advance Directive Jan 25,01

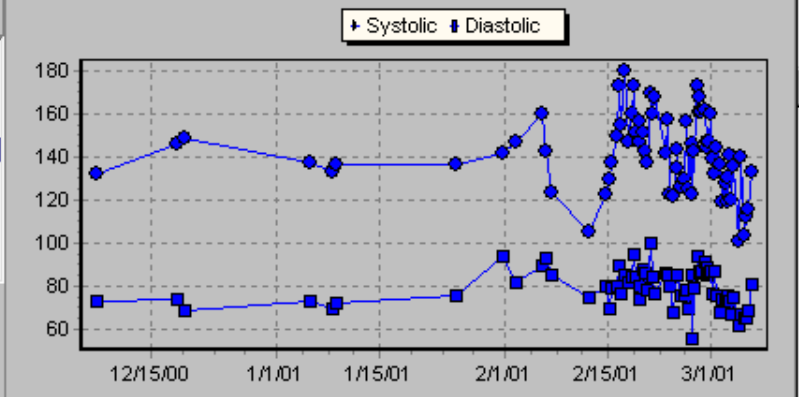
Active Medications
Vancomycin Inj
Levofloxacin (levaquin) Inj
Sodium Chloride 0.9% Soln. Inj
Acetaminophen Elixir
Multivitamins Liquid(sf)
Lorazepam Inj
Morphine Inj

Vitals

Enter Vitals

Today
One Week
Two Weeks
One Month
Six Months
One Year
Two Years
All Results
Date Range

Values
Zoom
3D



	03/05/01 19:28	03/05/01 21:57	03/06/01 02:12	03/06/01 06:47	03/06/01 08:30
Temperature	100.5	98.6	99		99.2
Pulse			96		101
Respiration			18		24
Blood Pressure			116/69		133/81
Height					
Weight				141.3	
Pain					

Recent Lab Results
- Vancomycin Blood Serum Lc Lb #64880 Mar 0
- Mineral Panel Blood Serum Lc Lb #64880 Mar 0
- 7 Chem Blood Serum Lc Lb #64880 Mar 0
- Mineral Panel Blood Serum Wc Lb #64542
- 7 Chem (stat) Blood Serum Stat Wc Lb #64542
- Cbc Blood Wc Lb #64744 Mar 0
- Urinalysis(inpatient) Urine(random) Wc Lb #6393

Vitals

T	99.2 F	Mar 06,01	(37.3 C)
P	101	Mar 06,01	
R	24	Mar 06,01	
BP	133/81	Mar 06,01	
HT	75 in	Feb 12,01	(190.5 cm)
WT	141.3 lb	Mar 06,01	(64.2 kg)
PN	7	Mar 05,01	

Appointments / Visits / Admissions
- Mar 29,01 11:00 Radiation Therapy-Hussain Mc
- Mar 28,01 11:00 Radiation Therapy-Hussain Mc
- Mar 27,01 11:00 Radiation Therapy-Hussain Mc
- Mar 26,01 11:00 Radiation Therapy-Hussain Mc
- Mar 26,01 10:30 Neuro/Primcare/Goodman
- Mar 23,01 11:00 Radiation Therapy-Hussain Mc
- Mar 22,01 11:00 Radiation Therapy-Hussain Mc

Cover Sheet | Problems | Meds | Orders | Notes | Consults | D/C Summ | Labs | Reports

Start | CPRS - Patient Chart | Microsoft PowerPoint - [Pr... | 4:53 PM

TELEHealth:Electronic Transmission of Home BP Measurements

- BP 01/02/2009 12:42:35 PM 01/02/2009 12:39:56 PM 134 76 54
- BP 01/04/2009 9:30:11 PM 01/04/2009 9:26:57 PM 131 69 56
- BP 01/05/2009 10:31:53 AM 01/05/2009 10:29:11 AM 133 80 60
- BP 01/05/2009 10:08:50 PM 01/05/2009 10:06:00 PM 112 59 64
- BP 01/06/2009 11:34:35 AM 01/06/2009 11:31:57 AM 124 62 57
- BP 01/06/2009 9:24:45 PM 01/06/2009 9:22:20 PM 121 66 54
- BP 01/07/2009 9:27:16 AM 01/07/2009 9:24:47 AM 109 66 64
- BP 01/08/2009 10:57:04 AM 01/08/2009 10:55:16 AM 112 64 60
- BP 01/09/2009 9:50:20 AM 01/09/2009 9:48:08 AM 110 58 60
- BP 01/09/2009 9:46:24 PM 01/09/2009 9:44:08 PM 113 64 69
- BP 01/12/2009 9:52:01 AM 01/12/2009 9:49:53 AM 142 76 62
- BP 01/12/2009 9:38:49 PM 01/12/2009 9:36:19 PM 137 72 58
- BP 01/13/2009 12:13:38 PM 01/13/2009 12:10:40 PM 124 76 80
- BP 01/14/2009 10:30:38 AM 01/14/2009 10:28:12 AM 141 76 61
- BP 01/14/2009 11:08:08 PM 01/14/2009 11:05:50 PM 140 70 59
- BP 01/15/2009 10:10:25 AM 01/15/2009 10:07:57 AM 139 78 68
- BP 01/15/2009 9:56:58 PM 01/15/2009 9:54:21 PM 113 62 67
- BP 01/22/2009 9:58:36 AM 01/16/2009 9:40:53 AM 114 70 58
- BP 01/22/2009 9:58:38 AM 01/22/2009 9:56:41 AM 122 70 66
- BP 01/22/2009 9:48:36 PM 01/22/2009 9:46:14 PM 126 67 61
- BP 01/23/2009 8:56:20 AM 01/23/2009 8:54:14 AM 136 71 56
- BP 01/23/2009 10:19:49 PM 01/23/2009 10:17:06 PM 99 56 73
- BP 01/26/2009 9:33:43 AM 01/26/2009 9:31:05 AM 140 76 67
- BP 01/26/2009 10:21:52 PM 01/26/2009 10:18:57 PM 123 68 56
- BP 01/27/2009 11:18:57 AM 01/27/2009 11:16:40 AM 126 72 65
- BP 01/27/2009 9:34:45 PM 01/27/2009 9:32:42 PM 112 64 58
- BP 01/28/2009 9:52:18 AM 01/28/2009 9:49:50 AM 125 69 52
- BP 01/28/2009 9:36:22 PM 01/28/2009 9:34:02 PM 103 63 61
- BP 01/29/2009 11:23:29 PM 01/29/2009 11:20:33 PM 95 56 61
- BP 01/30/2009 11:01:17 AM 01/30/2009 10:58:59 AM 122 70 60
- BP 02/02/2009 9:41:56 AM 02/02/2009 9:39:21 AM 112 65 76
- BP 02/03/2009 9:25:18 AM 02/03/2009 9:22:32 AM 113 64 59
- BP 02/03/2009 9:05:35 PM 02/03/2009 9:03:32 PM 108 60 59
- BP 02/05/2009 9:17:41 AM 02/05/2009 9:15:03 AM 110 60 67

Blood Pressure Control at The Department of Veterans Affairs

- Data from The DC VAMC
- Data form 15 cities
- National data
- Preliminary Outcome Data

Blood Pressure Initiative at The Washington D.C. VAMC

Recommendations included:

- Patient and family member involvement
- Free BP devices to patients
- Electronic reminders to providers
- Virtual, electronic and curb side consults
- Referral to specialty clinics
- Frequent appointments until BP control was achieved
- BP recheck and regimen adjustment, life style modification or compliance reinforcement in all patients with BP not at target.

Methods

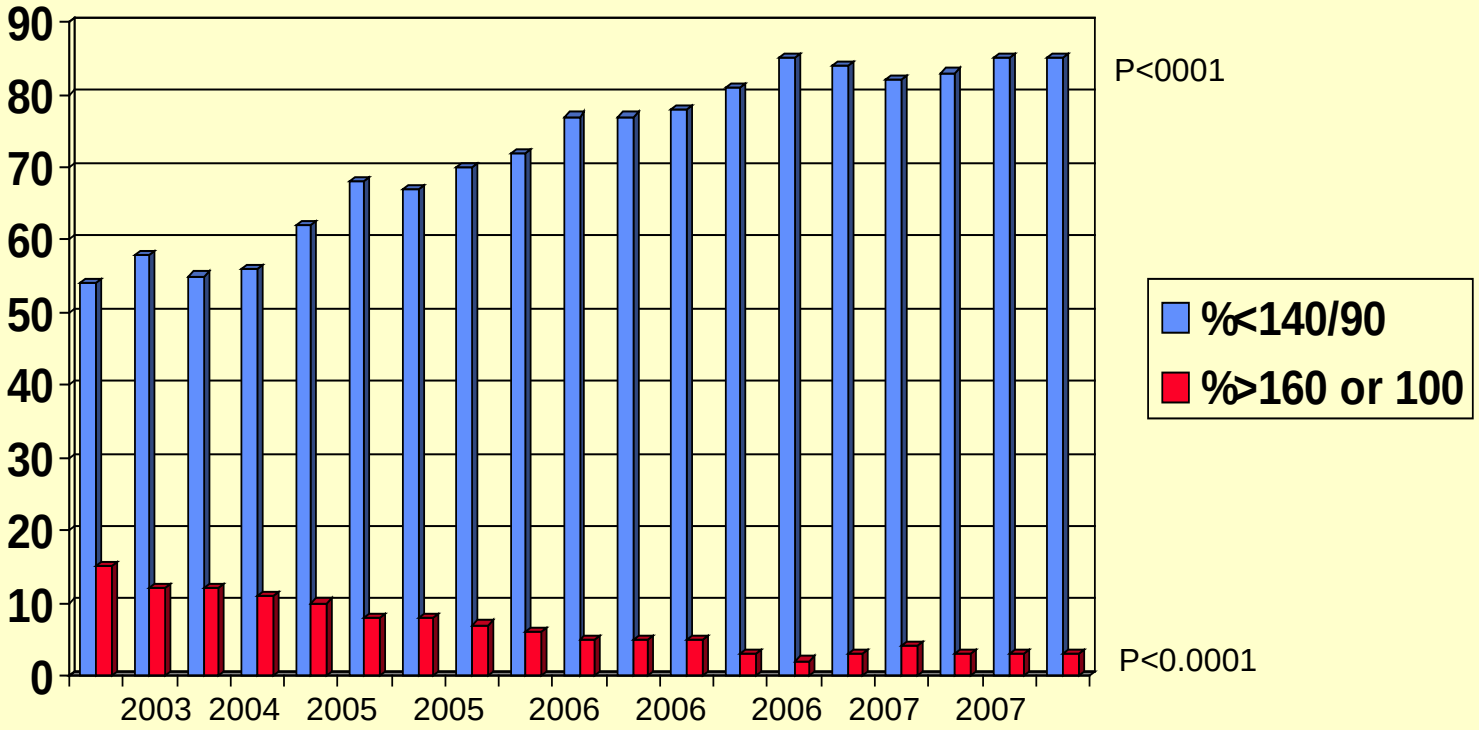
- Outcomes were monitored either by:
  - a random sample (performance measures) or
  - by data base.
- BP was considered controlled when <140/90 mmHg.
- Moderate/Severe hypertension was considered as BP >160 systolic or >100 diastolic.

Results

- The Number of patients enrolled in this initiative increased:
  - 1998: N=3,133
  - 2003: N=12,606
  - 2007: N=13,485

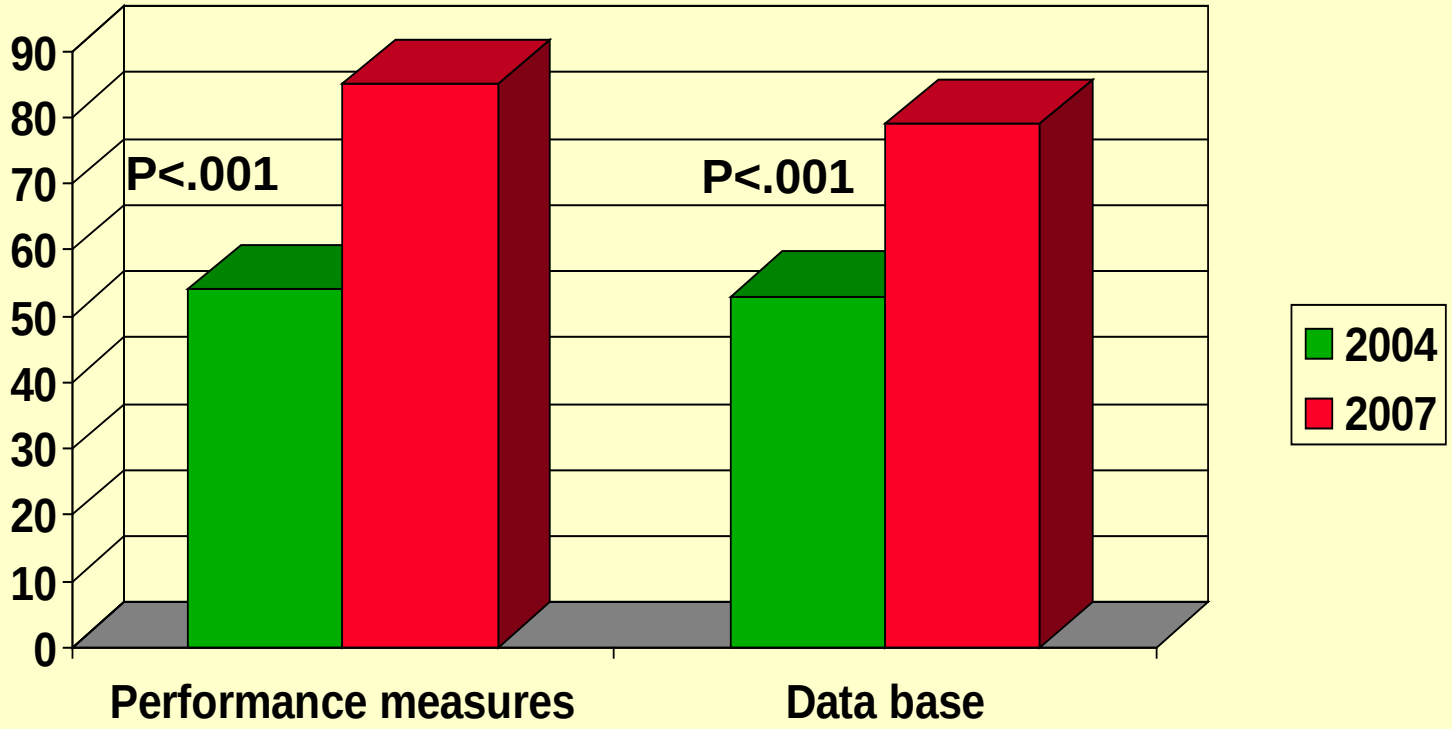
Hypertension Control

Washington DC, VAMC

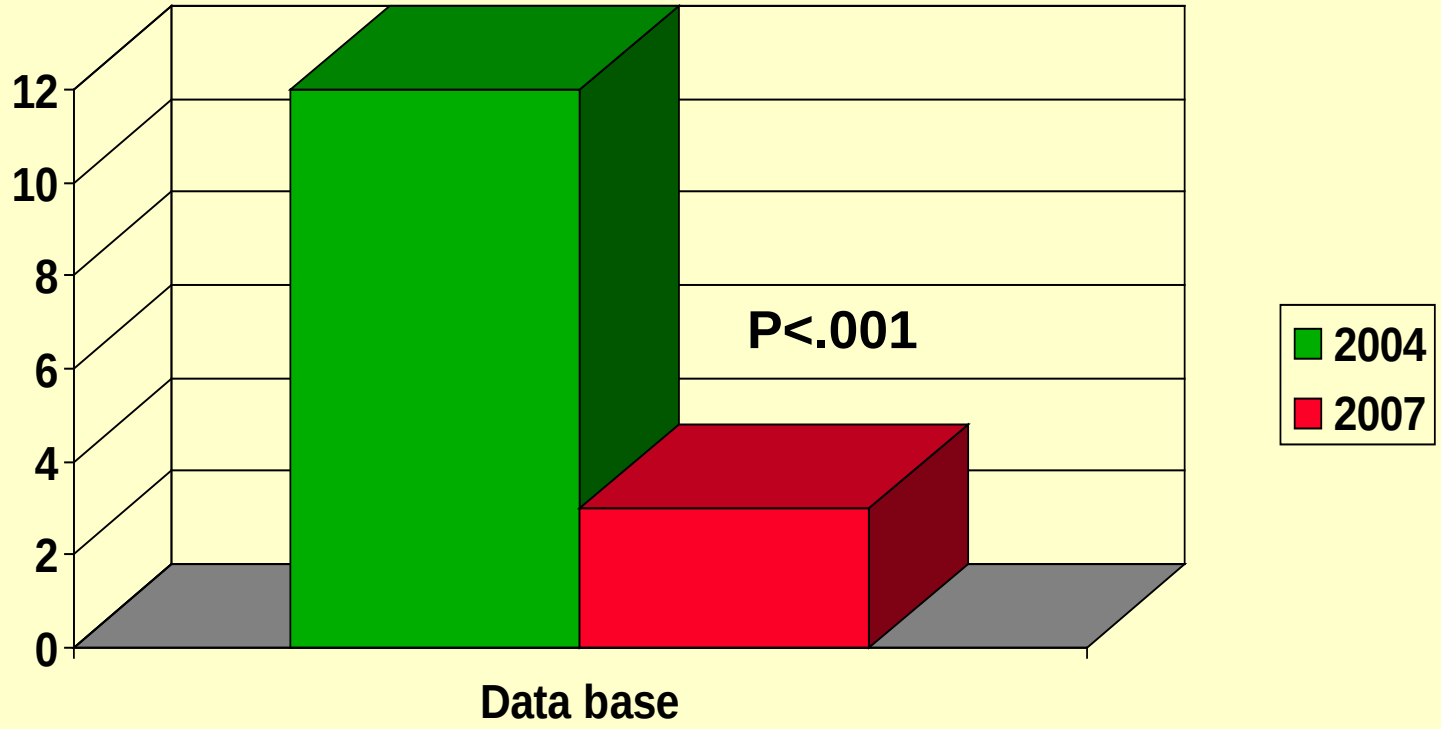


Hypertension control increased from 54% in 2003 to 85% in 2007,
and patients with BP>160/100 decreased from 15% to 3% in 2007

Percent of Patients with Blood Pressure Control from 2004 to 2007.



Percent of Patients with BP>160 systolic or >100 diastolic



ASH meeting New Orleans, 2008

Evaluation and Treatment of Resistant or Difficult-to-Control Hypertension

Table I. Patient Baseline Characteristics

Characteristic	No. (%) or Mean ± SD
Total patients	164
Male	157 (95.73)
Female	7 (4.27)
Average age, y	63.68±11.75
Ethnicity	
White	20 (12.20)
Black	142 (86.59)
Asian	0 (0)
Pacific Islander	1 (0.57)
Hispanic	1 (0.57)
Average duration of hypertension, y	13.57±11.46
Diabetes	69 (42.07)
Renal disease	43 (26.22)
Diabetes and/or renal disease	87 (53.05)
Average eGFR in	83.55±35.30

David Wojciechowski, DO; Vasilios Papademetriou, MD; Charles Faselis, MD; Ross Fletcher, MD

JCH 2008;10(11)

Evaluation and Treatment of Resistant or Difficult-to-Control Hypertension

Table II. BP at Baseline in Total Patient Population and by Diabetic and Renal Disease Subgroup

BP at Baseline	
Average systolic BP, mm Hg	160.06±15.80
Average diastolic BP, mm Hg	87.45±13.86
Patients without DM and/or renal disease and BP ≤140/90 mm Hg	0
Patients with DM and/or renal disease and BP ≤130/80 mm Hg	0
Patients with systolic BP ≥160 mm Hg	85 (51.83%)

Abbreviations: BP, blood pressure; DM, diabetes mellitus.

Evaluation and Treatment of Resistant or Difficult-to-Control Hypertension

Table V. Evaluation of Secondary Causes of Hypertension	
Total patients with a secondary cause	23
Single Cause	
Obstructive sleep apnea (OSA)	16
Hyperaldosteronism	3
Renal artery stenosis (RAS)	1
Mixed Cause	
Hyperaldosteronism and OSA	2
RAS and OSA	1

Blood Pressure control

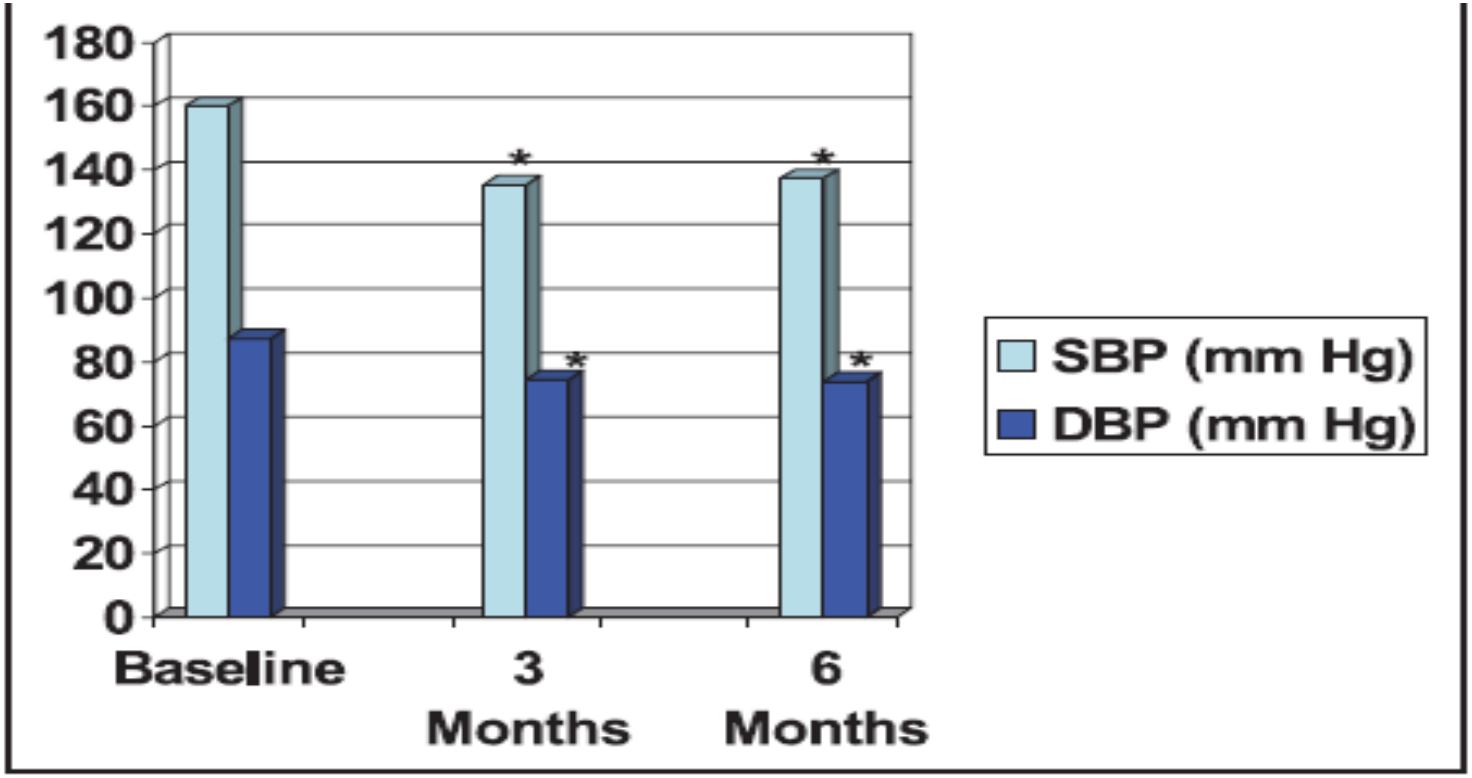


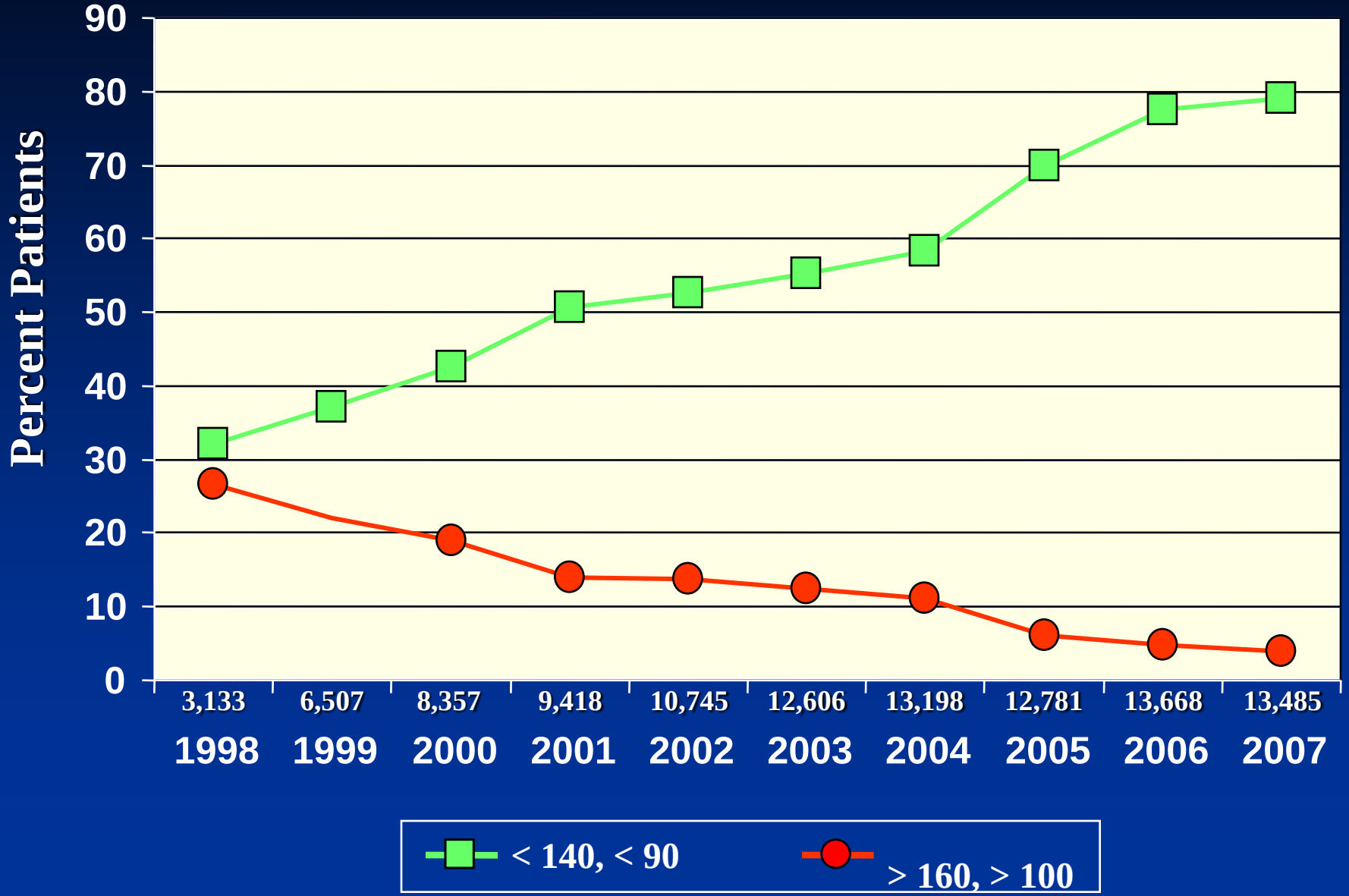
Figure 1. Change in systolic (SBP) and diastolic blood pressure (DBP) from baseline to 3 and 6 months.
**P value compared to baseline <.0001.*

Seasonal variability of blood pressure

- The 15 city project

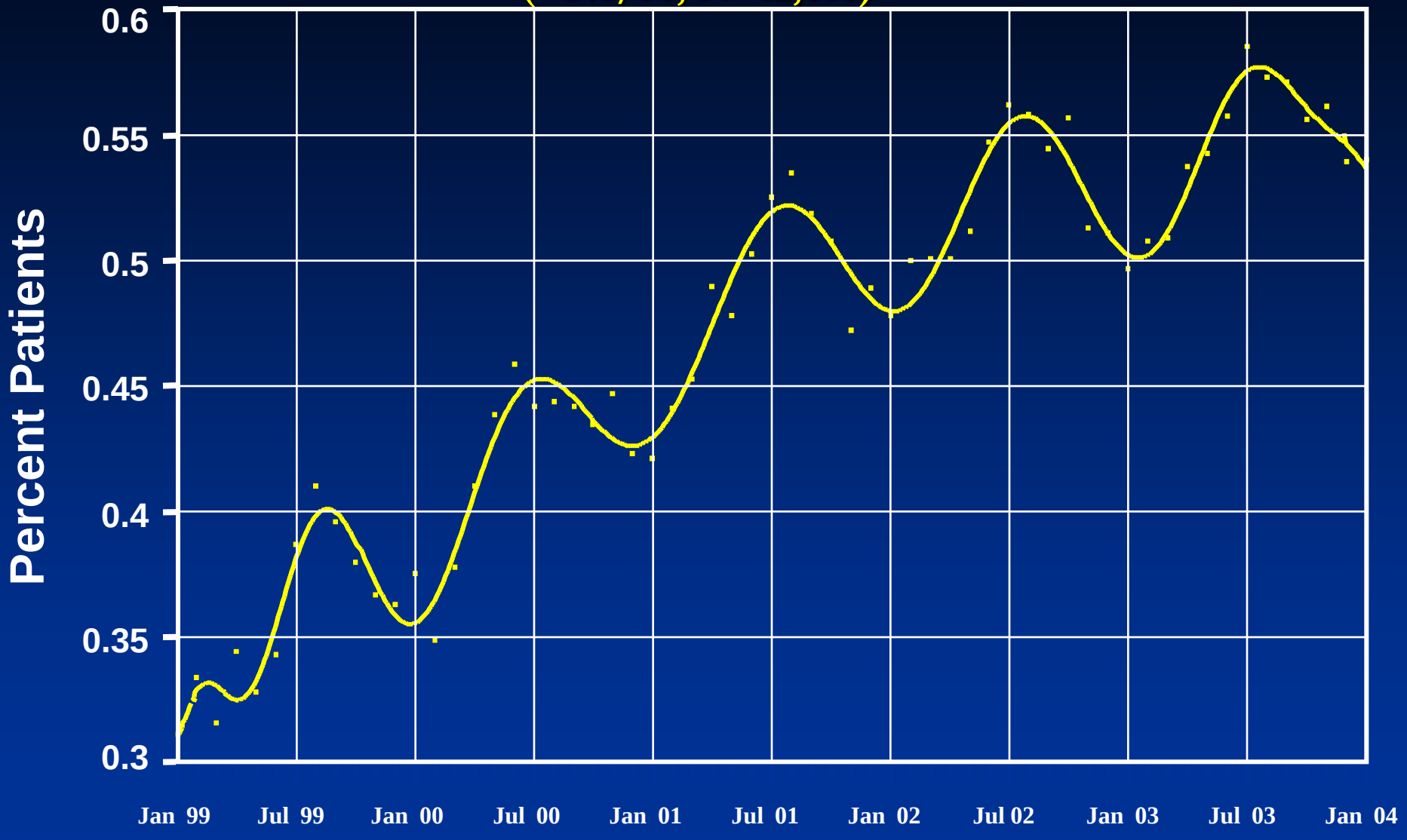
Improving Hypertensives

Washington, DC VAMC



Hypertensives Returning to Normal

(<140/90, N=12,000)

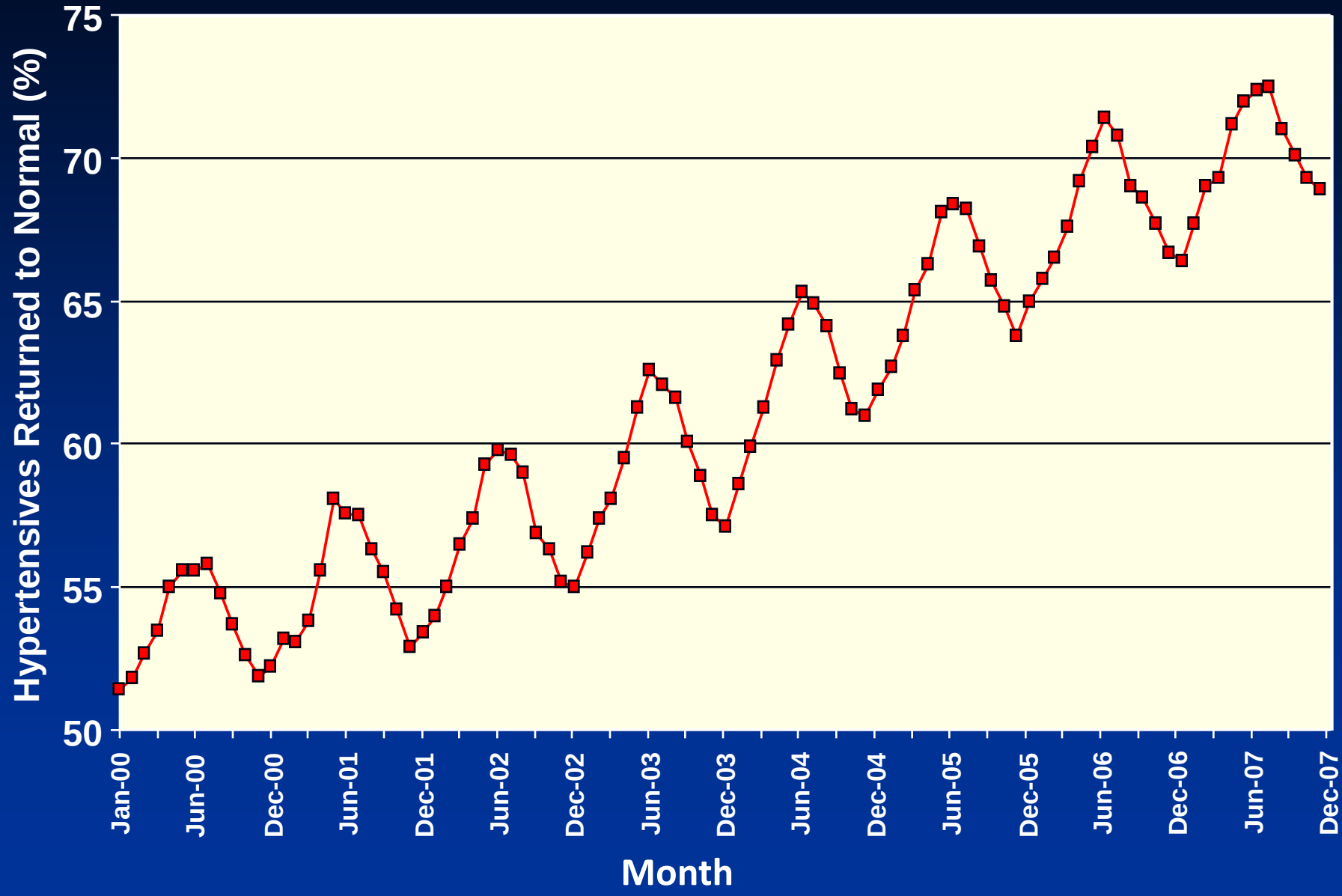


Washington VAMC

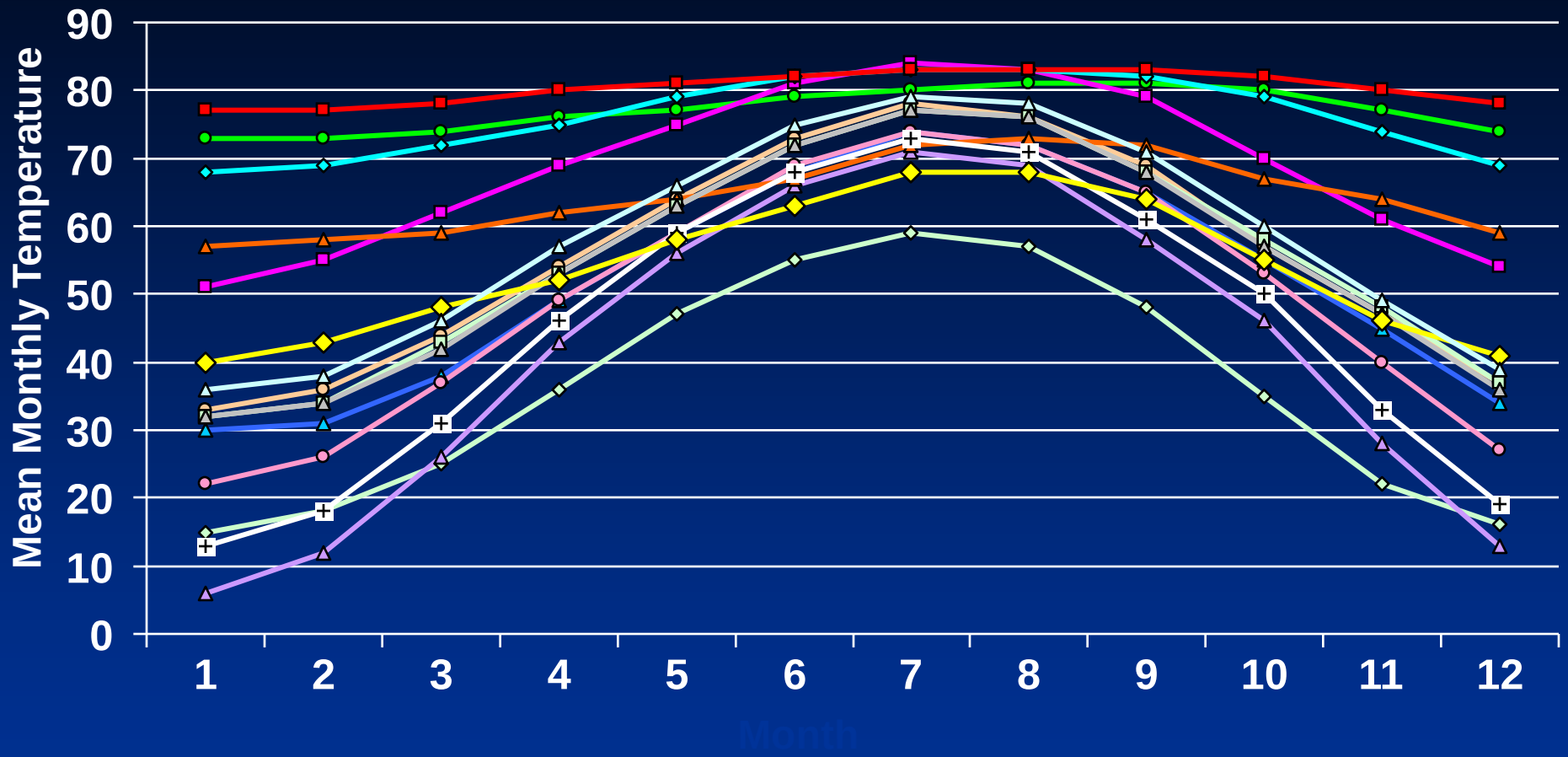

Anchorage, AL
Portland, OR
Fargo, ND
Minneapolis, MN
Boston, MS
Philadelphia, PA
New York, NY
Chicago, IL
Baltimore, MD
Washington, DC
Los Angeles, CA
Houston, TX
Miami, FL
Honolulu, HI
San Juan, PR

Controlling Hypertension Showing Seasonal Variation

15 Cities – 522,264 patients

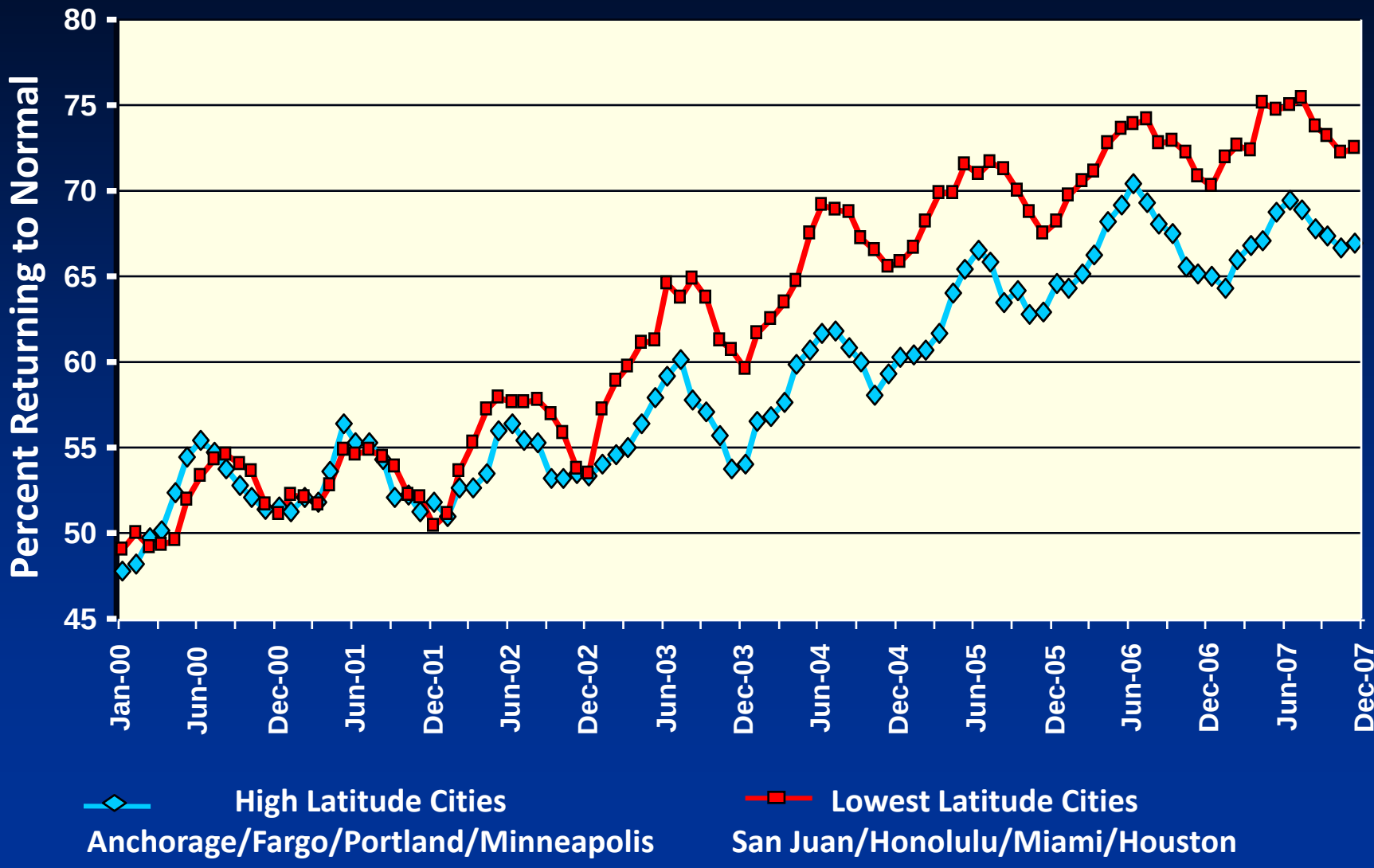


City Temperature Variations



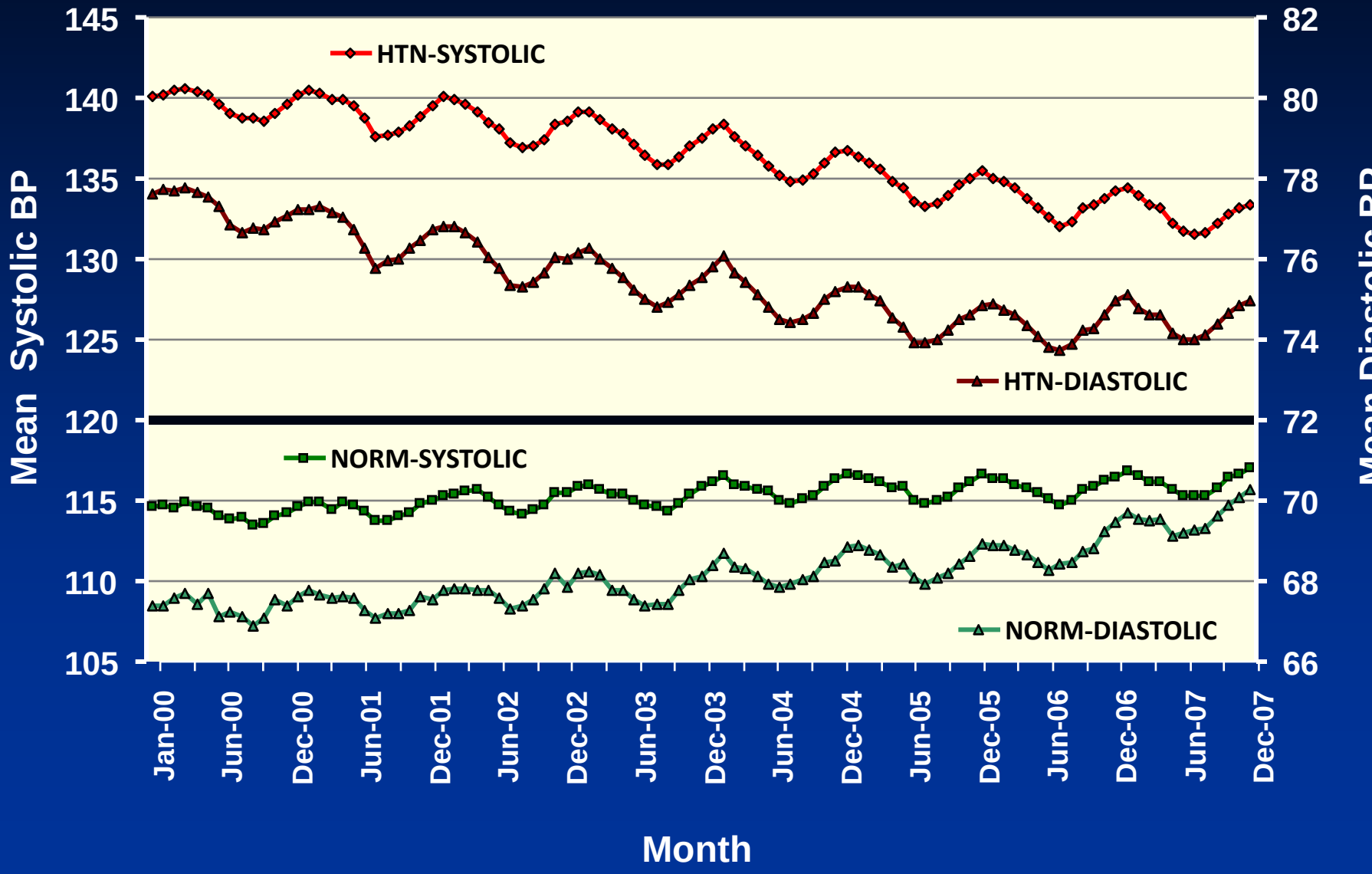
Latitude and Seasonal Variation

4 Cities with the Highest vs. 4 with the Lowest Latitude



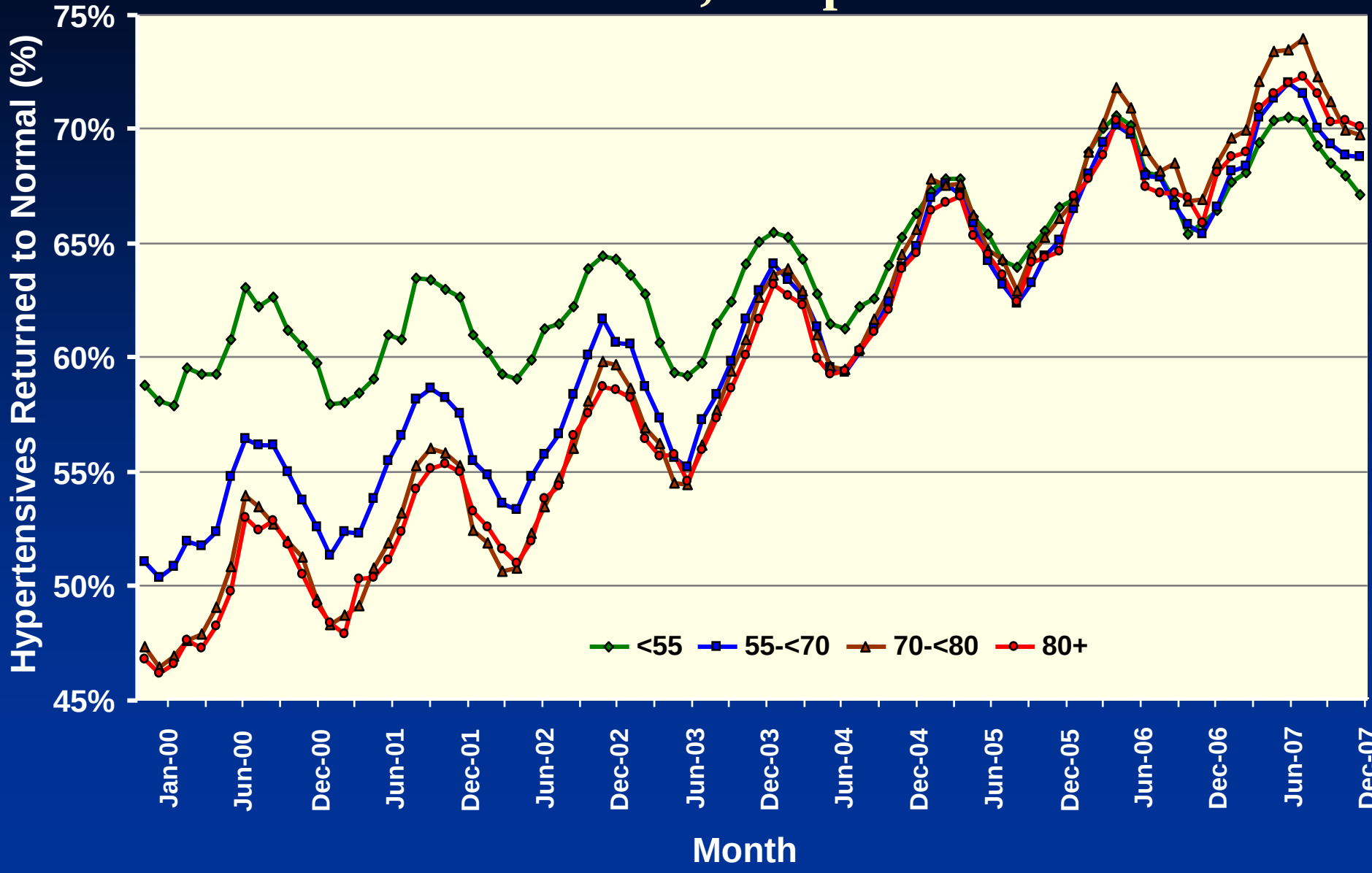
BP Seasonal Variation

Hypertensives vs. Normotensives



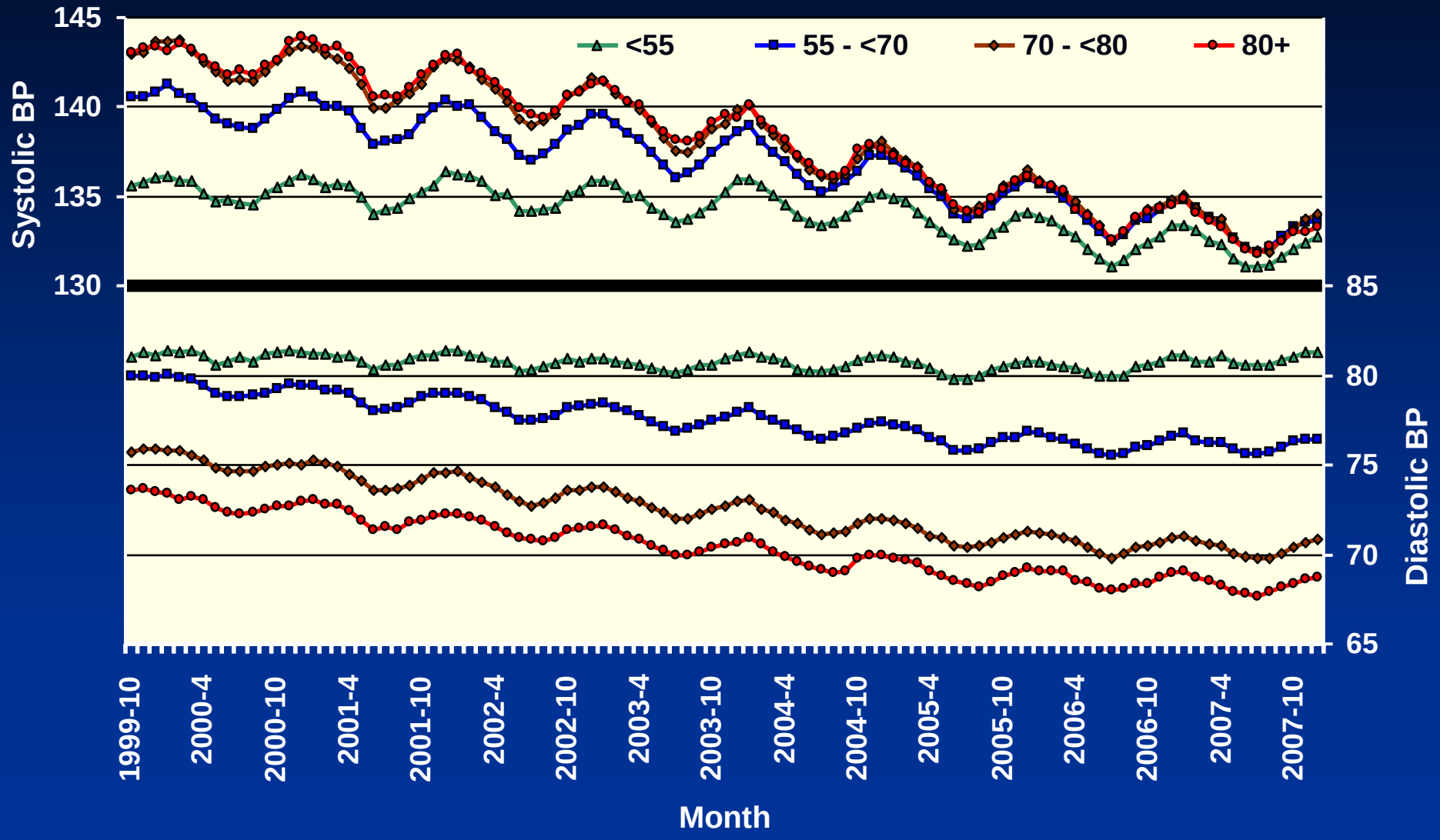
Controlling Hypertension by Age

15 Cities – 522,264 patients

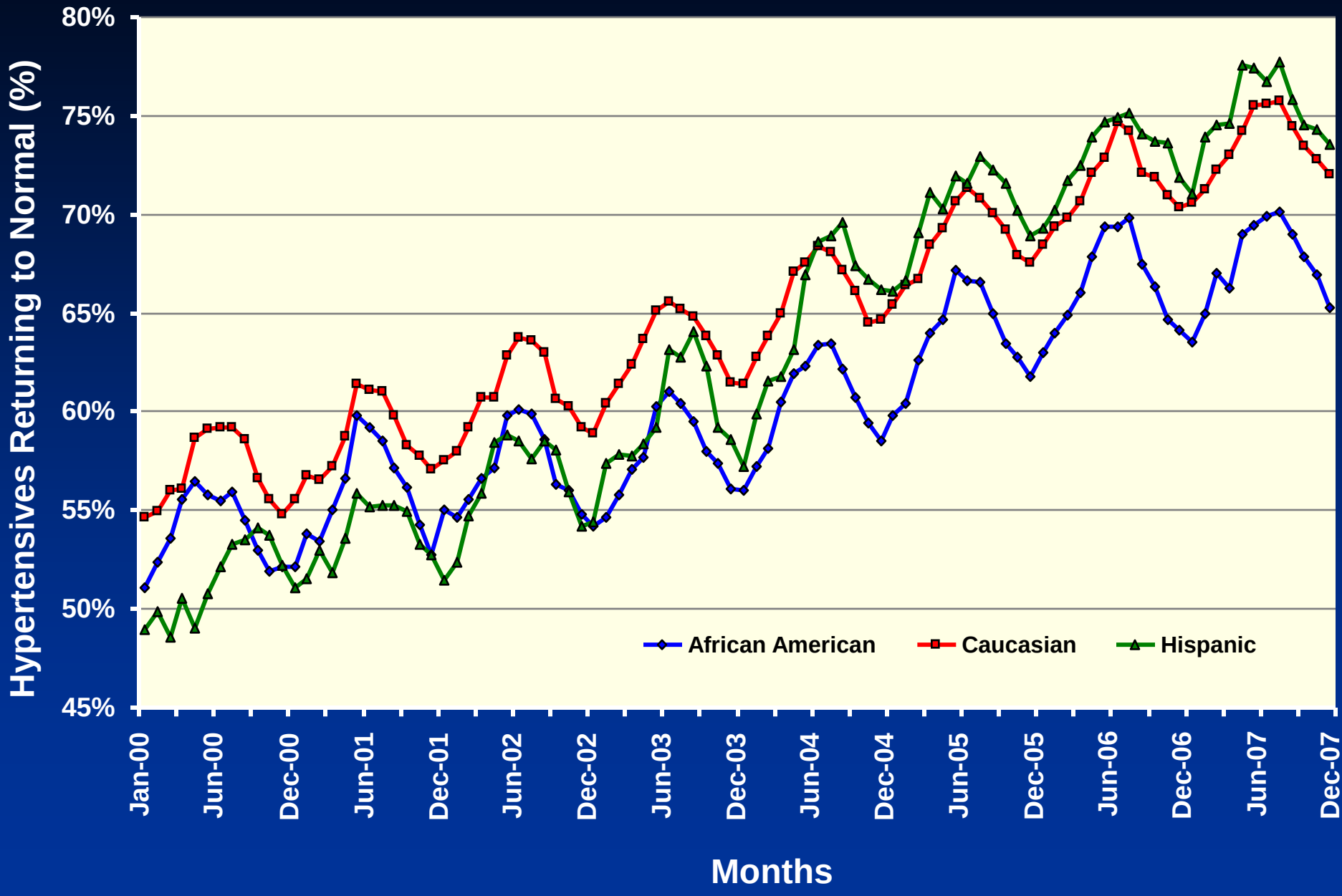


Systolic and Diastolic BP by Age

15 Cities – 522,264 hypertensive patients



Controlling Hypertension by Race



National utilization of antihypertensive medications from 2000 to 2006 in the veterans health administration: focus on diuretics

- Prescribing practices of clinicians treating veterans with hypertension.
- Descriptive analysis was performed using a national pharmacy database
- Patients with a diagnosis of hypertension receiving antihypertensive medication in the fiscal years 2000 to 2006 were included in the study

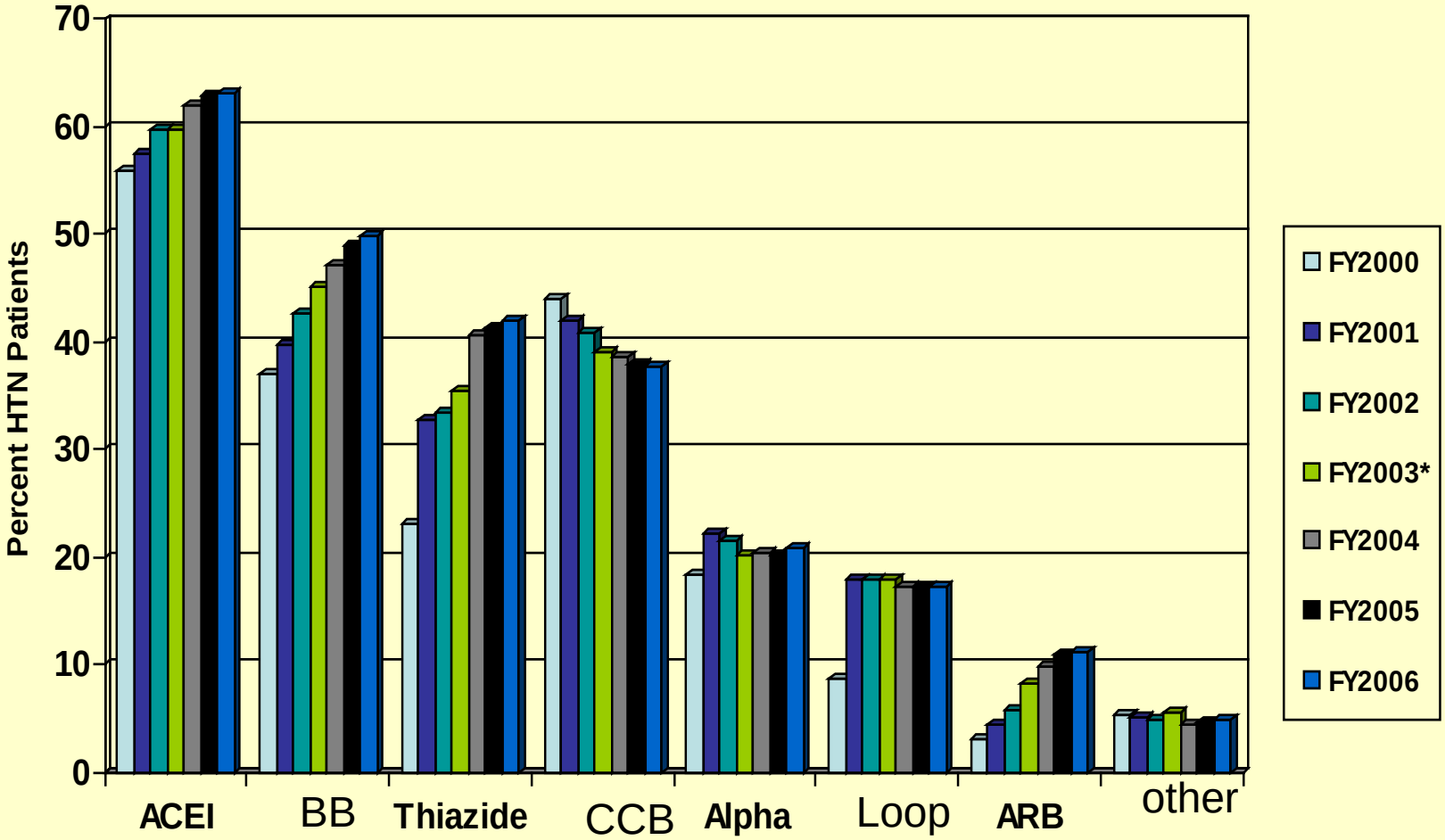
J Clin Hypertens (Greenwich). 2008 Oct;10(10):770-8.

Number of Patients with Hypertension Receiving Meds

Fiscal Year	Patients
2000	1,166,681
2001	1,464,068
2002	1,596,785
2003	1,005,393*
2004	1,583,403
2005	1,607,630
2006	1,619,824

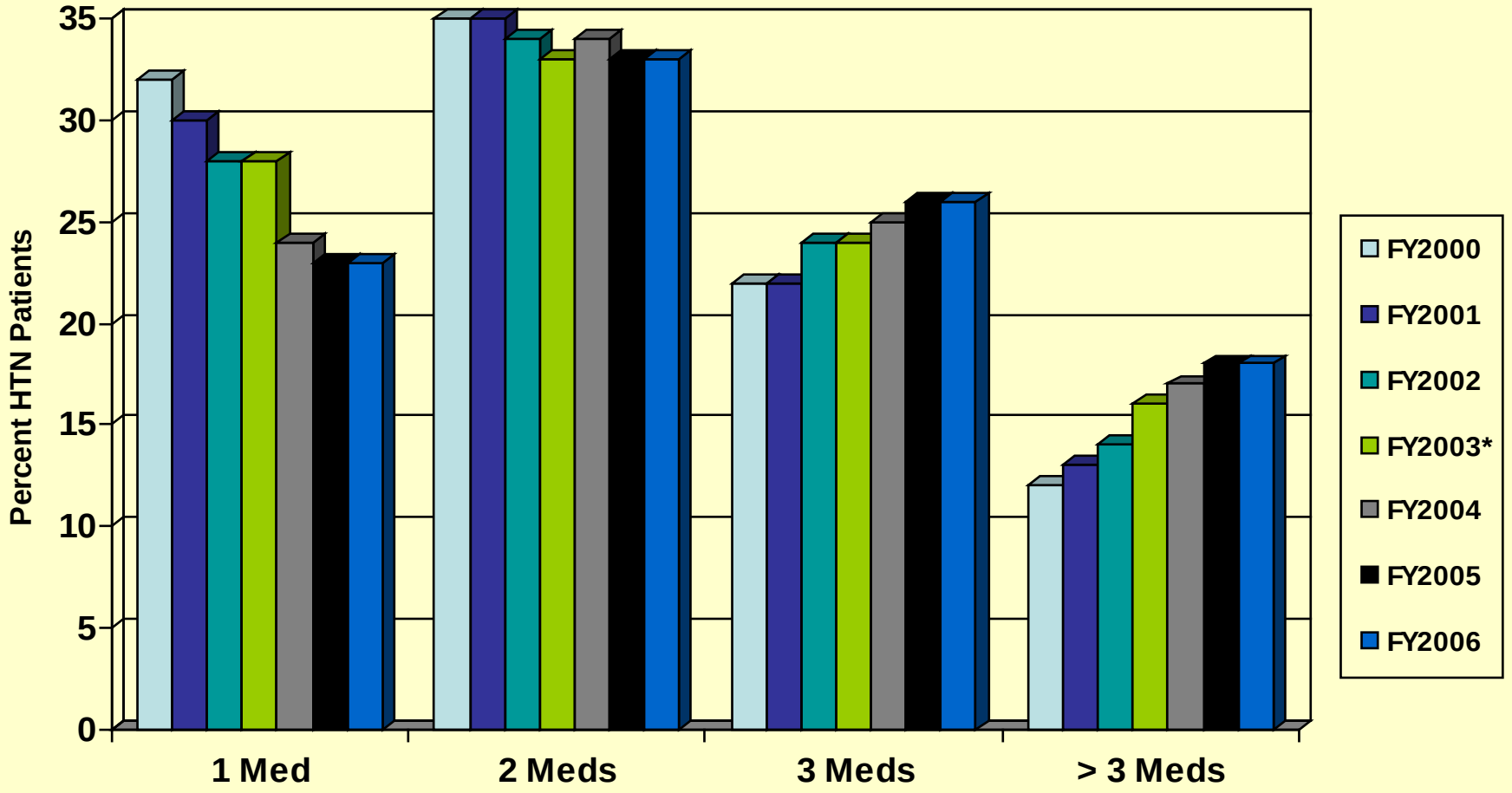
J Clin Hypertens (Greenwich). 2008 Oct;10(10):770-8

VHA Patient Utilization of Antihypertensive Medications by Drug Class FY 2000 to 2006

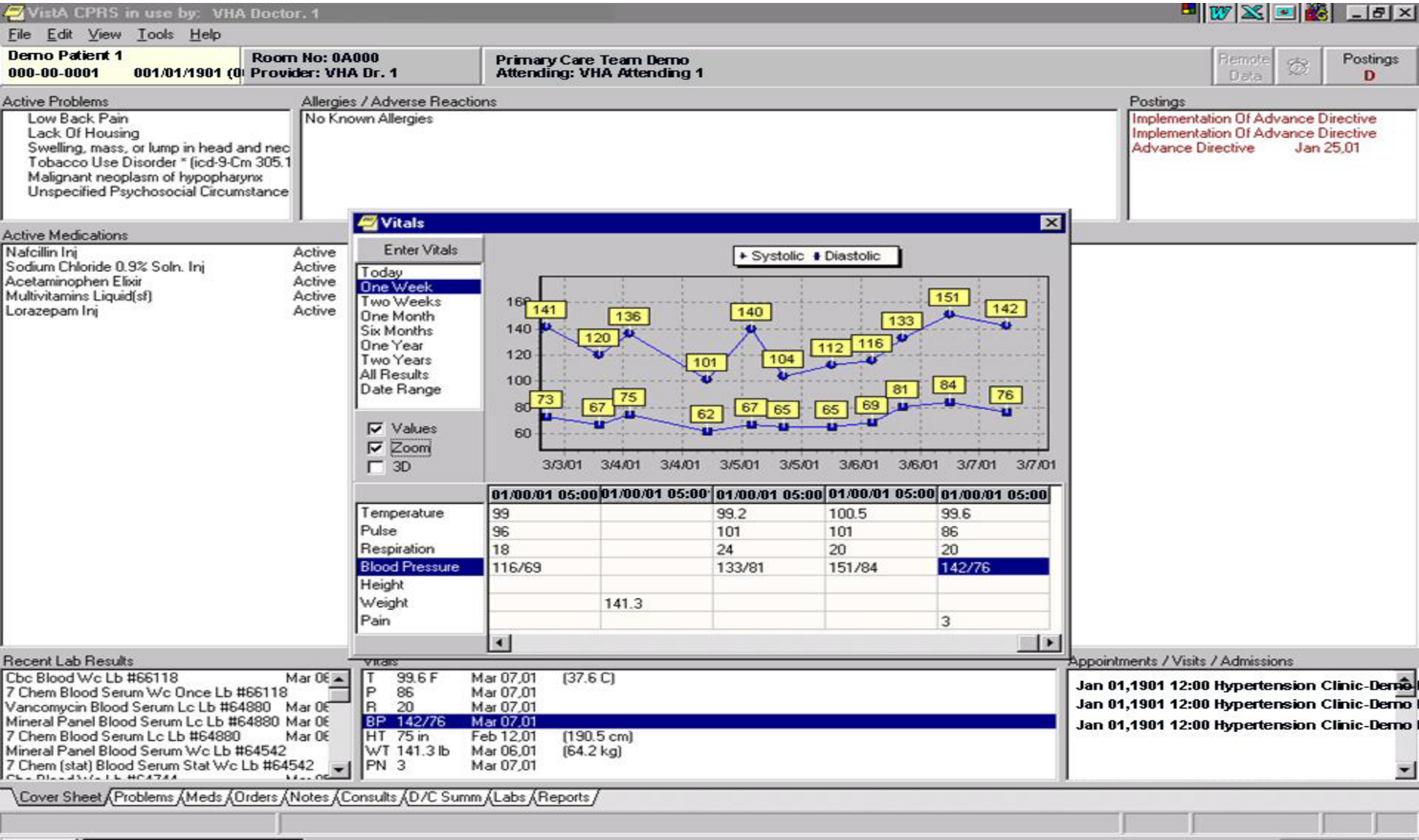


J Clin Hypertens (Greenwich). 2008 Oct;10(10):770-8

VHA Patient Utilization of Antihypertensive Medications by Number of Medications (FY 2000 to 2006).

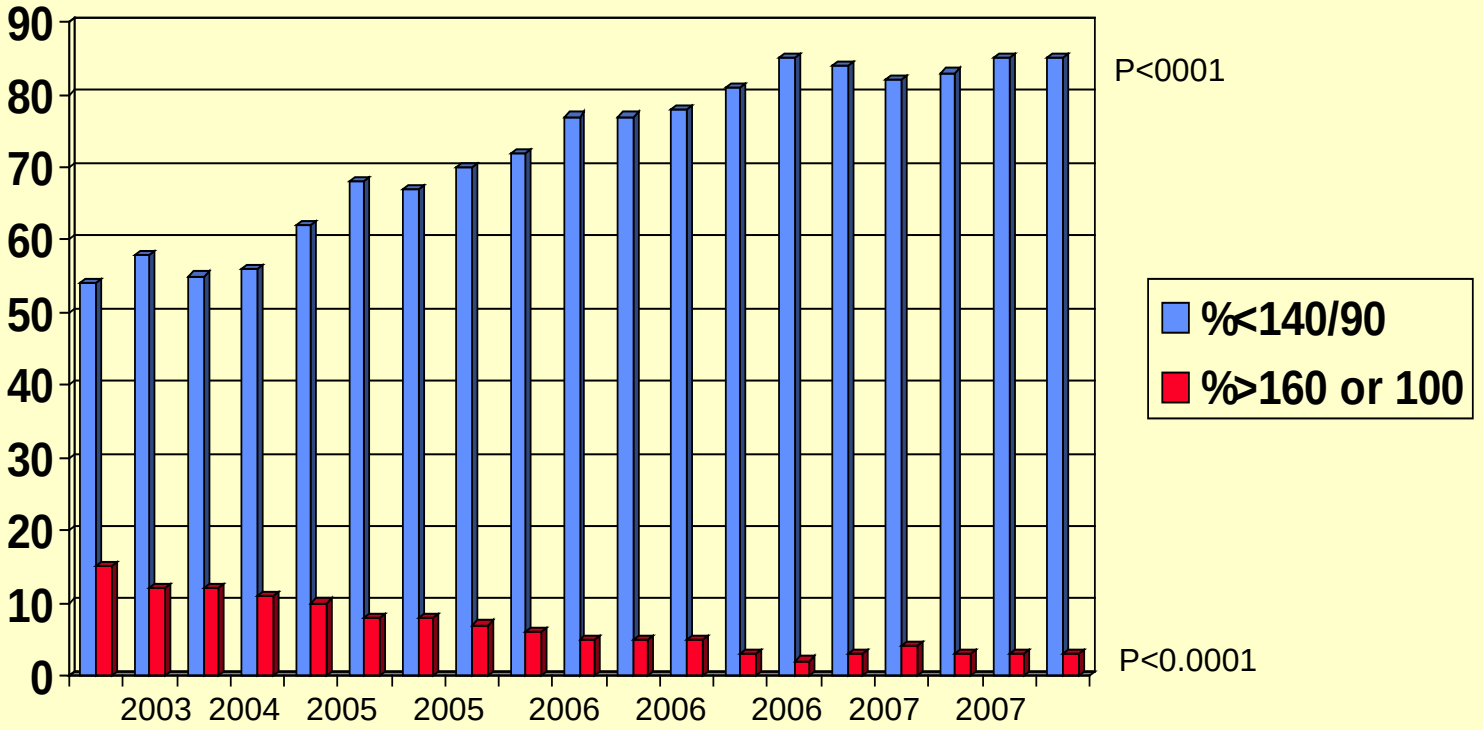


Electronic Records and Blood Pressure Reports



Hypertension Control

Washington DC, VAMC. Effect on outcome

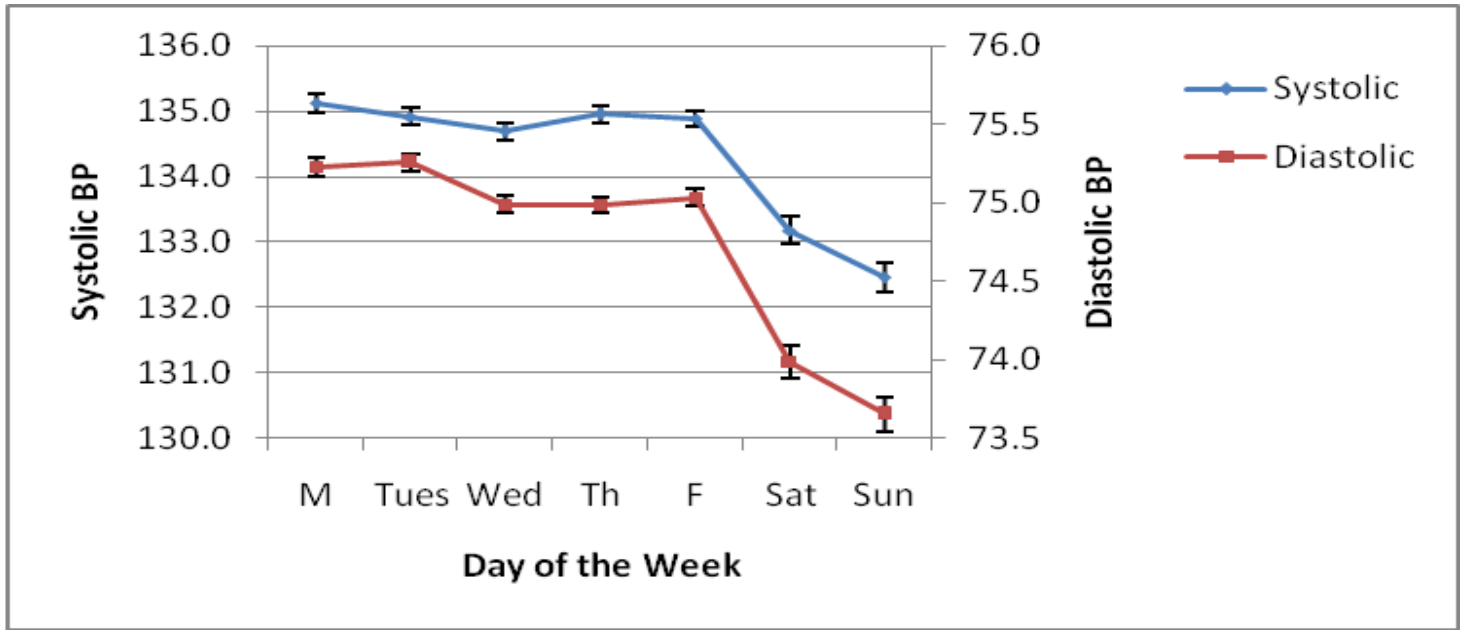


Hypertension control increased from 54% in 2003 to 85% in 2007,
and patients with BP>160/100 decreased from 15% to 3% in 2007

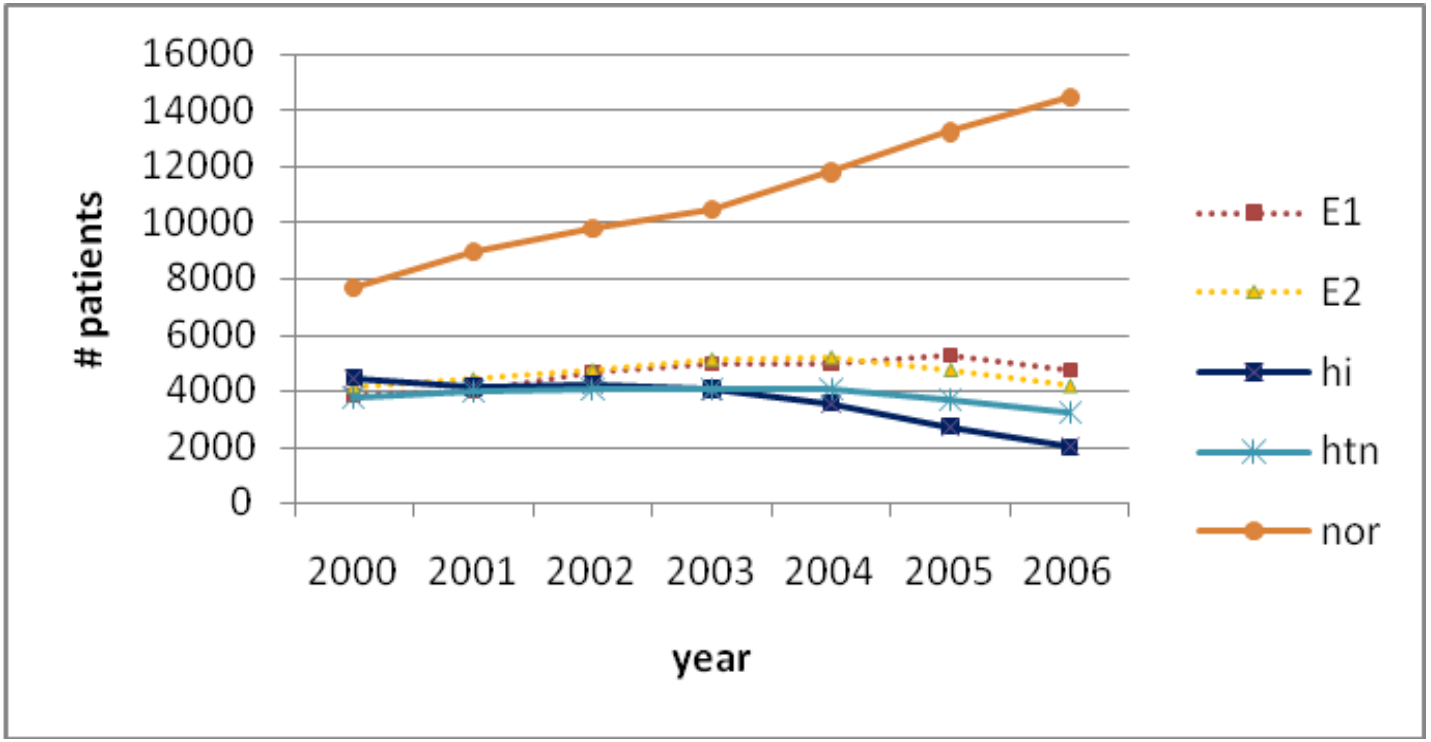
Outcomes:Coding Hypertension

- HTN = Hypertensive all non missing years
- NORMOTENSIVE = All non-missing years are NOR (never hypertensive)
- Other: Intermittently controlled

Mean Systolic and Diastolic BP by Day of Week 2000-2006



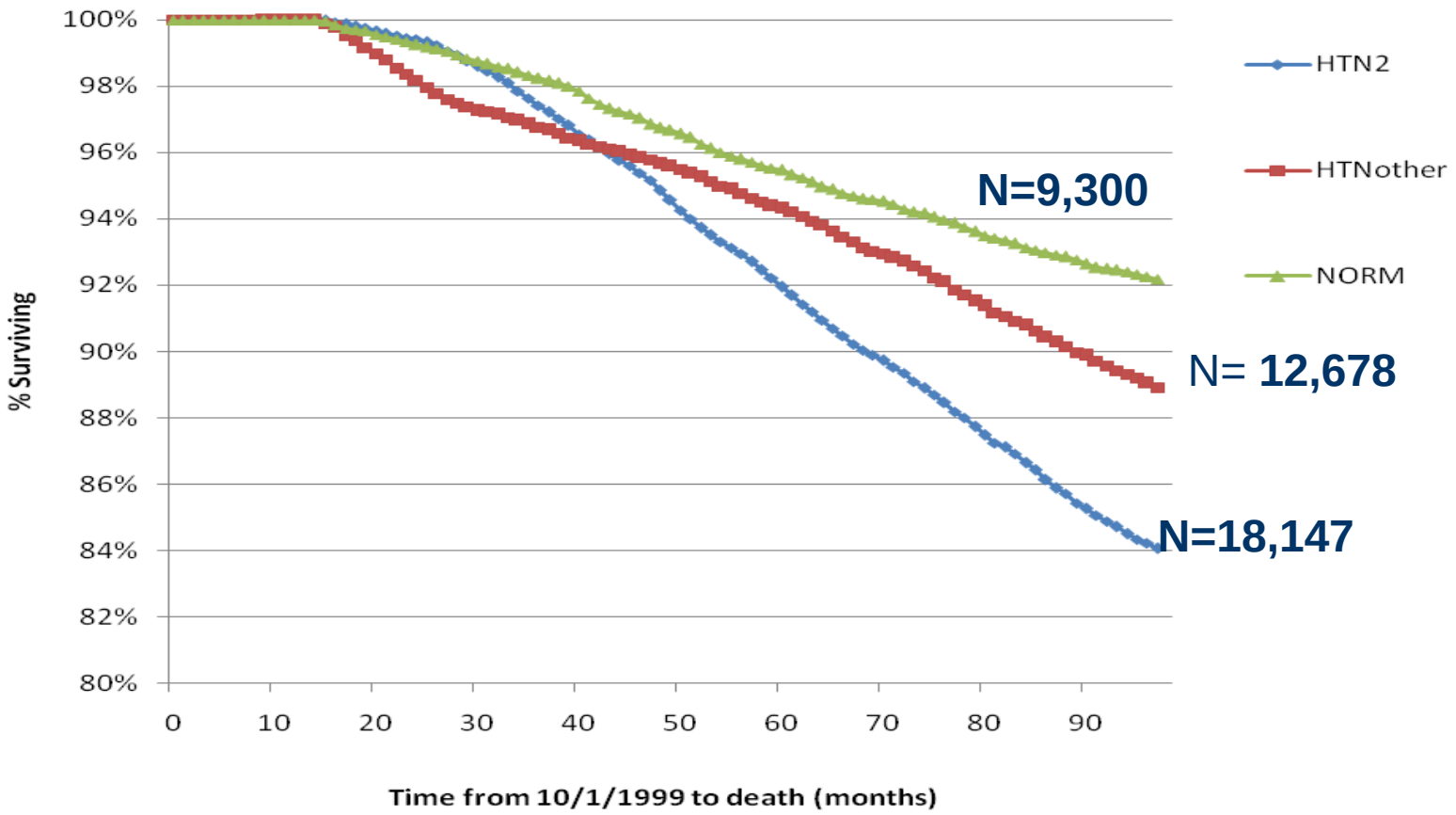
BP Patterns by Year of Observation



Mortality by Hypertension status 1999 to 2007

Group	N	Died	%dead	
Hypertensive HTN2	18,147	2,926	16.12%	
Intermittently Controlled (Other HTN)	12,678	1,425	11.24%	
Normotensive	9,300	730	7.85%	
Total	40,125	5,081		

Mortality by Hypertension Status



after correcting for age, gender, BMI, BUN, and blood glucose

Mortality By Hypertension status

- As compared to Normotensives Patients with:
- -Persistent hypertension had a 60% increased mortality (P<.001)
- -Intermittently controlled hypertension had a 25% increased mortality (P<.05)

Conclusions

- Long term hypertension control in a high % of patients is feasible
- Team work is instrumental
- Electronic records/reminders essential
- Improvement in outcomes can be substantial