Kaiser Permanente Northern California

Large Scale Hypertension Control Program

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Speaker's Financial Disclosure

- I have no financial relationship with any medically related enterprise other than Kaiser Permanente
- I am not an investigator for a pharmaceutical sponsored trial
- I am not on a pharmacy sponsored speakers bureau

It's All About Implementation

It has to work in the real world

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JAMA. 2013;310(7):699-705.

Research

Original Investigation

Improved Blood Pressure Control Associated With a Large-Scale Hypertension Program

Marc G. Jaffe, MD; Grace A. Lee, MD; Joseph D. Young, MD; Stephen Sidney, MD, MPH; Alan S. Go, MD

IMPORTANCE Hypertension control for large populations remains a major challenge.

OBJECTIVE To describe a large-scale hypertension program in Northern California and to compare rates of hypertension control in that program with statewide and national estimates.

DESIGN, SETTING, AND PATIENTS The Kaiser Permanente Northern California (KPNC) hypertension program included a multifaceted approach to blood pressure control. Patients identified as having hypertension within an integrated health care delivery system in Northern California from 2001-2009 were included. The comparison group comprised insured patients in California between 2006-2009 who were included in the Healthcare Effectiveness Data and Information Set (HEDIS) commercial measurement by California health insurance plans participating in the National Committee for Quality Assurance (NCQA) quality measure reporting process. A secondary comparison group was included to obtain the reported national mean NCQA HEDIS commercial rates of hypertension control between 2001-2009 from health plans that participated in the NCQA HEDIS quality measure reporting process.

MAIN OUTCOMES AND MEASURES Hypertension control as defined by NCQA HEDIS.

Editorial page 695

Author Video Interview at jama.com

Supplemental content at jama.com

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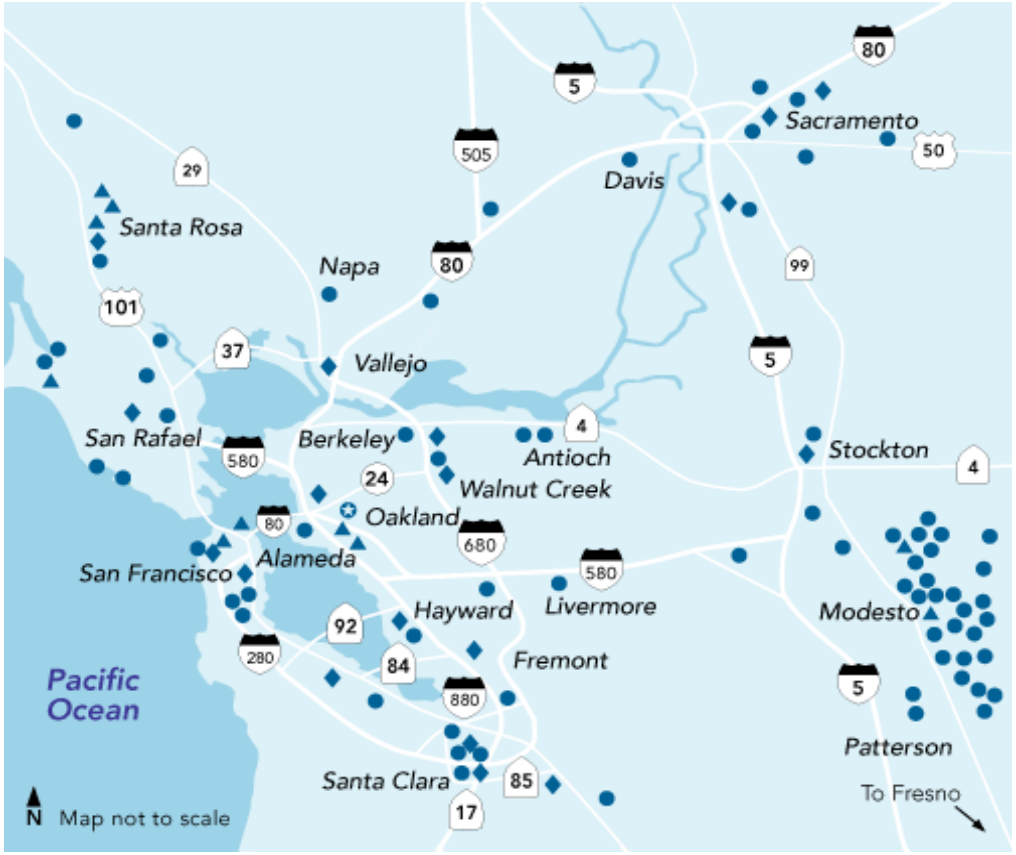
Kaiser Permanente Northern California

- More than 2.3 million adult members
- Comprehensive inpatient and outpatient services
- 21 hospitals and 45 medical facilities
- More than 7,000 physicians



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Health System-Wide Hypertension Registry

- Hypertension Registry developed in 2000
- Elements used for identification
  - Outpatient diagnostic codes
  - Pharmaceutical utilization data
  - Hospitalization records
- Chart review audits of random samples of identified members were conducted

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Hypertension Registry Inclusion Criteria

- 2 or more Primary Care Hypertension diagnoses within the past 2 years
- 1 or more Primary Care Hypertension diagnoses and 1 or more filled prescriptions for hypertension medication within the prior six months.
- 1 or more Primary Care Hypertension diagnoses and 1 or more hospitalizations with a primary or secondary Hypertension diagnosis within the past 2 years
- 1 or more Primary Care Hypertension diagnoses and 1 or more Stroke-related hospitalizations or a history of coronary disease, heart failure or diabetes mellitus.

NOTE: BP measurements alone were not included as a diagnostic criterion as per NCQA-HEDIS specifications.

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Hypertension Registry Patient Characteristics

Table 2. Patient Characteristics of the Kaiser Permanente Northern California (KPNC) Hypertension Registry, 2001-2009

	%								
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
KPNC, No.									
Total adult population	2 278 043	2 345 910	2 325 616	2 339 898	2 384 895	2 421 141	2 423 368	2 416 095	2 371 761
Hypertension registry	349 937	415 687	432 611	509 783	543 650	572 100	600 523	610 724	652 763
Percentage of total KPNC adult membership	15.4	17.7	18.6	21.8	22.8	23.6	24.8	25.3	27.5
Age, mean (SD), y	63.0 (13.6)	63.0 (13.8)	62.9 (13.8)	63.0 (13.9)	63.0 (13.9)	62.9 (14.0)	63.0 (14.1)	63.3 (14.2)	63.0 (14.4)
Age category, y									
18-44	10.4	10.6	10.7	10.7	10.7	10.9	10.9	10.5	11.0
45-65	44.7	44.8	45.0	45.5	45.9	46.3	46.0	45.6	45.7
66-85	44.8	44.6	44.3	43.8	43.4	42.8	43.1	44.0	43.3
Women	52.1	52.2	52.3	52.4	52.3	52.2	52.2	52.3	52.7
Race/ethnicity									
White	NA	NA	NA	NA	NA	NA	NA	58.8	58.4
Black or African American	NA	NA	NA	NA	NA	NA	NA	10.6	10.8
Hispanic or Latino	NA	NA	NA	NA	NA	NA	NA	13.3	13.2
Asian or Pacific Islander	NA	NA	NA	NA	NA	NA	NA	16.1	16.5
Multiracial	NA	NA	NA	NA	NA	NA	NA	0.8	0.8
American Indian or Alaskan Native	NA	NA	NA	NA	NA	NA	NA	0.3	0.3
Diabetes mellitus	25.6	25.9	26.2	28.0	27.8	27.8	28.0	29.1	28.5

Abbreviations: KPNC, Kaiser Permanente Northern California; NA, not available.

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Evolution of the Drug Treatment Algorithm

Table 1. Summary of Evidence-Based Clinical Practice Guideline for Initial Therapy and Treatment Intensification for the Kaiser Permanente Northern California Hypertension Program, by Year

Step	2001	2003	2005	2007	2009
1	Thiazide diuretic or β-blocker	Thiazide diuretic	Thiazide diuretic or thiazide diuretic + ACE inhibitor	Thiazide diuretic or thiazide diuretic + ACE inhibitor	Thiazide diuretic or thiazide diuretic + ACE inhibitor
2	Thiazide diuretic + β-blocker	Thiazide diuretic + ACE inhibitor or thiazide diuretic + β-blocker	Thiazide diuretic + ACE inhibitor	Thiazide diuretic + ACE inhibitor	Thiazide diuretic + ACE inhibitor
3	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + β-blocker + ACE inhibitor	Thiazide diuretic + ACE inhibitor + DCCB
4	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + β-blocker + ACE inhibitor + DCCB	Thiazide diuretic + ACE inhibitor + DCCB + β-blocker or spironolactone

Abbreviations: ACE, angiotensin-converting enzyme; DCCB, dihydropyridine calcium channel blocker.

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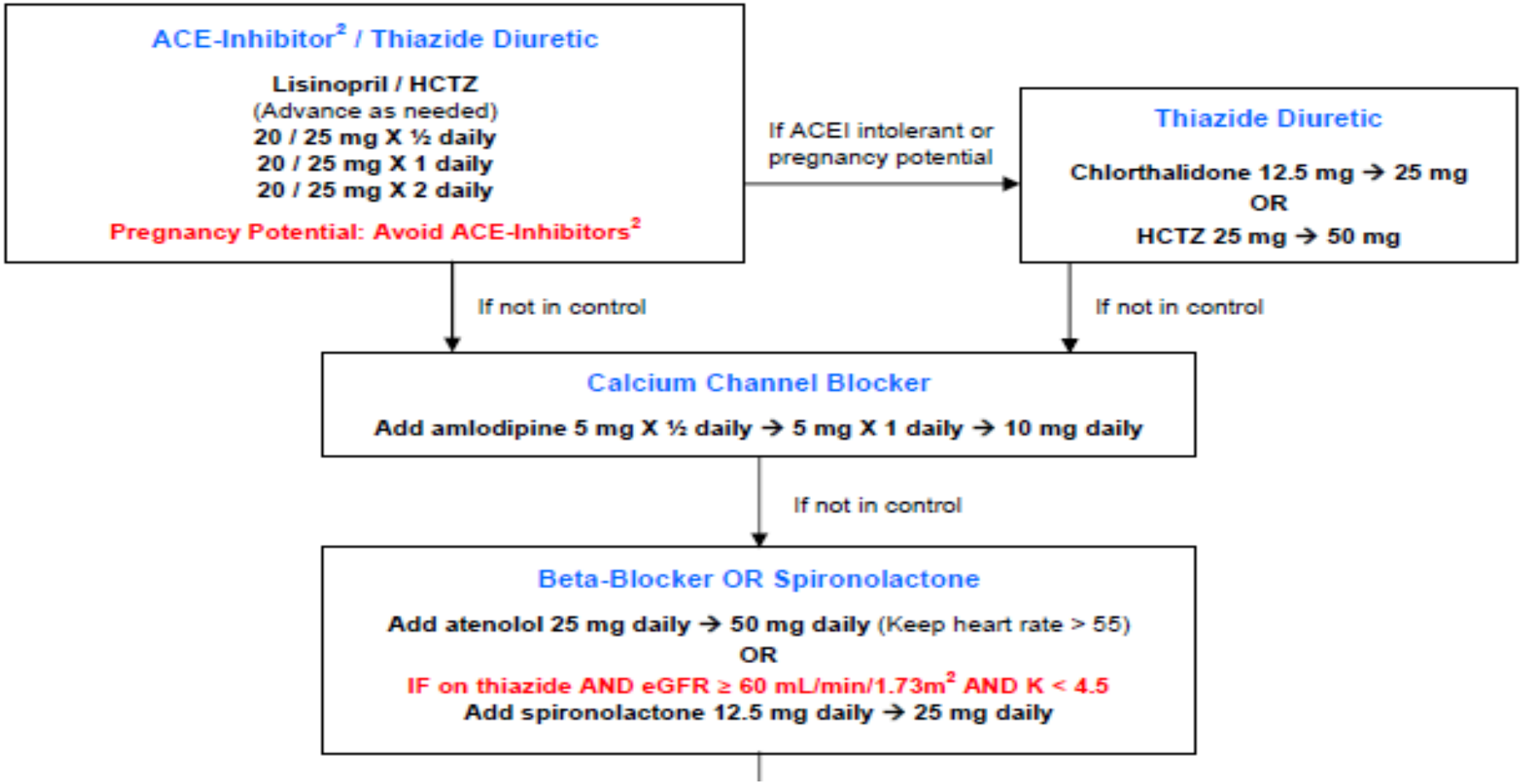
KP HTN Treatment Algorithm

3 Meds to Max Dose in 6 Steps



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NCQA-HEDIS Hypertension Control Specifications

Inclusion & Exclusion Criteria

- Denominator Inclusion criteria:
  - Continuous enrollment and with hypertension diagnosis confirmed one or more times in the medical record on or before June 30 of the measurement year.
  - Ages 18 to 85 (ages 46 to 85 prior to 2006.) :
- Denominator Exclusion criteria
  - ESRD
  - Pregnancy
  - Admission to a non-acute inpatient setting any time during the measurement year

NCQA-HEDIS Hypertension Control Specifications

Numerator compliant:

- Blood pressure reading from the most recent visit at goal
- AND this reading must be from the measurement year.
- AND this reading must be recorded after the diagnosis of hypertension was made.
- AND lowest systolic recorded for a single date < 140 mm Hg
- AND lowest diastolic recorded for a single date <90 mm Hg (<= 90 mm Hg before 2006)

NOTE – representative systolic and diastolic results need not be from the same reading.

NCQA-HEDIS Hypertension Control Specifications

Measurement exclusion criteria:

- Measurement from visit for the sole purpose of having diagnostic tests or surgical procedures performed, e.g., sigmoidoscopy
- Measured on the same day as a major diagnostic or surgical procedure, e.g., stress test, endoscopy
- Self-reported measurements.

NCQA-HEDIS Hypertension Control Specifications

NCQA-HEDIS Sample

- Random sample based on NCQA-HEDIS specifications
- Sample size is small - ranges between 305 and 411 each year

Internal Hypertension Control Reports

- Developed for Purpose of Quality Improvement
- All KPNC members eligible for the NCQA HEDIS hypertension control metric. As not limited to a random sample, much larger n.

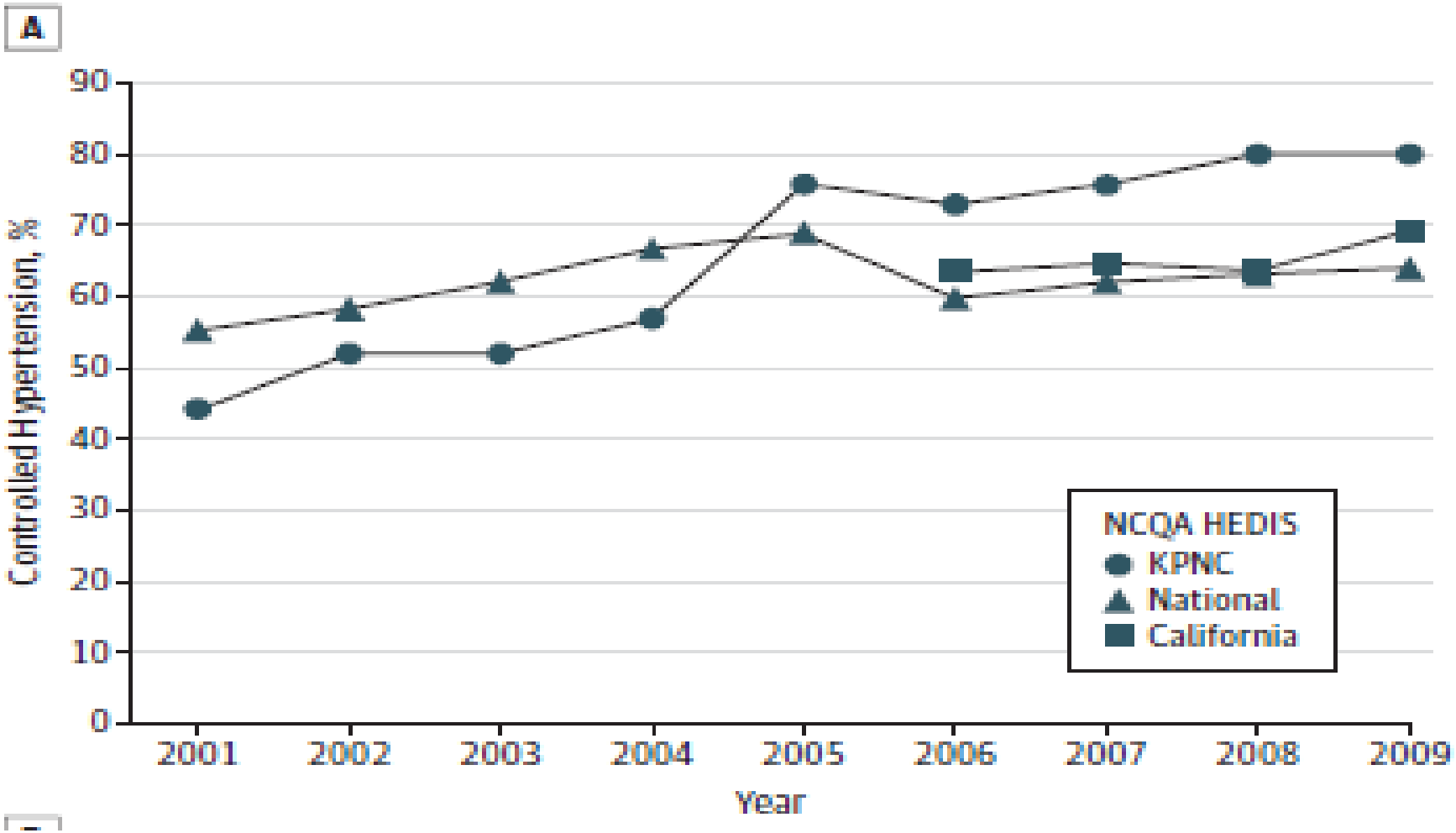
Sample sizes 2001 to 2009

- NCQA
  - n = 305 to 411
- Internal Control Metric
  - N = 234,852 in 2001 → 353,256 in 2009.
- Hypertension Registry
  - 349,937 (15.4% of adult KPNC membership) in 2001 → 652,763 (27.5% of adult KPNC membership) in 2009

Culture of Quality Improvement and Accountability

- Annual Quality Goal Targets
- Un-blinded Medical Center Performance Reports
- Central Hypertension Management Team identified Best Practices
- Medical Center Cardiovascular Risk Reduction Teams to Support Physicians
- Best Practices Disseminated through Regional Peer Meetings
- Clinic-level feedback to facilitate operational and system-level change.

KPNC NCQA HEDIS Control Rate vs. National and California Rates



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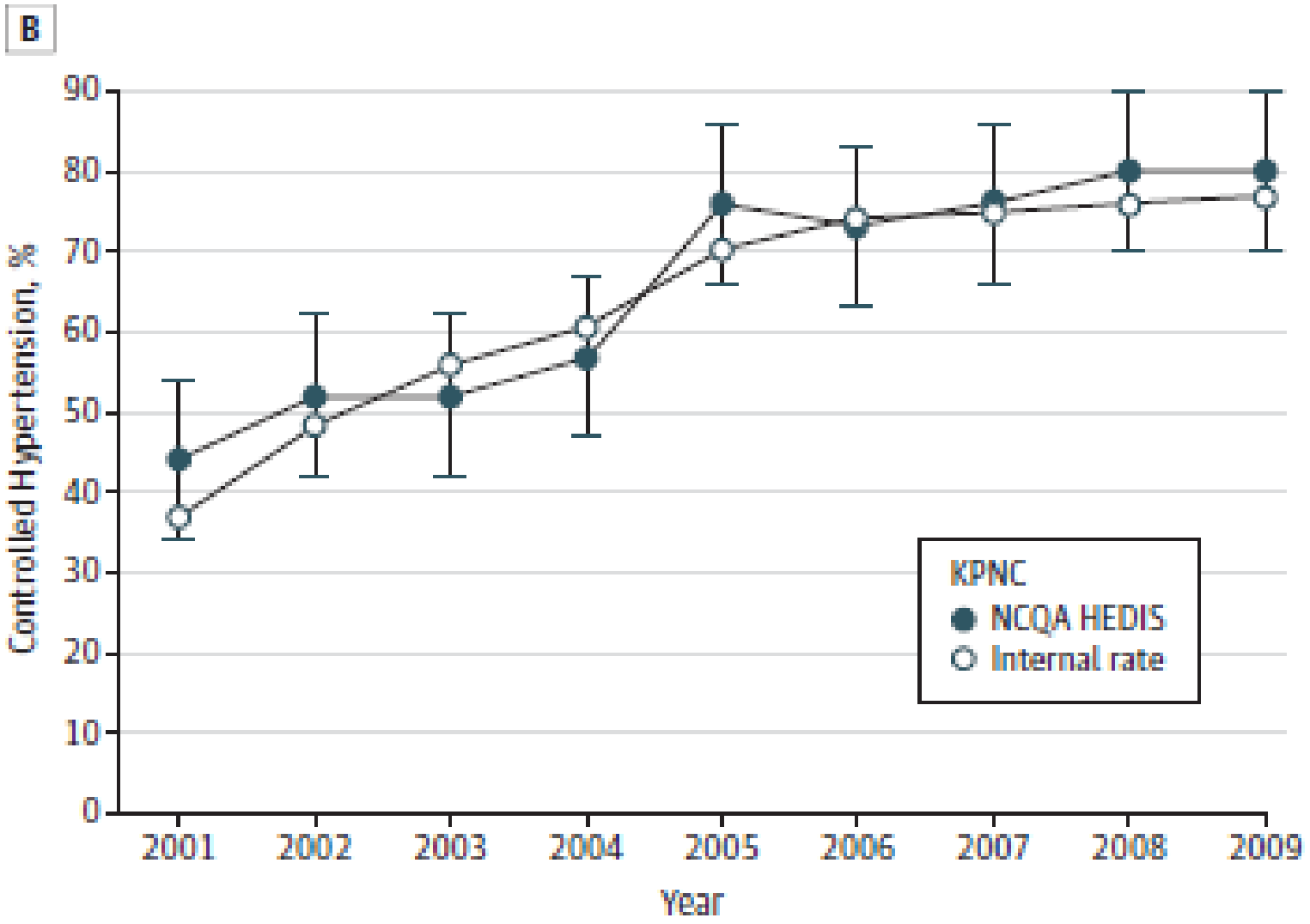
KPNC NCQA HEDIS Control Rate vs. Internal Control Rate



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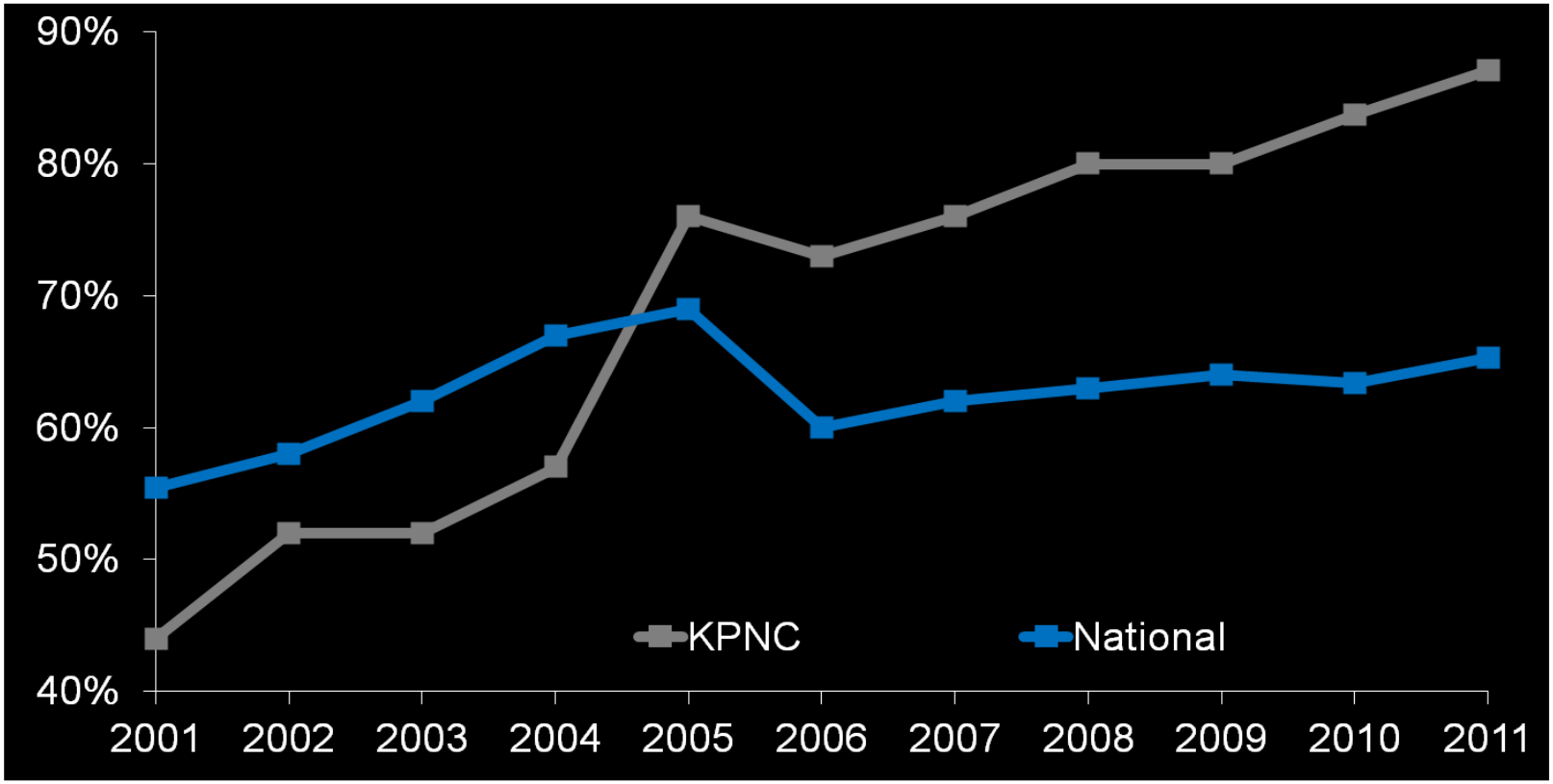
Commercial NCQA-HEDIS HTN Control Rate Through 2011 – KPNC vs. National



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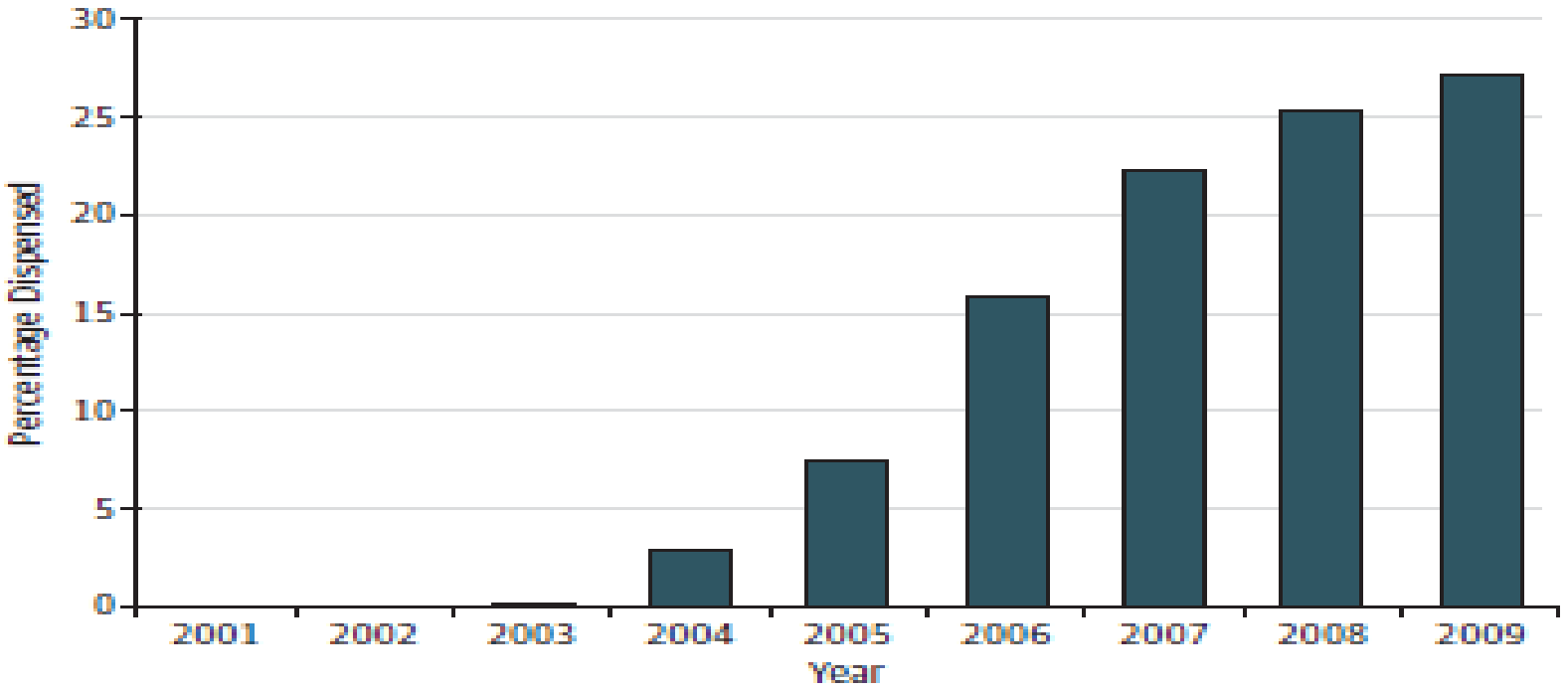
Percentage of ACE-I Prescriptions dispensed as Single-Pill Combination (SPCs) tablets

Figure 2. Percentage of Angiotensin-Converting Enzyme Inhibitor Prescriptions Dispensed as Single-Pill Combination Angiotensin-Converting Enzyme Inhibitor–Hydrochlorothiazide Combination Tablets for Kaiser Permanente Northern California Members, 2001-2009



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Medical Assistant BP Measurement Checks

Because Doctor Office Visits are neither cost-effective nor convenient for BP measurement

- EHR enables asynchronous communication
- MA Measurement reduces white-coat effect
- Enhanced compliance because of
  - No co-pay
  - Member convenience - delays are rare
- Enables “repatriation” to Primary Care when BP measurement is high outside of Primary Care.

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EHR at Point of Care – 2nd BP Best Practice Alerts

- Fires if initial BP > 139/89
- Calls for 2nd BP using optimal technique
- Age specific
  - 69 years old or younger: repeat BP done sitting
  - 70 years old or older: repeat BP done standing

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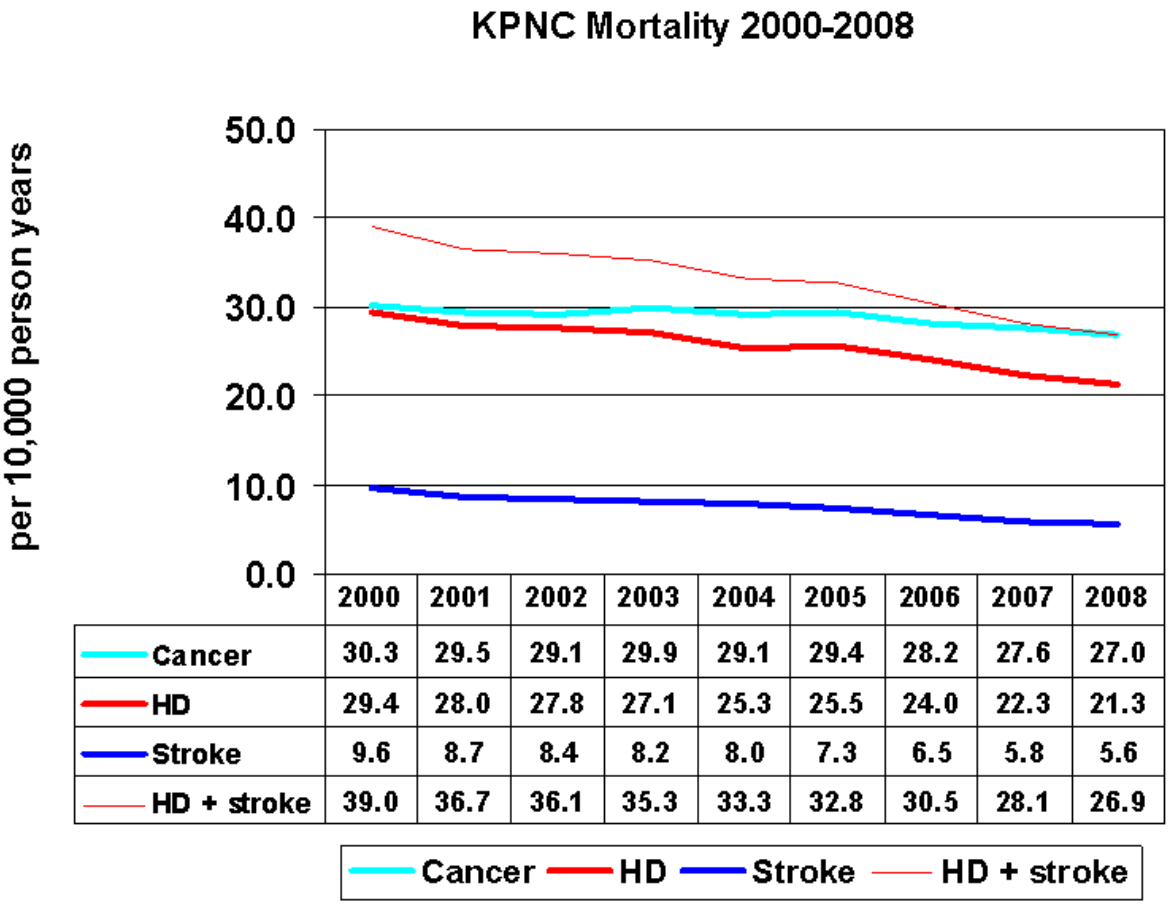
Falling CV Morbidity and Mortality - KPNC



	2000	2001	2002	2003	2004	2005	2006	2007	2008
Cancer	30.3	29.5	29.1	29.9	29.1	29.4	28.2	27.6	27.0
HD	29.4	28.0	27.8	27.1	25.3	25.5	24.0	22.3	21.3
Stroke	9.6	8.7	8.4	8.2	8.0	7.3	6.5	5.8	5.6
HD + stroke	39.0	36.7	36.1	35.3	33.3	32.8	30.5	28.1	26.9

Since Year 2000:

- **30.4% reduction** in mortality from CVD
- **42.2% reduction** in mortality from stroke
- **10.9% reduction** in mortality from cancer

Sidney S, Jaffe M, Nguyen-Hyunha M, Kushi L, Young J, Sorel M, Selby J, Go A. Closing the Gap Between Cardiovascular and Cancer Mortality in an Integrated Health Care Delivery System, 2000-2008: The Kaiser Permanente Experience. Circulation 2011; 124: A13610

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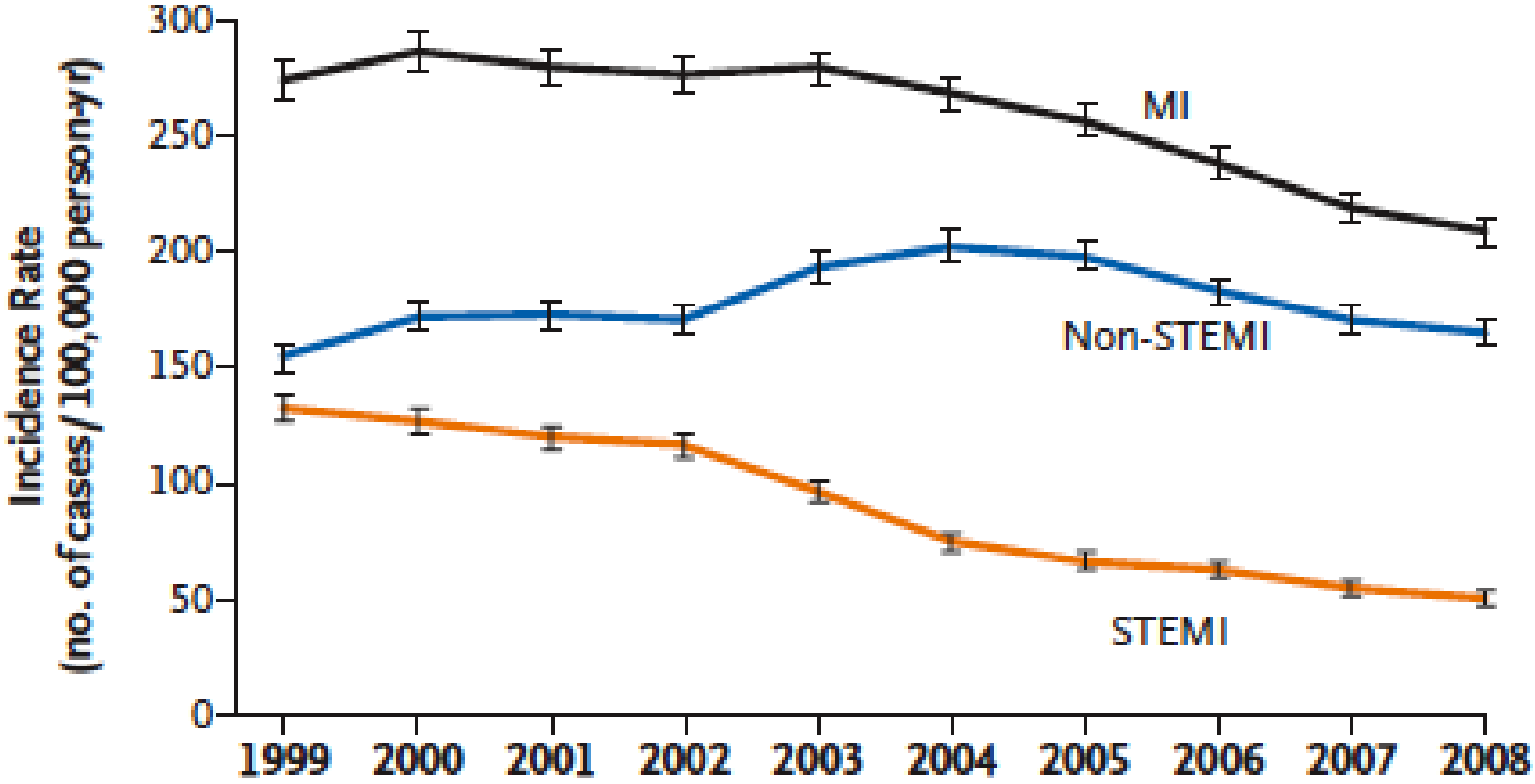
Falling CV Heart Attack Rates - KPNC



Yeh RW, Sidney S, Chandra M, Sorel M, Selby JV, Go AS. Population trends in the incidence and outcomes of acute myocardial infarction. N Engl J Med 2010;362:2155-165.

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Key Elements of a Comprehensive Large-Scale Hypertension Control Program

- Hypertension Registry, Comprehensive
  - Performance Metrics, Transparent and Widely Visible
- Clinic-level feedback to facilitate operational and system-level change.
- Treatment Algorithm
  - Evidence-Based
  - Simple, Implementable
- Single Pill Combination (SPC) pharmacotherapy
- Medical-Assistant BP Checks
  - Better leverage ancillary staff skills
  - Reduced barriers to patients
- Medical Assistant BP Best Practice Alert at Point of Care / Electronic Heath Record (EHR)

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