



Narrowing the Fragility Fracture Care Gap

Proactive approaches to help improve
care for osteoporosis patients

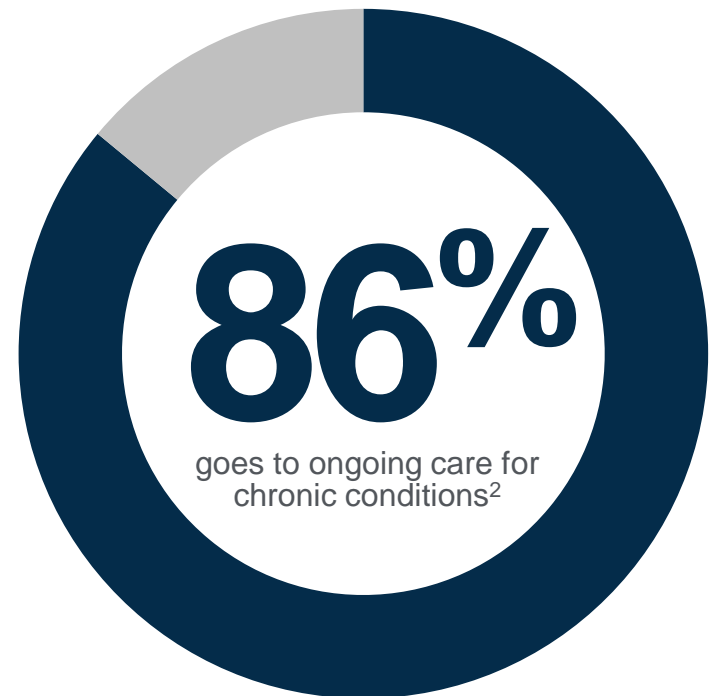


Reducing the Burden

Disease management programs have a positive impact,
but all too often an unmet need remains.

Chronic conditions are a costly burden for the US healthcare system

Of the ~**\$2,600,000,000**
spent in 2010 on
US healthcare¹



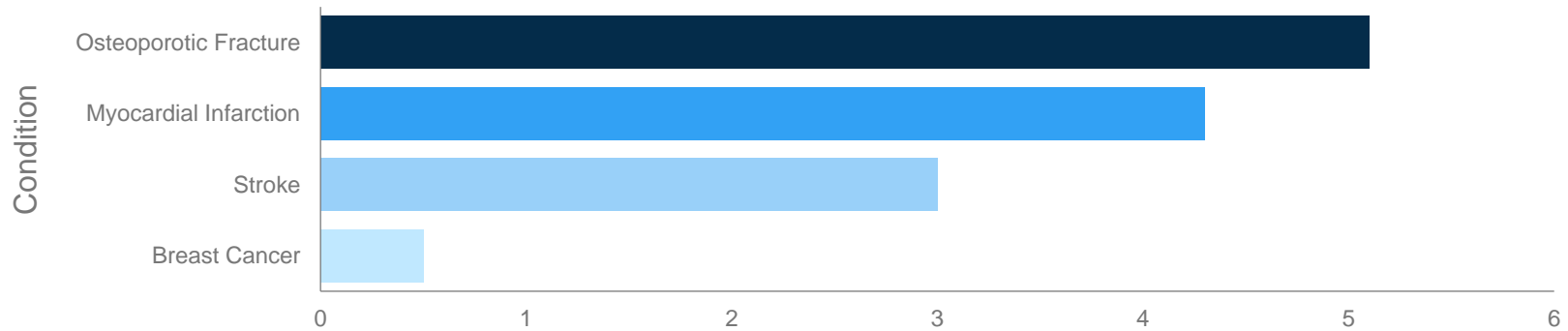
References:

1. CDC Health Spending. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/NHEGDP16.zip>. Accessed December 14, 2017.
2. Gerteis J, et al. "Multiple Chronic Conditions Chartbook": 2014.

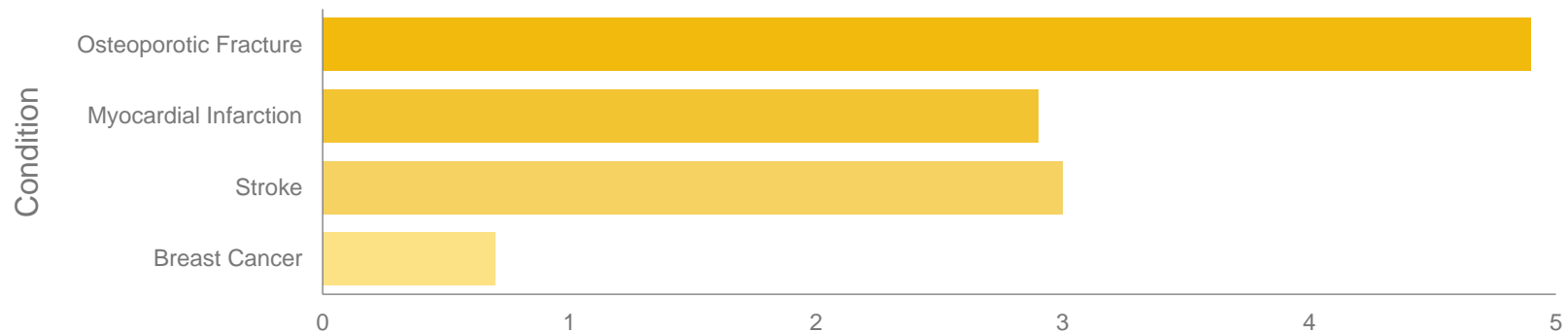


Hospitalization costs of osteoporotic fractures are much higher than other high-cost conditions

Cost of Hospitalizations During 2000-2011 (Billions, USD)²



Number of Hospitalizations During 2000-2011 (Millions)²



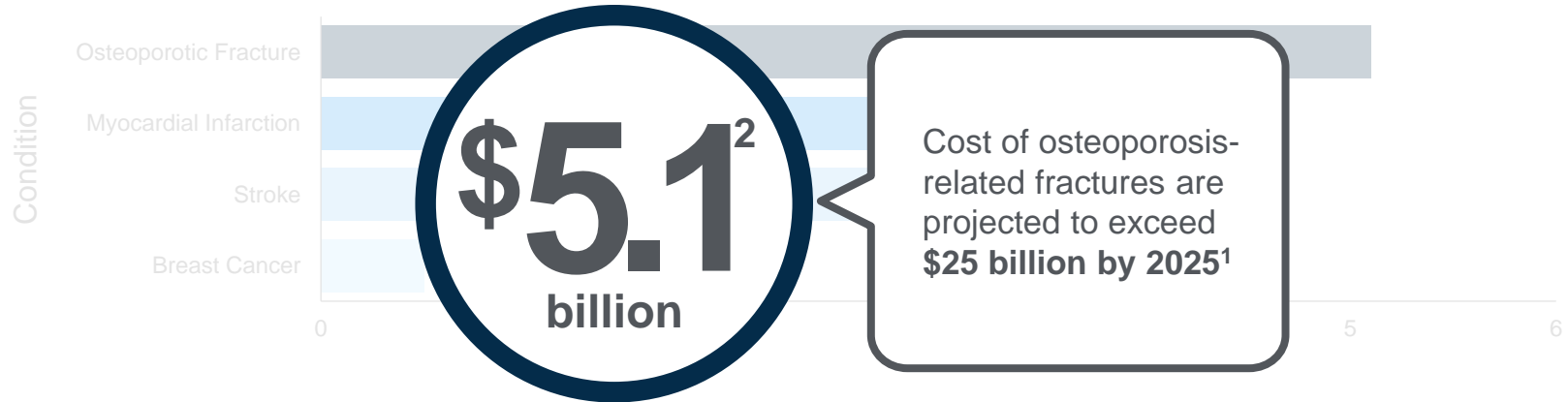
References:

1. Burge R, et al. *J Bone Miner Res.* 2007;22:465-475.
2. Singer A, et al. *Mayo Clin Proc.* 2015;90:53-62.

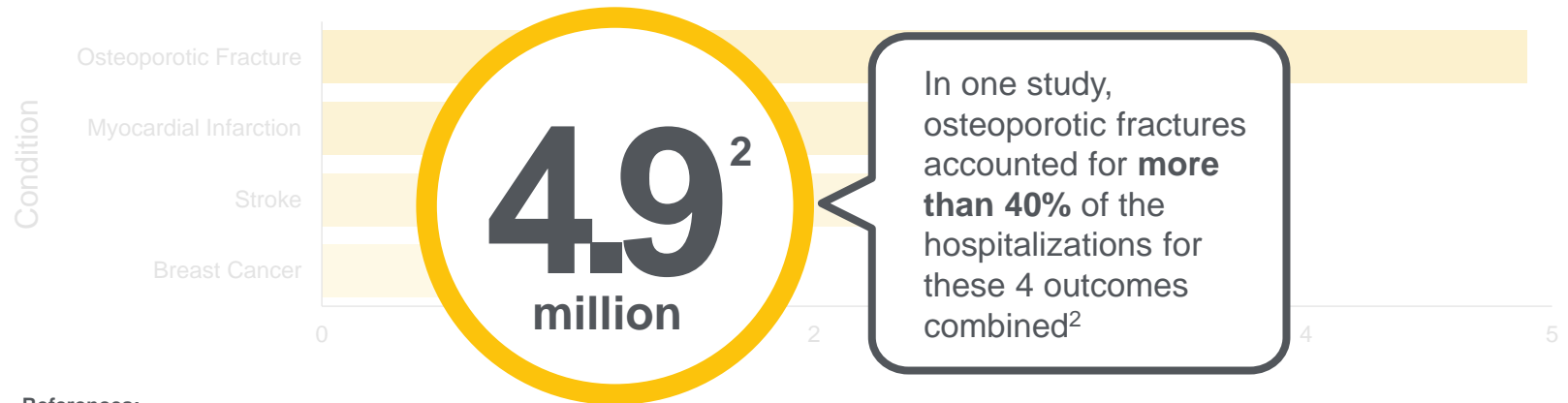


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1. Burge R, et al. *J Bone Miner Res.* 2007;22:465-475.
2. Singer A, et al. *Mayo Clin Proc.* 2015;90:53-62.



Working together to manage costly chronic diseases, reduce the economic burden, and improve quality of patient care

Disease management programs are developed by experts in care, who work together to help reduce the risk of preventable events and reduce the impact of chronic conditions¹



Providers, health plans, hospitals, and government agencies help to find innovative ways to elevate quality of care and manage costs¹

When choosing which diseases to manage, they focus on chronic and high-expenditure conditions with²:

- High-prevalence chronic disease states
- High-dollar volume or high-velocity drug use
- Potential for wide variation in treatment approach
- Potential for lifestyle modification to improve outcomes
- Many treatment options
- Diseases with high risk of negative outcomes

References:

1. Partnership to Fight Chronic Disease. <http://www.fightchronicdisease.org/sites/default/files/docs/BestPracticeCatalog5-28-08.pdf>. Accessed October 9, 2017.
2. Gurnee MC, et al. *Manag Care*. 1997;6:67-76, vi.



Disease management programs help patients make a positive impact on expensive, ongoing conditions

For People at Risk of Heart Disease and/or Stroke¹:

48% to **54%** from 2008-2014

Increase in adults who take steps to control their hypertension

4.7 could save the system **\$25.3**
million people billion per year

Helping control high BP could save billions in healthcare system costs

For People at Risk of Breast Cancer^{2,3}:

36% increase from 1987 to 2015

From the beginning of breast cancer management programs, mammograms among white women ages 40 to 74

Breast cancer programs and early detection helped reduce deaths by **34%** reduction from 1990 to 2010

References:

1. CDC. <https://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/2016/ncccdphp-aag.pdf>. Accessed October 31, 2017.
2. National Center for Health Statistics. *Health, United States, 2016: "With Chartbook on Long-term Trends in Health"*. 2017.
3. American Cancer Society. <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/breast-cancer-factsand-figures/breast-cancer-facts-and-figures-2013-2014.pdf>. Accessed October 31, 2017.

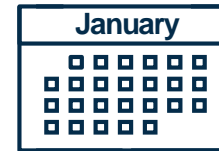


The benefits of disease management programs continue to be studied extensively



A meta-analysis of randomized trials indicated that heart failure management programs¹:

- Improve prescribing practices
- Reduce costs
- Reduce risk of hospitalization due to heart failure by 23%



A study of people ages 40 and older with heart disease, lung disease, or arthritis enrolled in a 6-month disease management program showed²:

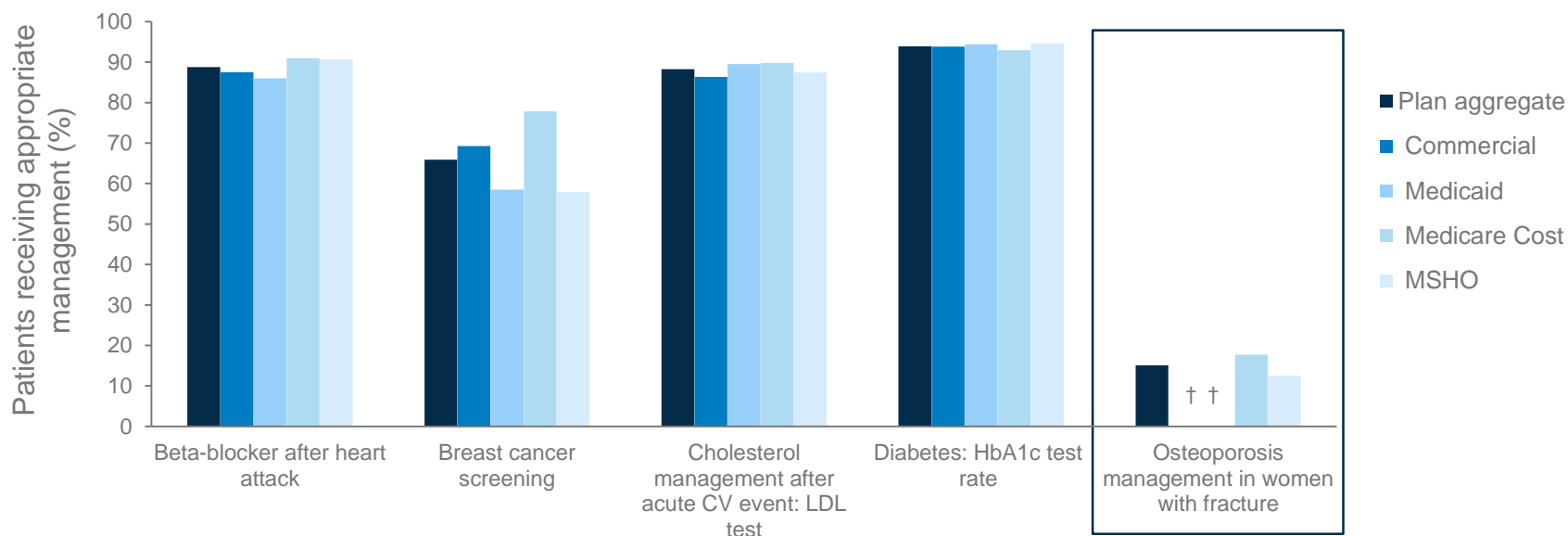
- A reduction in outpatient visits, including ER/PCP visits, and hospital stays subsequently reduced healthcare expenditures over a 2-year period

References:

1. McAlister FA, et al. *Am J Med.* 2001;110:378-384.
2. Lorig K, et al. *Med Care.* 2001;1217-1223.

Rates of osteoporosis management after fracture are significantly lower than in other chronic diseases

Rates for Selected HEDIS Measures^{1*}



*The HEDIS measure assesses the rate of osteoporosis management in women who had a fracture: percentage of women 67 years of age and older who suffered a fracture and who had either a bone mineral density (BMD) test or prescription for a drug to treat or prevent osteoporosis in the 6 months after the fracture.

†No data available.

Chart based on data in Medica® Clinical Performance Measures Report 2012-2013.¹

Data based on Medica® plans. Medica refers to the family of health plan businesses that includes Medica Health Plans, Medica Health Plans of Wisconsin, Medica Insurance Company, and Medica Self-Insured. HEDIS = Healthcare Effectiveness Data and Information Set; MSHO = Minnesota Senior Health Options.

Reference:

1. Medica. https://www.medica.com/-/media/documents/quality/cpm_report_member.pdf. Accessed November 16, 2017.

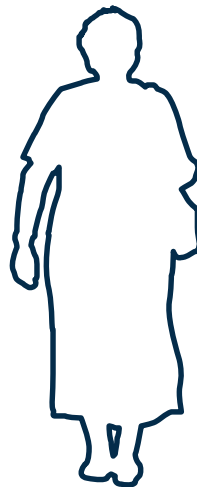


Despite the burden and the clear need for attention, there is a significant gap in post-fracture care



The number one risk factor of a fracture is a previous fracture.¹

However, in a survey of patients with osteoporosis at risk of another fracture:



84% of women who suffer from a fragility fracture **did not get treated** for the underlying disease of osteoporosis¹

More than **50%** reported that their doctor did **not discuss fracture risk reduction** or osteoporosis management after a recent fragility fracture¹

Reference:

1. Boudreau DM, et al. *J Am Geriatr Soc*. doi:10.1111/jgs.14921.



Each fracture is a warning that demands attention

Experts in osteoporosis management and fracture risk reduction agree:



Per the US National
Osteoporosis Foundation:

A recent fracture at any major skeletal site in an adult older than 50 years of age should be **considered a significant event** for the diagnosis of osteoporosis **and provides a sense of urgency** for further assessment and treatment¹



Per the International
Osteoporosis Foundation:

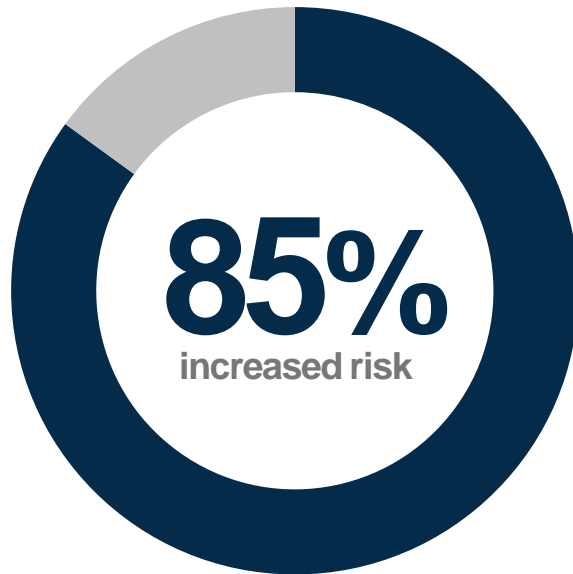
Secondary fracture risk reduction is the single most important thing that can be done to directly improve patient care and reduce fracture-related healthcare costs worldwide²

References:

1. Cosman F, et al. *Osteoporos Int*. 2014;25:2359-2381.
2. International Osteoporosis Foundation. <http://www.capture-the-fracture.org>. Published 2016. Accessed February 24, 2017.



Every fragility fracture* signals an increased risk of future fracture



Among women,
prior fragility fracture
is associated with an
85% increased risk
of another fracture^{1†}

46% of women with minimal trauma fracture report prior fragility fractures²

7x **greater relative risk**

Women with prior clinical vertebral fractures have a 7x greater relative risk of another vertebral fracture³

*Fragility fracture is defined as fracture caused by minimal trauma, such as a fall from a standing position.^{4,5}

†Assessment based on fracture associated with a history of prior fracture without adjustment for bone mineral density (BMD).

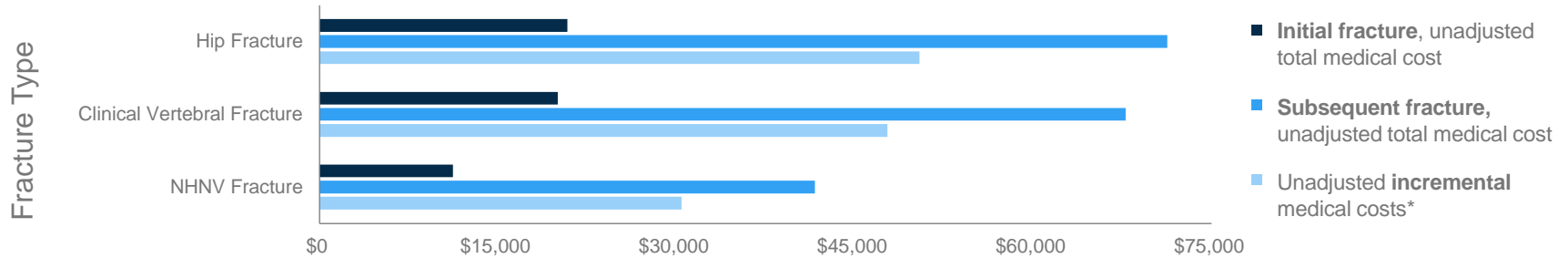
References:

1. Kanis JA, et al. *Bone*. 2004;35:375-382.
2. Edwards BJ, et al. *Clin Ortho Relat Res*. 2007;461:226-230.
3. Gehlbach S, et al. *J Bone Miner Res*. 2012;27:645-653.
4. Prentice, et al. *Proc Nutr Soc*. 2006;65:348-360.
5. Boonen S, et al. *Curr Med Res Opin*. 2008;24:1781-1788.

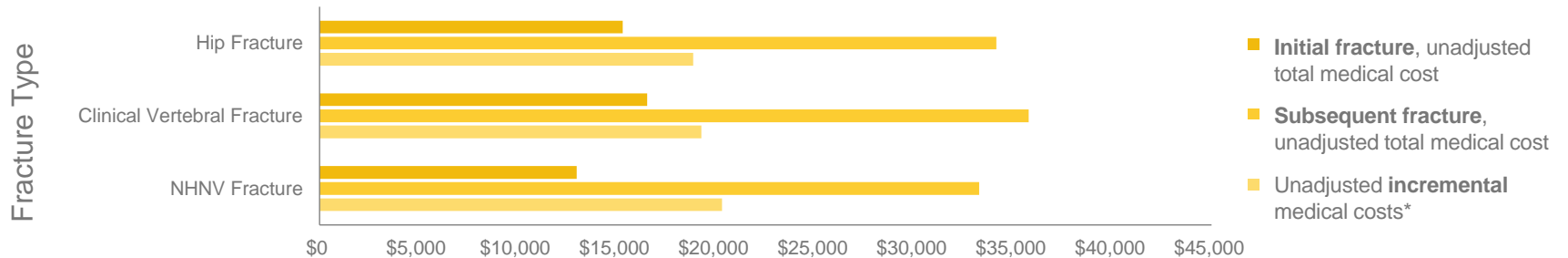


Healthcare costs associated with a subsequent fracture are up to 3 times more than an initial fracture¹

Commercial Population¹



Medicare Population¹



NHNV = nonhip, nonvertebral.

Both Commercial and Medicare costs were measured over a 12-month period and include inpatient, emergency room, outpatient including nursing home and rehab, and pharmacy costs. Costs were collected from 2002-2008 and are expressed in 2008 dollars.¹

*Adjusted for differences between the single-fracture vs repeat-fracture cohorts in the use of select medications, presence of concurrent fracture near the time of the first fracture, 12-month preperiod total medical costs, and patient comorbidity profiles.¹

Reference:

1. Song X, et al. *Bone*. 2011;48:828-836.



Each fracture adds to the burden

Fragility fractures may have a detrimental impact on patients' lives¹

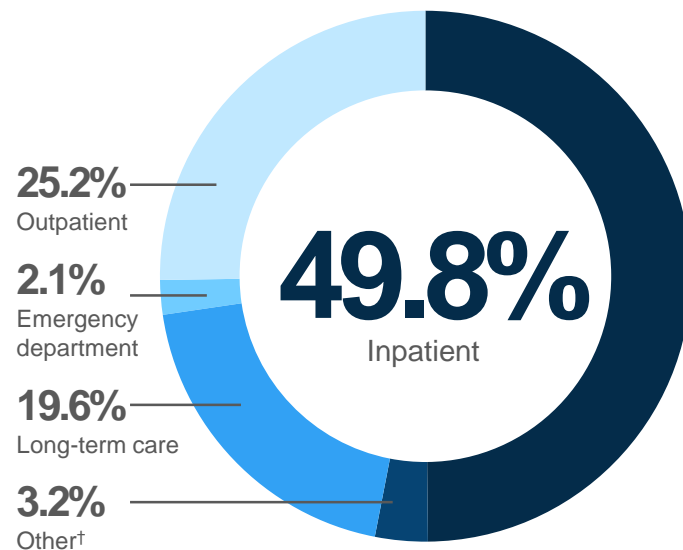
50%

of patients need **rehabilitation services** after a nonvertebral fracture^{2*}

24%

of patients treated in an **inpatient setting** after a nonvertebral fracture^{2*}

Percentage of Incremental Direct Cost for Post-fracture Medicare Patients²



*Patients with osteoporosis on private insurance.

†“Other” category is undefined.

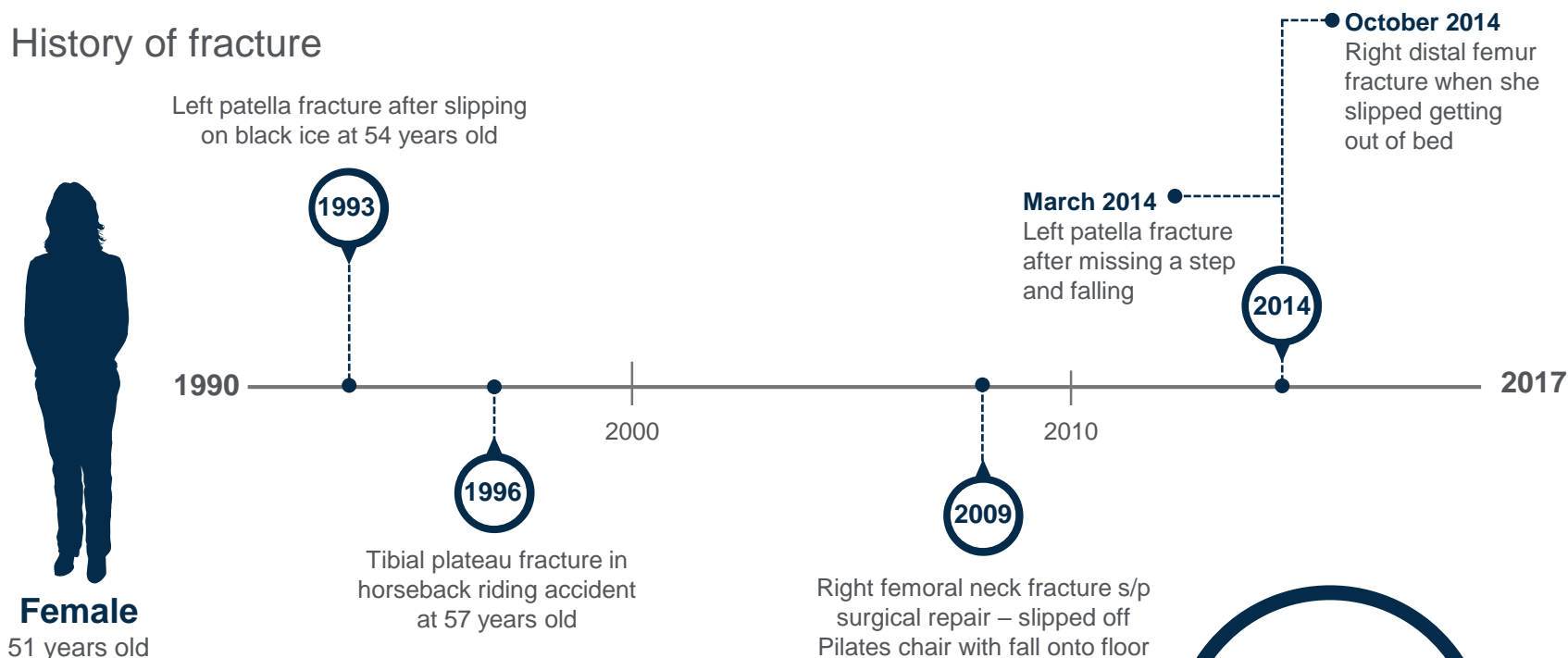
References:

1. Boudreau DM, et al. *J Am Geriatr Soc.* 2017;65:1829-1835.
2. Pike C, et al. *Pharmacoeconomics.* 2010;28:395-409.



A hypothetical patient profile

History of fracture



Each fracture is a sentinel event

History of missed opportunities

- **No diagnostic tests** for skeletal fragility factors
- **No DXA** since recent fractures
- No steps taken **to reduce her fall risk or reduce her risk of fracture**

DXA = dual-energy X-ray absorptiometry. Profile based on an actual patient, de-identified.





Making a Difference

Consider the economic and clinical impact that post-fracture care can make for your patients.

Post-fracture care (PFC) helps manage risk factors to reduce risk of future fractures

Post-fracture care is a focused, strategic, and persistent approach to disease management for patients with osteoporosis at high risk for fractures¹



A collaborative approach to preventative care includes a Fracture Care Coordinator such as a nurse coordinator or other dedicated personnel working in fracture clinics and on orthopedic/trauma wards to ensure that patients who suffer a fracture receive appropriate diagnosis, treatment, and education.¹



Orthopedics



Primary
Care



Medical
Specialists



Fracture Care
Coordinator



Hospital/
Emergency
Department



Nursing
Physical Therapy,
Nutritionist

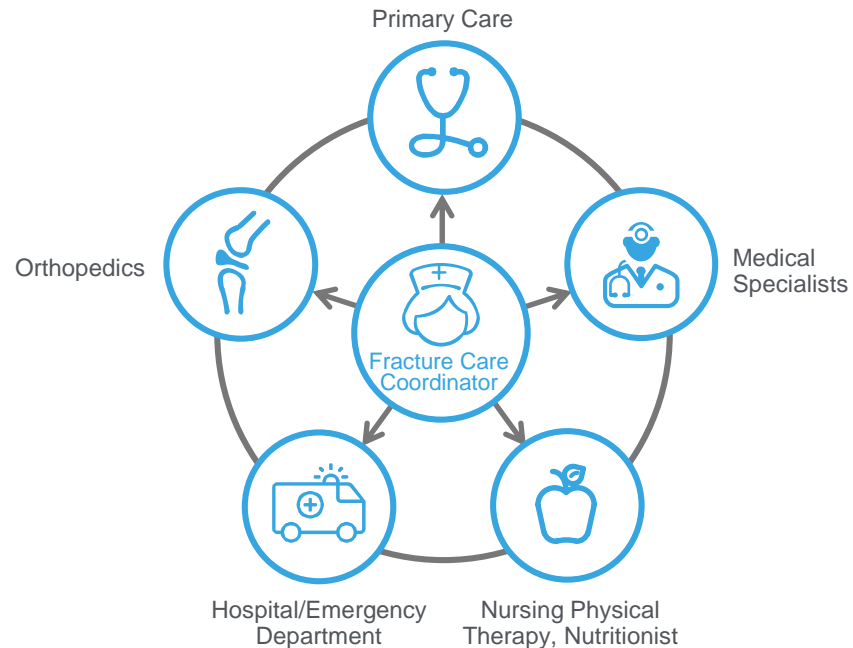


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Working together to reduce future fracture rates by identifying, assessing, diagnosing, and managing fracture patients¹

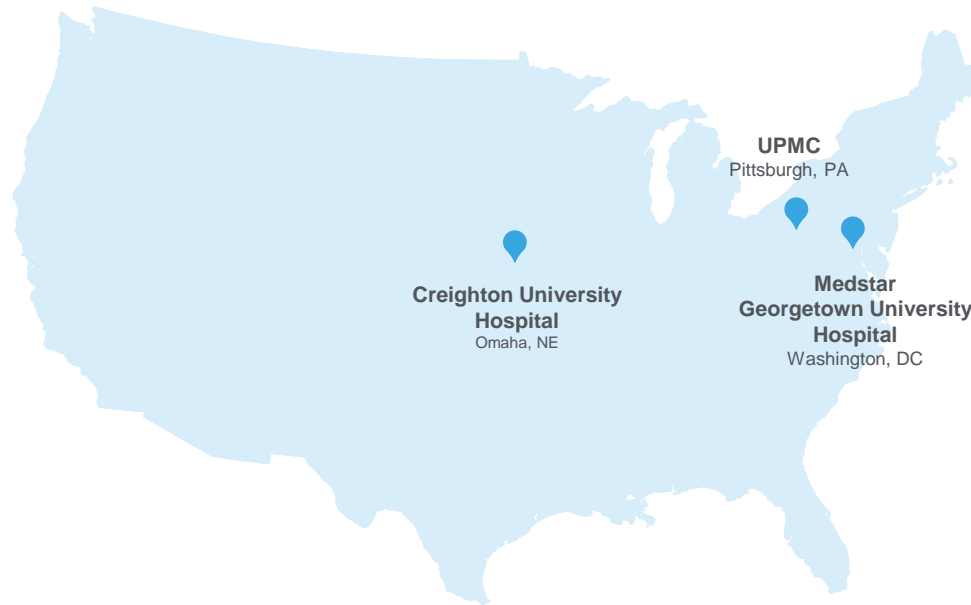
Reference:

1. Eisman JA, et al. *J Bone Miner Res.* 2012;27:2039-2046.



Positive impact of PFC: Open integrated model pilot

Premier, the National Osteoporosis Foundation, and the National Bone Health Alliance worked together across 3 clinical sites to demonstrate the effectiveness of implementing PFC throughout communities of care¹



Automate data collection more efficiently through a **centralized registry**¹

Benchmark performance against a set of diagnosis, screening, and treatment quality measures **while tracking data in real time**¹

Improve and enable care coordination and transitions across institutions to the ambulatory setting¹

Provide improvement tools to help the care team and fracture care coordinators take the next step in post-fracture care for each patient¹

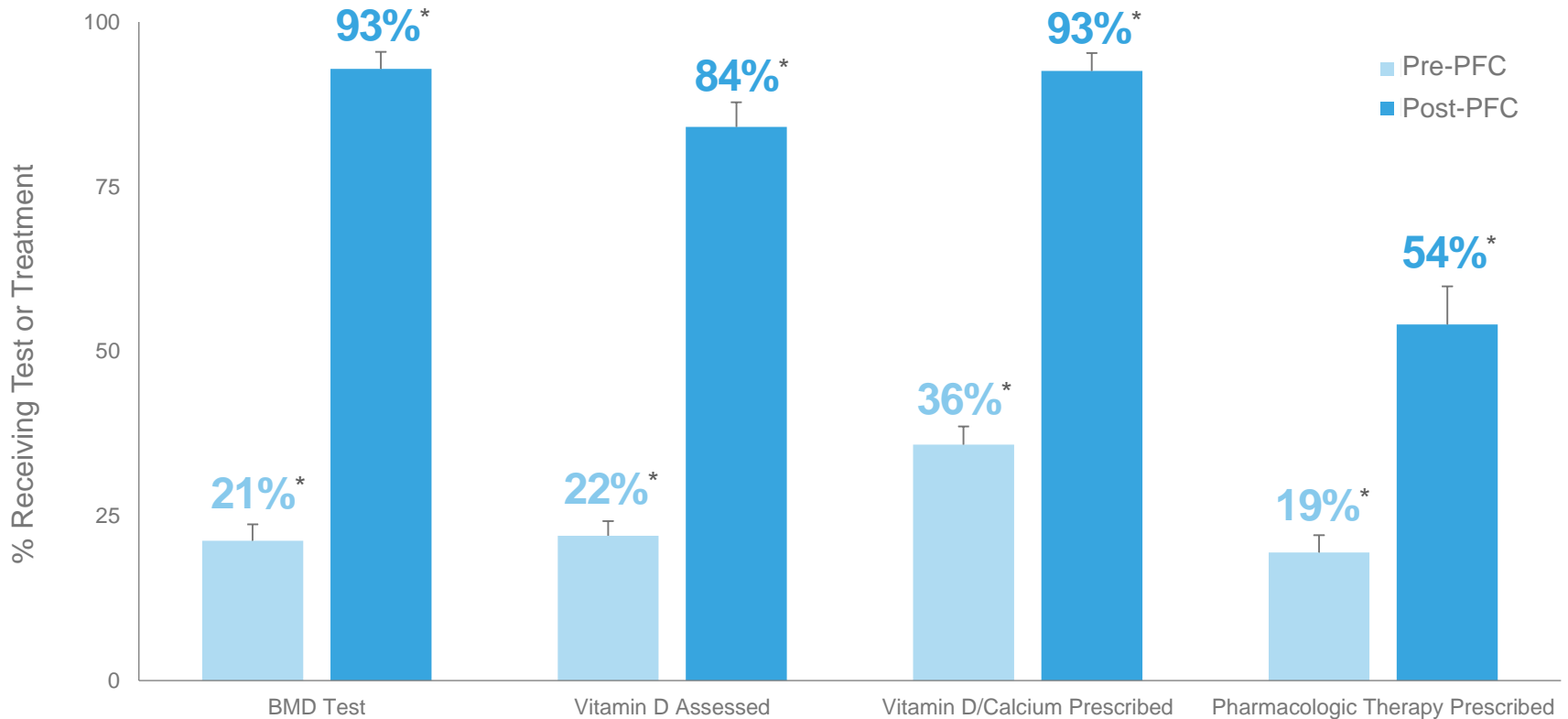
Reference:

1. Greenspan, et al. Poster presented at: American Society for Bone and Mineral Research 2016 Annual Meeting; September 2016; Atlanta, GA.



Positive impact of PFC: Open integrated model pilot results

Significantly More Patients Received Testing or Treatment Due to PFC¹



The proportion ± standard error of patients receiving a BMD test, vitamin D test, calcium/vitamin D supplementation, or pharmacologic treatment Pre-PFC (light blue) compared to Post-PFC (dark blue) for the three sites combined. * $p < 0.001$.

Reference:

1. Greenspan, et al. Poster presented at: American Society for Bone and Mineral Research 2016 Annual Meeting; September 2016; Atlanta, GA.



Post-fracture care has made a positive impact across various systems

In an Open Model

(Midsized regional health system)

Dignity Osteoporosis Quality Initiative, Marian Regional Medical Center

In a Closely Aligned Model

(Physician-led, integrated healthcare system)

Geisinger Health System Osteoporosis Program

In a Closed Model

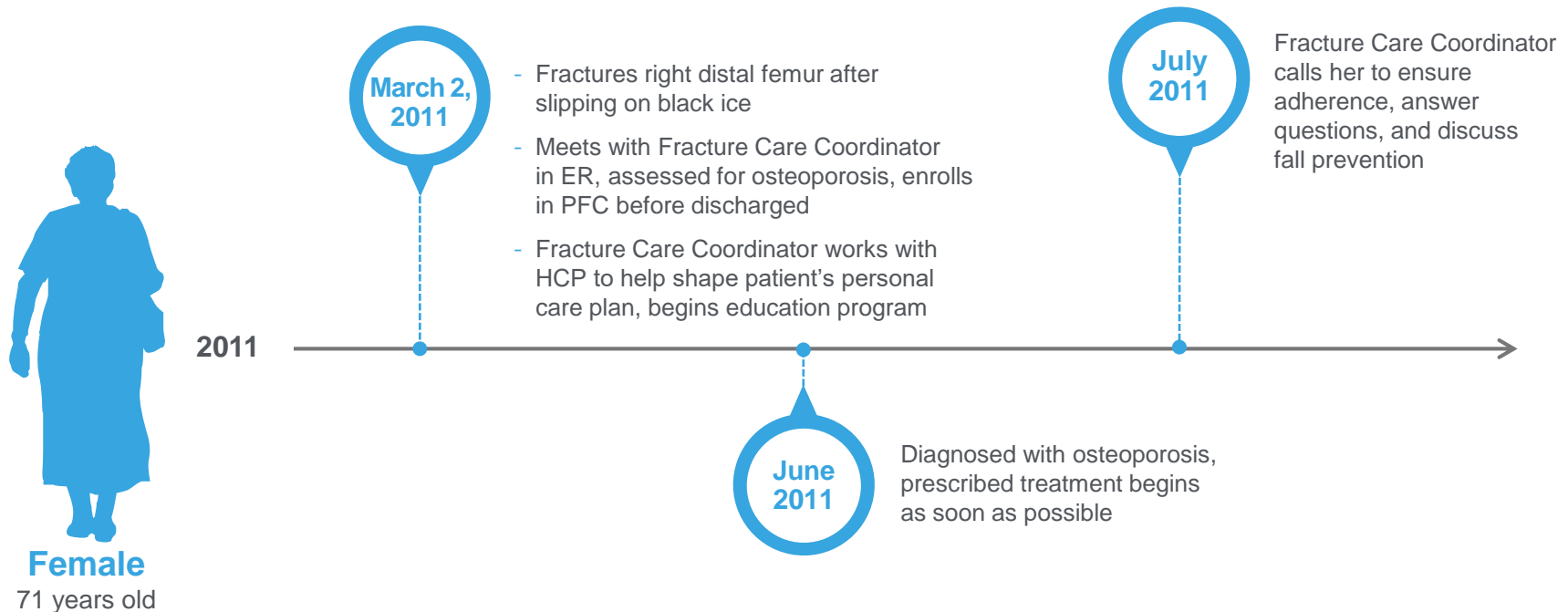
(Orthopedic surgeon-driven)

Kaiser SCAL Healthy Bones Program



How a post-fracture care approach can help patients in your institution

History of post-fracture care impact on a hypothetical patient:



Ongoing, personal post-fracture care helps patient:

- **Adhere to treatment** as directed by her healthcare provider
- **Get repeat DXA** test as medically indicated
- Follow Fracture Care Coordinator advice **to reduce her fall risk or reduce her risk of fracture**

DXA = dual-energy X-ray absorptiometry. Profile based on an actual patient, de-identified.

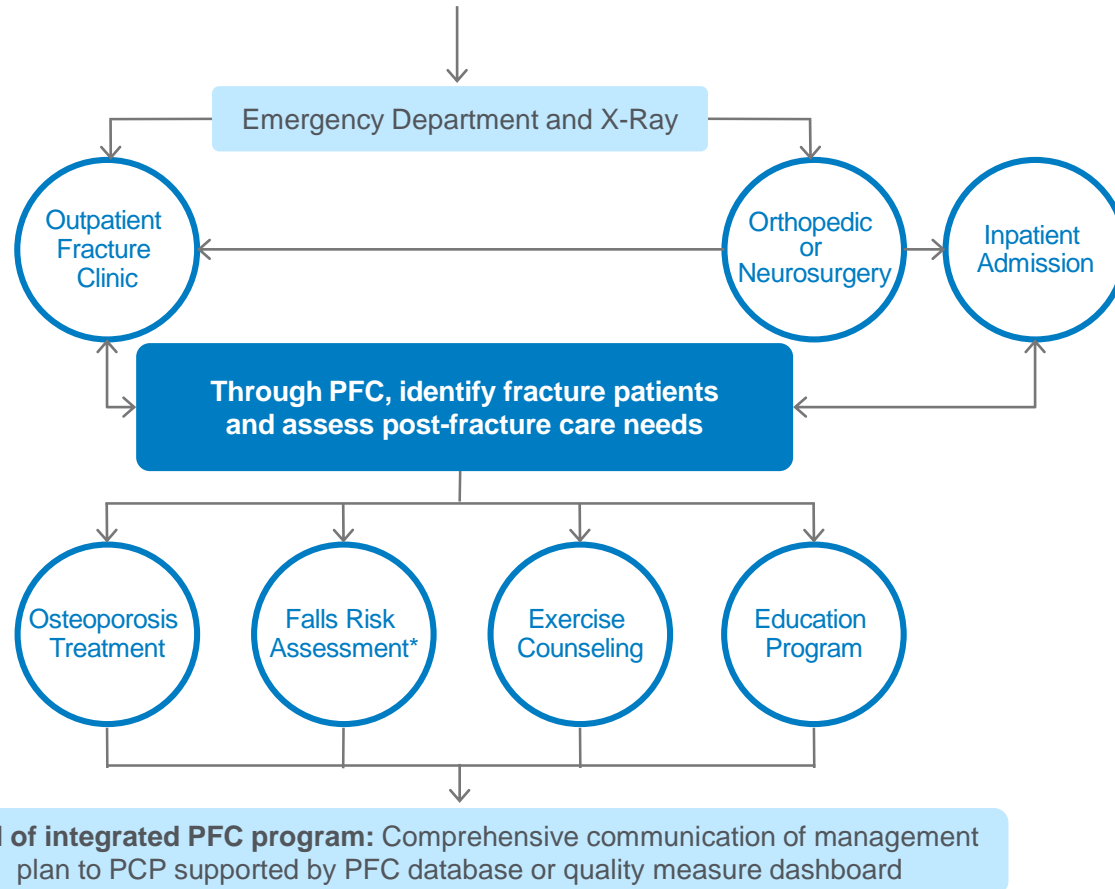


Narrowing the Gap

When putting these programs into practice, you are not alone. Find out what resources can help you narrow the gap.

Integrating post-fracture care into a hypothetical patient's healthcare journey

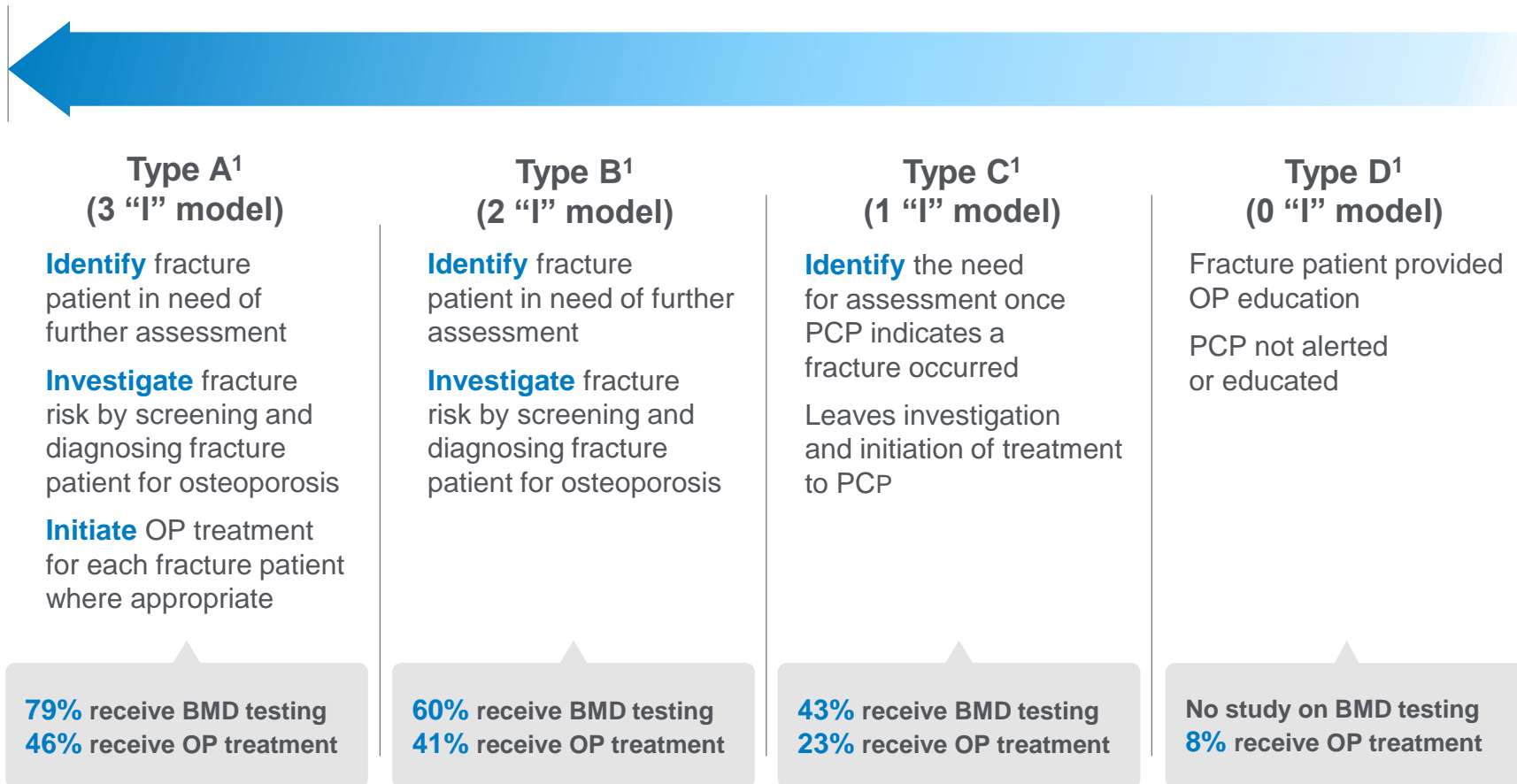
Patient Presents with New Fracture



PCP = primary care physician.

*Postmenopausal women and men 50 and above are assessed for risk factors for falls. Adapted from 2014 NOF Clinician's Guide.

Identify, investigate, and initiate: the most successful PFC programs are also the most comprehensive¹



Reference:

1. Ganda K, et al. *Osteoporos Int.* 2013;24:393-406.



Overall, “high-functioning” PFC programs can help raise the post-fracture assessment/treatment rate¹

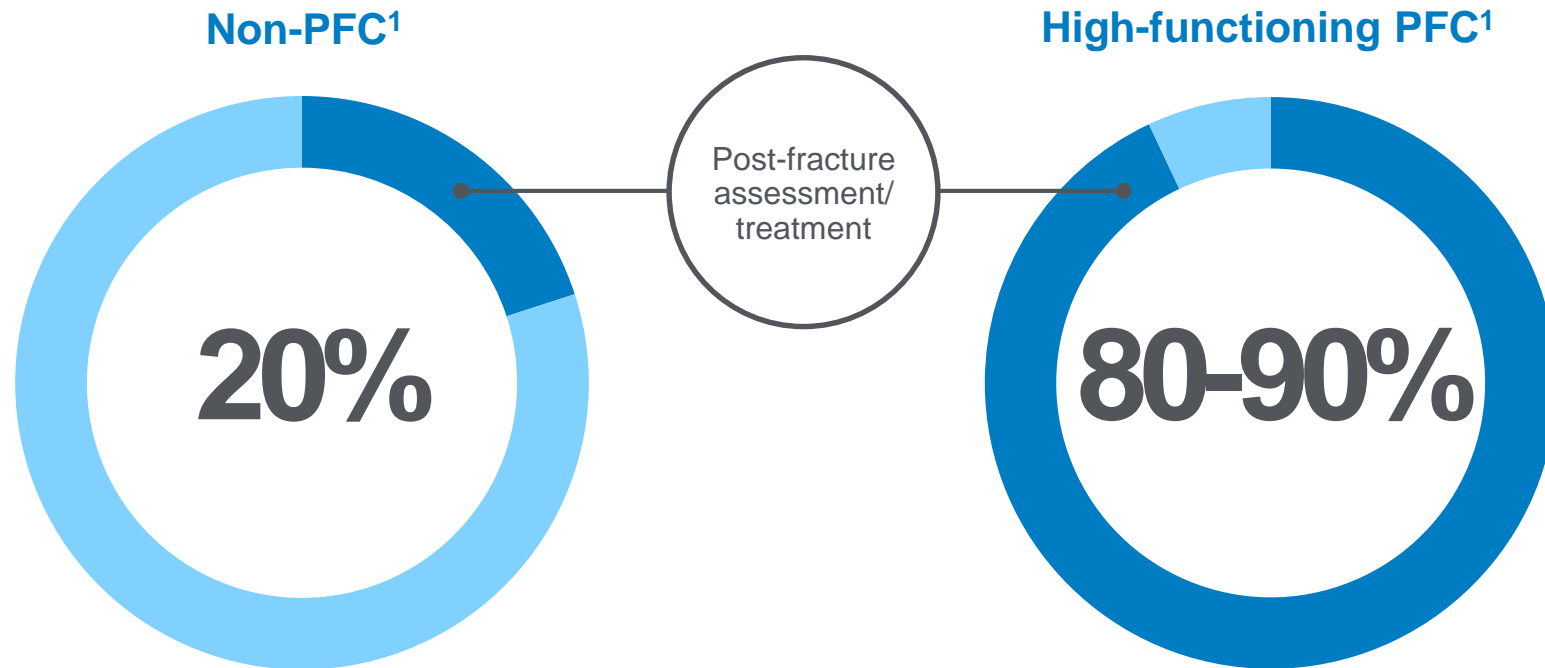


Chart based on data in Eisman JA.¹

Reference:

1. Eisman JA, et al; for the ASBMR Task Force on Secondary Fracture Protection. *J Bone Miner Res.* 2012;27:2039-2046.



Consider these six core elements of PFC success¹



Fracture Care Coordinator

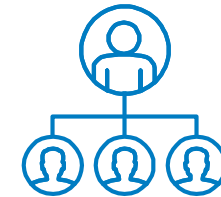
One focused health professional who helps various members of the healthcare team work together to effectively/efficiently ensure that people who suffer a fracture receive appropriate diagnosis, treatment, and support when it matters most.



Focused PFC Champion

As dedicated advocates of PFC, one or two dedicated people focus on establishing and directing how to maintain a PFC program as appropriate for each site of care.

The PFC champion(s) also engage with hospital administration to secure the resources needed to implement a successful PFC program.



Multidisciplinary Stakeholder Group

PFC champions gather a wide perspective by recruiting representatives from:

- Endocrinology, rheumatology, orthopedics, geriatrics, internal medicine, gynecology, care managers; with some specialties leading/co-leading development
- Pharmacy, radiology, physical therapy, physical medicine and rehabilitation, hospitalists, care management leadership

Reference:

1. NBHA. <http://www.nbha.org/fpc/about-0>. Accessed June 27, 2017.

Consider these six core elements of PFC success¹ (continued)



Performance Evaluation

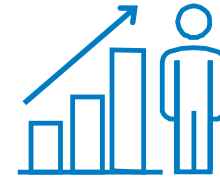
- Secondary fracture risk reduction has been included in both NCQA HEDIS and MACRA Quality Payment Program measures
- Organizations participating in such Quality Assurance programs have access to performance measures, which help show how they perform vs national average



Communication

Consistent, ongoing dialogue among the Fracture Care Coordinator and the patient, the primary care provider, local falls prevention service, and specialists as appropriate.

There are effective techniques that can be deployed through EHR systems to track an institution's post-fracture patient population.



Long-term Management

Monitoring adherence to a long-term plan, establishing mechanisms to measure adherence to therapy, and ongoing assessment of future fracture risk.

Reference:

1. NBHA. <http://www.nbha.org/fpc/about-0>. Accessed June 27, 2017.

Resources to support your post-fracture care efforts



National Bone Health Alliance (NBHA) Fracture Prevention CENTRAL www.FracturePreventionCENTRAL.org

One easy-to-reach online resource to support the widespread implementation of post-fracture care coordination programs throughout the United States¹:

Reimbursement and
business plan resources

Quality measures
and quality improvement tools

Bimonthly ECHO
seminars to help new programs

Electronic
health records

PFC education,
including a Webinar series

Tips, resources, and case
studies from successful programs

Amgen does not endorse and is not responsible for the content included in this resource.

Reference:

1. NBHA. <http://www.nbha.org/fpc/about-0>. Accessed June 27, 2017.



Resources to support your post-fracture care efforts



American Orthopaedic Association (AOA) Own the Bone Program

<http://www.ownthebone.org/>

This AOA quality improvement program is designed to help you establish your own post-fracture care program liaison service, providing tools such as¹:

System and
benchmarking reports

Best practices and PFC
case studies

Economic models and an
economic impact calculator

Clinical and patient
education resources

Guidance on introducing
PFC to your team

Amgen does not endorse and is not responsible for the content included in this resource.

Reference:

1. AOA. http://www.ownthebone.org/OTB/About/What_Is_Own_the_Bone.aspx. Accessed June 27, 2017.

Core Elements of Success | **Resources for Support**



Resources to support your post-fracture care efforts



International Osteoporosis Foundation (IOF) Capture the Fracture Campaign

<http://www.capturethefracture.org/>

This global campaign offers you another perspective on implementing a PFC with resources and highlights success stories from around the world:

A highly curated literature anthology focused on PFC

Teaching/training slide kits, position papers, and reports

A global campaign report on breaking the fragility fracture cycle

IOF position paper on breaking the fragility fracture cycle

Amgen does not endorse and is not responsible for the content included in this resource.



Amgen and UCB can provide educational resources to support post-fracture care in your practice



Provides education to US hospital administrators and decision makers to support post-fracture care

Other industry support for post-fracture care in your practice*

*Industry organizations are limited in support they can provide. Disease state/post-fracture care information cannot be combined with branded promotional efforts. Industry organizations cannot provide guidance on setting up or implementing an a post-fracture care program.





Thank you



PFC Model Examples

Open Model¹

(Midsized regional health system): Dignity Osteoporosis Quality Initiative, Marian Regional Medical Center

Closely Aligned Model^{2,3}

(Not-for-profit, physician-led integrated healthcare system): Geisinger Health System Osteoporosis Program

Closed Model⁴

(Orthopedic surgeon-driven): Kaiser SCAL Healthy Bones Program

References:

1. Oates MK. *Curr Osteoporos Rep.* 2013;11:369-376.
2. Newman ED. *Osteoporos Int.* 2011;22(Suppl 3):S451-S455.
3. Newman ED, et al. *Osteoporos Int.* 2003;14:146-151.
4. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.



Open PFC Model Example

Dignity Osteoporosis Quality Initiative,
Marian Regional Medical Center
(Midsized regional health system)

Dignity Initiative: nonprofit, open-model PFC to help improve fracture identification and follow up

BACKGROUND

- The Marian Osteoporosis Center was established in 2008 at Marian Regional Medical Center in Santa Maria, CA¹
- Nonprofit hospital system¹
- PFC program established with private donor money to design a program with a multidisciplinary approach to manage osteoporosis¹:
 - Evaluation for secondary causes of osteoporosis
 - Physical therapy
 - Fall prevention
 - Dietary counseling
 - Medication recommendations
 - Exercise specifics
- Most patients with osteoporotic fractures are not enrolled in a closed (or managed care) system¹
 - Receive “distinctly separate and uncoordinated care” from many different entities¹

Reference:

1. Oates MK. *Curr Osteoporos Rep.* 2013;11:369-376.



Identify fracture patients > 50 years for appropriate osteoporosis treatment and follow up

OBJECTIVE

Identify patients over the age of 50 with fractures¹

Provide discharge instruction sheet¹

- Underlying risk of osteoporosis and future fractures
- Talking with your primary care provider
- “After the Fracture” handout and Web site information in English or Spanish

Encourage follow up with PCP or orthopedic surgeon for evaluation and treatment of possible underlying osteoporosis¹

Reference:

1. Oates MK. *Curr Osteoporos Rep.* 2013;11:369-376.



PFC reviewed records to find fractures, called fracture patients, and provided community services

HOW IT WORKS

- Conducted a database query of patients ≥ 50 years, reviewed monthly by a clinical specialist¹
- Developed a registry based on query results¹
- QI staff/hospital volunteer made calls using standard questionnaire¹
 - Additional information sent to patients if desired
 - Checked on compliance and follow-up plans
- Provided additional hospital and community resources¹
 - Conducted Skilled Nursing Facility (SNF) screenings
 - Held osteoporosis exercise classes free to the senior population
 - Partnered with the city to offer senior fitness testing, fall prevention classes, and free heel ultrasound testing at senior health fairs
 - Established the Marian Osteoporosis Resource Center
 - Established a hospital outpatient and pharmacy infusion center with written protocols for IV and injectable medications

The list of fracture codes used at the Marian Regional Medical Center was based on recommendations from the 2008 monograph from The Joint Commission, "Improving and Measuring Osteoporosis Management," as well as from the 2004 Surgeon General's report on osteoporosis, HEDIS criteria, and Medicare Advantage 5-star criteria.

Reference:

1. Oates MK. *Curr Osteoporos Rep*. 2013;11:369-376.



Marian measured improvement through evaluation, treatment, and lifestyle modification

OUTCOMES

- Evaluation after the first fragility fracture¹
 - At 1 month, only 20% of patients knew they needed a BMD test; only 16% had one prescribed
- Treatment after the first fragility fracture¹
 - Over 3 out of 4 patients did not receive a prescription for osteoporosis medication
- Calcium, vitamin D recommendations¹
- Modify lifestyle risk factors¹
 - Smoking cessation, limiting alcohol
 - Fall prevention/precautions
 - Weight-bearing, muscle-strengthening, and balance exercises

Reference:

1. Oates MK. *Curr Osteoporos Rep.* 2013;11:369-376.



Lessons learned from the Marian Osteoporosis Initiative

- Establish a process and pathways to identify care gaps¹
 - To close the care gap, it is important to have a healthcare professional who can order a DXA, labs, therapy, and medications
- It is important to have a DXA machine in the hospital setting¹
 - Portable ultrasound machine to assess patients in SNF (mostly hip fractures) and orthopedic floor and ED (mostly wrist and vertebral fractures)
- More resources were needed in the SNF setting in the more elderly Marian population¹

Reference:

1. Oates MK. *Curr Osteoporos Rep.* 2013;11:369-376.





Closely Aligned PFC Model Example

Geisinger Health System Osteoporosis Program
(Not-for-profit, physician-led, integrated system)

Geisinger: not-for-profit, physician-led, integrated regional healthcare system

BACKGROUND

- Geisinger Health System (GHS) is dedicated to patient care, education, research, and service¹
 - Mission statement: “heal...teach...discover...serve”
 - Founded in 1915
- GHS spans 43 counties and serves nearly 3 million people in predominantly rural central Pennsylvania¹
- Over 800 employed physicians, 3 major hospitals, 18 specialty sites, 41 primary care sites¹
 - One of the largest rural health plans in the country
- Serves as an invaluable information resource¹

Reference:

1. Newman ED. *Osteoporos Int.* 2011;22(Suppl 3):S451-S455.



Improve osteoporosis diagnosis/treatment and monitor predefined outcomes

OBJECTIVE

- Early goals (1996 to 2000)^{1,2}:
 - Increase awareness, diagnosis, and treatment of osteoporosis
 - Monitor predefined outcomes: hip fracture incidence, rate of BMD testing, prevalence of osteoporosis diagnosis, and rate of medication use
 - Also performed a cost analysis
- Evolved goals (after 2000)²:
 - Program has moved from a focus on provider empowerment to considering how best to manage osteoporosis care across the healthcare system
 - Define and act on 4 major osteoporosis care gaps:
 - At-risk patients do not get tested
 - Tested patients are not accurately assessed
 - High-risk patients do not get treated
 - Treated patients are not adherent

References:

1. Newman ED, et al. *Osteoporos Int.* 2003;14:146-151.
2. Newman ED. *Osteoporos Int.* 2011;22(Suppl 3):S451-S455.



Healthcare provider empowerment involved osteoporosis management guidelines

HOW IT WORKS

- Geisinger-developed guidelines initially distributed as paper booklet with CME credits offered; later made fully electronic¹
- Guidelines set up as a practical set of algorithms or pathways¹
 - Pathways included: postmenopausal women, men > 70 years, patients with fracture
- EHR-based tools developed, including an osteoporosis “smartset”¹
 - With the osteoporosis smartset, the HCP could easily order a DXA, laboratory tests for osteoporosis secondary causes, medications, and patient instructions
 - Orders were associated with insurance carrier-specific diagnostic codes
- Community interventions trained pharmacists and nurses¹
- Outcomes were assessed¹

References:

1. Newman ED. *Osteoporos Int.* 2011;22(Suppl 3):S451-S455.
2. Newman ED, et al. *Osteoporos Int.* 2003;14:146-151.



Outcomes analysis at Geisinger reported multi-million dollar savings primarily from reduction in hip fractures

- Significant reductions in hip fracture were seen in the 65 to 74, 75 to 84, and ≥ 85 year age groups¹
 - 65 to 74 years: 5.0 to 2.8 hip fractures per 1000 person-years ($p = 0.011$)
 - 75 to 84 years: 20.1 to 12.5 hip fractures per 1000 person-years ($p = 0.005$)
 - ≥ 85 years: 53.5 to 33.4 hip fractures per 1000 person-years ($p = 0.005$)
- Between 2006 and early 2010²:
 - Women > 65 years with a DXA in the past 3 years rose from 40% to 74%
 - Women with a DXA at least once after age 65 rose to 83%
 - Treatment was started in 80.4% of identified high-risk patients; adherence at 3 months was 98%

References:

1. Newman ED, et al. *Osteoporos Int.* 2003;14:146-151.
2. Newman ED. *Osteoporos Int.* 2011;22 (Suppl 3):S451-S455.



Key features of the Geisinger Osteoporosis Program

- Physician champion to shepherd the program¹
- Innovative design, including^{1,2}:
 - Guidelines with practical pathways
 - EHR-based tools such as osteoporosis smartsets
 - High Risk Osteoporosis Clinic (HiROC) after 2000
 - Developed by the department of rheumatology; implemented with the division of orthopedics, primary care physician group, and inpatient hospitalist group
 - Seamless integration of inpatient to outpatient care for patients who sustained a fracture and were admitted to the hospital
 - Systematic care of high-risk outpatients
 - Follow-up adherence checks made by phone at 3 months for all patients taking oral or subcutaneous medication
- Understanding of redesign and quality improvement techniques¹
 - Allows program evolution as new challenges arise
- Systems-based approach¹
 - At-risk groups are assessed proactively
 - Intervention program to seek out patients at risk and those with prevalent fracture

References:

1. Newman ED. *Osteoporos Int.* 2011;22 (Suppl 3):S451-S455.
2. Newman ED, et al. *Osteoporos Int.* 2003;14:146-151.





Closed Model PFC Example

Kaiser SCAL Healthy Bones Program
(Orthopedic surgeon-driven)

Kaiser Southern California: orthopedic surgeon-driven screening and hip-fracture prevention program

BACKGROUND

Kaiser Southern California (Kaiser SCAL) is an HMO comprising 11 medical centers with 3.1 million members¹

Members received > 95% of their care at these centers¹

EMR capable of tracking DXA scans, fragility fractures, and osteoporosis medications¹

EMR = electronic medical record.

Reference:

1. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.



Reduce hip fracture rate by 25%*

OBJECTIVE

To reach this goal, Kaiser SCAL set several milestones¹:

Increase the use of DXA screening by at least 50% among patients considered to be at risk for hip fracture

Increase the rate of treatment with osteoporosis medication by at least 50% among patients diagnosed with osteoporosis on the basis of a DXA scan or patients with fragility fractures

Increase awareness of osteoporosis management among patients and HCPs

*Compared to the rate that would have been expected without the program.

Reference:

1. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.



Fully integrated program implemented at all Kaiser medical centers

HOW IT WORKS

- Healthy Bones Program: fully integrated program in place by 2002 at all 11 Kaiser SCAL medical centers¹
 - Several Kaiser medical centers began to develop osteoporosis disease-management programs in 1998
- Orthopedic surgeons served as champions in a large multidisciplinary team with HCPs from¹:
 - Endocrinology
 - Family practice
 - Internal medicine
 - Rheumatology
 - Gynecology
 - Physical therapy
 - Disease/care management
 - Radiology
 - Nursing education
- Outreach Programs targeted specific patients for DXA scans¹
 - Fall reduction and osteoporosis education programs were included

Reference:

1. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.



Kaiser SCAL used a 10-step plan-do-study-act approach that stressed continuous quality improvement

Plan¹

- Build a team led by a champion (“tough as nails, goal focused”)
- Set a goal (attention and resources should be focused on efforts that help achieve the goal)
- Identify patients at risk for hip fracture
- Risk-stratify these patients (prior hip fracture or ≥ 70 years with any prior fragility fracture)

Do¹

Work is done by the right person at the right time (“When a care gap is found, someone must close that care gap”)

Study¹

- Measure what was done (measure and report improvements and persisting care gaps)
- Look for variation and improve by adapting/adopting great ideas

Act¹

- Determine if incentives or penalties work best (carrot, stick, or both)
- Evolve until the goal is achieved
- Set higher goals once goals are achieved

Reference:

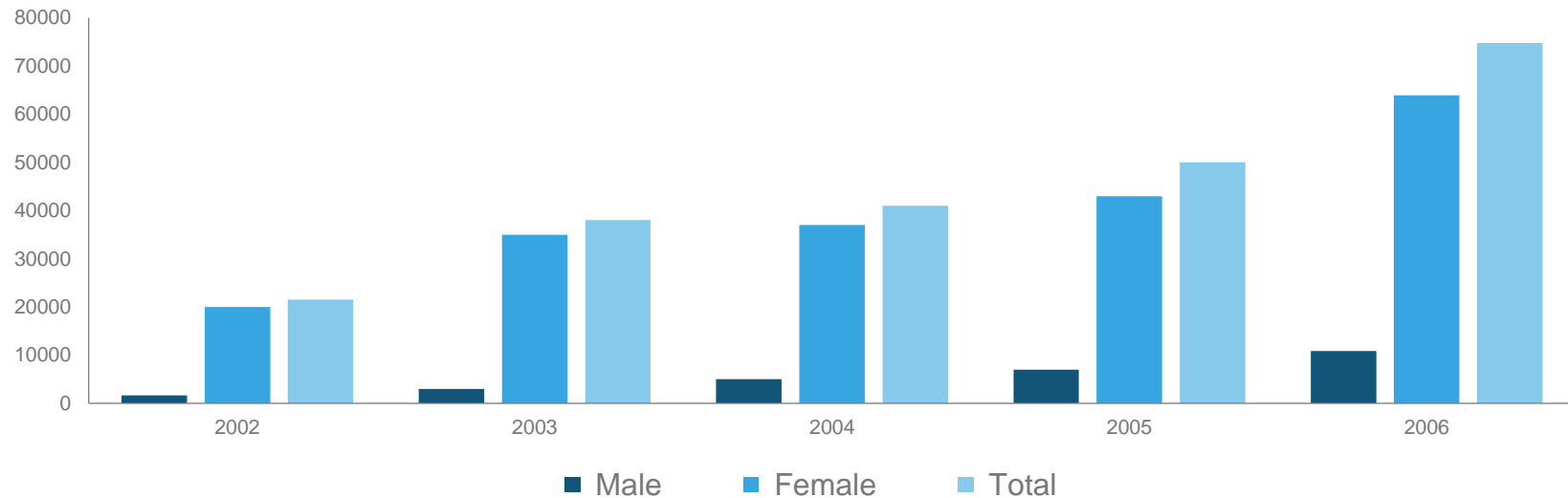
1. Dell R. *Osteoporos Int.* 2011;22(Suppl 3):S457-S460.



Clinical and economic outcomes DXA

scan utilization increased by 247% from 2002 to 2006¹

DXA scans by year¹



Prospective observational study of > 620,000 patients evaluated changes from 2002 to 2006¹

- > 60 years OR > 50 years with fragility fracture, DXA scan, or receiving osteoporosis medication (excluding hormonal therapy, calcium, vitamin D)

Bar graph illustrating the annual number of dual x-ray absorptiometry (DXA) scans in the Kaiser SCAL system from 2002 to 2006. The overall increase was 247% (from 21,557 to 74,770), the increase in women was 220% (from 20,008 to 63,929), and the increase in men was 600% (from 1549 to 10,841).

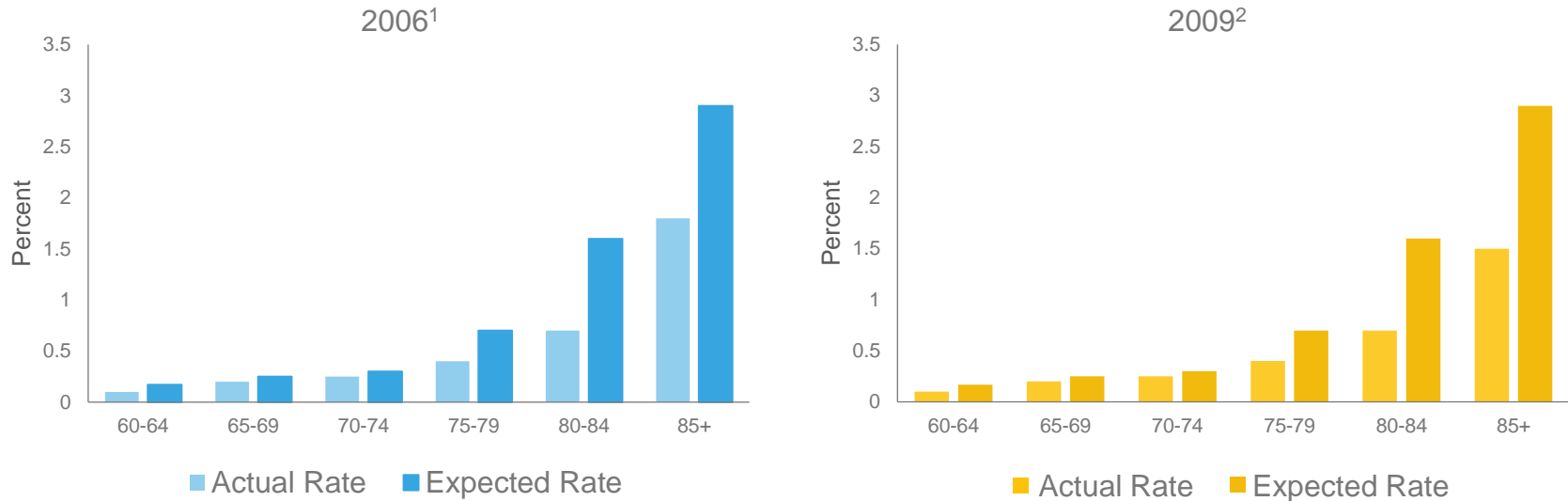
Reference:

1. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.



Average reduction in actual hip fracture rate vs expected rate was 37.2% in 2006 and > 40% in 2009^{1,2}

Expected* vs observed hip fractures by age group



- 935 hip fractures estimated to have been prevented in 2006 (2510 predicted; 1575 observed)¹
- > 40% reduction by 2009²
- Corresponding savings from hip fracture reduction reported to be above \$30 million¹

*Expected hip fracture rate for each age group was calculated on the basis of Kaiser SCAL historical hip fracture data from 1997 to 1999.¹

References:

1. Dell R, et al. *J Bone Joint Surg Am.* 2008;90(Suppl 4):188-194.
2. Dell R. *Osteoporos Int.* 2011;22(Suppl 3):S457-S460.

