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Shenwan Wang

University of San Diego, shenwanwang@sandiego.edu

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UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF NURSING PRACTICE

SCREENING FOR POSTMENOPAUSAL OSTEOPOROSIS IN WOMEN BETWEEN AGE  
30-64 IN PRIMARY CARE: A POLICY PERSPECTIVE WITH RECOMMENDATIONS

by

Shenwan Wang, DNP-S, BSN, RN

A Doctor of Nursing Practice Portfolio presented to the  
FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE  
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requirements for the degree  
DOCTOR OF NURSING PRACTICE

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Joseph F. Burkard, DNSc, CRNA, Faculty Advisor

Elaine R. Henson, DNP, ANP-C, Clinical Mentor

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It's been a long journey, but I feel so fortunate to have you as my classmates and friends.

**Final Manuscript**

Screening for Postmenopausal Osteoporosis in Women between Age 30-64 in Primary  
Care: A Policy Perspective with Recommendations

Shenwan Wang, DNP-S, RN

Elaine R. Henson, DNP, ANP-C Joseph F. Burkard, DNSc, CRNA

**Abstract**

Osteoporosis is a silent disease leading to osteoporotic fractures and even death. Postmenopausal women are extremely susceptible to osteoporosis because of estrogen deficiency. But less than 1 in 4 women with an osteoporotic fracture was screened or treated for osteoporosis. Postmenopausal women have been proven to benefit from early osteoporosis detection and treatment. However, there is no current national policy on screening for postmenopausal osteoporosis before age 65. Nurse practitioners can play an important role in screening for postmenopausal osteoporosis in primary care to prevent osteoporotic fractures and improve quality of life.

Screening for Postmenopausal Osteoporosis in Women between Age 30-64 in Primary Care: A  
Policy Perspective with Recommendations

### **Background**

Osteoporosis is a major health crisis in the United States. About 54 million Americans have osteoporosis and low bone mass (previously called osteopenia). Untreated osteoporosis may lead to osteoporotic fractures, especially hip fractures. Osteoporotic fractures may impact independent daily activities, decrease quality of life, increase hospitalization and require long-term care. 21%-30% of patients who have a hip fracture die within one year (Brauer, Coca, Cutler & Rosen, 2009).

The annual cost of caring for osteoporotic fractures is higher than the total annual costs of caring for breast cancer, myocardial infarction, or stroke in women over 55 years old (Singer, 2015). With the aging of the U.S. population, costs of osteoporotic fractures are estimated to be over 25 billion by 2025.

### **Evidence for the project**

United States has more than 2 million osteoporotic fractures each year, of which over 70% are women (Burge et al., 2007; Wright et al, 2014). Postmenopausal women have higher rates of osteoporosis than men in any given age because of estrogen deficiency. Postmenopausal women, either surgical or natural, are frequently diagnosed with osteoporosis. Because estrogen deficiency increases their risk for osteoporosis. It has been proven that postmenopausal women benefit from early osteoporosis treatment with better outcomes (Eastell, 1998).



Bone loss usually happens over a very long period of time. Patients may have osteoporosis for years without any awareness until having osteoporotic fractures. Osteoporosis is a common silent disease among postmenopausal women causing fractures or even death. However, less than 1 in 4 women over 67 years old with an osteoporotic fracture gets bone density measured or begins osteoporosis treatment (Camacho et al., 2016). The burden is that there is no current national policy that recommends screening for osteoporosis among postmenopausal women in an early age to prevent fractures.

### **Evidence based intervention**

With at least good level of evidence, US Preventive Services Task Force (USPSTF) recommends screening for osteoporosis in postmenopausal women (either surgical or natural) under 65 years old, with at least one risk factor (Curry et al., 2018). USPSTF recommends using a clinical risk assessment tool to consider risk factors associated with increased risk of osteoporotic fractures among postmenopausal women, including parental history of hip fracture, smoking, excessive alcohol consumption, and low body weight (Curry et al., 2018). Postmenopausal women with multiple risk factors at an early age are susceptible to osteoporosis and have much higher risk of osteoporotic fractures at an earlier time.

Several clinical risk assessment tools include Fracture Risk Assessment Tool (FRAX), Simple Calculated Osteoporosis Risk Estimation (SCORE), Osteoporosis Risk Assessment Instrument (ORAI), Osteoporosis Index of Risk (OSIRIS), and the Osteoporosis Self-Assessment Tool (OST). They have been shown to perform moderately accurate at predicting risk of osteoporosis (Curry et al., 2018). USPSTF recommends using FRAX tool to identify women for

increased osteoporosis risk. The threshold score of 9.3% indicates risk of major osteoporotic fracture.

However, a study conducted at Mayo Clinic suggests that the use of SCORE tool improves sensitivity to identify osteoporosis in women at an early age between 50-64, after comparing the performance of the USPSTF recommended FRAX with SCORE tools (Pecina et al., 2016). The FRAX threshold score of 9.3% cannot identify osteoporosis in a large number of women at an early age, which fails the purpose of fracture prevention (Pecina et al., 2016). On the other hand, SCORE tool is more sensitive in identifying osteoporosis in an early age. It takes race, rheumatoid arthritis, prior rib/wrist/hip nontraumatic fracture, prior estrogen use, age and weight into consideration. The threshold score over 6 points indicates increased osteoporosis risk.

Other organizations like American Association of Clinical Endocrinologist (AACE) and American College of Endocrinology (ACE) also strongly recommends with best evidence level screening osteoporosis among postmenopausal women based on individual fracture risk assessment (Camacho, 2020).

### **Purpose of the project**

This project will serve as an attention to policy makers to increase the identification of osteoporosis among postmenopausal women in an early age. By routinely assessing osteoporosis risk among postmenopausal women between age 30-64 using clinical risk assessment tools at primary care, it will not only prevent osteoporotic fracture, but will also reduce high medical cost related to consequences of osteoporotic fracture and improve quality of life. Initial osteoporosis

screening using clinical risk assessment tools in primary care is also considered cost-effective and efficient.

### **Project Plan**

This project will be based on literature review including national clinical guidelines, systemic reviews, high-quality clinical trials related to osteoporosis screening. And the data from Dr. Henson's pilot study screening postmenopausal osteoporosis in women aged 30-64 at SharpCare Grossmont will be used. The project will be continued by future students in larger scale participation to provide more evidence supporting the policy making decisions.

### **Framework / EB Model**

The problem-centered public policy-making process model is used. Block (2008) indicated that policy analysis was placed between problems and policy making as it provided analytical information for decision makers. The six phases of policy analysis correlated with the six phases of policy making (Block, 2008). Phases of policy analysis include problem structuring, forecasting, recommendations for policy adoption, monitoring, evaluation, and recommendations for policy modification (Block, 2008).

### **Policy Analysis**

There is no current national policy on screening osteoporosis among postmenopausal women in an early age in the U.S.. With at least good level of evidence, USPSTF recommends screening for osteoporosis using clinical risk assessment tools in postmenopausal women (either

surgical or natural) under 65 years old with at least one risk factor (Curry et al., 2018). Harms of early osteoporosis detection and treatment is minimum (Curry et al., 2018).

USPSTF also found convincing evidence that bone measurement tests are reliable for identifying osteoporosis and predicting osteoporotic fractures (Curry et al., 2018).

Pharmacological therapies reduce subsequent fracture rates in postmenopausal women.

Bone measurement testing with central Dual-Energy X-ray Absorptiometry

(DEXA) is the common standard for osteoporosis diagnosis. It uses radiation to measure Bone Mineral Density (BMD) at hip and lumbar spine in order to identify osteoporosis. World Health Organization (WHO) defines osteoporosis as BMD 2.5 Standard Deviation (SD) or more below the average value for young healthy women ( $T\text{-score} \leq -2.5 \text{ SD}$ ) (Kanis, 2008).

However, screening osteoporosis using DEXA among all of the population is associated with unnecessary radiation exposure, time and medical costs. Clinical risk assessment tools are considered more accessible and cost-effective in screening osteoporosis among postmenopausal women at an early age to prevent osteoporotic fractures.

A new systemic review and meta-analysis among 42,009 participants concludes that implementing osteoporosis population screening in primary care has been proven to be effective to reduce all osteoporotic fractures, especially hip fractures (Merlijn, Swart, Van der Horst, Netelenbos & Elders, 2020). The cost-effectiveness is a serious issue when considering performing DEXA scan among the general population in order to identify at-risk patients. However, clinical risk assessment tools are considered more cost-effective and efficient in screening for postmenopausal osteoporosis in primary care, compared to DEXA scan. This initial screening in primary care would identify at-risk patients based on results of simple questionnaires. Those identified at-risk patients will then be referred for DEXA scan for further

evaluation. Osteoporosis treatment will be initiated based on DEXA scan results in preventing fractures.

A pilot study at a primary care indicated 55% of participants who are postmenopausal between age 30-64 were identified as at risk for osteoporosis using Simple Calculated Osteoporosis Risk Estimation (SCORE) risk assessment tool (Henson, 2020). A total of 53 women ages 30-64 participated in the study. 28 were identified as postmenopausal, either surgical or natural, were screened using SCORE risk assessment tool. Among the 28 postmenopausal women, 13 scored as high risk of osteoporosis who need a DXA scan referral. The significant finding of the study indicated that postmenopausal women have a higher risk of osteoporosis at an early age compared to other elderly women.

Health policy changes in osteoporosis screening can largely improve health outcomes and reduce related costs in the U.S. (Lewiecki et al., 2019). A study projects that annual fractures will increase from 1.9 million to 3.2 million (68%) from 2018 to 2040 without national health policy changes (Lewiecki et al., 2019). Meanwhile, the related medical costs will rise from \$57 billion to over \$95 billion (Lewiecki et al., 2019). In contrast, health policy change on expansion of early osteoporosis identification and treatment of high-risk women can reduce this burden, preventing 6.1 million fractures while reducing payer costs by \$29 billion and societal costs by \$55 billion in the next 22 years (Lewiecki et al., 2019).

### **Recommendations**

A national policy on screening osteoporosis among postmenopausal women between age 30-64 is highly recommended. Clinical osteoporosis risk assessment tools are recommended to be utilized at primary care in the first place to identify at-risk patients. Further DEXA scan and

osteoporosis treatments are recommended based on individual risk assessment results. It will not only reduce the rate of osteoporosis and prevent osteoporotic fracture, but will also result in substantial cost-savings in a long term.

### **Implications for Clinical Practice**

Screening for osteoporosis among postmenopausal women aged 30-64 will increase identification of osteoporosis in an early age. It will also prevent osteoporotic fractures to improve healthcare outcomes and decrease high medical cost related to osteoporotic fractures. Nurse practitioners have sufficient knowledge and skills to improve health outcomes in primary care. They can play an important role in screening postmenopausal osteoporosis at primary care using clinical risk assessment tools. The early detection and treatment will benefit the aging population in the U.S. to raise quality of life and reduce the related costs in a long term.

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