**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Title**: OAF-01 Laboratory Investigation for Secondary Causes of Fracture

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Click here to enter composite measure title

**Date of Submission**: 12/6/2013

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| **Instructions**  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * Respond to all questions as instructed with answers immediately following the question. All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Maximum of 10 pages (*incudes questions/instructions*; minimum font size 11 pt; do not change margins). ***Contact NQF staff if more pages are needed.*** * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

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| **Note: The information provided in this form is intended to aid the Steering Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**  **Subcriterion 1a.** **Evidence to Support the Measure Focus**  The measure focus is a health outcome or is evidence-based, demonstrated as follows:   * Health outcome:**[3](#Note3)** a rationale supports the relationship of the health outcome to processes or structures of care. * Intermediate clinical outcome, Process,**[4](#Note4)** or Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence[**5**](#Note5)that the measure focus leads to a desired health outcome. * Patient experience with care: evidence that the measured aspects of care are those valued by patients and for which the patient is the best and/or only source of information OR that patient experience with care is correlated with desired outcomes. * Efficiency:**[6](#Note6)** evidence for the quality component as noted above.   **Notes**  **3.** Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.  **4.** Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement.  **5.** The preferred systems for grading the evidence are the U.S. Preventive Services Task Force (USPSTF) [grading definitions](http://www.uspreventiveservicestaskforce.org/uspstf/grades.htm) and [methods](http://www.uspreventiveservicestaskforce.org/methods.htm), or Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org/publications/index.htm).  **6.** Measures of efficiency combine the concepts of resource use and quality (NQF’s [Measurement Framework: Evaluating Efficiency Across Episodes of Care](http://www.qualityforum.org/Publications/2010/01/Measurement_Framework__Evaluating_Efficiency_Across_Patient-Focused_Episodes_of_Care.aspx); [AQA Principles of Efficiency Measures](http://www.aqaalliance.org/files/PrinciplesofEfficiencyMeasurementApril2006.doc)). |

**1a.1.This is a measure of**:

Outcome

☐ Health outcome: Click here to name the health outcome

*Health outcome includes patient-reported outcomes (PRO, i.e., HRQoL/functional status, symptom/burden, experience with care, health-related behaviors)*

☐ Intermediate clinical outcome: Click here to name the intermediate outcome

X☐ Process: Laboratory Assessment for Secondary Causes of Fracture

☐ Structure: Click here to name the structure

**HEALTH OUTCOME PERFORMANCE MEASURE**  *If not a health outcome, skip to* [*1a.3*](#Section1a3)

**1a.2.** **Briefly state or diagram the linkage between the health outcome (or PRO) and the healthcare structures, processes, interventions, or services that influence it.**

**1a.2.1.** **State the rationale supporting the relationship between the health outcome (or PRO) and at least one healthcare structure, process, intervention, or service**.

*Note: For health outcome performance measures, no further information is required; however, you may provide evidence for any of the structures, processes, interventions, or service identified above.*

**intermediate outcome, PROCESS, or STRUCTURE PERFORMANCE measure**

**1a.3.****Briefly state or diagram the linkages between structure, process, intermediate outcome, and health outcomes**. Include all the steps between the measure focus and the health outcome.

The process of laboratory assessment following fragility fracture for secondary causes of low bone mass will reveal or rule out any secondary disease process or condition causing the low bone mass. Once corrected, future fractures and the attendant hospitalization, costs, and morbidity will be prevented. Fragility fracture ⭢ laboratory assessment ⭢ determination of secondary condition causing fracture (osteoporosis) ⭢ correction of cause ⭢ decreased morbidity and decreased readmissions for fracture resulting in better patient outcomes

**1a.3.1.** **What is the source of the systematic review of the body of evidence that supports the performance measure?**

X☐ Clinical Practice Guideline recommendation – ***complete sections*** [***1a.4***](#Section1a4)***, and*** [***1a.7***](#Section1a7)

X☐ US Preventive Services Task Force Recommendation – ***complete sections*** [***1a.5***](#Section1a5) ***and*** [***1a.7***](#Section1a7)

☐ Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*) – ***complete sections*** [***1a.6***](#Section1a6) ***and*** [***1a.7***](#Section1a7)

X☐ Other – ***complete section*** [***1a.8***](#Section1a8)

*Please complete the sections indicated above for the source of evidence. You may skip the sections that do not apply.*

**1a.4. CLINICAL PRACTICE GUIDELINE RECOMMENDATION**

**1a.4.1.** **Guideline citation** (*including date*) and **URL for guideline** (*if available online*):

American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of postmenopausal osteoporosis.

Watts NB, Bilezikian JP, Camacho PM, Greenspan SL, Harris ST, Hodgson SF, Kleerekoper M, Luckey MM, McClung MR, Pollack RP, Petak SM, AACE Osteoporosis Task Force. American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of postmenopausal osteoporosis. Endocr Pract. 2010 Nov-Dec;16(Suppl 3):1-37. [209 references)

<http://www.guideline.gov/content.aspx?id=34968&search=osteoporosis>

**1a.4.2.** **Identify guideline recommendation number and/or page number** and **quote verbatim, the specific guideline recommendation**.

(BEL = Best Evidence Level)

**R2.** Maintain adequate vitamin D intake; supplement vitamin D, if needed, to maintain serum levels of 25-hydroxyvitamin D [25(OH)D] between 30 and 60 ng/mL (**Grade A; BEL 1**).

**R10.** Take measures to reduce the risk of falling (**Grade B; BEL 2**).

**R16.** Osteoporosis is defined as the presence of a fracture of the hip or spine (see section 4.4.2 in the original guideline document) (in the absence of other bone conditions) (**Grade B; BEL 3**).

**R17.** Evaluate for secondary osteoporosis (**Grade B; BEL 2**).

**1a.4.3.** **Grade assigned to the quoted recommendation with definition of the grade:**

Grade assigned appears above in 1a.4.2 for each recommendation. Definition of grade is:

| **Recommendation Grade** | **Description** |
| --- | --- |
| **A** | Homogeneous evidence from multiple well-designed randomized controlled trials with sufficient statistical power  Homogeneous evidence from multiple well-designed cohort controlled trials with sufficient statistical power  ≥1 conclusive level 1 publications demonstrating benefit >> risk |
| **B** | Evidence from at least 1 large well-designed clinical trial, cohort or case-controlled analytic study, or meta-analysis  No conclusive level 1 publication; ≥1 conclusive level 2 publications demonstrating benefit >> risk |

**1a.4.4. Provide all other grades and associated definitions for recommendations in the grading system.** (*Note: If separate grades for the strength of the evidence, report them in section 1a.7.*)

|  |  |
| --- | --- |
| **C** | Evidence based on clinical experience, descriptive studies, or expert consensus opinion  No conclusive level 1 or 2 publications; ≥1 conclusive level 3 publications demonstrating benefit >> risk  No conclusive risk at all and no conclusive benefit demonstrated by evidence |
| D | Not rated  No conclusive level 1, 2, or 3 publication demonstrating benefit >> risk  Conclusive level 1, 2, or 3 publication demonstrating risk >> benefit |

**1a.4.5. Citation and URL for methodology for grading recommendations** (*if different from 1a.4.1*)**:**

**1a.4.6. If guideline is evidence-based (rather than expert opinion), are the details of the quantity, quality, and consistency of the body of evidence available (e.g., evidence tables)?**

X ☐Yes **→ *complete section*** [***1a.7***](#Section1a7)

☐No **→ *report on another systematic review of the evidence in sections*** [***1a.6***](#Section1a6) ***and*** [***1a.7***](#Section1a7)***; if another review does not exist, provide what is known from the guideline review of evidence in*** [***1a.7***](#Section1a7)

**1a.5.** **UNITED STATES PREVENTIVE SERVICES TASK FORCE RECOMMENDATION**

**1a.5.1.** **Recommendation citation** (*including date*) and **URL for recommendation** (*if available online*):

**Prevention of Falls in Community-Dwelling Older Adults**

**U.S. Preventive Services Task Force Recommendation Statement**

Release Date: May 2012

<http://www.uspreventiveservicestaskforce.org/uspstf11/fallsprevention/fallsprevrs.htm>

**1a.5.2.** **Identify recommendation number and/or page number** and **quote verbatim, the specific recommendation**.

The USPSTF recommends exercise or physical therapy and vitamin D supplementation to prevent falls in community-dwelling adults aged 65 years or older who are at increased risk for falls ([B Recommendation](http://www.uspreventiveservicestaskforce.org/uspstf/gradespost.htm#brec)).

Recommendation is not numbered; there are no page numbers.

**1a.5.3.** **Grade assigned to the quoted recommendation with definition of the grade**:

Grade B - The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.

**1a.5.4. Provide all other grades and associated definitions for recommendations in the grading system.** (*Note: the* *grading system for the evidence should be reported in section 1a.7.*)

|  |  |
| --- | --- |
| **Grade** | **Definition** |
| **A** | The USPSTF recommends the service. There is high certainty that the net benefit is substantial. |
| **C** | *Note: The following statement is undergoing revision.*  Clinicians may provide this service to selected patients depending on individual circumstances. However, for most individuals without signs or symptoms there is likely to be only a small benefit from this service. |  | |
| **D** | The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits. |
| **I Statement** | The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined. |  |

**1a.5.5. Citation and URL for methodology for grading recommendations** (*if different from 1a.5.1*)**:**

http://www.uspreventiveservicestaskforce.org/uspstf/gradespost.htm#brec

***Complete section*** [***1a.7***](#Section1a7)

**1a.6. OTHER SYSTEMATIC REVIEW OF THE BODY OF EVIDENCE**

**1a.6.1.** **Citation** (*including date*) and **URL** (*if available online*):

**1a.6.2.** **Citation and** **URL for methodology for evidence review and grading** (*if different from 1a.6.1*)**:**

***Complete section*** [***1a.7***](#Section1a7)

**1a.7. FINDINGS FROM SYSTEMATIC REVIEW OF BODY OF THE EVIDENCE supporting the measure**

**1a.7.1.** **What was the specific structure, treatment, intervention, service, or intermediate outcome addressed in the evidence review?**

R2 Vitamin D intake and supplementation

R10 Reduction of fall risk for fracture prevention

R17 Evaluation for secondary causes of osteoporosis

**1a.7.2.** **Grade assigned for the quality of the quoted evidence with definition of the grade**:

R2 Vitamin D intake and supplementation – Evidence Level 1

R10 Reduction of fall risk for fracture prevention – Evidence Level 2

R17 Evaluation for secondary causes of osteoporosis – Evidence level 2

**2010 American Association of Clinical Endocrinologists Criteria for Rating of Published Evidence\***

|  |  |
| --- | --- |
| **Numerical Descriptor (evidence level)** | **Semantic Descriptor (reference methods)** |
| 1 | Meta-analysis of randomized controlled trials |
| 1 | Randomized controlled trial |
| 2 | Meta-analysis of nonrandomized prospective or case-controlled trials |
| 2 | Nonrandomized controlled trial |
| 2 | Prospective cohort study |
| 2 | Retrospective case-control study |
| 3 | Cross-sectional study |
| 3 | Surveillance study (registries, surveys, epidemiologic study) |
| 3 | Consecutive case series |
| 3 | Single case reports |

**1a.7.3. Provide all other grades and associated definitions for strength of the evidence in the grading system.**

|  |  |  |
| --- | --- | --- |
| **Numerical Descriptor (evidence level)** | | **Semantic Descriptor (reference methods)** |
| 4 | No evidence (theory, opinion, consensus, or review) | | |

\*1 = strong evidence; 2 = intermediate evidence; 3 = weak evidence; 4 = no evidence.

**1a.7.4.** **What is the time period covered by the body of evidence? (*provide the date range, e.g., 1990-2010*). Date range**: 2003 - 2010

**QUANTITY AND QUALITY OF BODY OF EVIDENCE**

**1a.7.5.****How many and what type of study designs are included in the body of evidence**? (*e.g., 3 randomized controlled trials and 1 observational study*)

R2 Vitamin D intake and supplementation:

3 – Both meta-analyses of randomized controlled trials and randomized control trials (Level 1)

7 - Meta-analyses of nonrandomized prospective or case-controlled trials, prospective cohort studies, nonrandomized controlled trials (Level 2)

1 - Cross-sectional studies, surveillance studies (registries, surveys, epidemiologic study), consecutive case series, single case reports (Level 3)

1 – No evidence (theory, opinion, consensus, or review) (Level 4)

R10 Reduction of fall risk for fracture prevention:

2 - Meta-analyses of randomized controlled trials and randomized control trials (Level 1)

3 - Meta-analyses of nonrandomized prospective or case-controlled trials, prospective cohort studies, nonrandomized controlled trials (Level 2)

1 - Cross-sectional studies, surveillance studies (registries, surveys, epidemiologic study), consecutive case series, single case reports (Level 3)

R17 Evaluation for secondary causes of osteoporosis – Evidence level 2

1 - Meta-analyses of nonrandomized prospective or case-controlled trials, prospective cohort studies, nonrandomized controlled trials (Level 2)

1 - No evidence (theory, opinion, consensus, or review) (Level 4)

**1a.7.6.** **What is the overall quality of evidence across studies in the body of evidence**? (*discuss the certainty or confidence in the estimates of effect particularly in relation to study factors such as design flaws, imprecision due to small numbers, indirectness of studies to the measure focus or target population*)

There was no statement of the overall quality of evidence in guideline documents, but it appears to be Level 2 - Meta-analyses of nonrandomized prospective or case-controlled trials, prospective cohort studies, nonrandomized controlled trials There were eleven Level 2 studies evaluated for the 3 recommendations.

Factors considered in analysis were premise correctness, allocation concealment (randomization), selection bias, appropriate blinding, using surrogate end-points, sample size, and null hypothesis vs. Bayesian statistics. The estimated effect of these factors was not stated in guideline documents – only that they were considered.

**ESTIMATES OF BENEFIT AND CONSISTENCY ACROSS STUDIES IN BODY OF EVIDENCE**

**1a.7.7.** **What are the estimates of benefit—magnitude and direction of effect on outcome(s) across studies in the body of evidence**? (*e.g., ranges of percentages or odds ratios for improvement/ decline across studies, results of meta-analysis, and statistical significance*)

Unstated in guideline documents.

**1a.7.8.** **What harms were studied and how do they affect the net benefit (benefits over harms)?**

Treatment failure and resultant fracture was acknowledged as a possible harm; however, it was felt that more bone loss and earlier fracture would have occurred without treatment, so that the benefit outweighed the harm in the opinion of the guideline authors.

**UPDATE TO THE SYSTEMATIC REVIEW(S) OF THE BODY OF EVIDENCE**

**1a.7.9.** **If new studies have been conducted since the systematic review of the body of evidence, provide for each new study: 1) citation, 2) description, 3) results, 4) impact on conclusions of systematic review**.

None

**1a.8 OTHER SOURCE OF EVIDENCE**

*If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.*

**1a.8.1** **What process was used to identify the evidence?**

A fulsome literature search of Medline, PubMed, Cinhal, Medline, Cochrane Reviews, The National Guideline Clearinghouse, The National Quality Measure Clearinghouse, Clinical Trials.gov, and other sources was conducted in July 2007, inclusive of publications from 2000 through 2007. This search was repeated in August 2013, inclusive of publications from 2008 through 2013. 888 references were identified in this second review. These 888 references were further narrowed to 58 germane references. A secondary targeted search of references in these publications so identified was also conducted, resulting in an additional 36 references.

References included were evidence-based guidelines, meta-analyses, The Surgeon General’s 2004 report, randomized control trials, cohort studies, consecutive case series, and other well-referenced publications.

**1a.8.2.** **Provide the citation and summary for each piece of evidence.**

American Association of Clinical Endocrinologists. Medical guidelines for clinical practice for the diagnosis and treatment of postmenopausal osteoporosis: Endocr Pract. 2010 Nov-Dec;16 (Suppl 3):1-37. [209 references]

*Summary:* This guideline publication presents evidence-based information about the diagnosis, evaluation, and treatment of postmenopausal osteoporosis. It is an update of the 2001 guideline. Among other recommendations, it recommends a basic laboratory panel of tests to evaluate patients for secondary causes of osteoporosis, DXA scanning to establish a diagnosis of osteoporosis or osteopenia and for follow-up monitoring, use of various medications for low bone mass, and Vitamin D supplementation for deficiency; osteoporosis is defined as a fracture of the hip or vertebra, in addition to DXA result definitions.

Andrade SE, Majumdar SR, Chan KA, Buist DS, et al. Low Frequency of Treatment of Osteoporosis Among Postmenopausal Women Following a Fracture. Arch Int Med; Vol 163, Sep 22, 2003.

*Summary:* A retrospective review of the databases of 7 health maintenance organizations was conducted to evaluate the use of drugs recommended for secondary prevention of osteoporotic fracture among women 60 and older with a fracture of the hip, wrist, spine or vertebra. 3492 patients were evaluated for use of FDA-approved pharmacotherapy within 1 year of fracture. Women with fracture of the vertebra were treated twice as often as women with fracture of the wrist or hip (44% vs. 22% and 21%, respectively). Interventions to improve the detection and treatment of osteoporosis are warranted.

Colon-Emeric, C, Kuchibhatia M, Pieper C, Hawkes W et al. The contribution of hip fracture to risk of subsequent fractures: data from two longitudinal studies. Osteoporosis Int (2003) 14: 879-883.

*Summary:* This article is an analysis of data from 2 large cohort studies (the Baltimore Hip Studies and the Established Populations for Epidemiologic Studies of the Elderly, EPESE) to assess the risk of future fracture after hip fracture. After adjustment for other known fracture risk factors, the risk increase after hip fracture was 1.6 for both men and women; unadjusted rates were 2.52. This increased risk for fracture persisted over time (the study evaluated 10 years after hip fracture).

Dawson-Hughes B. Serum 25-hydroxyvitamin D and functional outcomes in the elderly. Am J Clin Nutr 2008:88(suppl): 537S-40S.

*Summary:* Article reporting on key evidence that treatment with Vitamin D has measurable benefits to the musculoskeletal system in the elderly. Target levels are described as above 65 ng/ml, while 30% of persons living in lower latitudes are estimated to have insufficiency. Conclusion is that Vitamin D improves muscle function and reduces the risk of falling.

Dell RM, Greene D, Anderson D, Williams K. Osteoporosis Disease Management: What Every Orthopedic Surgeon Should Know. J Bone Joint Surg Am. 2009:91 Suppl 6: 79-86.

*Summary:* Overview of osteoporosis prevalence, pathophysiology, laboratory tests for routine

evaluation, and treatment.

Deutschmann HA, Weger M, Weger W, Kotanko P, et al. Search for occult secondary osteoporosis: impact of identified possible rsik factors on bone mineral density. Journal of Internal Medicine 252: 389-397.

*Summary:* 377 subjects with osteoporosis or nontraumatic lumbar vertebral fracture were investigated to determine whether diagnostic tests can identify possible risk factors for secondary osteoporosis and the impact of the risk factors on bone density. In 241 of the 337 patients (64%), one or more risk factors were revealed, and the number of risk factors in each patient was directly related to disease severity.

Edwards BJ, Koval K, Bunta AD, Genuario K, et al. Addressing Secondary Prevention of Osteoporosis in Fracture Care: Follow-up to “Own the Bone”. J Bone Joint Surg Am. 2011:93:e87(1-7).

*Summary:* Report of a prospective cohort study examining the effectiveness of two modes of intervention for inpatients with fragility fracture – immediate intervention, including initiation of pharmacotherapy while hospitalized, and delayed intervention by notification of the PCP after discharge that the patient should be evaluated or treated for osteoporosis. Immediate initiation of osteoporosis care resulted in a higher rate of treatment (67%) vs. a 30% treatment rate in the delayed care group. Treatment rates prior to any intervention were 0%.

Gabaroi DC, Peris P, Monegal A, Albaladejo C, et al. Searcxh for hidden secondary causes in postmenopausal women with osteoporosis. Menopause, Vol 17, No. 1, 2010.

*Summary:* This is a report of a study to analyze the prevalence of conditions contributing to bone loss in postmenopausal women with osteoporosis and to evaluate the impact of these disorders on the severity of the disease. As a group, 82% had low 25(OH)D levels (<30 ng/ml), 35% had increased PTH levels, 20% had hypercalciuria, and 41% had urinary abnormalities.

Hamdy, NAT. Secondary Osteoporosis: Other Causes. Primer on the Metabolic Bone Diseases and Disorders of Mineral Metabolism, 2013. Ch 60: 489-494. (60 references)

*Summary:*  Review of secondary causes of osteoporosis, which are prevalent in two-thirds of men, more than half of premenopausal women, and one-fifth of postmenopausal women. Explores the pathophysiology of three common underlying causes – systemic inflammatory disorders, diabetes, and mastocytosis. Recommends a basic laboratory evaluation consisting of a CBC, biochemistry profile, 24 hour urine calcium excretion, and 25(OH)D for the majority of osteoporosis patients.

Hanley DA, Cranney A, Jones G, Whiting SJ, et al. Vitamin D in adult health and disease: a review and guideline statement from Osteoporosis Canada (summary). CMAJ September 7, 2010: 182 (12).

*Summary:* Review of systematic reviews of the role of Vitamin D in the management of osteoporosis; after screening, 16 systematic reviews of randomized control trials and observational studies remained recommends supplementation with 800-1000IU daily for adults over 50 years of age to maintain optimum Vitamin D status. Deficiency is defined as a level below 25ng/ml (Level 3 evidence) and insufficiency as a level between 25 and 75 ng/ml. (Level 2 evidence).

Johnell O, Kaufman J, Cummings S, Lane J, Bouxein M. Recommendations for Car of the Osteoporotic Fracture Patient to reduce the Risk of Future Fracture. Developed by the World Orthoped Osteoporosis Organization. Downloaded July 2, 2012 from [www.boneandjointdecade.de/downloads](http://www.boneandjointdecade.de/downloads).

*Summary:* Series of recommendations to orthopedic surgeons when treating fragility fracture patients, encouraging acting as a patient advocate to ensure that osteoporosis is addressed. Includes recommendations for investigation for secondary causes of osteoporosis and over view of pharmacologic and non-pharmacologic interventions.

Johnson BH, Lucasey B, Robinson RG, Lukert BP. Contributing Diagnoses in osteoporosis. Arch Int Med – Vol 149, May, 1989.

*Summary:* 300 consecutive osteoporosis patients who presented to an osteoporosis clinic for evaluation were tested with laboratory tests that included CBC, thyroxine, urinary calcium and 25(OH) D levels; 83 (46%) were found to have contributing diagnoses.

Klotzbuecher CM, Ross PD, Landsman PB, Abbott TA, Berger M. Patients with Prior Fractures Have an Increased Risk of Future Fractures: A Summary of the Literature and Statistical Synthesis. Journal of Bone and Mineral Research Vol 15, No.4, 2000.

*Summary*: A literature summary and statistical syntheses of the risk of future fracture given the occurrence of prior fracture. Studies of peri- and postmenopausal women with prior fracture demonstrated 2.0 times the risk of future fracture compared with women without prior fracture. In other studies that included men and women of all ages, the risk was increased by 2.2 times. Authors conclude that patients with a history of fracture at any site is an important risk factor for future fractures and they should receive further evaluation for osteoporosis and fracture risk.

Majumdar, SR. Recent Trends in Osteoporosis Treatment After Hip Fracture: Improving But Wholly Inadequate. (Editorial) The Journal of Rheumatology, February 2008. Downloaded on July 2, 2012 at [www.jrheum.com/subscribers/08/02/190.html](http://www.jrheum.com/subscribers/08/02/190.html%20%20on%20July%202)

*Summary:* Editorial relative to the stat of osteoporosis care following hip fracture. 80% of hip fracture patients have low bone mass, but only 10-20% receive care for osteoporosis. Highlighted is a report of a 10 year time-series in a population-based cohort of elderly hip fracture patients that illustrates the persistent care gap after fracture; while treatment rates improved over the course of 10 years from 7% treatment to 30%, a treatment rate of 50% would have been expected. Outside of the study, treatment rates for the same time period were 4% in 1995 and 17% in 2004. Barriers to treatment are discussed, and the positive effects of a case manager are described.

National Osteoporosis Foundation Releases New Data Detailing the Prevalence of Osteoporosis. National Osteoporosis Foundation. [www.nof.org](http://www.nof.org). downloaded September 23, 2013.

*Summary:* A press release detailing the current prevalence of osteoporosis and projected volume and expenditures in the future.

Painter SE, Kleerekoper M, Camacho, PM. Secondary Osteoporosis: A Review of the Recent Evidence. Endocrine Practice Vol 12 No.4 July/August 2006.

*Summary:* This article is a literature review of the many causes of osteoporosis that were published between 1990 and 2005 (15 years), focusing on literature between 2000 and 2005. Findings were that secondary osteoporosis occurs in almost two-thirds of men, more than half of premenopausal and perimenopausal women, and in about one-fifth of postmenopausal women. The causes of secondary osteoporosis are numerous, and heightened awareness of their possible existence is necessary to provide optimal care.

Papaioannou A, Morin S, Cheug AM, Atkinson S, et al. 20120 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary. Can Med Assoc Journal, November 23, 2010; 182(17).

*Summary:* This update of guidelines is formulated for both men and women over the age of 50. The basis for the guidelines includes a literature review of 7 databases from January 1990 to December 2009, and included were Cochrane reviews, a MacLean review of 76 randomized trials and 24 meta-analyses, and 34 other papers. The guidelines state that for individuals with osteoporosis, only limited lab investigation is warranted initially, consisting of serum calcium, CBC, Creatinine, alkaline phosphatase, TSH, protein electrophoresis, and 25 (OH)D; that is sufficient to reveal any abnormalities indicative of the need for further testing for any of the myriad disorders than can result in osteoporosis. Vitamin D dosing for those deficient (<30ng/ml) should be at the level of 800-1000 IU daily. (71 references).

Pope R. Multidisciplinary care for osteoporosis: What the primary care physician needs to know. Supplement to The Journal of Family Practice July 2009, Vol 58, No. 7.

*Summary:* This article reviews the role of the multidisciplinary care team in the prevention and management of osteoporosis and concludes that improved communication among providers and continuity are needed. Noted are the incidence of low bone mass among wrist fracture patients (70 to 80%), and a chart review of postmenopausal women hospitalized for a low-impact fracture showing that osteoporosis was not considered in 75% of these cases.

The American College of Obstetricians and Gynecologists. Osteoporosis Practice Bulletin. Obstetrics and Gynecology Vol 120, No. 3, September 2012.

Summary: Recommended approaches that obstetricians/gynecologist should take in the approach to detection, management and treatment of osteoporosis. Relevant highlights are that A) 72% of the 2005 $17 billion cost of caring for osteoporosis-related fractures is cost for care of hip fracture, and B) initial evaluation for secondary causes of osteoporosis should include CBC, metabolic profile, urinary calcium, 25(OH)D, and TSH. (78 references).

U.S.Department of Health and Human Services. *Bone Health and Osteoporosis: A Report of the Surgeon General.*  Rockville, MD. U.S. Department of Health and Human Services. Office of the Surgeon General, 2004.

Summary: Comprehensive review of effective diagnosis and management of osteoporosis Included is the recommendation that “all patients with low-trauma fractures should be evaluated for other bone diseases and secondary causes of bone loss. They should also be evaluated with respect to the need for additional preventive measures (calcium, vitamin D, exercise, fall prevention) and for drug therapy…” (Chapter 9). Available at: http://www.surgeongeneral.gov/library/reports/bonehealth/chapter\_9.html

Warriner AH, Saag K. Osteoporosis Diagnosis and Medical Treatment. Orthop Clin N Am 44 (2013): 125-135.

*Summary:* Hip and vertebral fractures are 2 of the most common fracture sites related to osteopenia/osteoporosis and affect nearly 1 million Americans annually, at a cost (in 2005) of $19 billion 1.Osteoporosis can be diagnosed by measurement of bone mineral density or based on the history of a nontraumatic fracture. 2. Osteoporosis treatment should be considered for all people with a risk of future fracture; fracture risk assessment tools can assist in determining which patients will benefit from treatment. 3. Benefits and potential risks of each of the several treatment options should be weighed for each patient.