

# USING SYSTEMS IMPLEMENTATION STUDIES TO IMPROVE OSTEOPOROSIS SCREENING

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# Osteoporosis Consequences

- **1.5 Million Bone Fractures Annually Including**
  - Hip Fractures
  - Vertebral (Spine) Fractures
  - Wrist and Other Fractures
- **Annual Consequences of Hip Fractures**
  - 24% will die from complications
  - 25% will require long-term care



# Silent Conditions

## CONDITION

High cholesterol 

Hypertension 

Osteoporosis 

## COMPLICATION

Myocardial infarction

Stroke

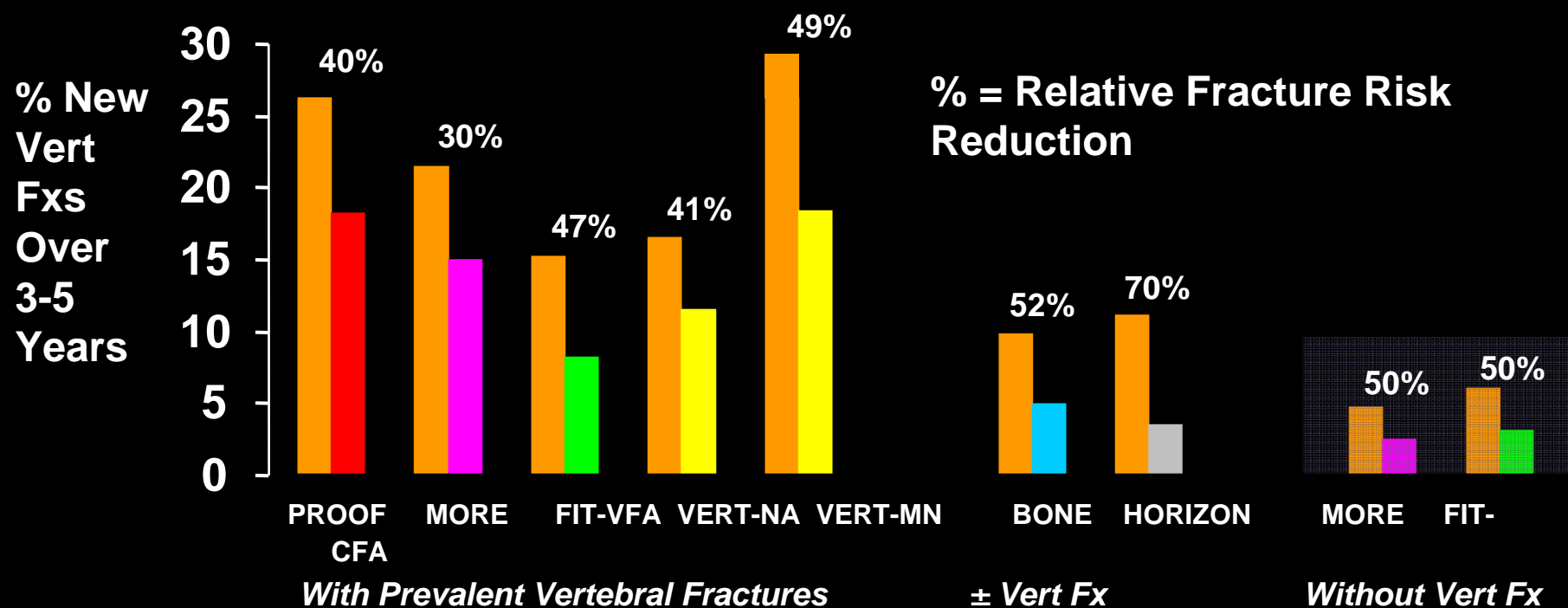
Fracture

The only way to identify people with these conditions prior to their first complication is to make a measurement

# Vertebral Fracture Effects In Prospective RCTs

Direct Comparisons Among Trials Cannot Be Made

■ Calcium 
 ■ CT 
 ■ RLX 
 ■ ALN 
 ■ RIS 
 ■ IBN 
 ■ ZOL



Chesnut CH, et al. *Am J Med.* 2000;109:267  
 Black DM, et al. *Lancet.* 1996;348:1535  
 Harris ST, et al. *JAMA.* 1999;282:1344  
 Chesnut CH, et al. *J Bone Miner Res.* 2004;19:1241

Ettinger B, et al. *JAMA.* 1999;282:637  
 Cummings SR, et al. *JAMA.* 1998;280:2077  
 Reginster J, et al. *Osteoporos Int.* 2000;11:83  
 Black DM, et al. *N Engl J Med* 2007;356:1809

# Low Rates of Treatment After Hip Fracture

## HEDIS<sup>®</sup> Measures 2003

### Medicare Disease Management Rates<sup>1</sup>

<b>Disease Management</b>	<b>Rates, %</b>
<b>Beta blocker after MI</b>	<b>94</b>
<b>Breast cancer screening</b>	<b>74</b>
<b>Colorectal cancer screening</b>	<b>50</b>
<b>Dx or Rx after fracture</b>	<b>18</b>

HEDIS = Health Plan Employer Data and Information Set; MI = myocardial infarction.

1. The National Committee For Quality Assurance. The state of health care quality 2004.  
NCQA Washington, DC.

# Osteoporosis HEDIS

## Trends, 2003 - 2004

Year	Medicare
2003	18.0 %
2004	19.0 %

# Osteoporosis HEDIS

## Trends, 2003 - 2005

Year	Medicare
2003	18.0 %
2004	19.0 %
2005	20.1 %

# Osteoporosis HEDIS

## Trends, 2003 - 2007

Year	Medicare
2003	18.0 %
2004	19.0 %
2005	20.1 %
2006	21.8 %
2007	20.7%

# Current Osteoporosis Care Gaps

- How well are we treating people?
  - After a fracture 15% of patients receive bisphosphonates<sup>1</sup>
  - After a fracture 30% of patients receive calcium and vitamin D<sup>1</sup>
- How well are we screening people?
  - 30% of women >65 have had a BMD (bone mineral density) test in the last 5 to 7 years<sup>2</sup>
  - 40% to 73% of women get a repeated BMD<sup>2</sup>
- How well are we diagnosing people?
  - >50% of women and 75% of men with osteoporosis are undiagnosed<sup>3</sup>
  - By age 85, >80% of osteoporosis goes undiagnosed<sup>3</sup>
  - After a fracture only 30% of patients get diagnosed<sup>1</sup>

1. Teng GG, et al. *Curr Osteoporos Rep.* 2009;7:27-34.

2. Curtis JR, et al. *J Bone Miner Res.* 2008;23:1061-1067.

3. Bone Health and Osteoporosis: A Report of the Surgeon General. 2004.

# **Selected Osteoporosis Evidence Implementation Interventions Post Fracture**

## ***Hospital interview and 6-month call***

- **Doubled osteoporosis management by PCP<sup>1</sup>**

## ***Faxed clinician reminders***

- **3X increase in BMD testing and treatment<sup>2</sup>**

## ***Guidelines to PCPs and educational materials to patients***

- **Increased BMD testing and discussion with MDs<sup>3</sup>**

1. Gardner MJ et al. *J Bone Joint Surg Am.* 2005;87:3-7.

2. Majumdar SR et al. *Ann Intern Med.* 2004;141:366-373.

3. Cuddihy MT et al. *Osteoporos Int.* 2004;15:695-700.

# Selected Osteoporosis Post Fracture Interventions (cont)

*Fx liaison service or bone doc referral*

- Increased BMD testing<sup>1</sup>
- Increased investigation and follow-up but NOT treatment<sup>2</sup>
- Offered BMD in orthopedic clinic<sup>3</sup>

1. McLellan AR et al. *Osteoporos Int.* 2003;14:1028-1034.

2. Hawker G et al. *Osteoporos Int.* 2003;14:171-178.

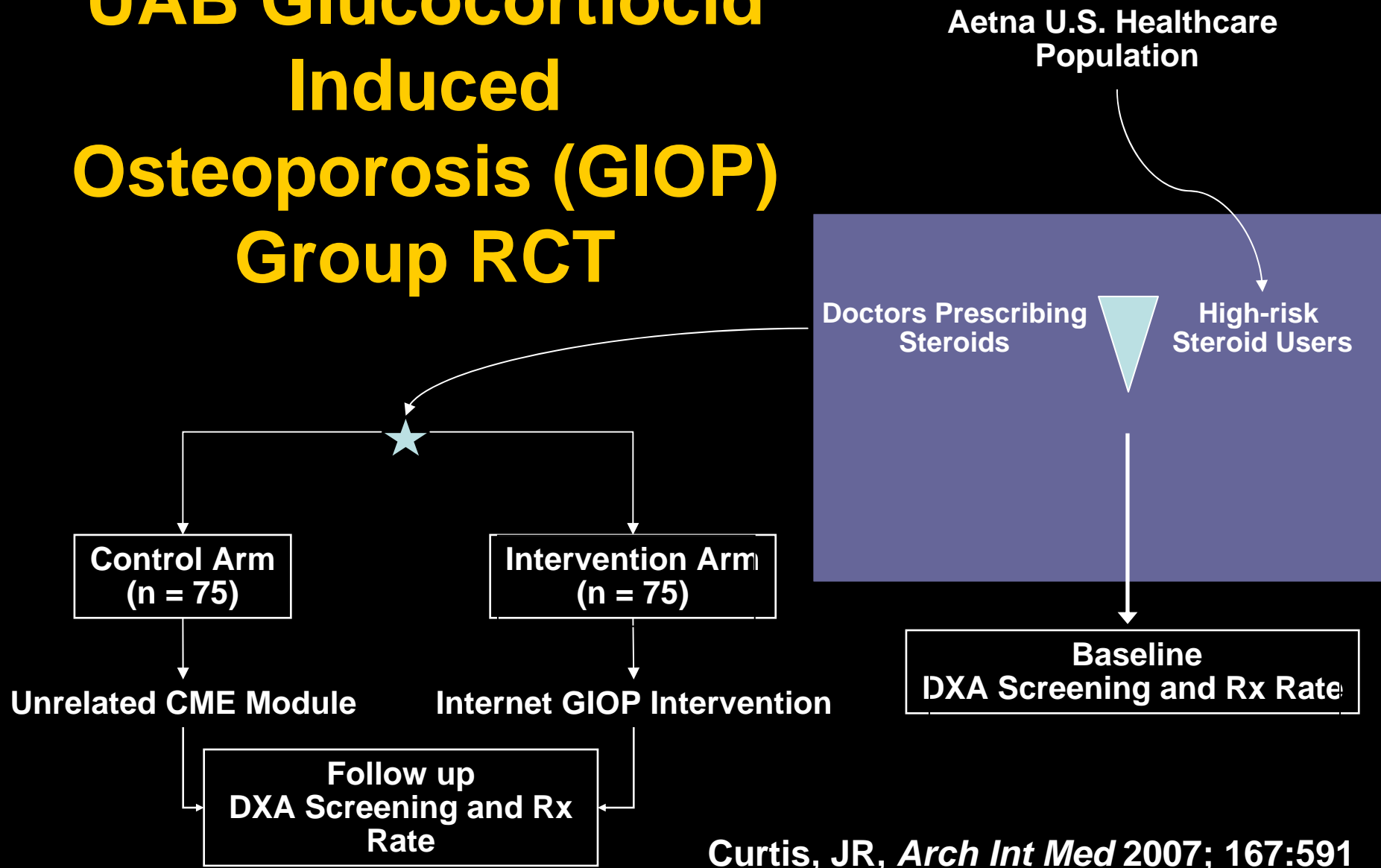
3. Johnson SL et al. *Osteoporos Int.* 2004;16:1079-85.

# System Strategies

## Closed Health Systems - Geisinger Clinic

- Implementation of an osteoporosis disease management program
  - Clinical practice guidelines
  - Physician and allied healthcare provider education
  - Bone density testing program
- Outcomes measured
  - Decreased age adjusted incidence hip fractures
  - Reduced costs by \$7.8 million over 5 yrs

# UAB Glucocorticoid Induced Osteoporosis (GIOP) Group RCT

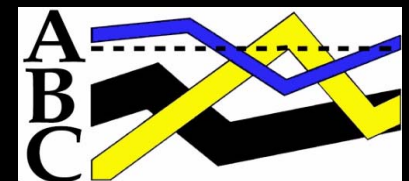


Curtis, JR, *Arch Int Med* 2007; 167:591

# GIOP Internet Intervention

- Access via e-mail
- Tailored presentation
- Case-based interactive learning
- Personal data feedback using Achievable Benchmark of Care (ABC™)
- Improvement “toolbox”
- Printable CME certificate
- Continued exposure to combat “decay”

Kiefe C. *JAMA* 285(22):2871-2879, 2001.



# GIOP Group RCT Results

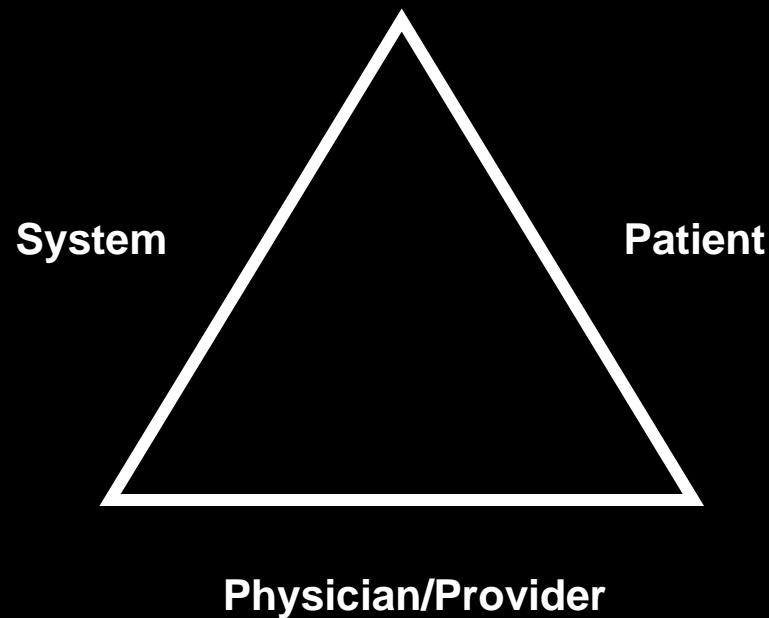
## % Receipt

<b>Intent-To-Treat</b>	<b>Intervention (n = 76 docs)</b>	<b>Control (n = 73 docs)</b>	<b>p-value</b>
BMD	19	21	NS
Prescription Rx	26	24	NS
<b>Per Protocol*</b>	<b>(n = 27 docs)</b>	<b>(n = 18 docs)</b>	<b>p-value</b>
BMD	26	16	0.04
Bisphos Rx	24	17	0.09
BMD or Rx	54	44	0.07

Curtis, JR, *Arch Int Med* 2007; 167:591

\* Completed all 3 modules

# Alternate Evidence Implementation Approaches in Osteoporosis

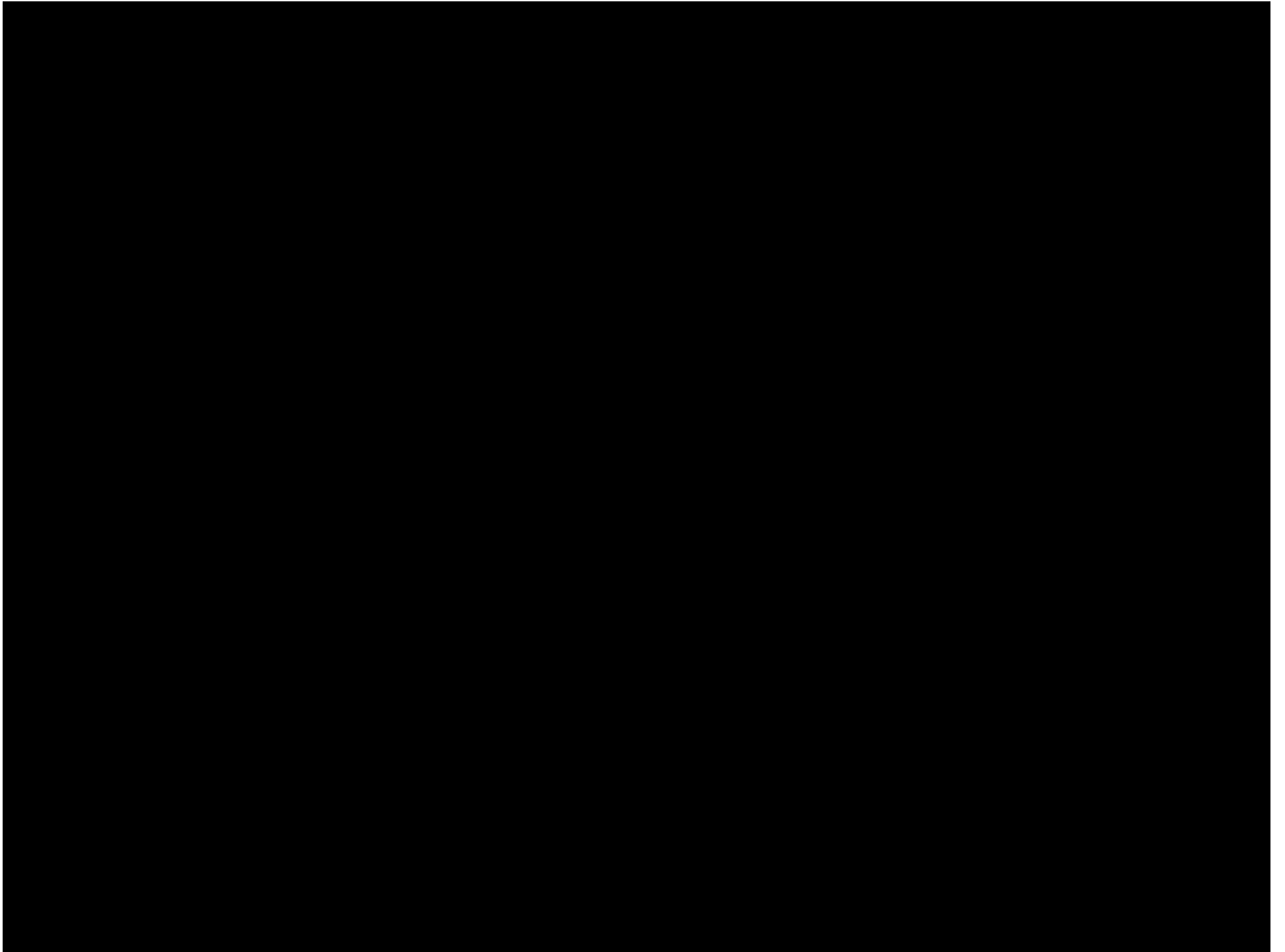


# Designing Evidence-Based Interventions to Overcome Barriers to Best Practice in Osteoporosis

- System level
  - Lack of information systems ( i.e., registries with real time reminders); access; reimbursement
- Physician level
  - Lack of knowledge; **lack of time** ; clinical inertia
- Patient level
  - Lack of information; symptomatic vs preventive care bias; preferences, demands, expectations; non-adherence

# New UAB Approaches to Improve Osteoporosis Prevention and Treatment

- Target health care system and “activate” patients (ICOMMIITT, NIH)
- Test feasibility and potential effectiveness in different health care systems (Home Health, AHRQ)
- Engage at other points in care such as when filling prescriptions (Within Our Reach Program, ACR)



# **Improving Care of Osteoporosis Multi-Modal Intervention to Increase Testing and Treatment (ICOMMIITT) Interventions at the Patient and System Level**

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**Centers for™  
Education &  
Research on  
Therapeutics**

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Amgen

# Improving Rates of BMD Screening in Women at Risk for Osteoporosis

- ~1.5 million fractures occurred as a result of osteoporosis annually<sup>1,2</sup>
- Many of fractures preventable with current osteoporosis treatments<sup>3</sup>
- Bone Mineral Density (BMD) testing
  - Gold standard for diagnosing osteoporosis<sup>4-6</sup>
  - Strong predictor of fragility fracture<sup>7</sup>
- National guidelines recommend BMD in all women  $\geq 65$  years old<sup>2,8,9</sup>
- <30% of women  $\geq 65$  years old received BMD testing<sup>10,11,12</sup>
- Additional BMD testing could prevent over 35,000 fractures and save Medicare nearly \$78 million<sup>10</sup>

1 Riggs BL, et al. Bone 1995; 17: 505S-511S

2 US Dept HHS [www.surgeongeneral.gov/library/bonehealth/content.html](http://www.surgeongeneral.gov/library/bonehealth/content.html)  
[www.ahrq.gov/clinic/3rduspstf/osteoporosis/osteorr.pdf](http://www.ahrq.gov/clinic/3rduspstf/osteoporosis/osteorr.pdf)

3 Kern LM, et al. Ann Intern Med 2005; 142: 173-81

4 Barrett-Connor E, et al. JBMR 2005; 20: 185-94,

5 Johnell O, et al. JBMR 2005; 20: 1185-94

6 Nevitt MC, et al. JBMR 2005; 20: 131-40

7 Marshall D et al. BMJ 1996; 312: 1254-59

8 US Prev Serv TF

9 NOF <http://www.nof.org/physguide/diagnosis.htm>

10 King AB, et al. Osteo Int 2005; 16: 1545-57

11 Curtis JR, et al. JBMR 2008; 23: 1061-67

12 Curtis JR, et al. Arch Int Med 2007; 167: 591-96

# Specific Aims

## ICOMMIITT

- Develop and pilot test a multimodal intervention to improve osteoporosis testing and treatment with system, patient, and provider components
  - **Provider intervention** – Web-based osteoporosis CME to providers affiliated with the selected patients
  - **System intervention** – Alert patients to receive BMD test and provide direct access to schedule a DXA
  - **Patient intervention** – Educate and activate women  $\geq 65$  about osteoporosis testing and treatment and improve patient-provider communication
- Conduct a group-randomized trial of the three interventions with women  $\geq 65$  not previously tested or treated for osteoporosis
  - Unit of randomization is Kaiser primary care clinic
  - Unit of analysis is the patient

# Specific Aims – Hypotheses

## ICOMMIITT

- Determine the differential impact of the three interventions on:
  - Greater BMD testing rates
    - H1: Any System > Provider alone
    - H2: System + Patient > System
  - More prescription therapy and fewer clinical fractures:
    - H3: Any System > Provider alone
  - More osteoporosis treatment with BMD below intervention threshold T-score of -2.5
    - H4: System + Patient > Provider alone

# Specific Aims – Hypotheses

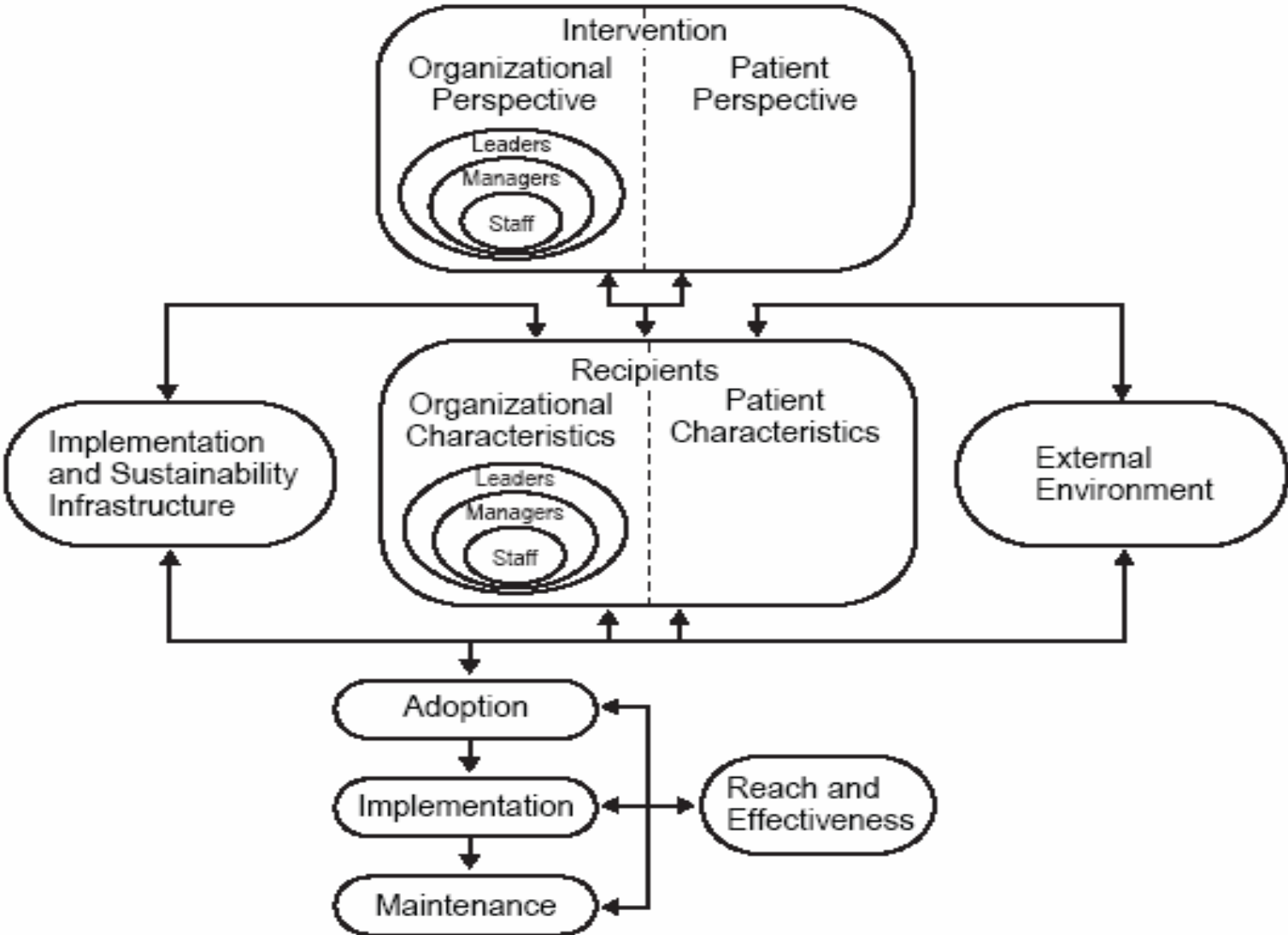
## ICOMMIITT

- To further determine the impact of the three interventions on additional outcomes, we will survey study patients 6 months post-intervention to evaluate:
  - Osteoporosis-related patient-provider communication
    - H5: System + Patient > Provider alone
  - Use of calcium and vitamin D
    - H6: System + Patient > Provider alone

# Transtheoretical Model of Behavior Change Stages

	Model Stages	Definition
Stage 1	Precontemplation	Individual not intending to take action in foreseeable future.
Stage 2	Contemplation	Individual intending to take action in foreseeable future
Stage 3	Preparation	Individual intending to take action in immediate future and taken some small action steps
Stage 4	Action	Individual made overt changes in behavior
Stage 5	Maintenance	Individual sustained overt changes over time

The Practical Robust Implementation and Sustainability Model (PRISM)



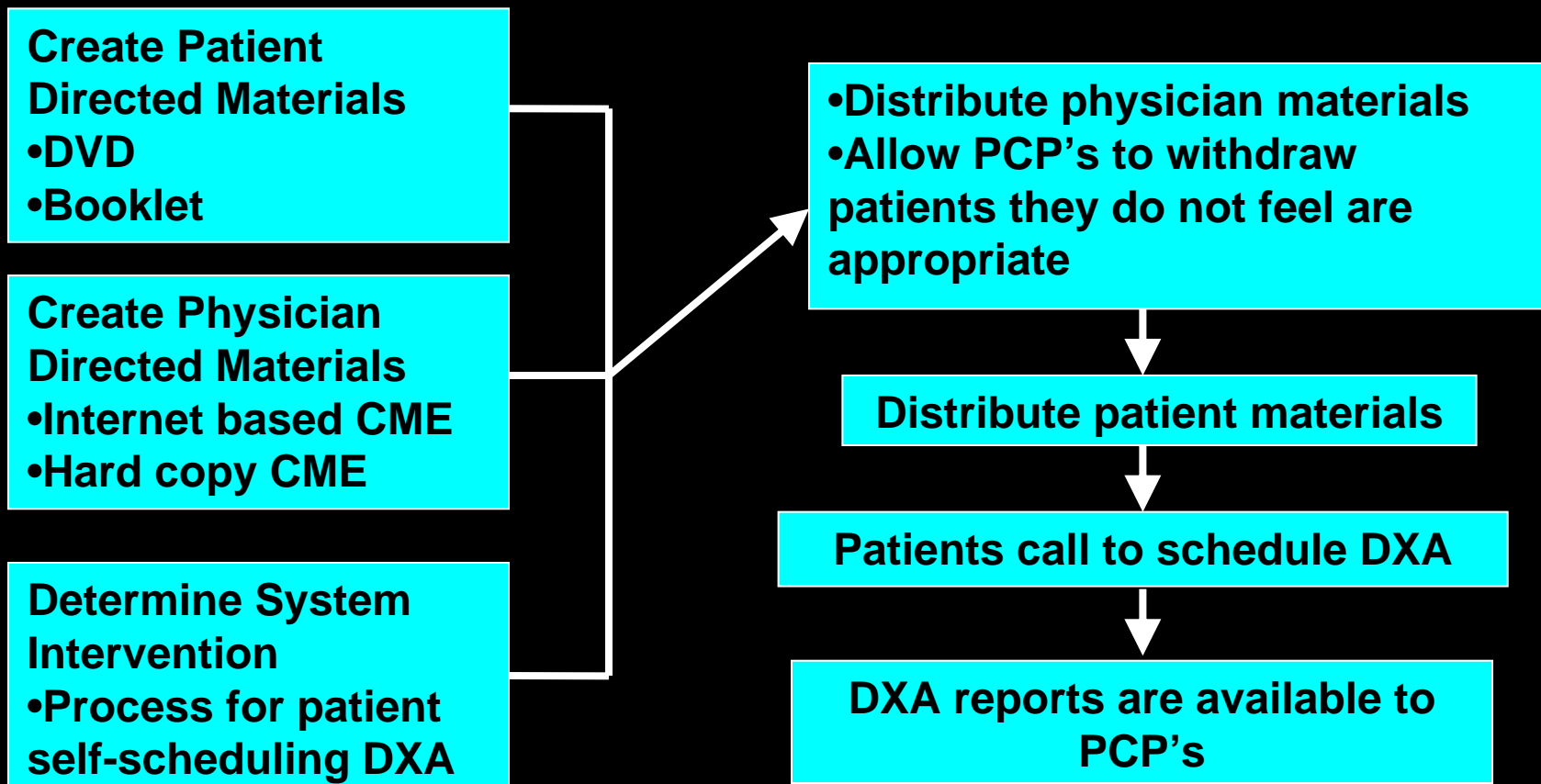
# Methods - Study Population

## ICOMMIITT

- **Eligible Patients:**
  - All women  $\geq$  65 years old with a Primary Care Provider (PCP) at a KP facility
- **Exclusions (based on KP Health Record or Pharmacy data):**
  - Prior DXA scan (previous 5 years)
  - Use of anti-osteoporosis medication (except estrogen) (previous 5 years)
  - Osteoporosis diagnosis (previous 12 months)
  - Chronic renal failure (Stage 4 or 5) (previous 12 months)
  - Chemotherapy treatment (previous 6 months)
  - HIV diagnosis or anti-retroviral agents
  - Hospice and long term care (previous 12 months)
  - PCP indication to not be tested

# Methods - Study Design

## ICOMMIITT



# Provider Intervention

## ICOMMIITT

- Usual care
- Web based CME of 5 case studies
- Objectives recognize patients at risk for osteoporosis and determine appropriate testing and treatment options
- Input from KP clinicians familiar with KP system

# System & Patient Interventions

## ICOMMIITT

- Letter (System and Patient)
  - Who, What, Where, When, & Why's of DXA scans
  - Invites patient to self-schedule a DXA
  - Telephone number for self-scheduling
- Folio (Patient Only)
  - Stories and quotes from patient interviews
  - Quick tips about prevention and treatment
  - Facts about osteoporosis
  - Telephone number for self-scheduling
  - Content developed and reviewed by group
  - KP graphic designer designed layout

# Patient Intervention

## ICOMMIITT

- DVD (Patient only)
  - Collaboration with Dr. Jean Bodon and CME (UAB) and KP Media Relations Manager
  - Patient interviews (n = 6)
  - Interview segments rated by team<sup>1</sup>
    - Ratings based on strength and clarity of message
    - Scale: 1 = Low, 2 = Medium, 3 = High
    - Ratings compiled and discrepancies discussed
    - Raters also provide general comments
      - Filmed patients in real world settings to supplement interview
      - Filmed KP physician and UAB instructor for doctor segments

<sup>1</sup> Kreuter, M. *Journal of Cancer Survivorship*. 2008; 2 (1): 33-44

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## UAB

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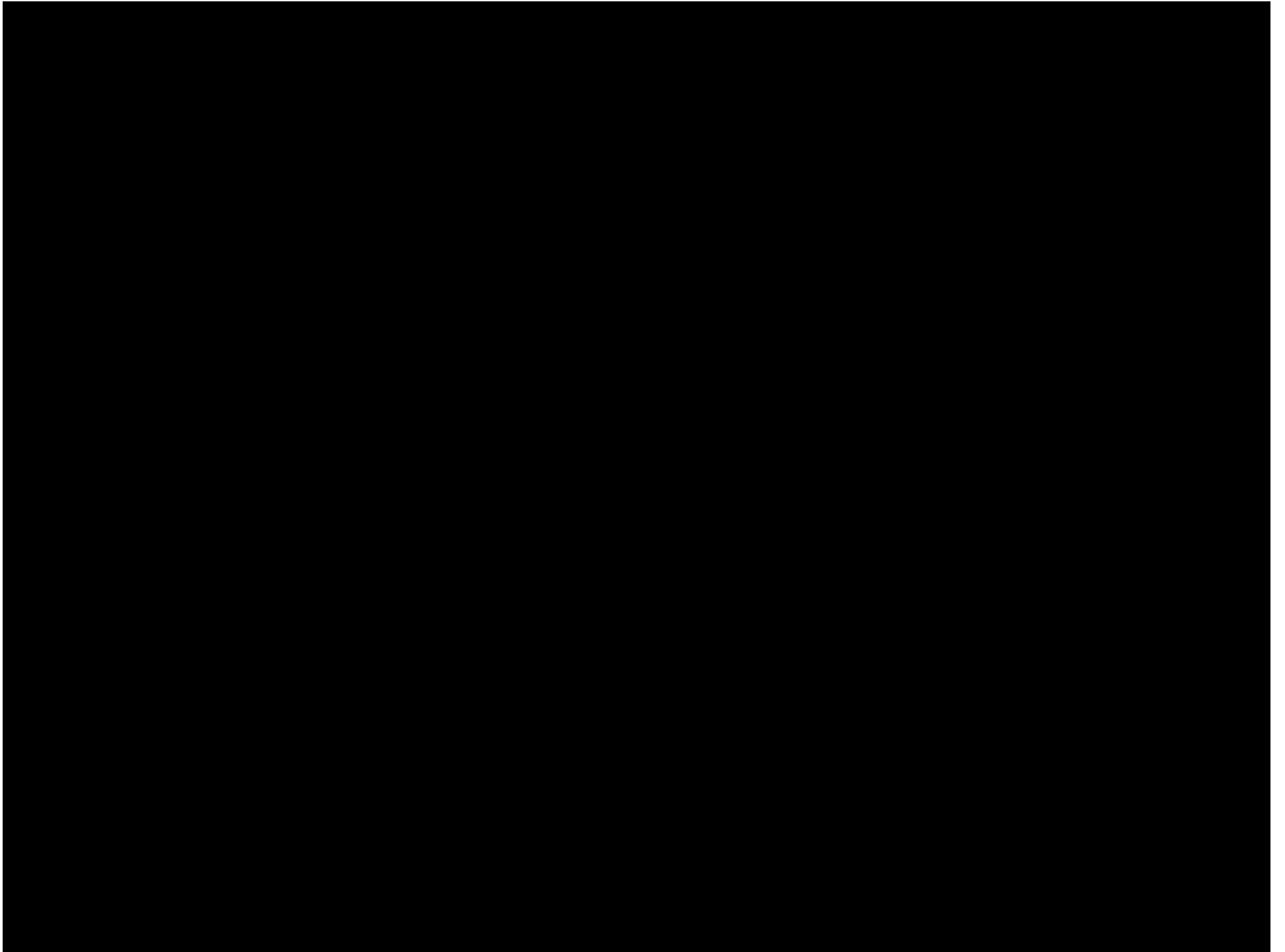
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hmo research network





# A High Intensity Intervention to Prevent Fractures in Home Health Patients

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**SCHOOL OF PUBLIC HEALTH**



U18HS1038

# Disclosures

# Osteoporosis Treatment Rates among Home Health Patients

	<b>N</b>	<b>Prescription Medications (%)</b>	<b>Estrogens (%)</b>	<b>Calcium ± D (%)</b>
<b>Patients with Fractures</b>	<b>497</b>	<b>17</b>	<b>7</b>	<b>21</b>
<b>Patients with Hip Fractures</b>	<b>130</b>	<b>15</b>	<b>6</b>	<b>20</b>
<b>Osteoporosis Diagnosis</b>	<b>263</b>	<b>61</b>	<b>14</b>	<b>33</b>

Arthritis & Rheumatism (Arthritis Care & Research)  
 Vol. 55, No. 6, December 15, 2006, pp 971–975  
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CONTRIBUTION FROM THE FIELD

## Osteoporosis in the Home Health Care Setting: A Window of Opportunity?

JEFFREY R. CURTIS,<sup>1</sup> YOUNG KIM,<sup>1</sup> TARA BRYANT,<sup>2</sup> JEROAN ALLISON,<sup>1</sup> DANA SCOTT,<sup>2</sup> AND KENNETH G. SAAG<sup>1</sup>

# **Home Health Osteoporosis Intervention**

## **Overview**

- **Multimodal Intervention Targeted Primarily at Nurses**
- **Main Outcome Measure:**
  - **Proportion of high risk patients treated with bisphosphonates or other anti-osteoporosis medications**
- **Patient Population**
  - **Receiving home health care**
  - **History of fracture after age 50**
  - **Not in hospice care**

# **Intervention Development**

## **Physician**

- **Desired Response**
  - **Order calcium and vitamin D**
  - **Prescribe medications**
- **Physician Materials**
  - **Care algorithm & FAQs**
  - **Prepared order sheets**
- **Focus Group - Nominal group technique**
  - **Primary care physicians with home health patients**
  - **What patient information do they want?**
  - **How do they want it communicated?**

# **Intervention Development**

## **Nurses**

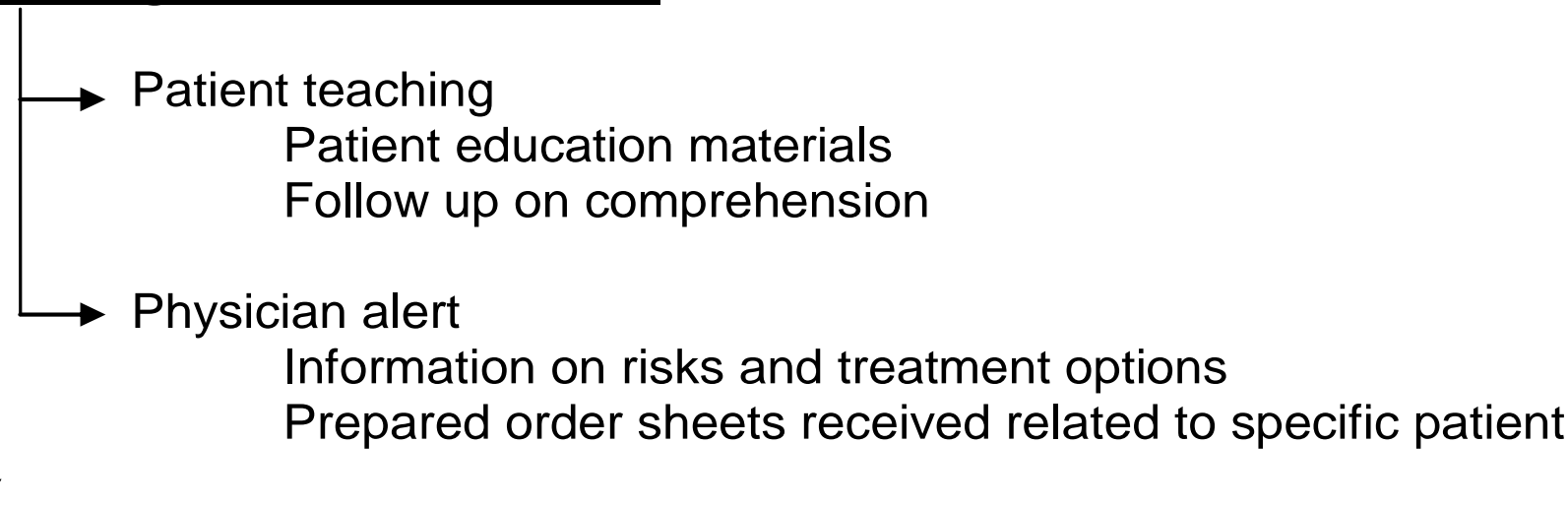
- **Desired Response**
  - **Identify patients at risk for osteoporosis**
  - **Teach patients about osteoporosis risks and treatments**
  - **Communicate with physicians to increase osteoporosis treatment rates**
- **In-service training**
  - **General information on osteoporosis**
  - **Information on osteoporosis therapies**
    - **Diet and exercise**
    - **Supplements**
    - **Medications**

# Home Health OP Process Flowsheet

## Patient Identified as High Risk (Primary or Secondary Diagnosis of Fracture)

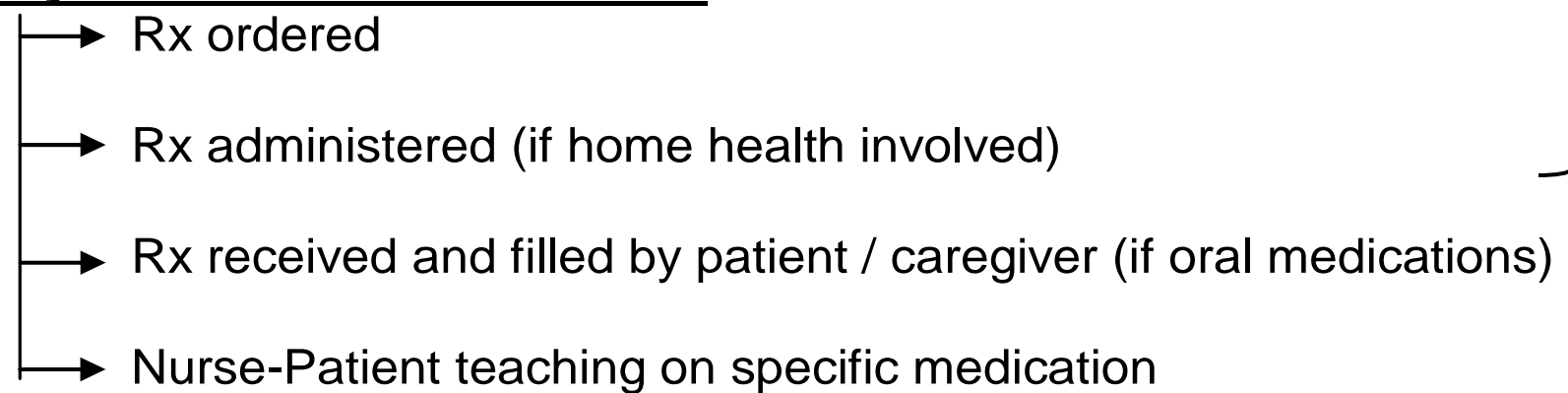


### Nursing Care Plan Activated



Information  
Captured  
in EMR

### Physician Order for Treatment



Information  
Captured  
in EMR

# Home Health Nursing Actions

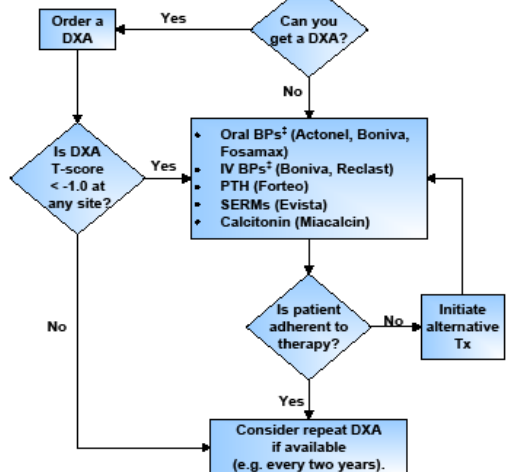
- **Identification of Patients at Risk**
  - Pre-admission diagnosis
  - Fall risks assessment
  - Quality assurance review
- **Written Materials/EMR Prompts**
  - Coordinate with Alacare patient education specialists
  - Nursing Diagnosis Pathway
    - Programmed into EMR
    - Physician alert for untreated high risk patients
    - Patient teaching goals
    - Patient comprehension assessment

# Physician Osteoporosis Information

## Osteoporosis Testing and Treatment for Home Health and Long Term Care Patients with a Prior Fracture

- Recommended lab tests:
  - Serum Calcium, Creatinine (calculate GFR<sup>1</sup>), Alkaline Phosphatase
- Supplemental lab tests:
  - Serum 25 (OH) vitamin D level
  - Intact PTH, if calcium is elevated
  - TSH, if on thyroid medication
  - SPEP, if clinical suspicion for myeloma

- Calcium: 500mg twice daily
- Vitamin D: 50,000 IU of D<sub>2</sub> (ergocalciferol) once a week for 12 weeks, thereafter 50,000 IU of D<sub>2</sub> (ergocalciferol) once monthly indefinitely
- Fall risk prevention measures<sup>†</sup>
- Weight bearing exercise (e.g. walking)



<sup>1</sup>Glomerular Filtration Rate (GFR) = [(140-age) x weight]/(creatinine x 72)(x .85 for women)

<sup>†</sup>See other side of card for list of measures (Item #4)

<sup>‡</sup>Assuming no contraindications (e.g., GFR <30-35 ml/min)

BP – bisphosphonate; DXA – dual energy X-ray absorptiometry; IU – international unit; IV – intravenous; (OH)D – hydroxyvitamin D; PTH – parathyroid hormone; SERM – selective estrogen receptor modulator; SPEP – Serum Protein Electrophoresis; TSH – thyroid-stimulating hormone; Tx – Treatment

### 1. Do I need a DXA to start treatment?

No. For many home health or long term care patients, obtaining a DXA is infeasible. In the absence of major trauma (e.g. a motor vehicle accident), if patients over age 50 have had a fracture, they have osteoporosis and can be treated with prescription medication. Medicare recommends that post fracture patients either be screened with a DXA OR treated with a prescription medication within 6 months of fracture. For patients for whom obtaining a DXA is infeasible, the following table<sup>1</sup> provides the ten-year percent probability of a major osteoporotic fracture (e.g. hip, clinical vertebral, proximal humerus, distal forearm) among patients with a prior fracture and normal body mass index.

Age	Caucasian Female		Caucasian Male	
	65	75	65	75
Risk Factors				
None	26%	46%	51%	16%
Current smoking	39%	61%	60%	24%
Currently taking	27%	46%	50%	16%

### 2. Why is serum 25-hydroxyvitamin D (OHD) important and what is a healthy level?

- Increases calcium absorption<sup>2</sup>
- Decreases fracture risk<sup>3</sup>
- Decreases fall risk<sup>4</sup>
- Increases muscle strength<sup>5</sup>

A threshold of  $\geq 30$  ng/ml (75 nmol/l) is the serum 25(OH)D concentration at which older men and women are at a lower risk of fracture<sup>6</sup>. A desirable range is 30-80 ng/mL. Many "healthy" adults are too low.

### 3. How much vitamin D should I give?

- 50,000 IU of D<sub>2</sub> (ergocalciferol) once a week for 12 weeks, thereafter 50,000 IU of D<sub>2</sub> (ergocalciferol) every other week indefinitely
- Vitamin D toxicity is rare. Doses as high as 10,000 IU of vitamin D<sub>3</sub> per day for up to 5 months have not resulted in toxicity<sup>7</sup>. Persons spending long amounts of time in the sun (e.g. migrant farm workers, lifeguards) have vitamin D levels in the 150ng/ml range without any adverse effect<sup>8</sup>.

### 4. What fall risk prevention measures should I consider?

- Home safety evaluation by home health occupational therapist if homebound, or home safety checklist (see [www.cdc.gov/ncipc/falls/FallPrev4.pdf](http://www.cdc.gov/ncipc/falls/FallPrev4.pdf)) for examples)
- Physical therapy referral for proximal muscle strengthening, balance training and ambulation aids (walker, cane, etc.)
- When possible, taper off sedatives and psychoactive medications
- Vision test
- Alcohol cessation
- If a patient has symptoms of orthostasis, recommend care on rising quickly from supine/seated position.

### 5. What is the relative risk reduction (RR) for fractures that I can expect with prescription drugs for osteoporosis?

Drug Class	Vertebral Fracture RR (% 95% CI)*	Non-Vertebral Fracture RR (% 95% CI)*	Hip Fracture RR (% 95% CI)*
<b>Bisphosphonates</b>			
• Actonel® (risedronate)	39 (24-50)	20 (10-28)	26 (8-41)**
• Boniva® (ibandronate)	52 (29-68)	Not significant	Not significant
• Fosamax® (alendronate)	45 (31-57)	23 (8-36)**	53 (15-74)
• Reclast® (zoledronic acid)	70 (62-76)	25 (13-36)	41 (17-58)
<b>Calcitonin-salmon</b>			
• Fortical®/Miacalcin® (calcitonin)	36 (4-57)	Not significant	Not significant
<b>Parathyroid Hormone (PTH)</b>			
• Forteo® (teriparatide)	65 (45-78)	35 (2-57)	Not significant
<b>Selective estrogen-receptor modulators (SERMs)</b>			
• Evista® (raloxifene)	30 (14-44)	Not significant	Not significant

\*Data were obtained from product labeling and the Cochrane Collaboration (<http://www.cochrane.org>) and are not from head to head studies. Comparative efficacy is not implied. \*\*Evidence for effect but not an FDA-approved indication.

- Dawson-Hughes B, Tootton ANA, Melton III LJ, et al. Implications of absolute fracture risk assessment for osteoporosis practice guidelines in the USA. *Osteo Int* 2008; 19: 440-458
- Haney RP, Dowell MS, Hale CA, Brandt A. Calcium absorption varies within the reference range for serum 25-hydroxyvitamin D. *J Amer Coll Nutr* 2005; 22(2):142-146.
- Blackoff-Ferni HA, Willett WC, Wong JB, et al. Fracture prevention with vitamin D supplementation: a meta-analysis of randomized controlled trials. *JAMA* 2005; 293(18):2257-2264.
- Blackoff-Ferni HA, Dawson-Hughes B, Willett CW, et al. Effect of vitamin D on falls: a meta-analysis. *JAMA* 2004; 291(16):1999-2006.
- Blackoff HA, Stahelin HB, Dick W, et al. Effects of vitamin D and calcium supplementation on falls: a randomized controlled trial. *J Bone Miner Res* 2003; 18(2):345-351.
- Dawson-Hughes B, Heaney RP, Holick MF, et al. Estimation of optimal vitamin D status. *Osteoporosis Int* 2005; 16(7):713-716.
- National Osteoporosis Foundation's Updated Recommendations for Calcium and Vitamin D Intake. Washington, DC: National Osteoporosis Foundation; 2007. Available at: [http://www.nof.com/resources/calcium\\_and\\_vitamin\\_d.htm](http://www.nof.com/resources/calcium_and_vitamin_d.htm) Accessed November 1, 2007
- Vaith E. Why the optimal requirement for vitamin D is probably much higher than what is officially recommended for adults. *J Steroid Biochem Mol Biol* 2004; 89-90:575-9
- Vaith E. Vitamin D supplementation, 25-hydroxyvitamin D concentration, and safety. *Am J Clin Nutr* 1999; 69:842-846

# OP Home Health Trial Design

## Cluster Randomization

- Home Health Offices Throughout Alabama
  - Pilot Study at Home Office
- Remaining Offices Stratified by:
  - Size
  - Prescription treatment rates
- Training Conducted in Intervention Offices
  - Discussion of care plan(nurses to identify patient at high risk)
  - Provision of physician & patient education materials
- Control Arm Simply Observed

# **Osteoporosis Home Health Next Steps**

- **Role Out of Intervention Throughout Home Health Agency**
- **Automated Flag for High Risk Osteoporosis Patients**
  - **RN required to activate care plan or document reasons for not doing so**

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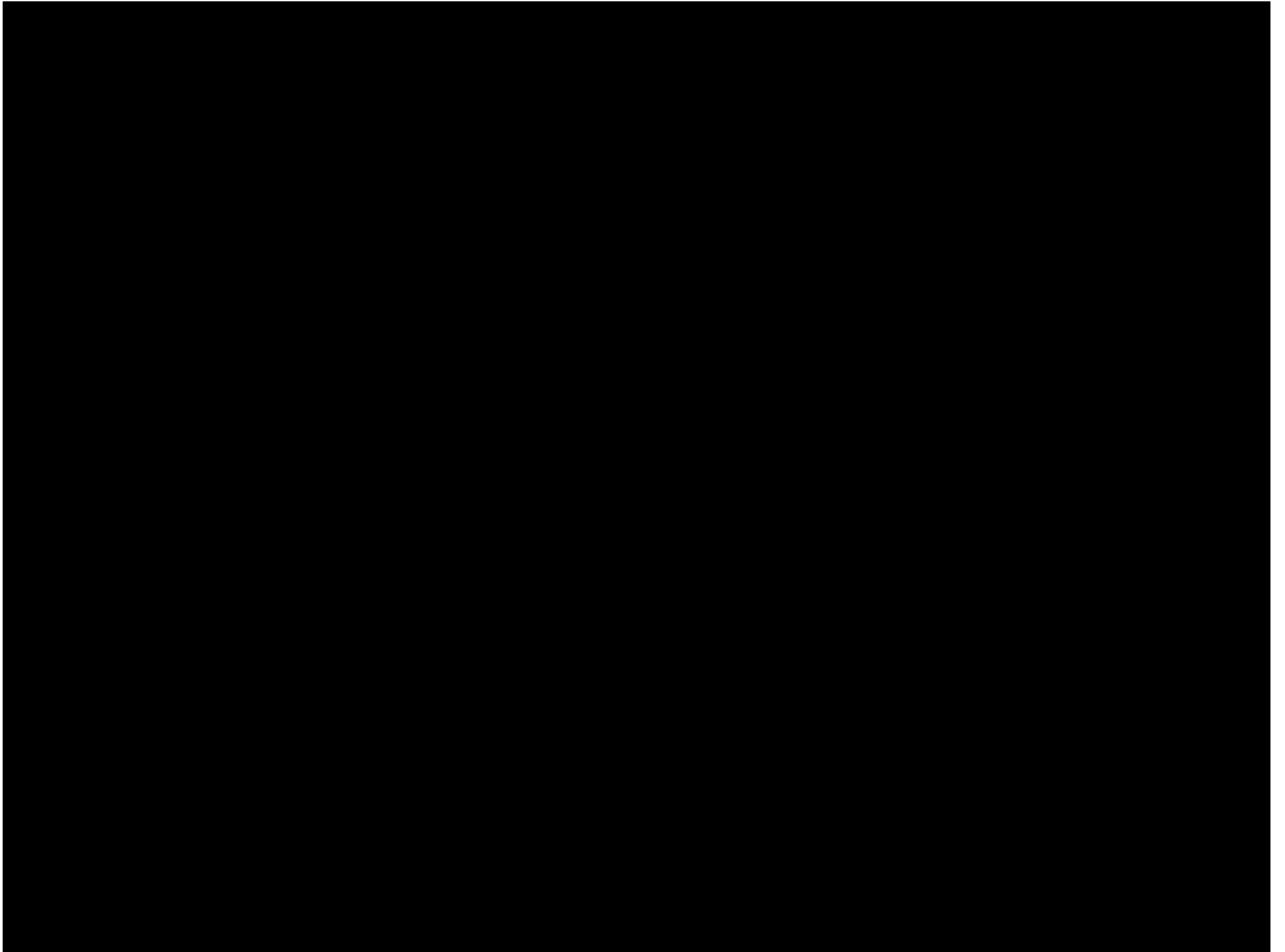
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U18HS1038





# Improving Care in Glucocorticoid Induced Osteoporosis (GIOP)

## Direct to Patient Interventions via the Pharmacy

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# Disclosures

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  - **NIH: 5P30 AR046031**
  - **American College of Rheumatology**
  - **Industry: None**
- **Advisory Board &/or Speaker: None**

# **Improving Bone Health Among Chronic Steroid Users**

## **A UAB WOR Program**

- **Long-term low dose glucocorticoids increase fracture risk and all-cause morbidity and mortality**
- **International Guidelines advocate bone mineral density measurement, calcium and vitamin D supplementation, and prescription anti-osteoporotic medicines\***
- **Majority users receive neither testing nor bone-specific pharmacotherapies †**

\* Geysebs et al. *Ann Rheum Dis* 2004; Nawata H et al *J Bone Miner Metab.* 2005; NOSaRCoP group (UK) 2002; Sambrook P et al, *Aust Fam Physician* 2001; Adler RA et. al. *Arch Int Med* 2003; ACR, *Arth Rheum.* 2001

† Mudano A, *J Rheumatol*, 2001;28:1298; Curtis JR. *Arth Rheum* 2005;52:2485

# Glucocorticoids and Other Secondary Causes of Osteoporosis<sup>1</sup>

## Numerator:

Patients who had a central DXA ordered or performed or pharmacologic therapy prescribed within 12 months

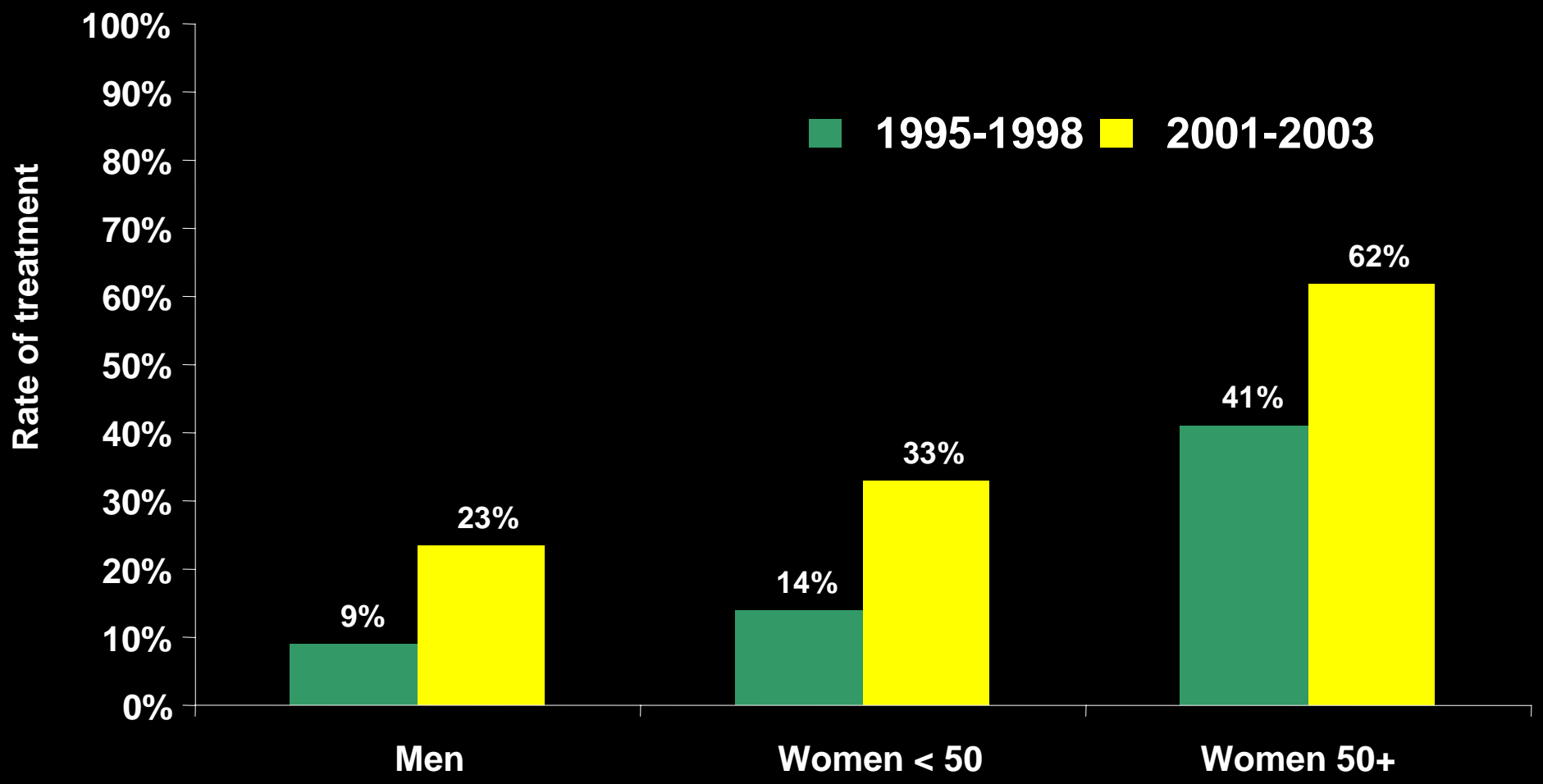
## Denominators:

Patients  $\geq 18$  years and with one of the following conditions or therapies:

- Receiving oral glucocorticoid therapy for greater than 3 months OR
- Hypogonadism OR
- Fracture history OR
- Transplant history OR
- Obesity surgery OR
- Malabsorption disease OR
- Receiving aromatase therapy for breast cancer

# Changing Patterns of GIOP Rx- US

## HRT + Bone Rx among New Glucocorticoid Users (n = 5,471)



# **Specific Aims- UAB WOR Improving Bone Health in Chronic Steroid Users**

- **Develop direct-to-patient intervention, educating steroid users about osteoporosis prevention and treatment and “activating” them to improve doctor-patient communication**
  - An internet-based, story- telling intervention
  - Provided to patients at time of steroid refill
- **Conduct quality improvement project of steroid users NOT on osteoporosis medications to determine post-intervention rates of osteoporosis care between the two study arms**
  - Pharmacy data - prescription rates of anti-osteoporosis therapies
  - Survey study patients to determine rates of BMD testing and use of calcium and vitamin D
- **Disseminate successful aspects of this intervention to control arm patients, other patients, and other steroid users nationally**

# Partnership with Medco Health Solutions Inc

- 41,137 online prescriptions for chronic glucocorticoids
- Online prescription refill service
- Deliver intervention at time of glucocorticoid refill
  - Highly teachable moment
  - Allows for monitoring of viewing of intervention materials
  - Able to track osteoporosis prescription medication use

# UAB Within Our Reach Study Population

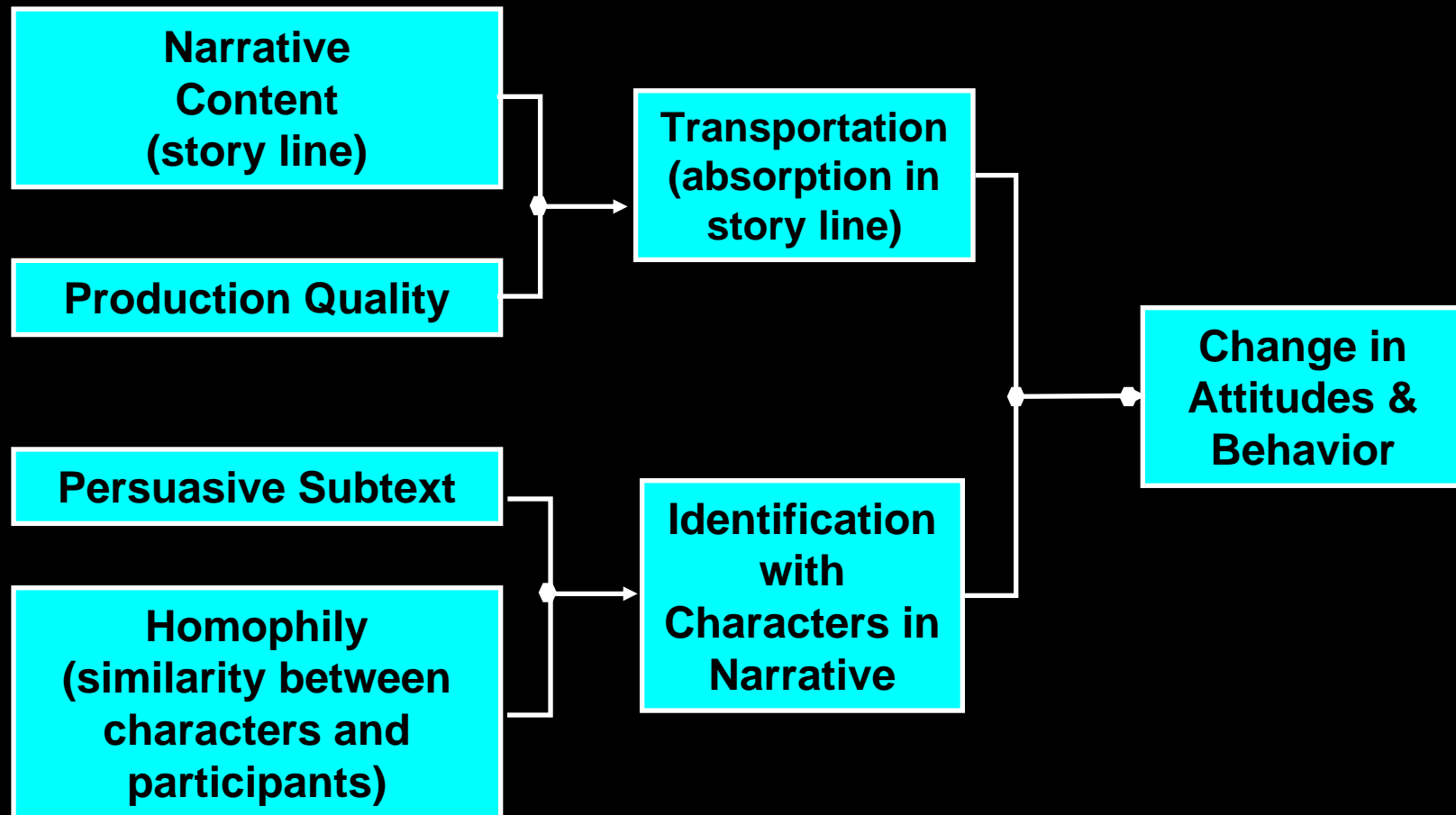
- **Inclusion criteria**
  - Adults ( $\geq$  19 years old)
  - On chronic glucocorticoids
    - $\geq$  5 mg/day prednisone or equivalent for  $\geq$  3 months
- **Exclusion criteria**
  - Currently or previously prescribed anti-osteoporosis therapy
  - Medical conditions and/or treatments that preclude osteoporosis intervention (i.e. Paget's disease, chronic renal failure, cancer chemotherapies)

# Patient “Activation” Intervention Development

- Focus groups and semi-structured individual patient interviews
- ‘How to talk to your Doctor’ - educate patients to more effectively interact with their physicians
- Stories from patients
  - Steroids side effects
  - Fears and risks of osteoporosis/fractures
  - Successful health interventions to modify risk factors

# Narrative Communication

## Why tell stories?



Slater M. *Communication Theory*. 2002; 12 (1): 173-191.

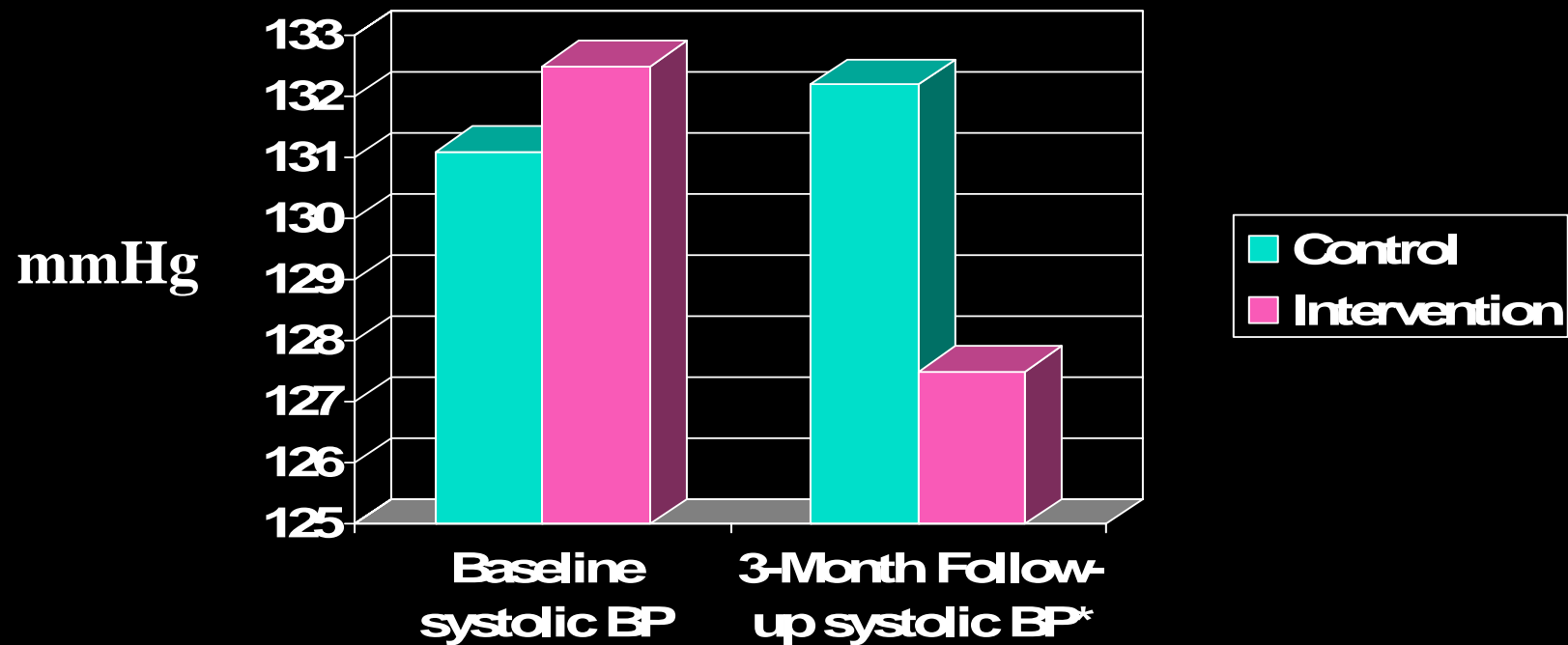
**“The power of narratives  
to change belief has  
never been doubted and  
has always been feared.”**

Green MC. Journal of Personality and Social Psychology. 2000; 79: 701-21

# Improving Blood Pressure Medication Adherence

## Culturally Sensitive Intervention (CSI)

### Cooper Green Jefferson County Hospital



Beneficial effect greatest among those with uncontrolled BP at baseline (-17 mmHg intervention, -7 mmHg control,  $p = 0.03$ )

\*  $p = 0.04$ , intervention vs. control

Houston, TK., *Ann Intern Med.* 2011;154(2):77-84.

# Outcomes Assessments

- **Outcome Variable: receipt of prescription anti-osteoporosis therapy (bisphosphonates, calcitonin, teriparatide, testosterone and raloxifene)**
- **Pharmacy Data: Medco databases**
- **Patient Survey (6 months after start of intervention)**
  - Receipt of DXA scan
  - Use of OTC calcium, Vitamin D
  - Discussion with doctor about osteoporosis

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