OBJECTIVE

Alberta clinicians will understand who and how to screen, assess, diagnose, treat and manage osteoporosis and/or fracture risk.

TARGET POPULATION

All men and women 50 years of age and older

EXCLUSIONS

All men and women under 50 years of age

This guideline is partially adapted from Papaioannou A, Morin S, Cheung AM, et al; for the Scientific Advisory Council of Osteoporosis Canada. 2010 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: Summary. CMAJ. 2010;182:1864-73.[1]

KEY MESSAGES

- The goal is to find patients at high risk of fracture, not just low bone mineral density (BMD) (see Algorithm).
- BMD results and repeated testing alone provide little if any value to drive long term management decisions. BMD should be used as a supporting tool only.
- For those patients previously diagnosed with osteoporosis, assess and manage based on the patient's absolute risk of osteoporosis-related fractures.
- Patients with a past fragility fracture have a higher risk for future fractures.
- Lifestyle modification and pharmacologic therapy recommendations may need to be individualized.

RECOMMENDATIONS

GENERAL PATIENT POPULATION (50-64 YEARS OF AGE)

- ✓ Use the Osteoporosis Self-assessment tool (OST): Weight (kg) – Age (years) in the context of finding those men and women 50-64 years of age where there is no known risk factors but there could be a future fracture risk.
- ✓ Order a bone mineral density (BMD) test only if OST score is <10 indicating patient is at moderate to high risk for osteoporosis.
- ✓ Reassess OST in five years if OST score is ≥10 indicating patient is at low risk for osteoporosis (see Algorithm).

PATIENTS WITH KNOWN RISK FACTORS

- ✓ Order BMD* test for men and women ≥50 years of age with one or more of the following risk factors:

- Fragility fracture after age 40 and at risk for future fractures
  - Fragility fractures are defined as low trauma fractures (e.g., from a fall from a standing height or less), or presenting in the absence of obvious trauma.
  - Typical osteoporotic fractures are forearm, humerus, femur, pelvis, and spinal compression.
- Vertebral compression fracture or osteopenia identified on radiography
- Parental hip fracture
- Prolonged use of glucocorticoids**
- Use of other high risk medications†
- Rheumatoid arthritis, malabsorption syndrome, other disorders strongly associated with osteoporosis
- Current smoker
- High alcohol intake (>3 units/day)
- Major weight loss (10% below their body weight at age 25)

✓ Discuss the limited value of a BMD test with all men and women ≥50 years of age who are requesting BMD test and/or concerned about risk for osteoporosis.

✓ Suggest BMD test for all women aged ≥65 and men aged ≥65 with ≥1 risk factor if not previously screened with BMD test per OST.

Notes:

**BMD measurement is generally performed using dual energy X-ray absorptiometry (DXA or DEXA) – these acronyms are often used interchangeably with BMD test.*

***At least three months cumulative therapy in the previous year at a prednisone-equivalent dose >7.5 mg daily*

†For example, aromatase inhibitors or androgen deprivation therapy

Inappropriate Indications for BMD

X DO NOT order BMD for:

- Chronic back pain (aiming to rule out vertebral fractures)
- Kyphosis (best investigated using lateral thoracic spine X-rays to rule out anterior compression fractures)
- Menopause, in the absence of risk factors

Assessment

✓ Use clinical factors and BMD T-score to determine absolute risk of fracture over the next 10 years with one of:

- Osteoporosis Canada 10 Year Fracture Risk Assessment Tool (based on the CAROC system):
  - http://www.osteoporosis.ca/multimedia/FractureriskTool/index.html#/Home
  - App available at: http://www.osteoporosis.ca/health-care-professionals/clinical-tools-and-resources/fracture-risk-tool/
- FRAX: www.sheffield.ac.uk/FRAX/tool.jsp?country=19 (note: FRAX® can be used with or without a BMD T-score)

✓ Consider lateral thoracic and lumbar spine radiography only if clinical evidence suggests a vertebral fracture. Clinical evidence of significant height loss defined as:[2,3]

- Historical height loss >5 cm
- Carefully measured height loss of >2 cm

✓ Consider the following biochemical tests if there is clinical suspicion of secondary causes for osteoporosis:

- Calcium, corrected for albumin
- Complete blood count
- Creatinine
- Alkaline phosphatase
- Thyroid-stimulating hormone
- Serum protein electrophoresis (for patients with vertebral fractures)

X DO NOT order 25-hydroxyvitamin D testing unless there is a specific indication. (See TOP's Vitamin D Testing and Supplementation clinical practice guideline.)

PREVENTION STRATEGIES

✓ Vitamin D intake: 1000 IU supplement daily (See Vitamin D Testing and Supplementation clinical practice guideline for more detail.)

✓ Exercise, awareness of falls and fall prevention (See patient resources available at: https://myhealth.alberta.ca/health/pages/conditions.aspx?hwid=av2500&#av2501.)

✓ Smoking cessation and reduction in alcohol use to less than three drinks per day

✓ Calcium intake: 1200 mg/day from all sources (e.g., three servings of low fat milk products or an additional 500 mg supplement to current diet)

- Patients can access more information on dietary calcium sources and supplements from: http://www.osteoporosis.ca/osteoporosis-and-you/nutrition/calcium-requirements/.

TREATMENT AND MANAGEMENT

PRACTICE POINT

Do not use Vitamin D or calcium as the sole source of treatment for increased fracture risk.

OST NEGATIVE ≥10 LOW RISK FOR OSTEOPOROSIS

✓ Offer prevention strategies only.

OST POSITIVE (<10) OR RISK FACTORS

LOW RISK: 10-YEAR RISK OF MAJOR OSTEOPOROTIC FRACTURE <10%

✓ Recommend fall prevention strategies for patients at risk for falls: https://myhealth.alberta.ca/health/pages/conditions.aspx?hwid=av2500&#av2501DO NOT offermedication.

X DO NOT offer medication.

✓ Reassess fracture risk using FRAX® in five years.

Note: BMD is unlikely to change management offered at <5 year intervals. For those with BMD T scores >-1.5 reassessing BMD at intervals <10 years is of little value.

MODERATE TO HIGH RISK: 10 YEAR RISK OF FRACTURE ≥10% TO >20%

✓ Offer medication.

✓ Inform patient of the benefit (~30% relative reduction in fracture) and the risks of each type of medication. (See Table 1: Therapy and Adverse Effects.)

✓ Discuss the risks and benefits of medication options and assist the patient in making an informed decision regarding medication use.

✓ Do not re-assess BMD within the first five years of therapy for patients who opt to initiate medication therapy.

Therapy	Possible Adverse Effects
IV bisphosphonate: zoledronic acid (Aclasta®).	Self-limiting flu like symptoms after first dose
Oral bisphosphonates: alendronate (Fosamax ®), risedronate (Actonel ®), etidronate (Didrocal ®). Also available are: Actonel DR™, Fosavance® (Fosamax® with vitamin D) and several generic versions.	*G-I Intolerance, esophagitis* *Rare potential adverse effects associated with long term treatment with oral and IV bisphosphonates:* • Osteonecrosis of the jaw • Atypical fractures of the femur (in the subtrochanteric or diaphyseal regions)
Denosumab (Prolia®)	Osteonecrosis of the jaw Atypical fracture Possible risk of serious infection (mostly immunocompromised patients)
Raloxifene (Evista®)	Thromboembolic events, including pulmonary embolism
Menopausal Hormone Therapy (estrogen)	Breast cancer only after 10 years
Teriparatide (Fortèo®)	Hypercalciuria and hypercalcemia (usually transient)

Table 1: Therapy and Adverse Effects

PRACTICE POINT

For those patients diagnosed with osteoporosis, assess and manage based on the patient's absolute risk of osteoporosis-related fractures not just a low bone mineral density test result.

First Line Therapies with Evidence for Fracture Prevention in Postmenopausal Women*							
Type of Fracture	Antiresorptive Therapy						Bone Formation Therapy
	Bisphosphonates*			Denosumab*	Raloxifene*	Hormone Therapy (Estrogen)**	teriparatide
	alendronate	risedronate	zoledronate				
Vertebral	✓	✓	✓	✓	✓	✓	✓
Hip	✓	✓	✓	✓	…	✓	-
Nonvertebral+	✓	✓	✓	✓	…	✓	✓

**For postmenopausal women, indicates first line therapies and Grade A recommendation.*

+In clinical trials, nonvertebral fractures are a composite endpoint including hip, femur, pelvis, tibia, humerus, radius, and clavicle.

For men requiring treatment, alendronate, risedronate, and zoledronate can be used as first line therapies for prevention of fractures.

***Hormone therapy (estrogen) can be used as first line therapy in women with menopausal symptoms.*

Table 2: First Line Therapies with Evidence for Fracture Prevention in Postmenopausal Women
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PRACTICE POINT

For those at higher risk of fractures >10%, prescribe medication based on patient preference.

- ✓ For men requiring treatment of osteoporosis, alendronate, risedronate and zoledronate can be used as first line therapies for prevention of fractures.
- ✓ Consider referral to endocrinologist or rheumatologist to manage therapy for those individuals over age 50 on long term glucocorticoid therapy (> three months cumulative therapy during the preceding year at a prednisone-equivalent dose > 7.5 mg daily).
- ✓ For long-term glucocorticoid users who are intolerant of first line therapies, etidronate may be considered for preventing loss of BMD.
- ✓ Women who are taking aromatase inhibitors and men who are undergoing androgen deprivation therapy should be first assessed for fracture risk.Osteoporosis therapy should be then be considered if fracture risk is estimated to be high moderate or high.

Treatment Not Recommended

- X DO NOT use testosterone to treat osteoporosis in men.
- X DO NOT use ipriflavone, vitamin K, and fluoride for preventing or treating osteoporosis.
- X DO NOT recommend additional intake of the following nutrients for the prevention of osteoporosis: magnesium, copper, zinc, phosphorus, manganese, iron, or essential fatty acids.

Discontinuing Bisphosphonate Therapy

- ✓ For patients at high risk of fractures:
    - For oral bisphosphonates (alendronate and, by inference, risedronate) drug holidays: Re-assess risk and need for therapy after five years. Consider extending therapy to a maximum 10 years of therapy in patients at high fracture risk (e.g., previous fragility fracture or risk >20%).
    - For yearly I-V zoledronate re-assess risk and need for therapy after three years up to a maximum of six years of therapy.
- ? For all other patients, the evidence remains unclear as to when to discontinue therapy or use a drug holiday in bisphosphonate treated patients. Thus, discuss with patient and proceed with patient preference. Discussion points include:
    - Patients at low-to-moderate risk of fracture (including those who were prescribed bisphosphonates without any fracture risk estimate) likely gain little or no benefit from continued bisphosphonate treatment beyond five years.
    - The risk of atypical femur fractures likely increases with continuous bisphosphonate exposure beyond five years.
    - Patients at the highest risk of fracture (usually as determined by very low femoral neck BMD, fracture risk assessment and prior fragility fracture) may see a fracture prevention benefit with continued therapy up to 10 years.

- There is no evidence addressing anti-fracture efficacy in any patient group beyond 10 years continuous bisphosphonate use.
- There are no validated markers for recommended follow up (e.g., BMD or biochemical markers of bone turnover) in the first three years after bisphosphonate discontinuation; expert opinion suggests consideration of re-assessment of fracture risk at three to five year intervals post discontinuation.
- There are no clinical trials of sufficient duration to model an entire 40 year menopausal life span; it is conceivably possible that a patient may have multiple limited bisphosphonate treatment courses over the span of decades of follow up.

FOLLOW-UP BMD MEASUREMENTS

? Repeated (follow-up) BMD measurements are of limited value. There is no clear evidence to support changing patient management based upon serial BMD measurements therefore no recommendation can be made.

REFER TO SPECIALIST[*]

- ✓ Multiple fractures despite adherence to therapy
- ✓ Secondary cause of osteoporosis/metabolic bone disease outside the expertise of the primary care physician
- ✓ Extremely low BMD, not explained by the patient's known risk factors
- ✓ Presence of chronic kidney disease (eGFR <30 ml/min)

[*]*There are a number of specialties that claim expertise in osteoporosis including endocrinologists, rheumatologists, geriatricians and internal medicine; the practitioner should identify who the local experts might be. Osteoporosis Canada may be a resource to find a local expert.*

BACKGROUND

The scope of this CPG is all patients 50 years and older with or without previously diagnosed osteoporosis/osteopenia and/or fragility fracture. A modified assessment algorithm is offered for general osteoporosis case finding. For those previously diagnosed with osteopenia/osteoporosis and/or fragility fracture and at risk of future fracture, a more thorough assessment is recommended. Treatment and management are based on the results of the absolute fracture risk not BMD results alone.

ASSESSMENT AND DIAGNOSIS

The Osteoporosis Self-Assessment Tool (OST) is suggested for clinicians to use in the context of case finding individuals 50 years of age and older who may be at risk of fracture and not just at risk for low BMD. A number of systematic reviews from 2007-2010, were conducted that examined the OST and other tools to assess the risk of osteoporosis[4-7] OST performed at least as well as other tools specifically, identifying femoral neck osteoporosis (sensitivity 92%, specificity 39%).[8] Unlike other

tools to assess the risk of osteoporosis, OST has been validated in both sexes and a variety of races.[7]

For all women, and men with one or more risk factors, 65 years and older, an absolute fracture risk assessment is suggested. The two tools currently available and recommended are as follows and provide tools, instruction and determining risk in detail:

- CAROC (Canadian Association of Radiologists and Osteoporosis Canada) http://www.osteoporosis.ca/multimedia/pdf/CAROC.pdf
- FRAX (www.sheffield.ac.uk/FRAX/tool.jsp?country=19)

The Canadian Association of Radiologists and Osteoporosis Canada (CAROC) tool stratifies women and men over age 50 into three zones of risk for major osteoporotic fracture within 10 years: low (< 10%), moderate (10%–20%) and high (> 20%). Initial risk is determined by age, sex and T-score for the femoral neck CPG.[9] A BMD test result is required to use this tool. The FRAX® assessment tool has the advantage of providing absolute fracture risk over 10 years. When absolute fracture risk is provided, patients have been shown to make better-informed decisions regarding treatment options.[10]

Some clinical factors increase the risk of fracture regardless of BMD. The presence of a prior fragility fracture after age 40 and/or recent prolonged systemic glucocorticoid use (i.e., at least three months cumulative use during the preceding year at a prednisone-equivalent dose ≥7.5 mg daily).[11] With either of these risk factors the individual's risk is raised to the next risk level (i.e., from low to moderate or from moderate to high). When both clinical factors are present, the patient is considered at high risk of fracture, regardless of BMD.[12]

The Osteoporosis Canada 10 year Fracture Risk Assessment Tool, based on the Canadian 2010 Osteoporosis Guidelines and the Canadian Association of Radiologists and Osteoporosis Canada (CAROC) system provides physicians with a calculator to determine a patient's 10 year risk of fracture and a summary of the guideline recommendations for the treatment and management of osteoporosis for each risk level.[8]
http://www.osteoporosis.ca/multimedia/FractureRiskTool/index.html#/Home

It is also available as an app and can be found at:

http://www.osteoporosis.ca/health-care-professionals/clinical-tools-and-resources/fracture-risk-tool/

Another tool available is the WHO Fracture Risk Assessment (FRAX). This tool uses age, sex, body mass index, prior fracture, parental hip fracture, prolonged glucocorticoid use, rheumatoid arthritis (or secondary causes of osteoporosis), current smoking, alcohol intake (three or more units daily) and BMD of the femoral neck. FRAX® can be used without BMD (it substitutes body mass index), yielding similar fracture risk prediction.

Determining fracture risk using the WHO Fracture Risk Assessment tool with BMD is more accurate than using either test alone.[13] BMD of the lumbar spine is not considered in the FRAX or CAROC calculation, and fracture risk is only slightly underestimated when the lumbar spine T-score is much lower than the hip T-score.[14] Use of either of these tools show close agreement between the predicted fracture rates and observed fracture rates for both men and women.[12]

Absolute Risk Levels

Moderate (10 year risk of fracture ≥10%) to High (10 year risk of fracture >20%)

More osteoporotic fractures occur in the moderate risk group than the high risk group (because of the increased numbers in this group) even though the relative risk of fracture is higher in the high risk group[12] Individuals assessed to be at moderate risk for fracture should be informed of their risk and the benefit and harms of treatment so the patient can decide if they wish to proceed with pharmacologic treatment. The presence of other risk factors for fracture could be a reason to decision to recommend pharmacologic therapy to moderate risk patients.

Individuals over age 50 who have had a fragility fracture of the hip or vertebra and those who have had more than one fragility fracture are at high risk for future fractures (>20% probability for major osteoporotic fracture over 10 years). Pharmacologic therapy should be offered to patients at high absolute risk.

Low Risk (10 year risk of fracture <10%)

Lifestyle measures including exercise, fall prevention, calcium and vitamin D intake optimization, and if relevant, smoking cessation and decreasing a high alcohol intake are sufficient for individuals with a low risk of fracture. They do not have any risk factors for rapid loss of BMD. Pharmacologic therapy is not required.

Treatment

Exercise and Prevention of Falls

Exercise improves quality of life, physical function, pain, muscle strength and balance, especially for those with osteoporosis.[15] There is limited evidence that exercise programs reduce fractures, but some evidence that moderate to vigorous walking reduces risk of hip fractures.[16] Home safety assessment is effective for those at high risk for falls and/or visually impaired.[17] Interventions to reduce falls have not been shown to reduce fractures.[18] Hip protectors are effective for reducing hip fractures in residents of Canadian long term care facilities but not those living independently in the community this may be due to non-compliance.

The following are the guideline recommendations for exercise:

- Resistance training as appropriate for age and functional capacity and/or weight-bearing aerobic exercises for those with osteoporosis or at risk for osteoporosis
- Core stability exercises will improve weak or postural abnormalities especially for individuals who've had vertebral fractures.
- Balance type exercise, i.e., tai chi and gait training are effective for those at risk of falls.
- Hip protectors for older adults in long-term care facilities at high risk for fracture

Calcium and Vitamin D Supplementation

It is very clear that vitamin D deficiency causes defective bone mineralization. A TOP Vitamin D Testing and Supplementation guideline has been developed and should be used for vitamin D supplementation. Similarly, a diet deficient in calcium will result in bone loss. However, the total daily intake of elemental calcium (through diet and supplements) for individuals age 50 and older should be no higher than 1200 mg.

Calcium supplement dosage should not exceed 500mg given usual dietary sources of calcium and normal intestinal absorption. The efficacy of calcium supplementation for reducing fractures is controversial.[19,20] In addition, there are possible adverse effects resulting from high dose supplements.[21]

Therapeutic Options

Therapeutic options available in Canada include: antiresorptive agents (bisphosphonates, denosumab, selective estrogen receptor modulator, hormone therapy) and a bone-forming agent (teriparatide), with different types of administration and dosing frequencies. All evidence from RCTs consistently demonstrates that therapies currently available in Canada reduce vertebral fracture risk in menopausal women with osteoporosis.[22]

There is also evidence that some interventions prevent nonvertebral and/or hip fractures[23] and may reduce the morality rate among individuals at high risk for fractures.[24,25]

Women with prior fragility fractures of the vertebra or hip can also benefit from pharmacologic intervention. Depending on the agent, level of adherence and non-selective presentation of data in various studies, a prudent estimate might be that pharmacotherapy can reduce the relative risk of fracture by 30% to 40%. Absolute risks are obviously dependent upon baseline risk but are numerically much lower.

The evidence is inconsistent in regards to pharmacologic therapy benefit for those having had a fracture at a site other than the spine or hip (e.g., the wrist), unless they have an osteoporotic T-score. Pain associated with vertebral fractures may be reduced with teriparatide.[26] Bisphosphonates may have similar effect on acute pain reduction and are also useful in secondary fracture prevention although the evidence is very poor.[27]

There are a limited number of studies that assess fracture rate reduction in men alone.[22] Reductions in vertebral fractures in men using bisphosphonates have been described in systematic reviews and meta-analyses[22,28] but there is no evidence that testosterone reduces fractures, and hypogonadal and eugonadal men respond similarly to bisphosphonate therapy.[28] (See Table 1.)

There may be increased risk of renal calculi and cardiovascular events with high dose calcium supplementation.[20,21] Up to 10% of patients have self-limiting flu-like symptoms with bisphosphonates, especially after the first dose of zoledronate by infusion.[29] There may be a slightly increased risk of serious infection with denosumab.[30] There is an increased risk of thromboembolic events, including pulmonary embolism from raloxifene and hormone therapy.[22] Teriparatide can cause hypercalciuria and hypercalcemia, both generally mild and both resolving spontaneously or with discontinuation of calcium supplementation.[22]

Controversy continues regarding the increased risk of osteonecrosis of the jaw, atypical fractures of the femur, esophageal cancer or atrial fibrillation with bisphosphonate therapy for osteoporosis. Osteonecrosis of the jaw is an area of exposed alveolar bone in the mandible or maxilla that does not heal after eight weeks.[31] It is very rare (less than one case per 10,000 patient years among patients with primary osteoporosis).[32] Osteonecrosis risk is higher in the following patient scenarios:

- Malignancy undergoing radiation and chemotherapy
- Taking high-dose bisphosphonates for bone metastases
- Taking glucocorticoids
- Diabetes
- Poor dental hygiene
- Undergoing invasive dental procedures such as tooth extractions or implants

Spontaneous "atypical" subtrochanteric or diaphyseal fractures of the femur have been associated with long-term bisphosphonate and denosumab therapy, although a definitive causative mechanism has not yet been established. Although rare, these fractures appear to develop as stress fractures and have been most commonly associated with increasing duration of bisphosphonate therapy, especially >5 years. Some patients describe thigh or groin pain prior to developing a complete fracture. Radiography or bone scanning (or both) should be considered for individuals who experience new thigh pain after having been on long-term bisphosphonate therapy.[33] Radiographic criteria for diagnosis of an atypical fracture have recently been established.[33]

For patients at high 10-year fracture risk, the benefits of pharmacologic therapy far outweigh the potential risks. The potential benefits and risks of the prescribed agents should be discussed with the patient before treatment is initiated. The risks of therapy must be explained in the appropriate context in order to support informed decision-making.

POSTMENOPAUSAL WOMEN[1] *(SEE TABLE 2)*

- Bisphosphonates (alendronate 70 mg or risedronate 35 mg p.o. once weekly for three to five years, and zoledronate 5 mg by intravenous injection once yearly for three years) are first-line preventive therapies in post-menopausal women with low bone density and for prevention of glucocorticoid induced osteoporosis.
- Denosumab 60 mg by cutaneous injection once every six months is first-line therapy for postmenopausal osteoporosis and osteoporosis in men.
- Raloxifene 60 mg p.o. daily is a first line therapy in the prevention of further bone loss in postmenopausal women with low bone density, but has not been demonstrated to prevent nonvertebral fractures.

- Hormone Replacement Therapy (HRT) is the first line preventive therapy for menopause before age 45 and can be considered first line for postmenopausal women with low bone density and estrogen deficiency symptoms. The latest meta-analysis and clinical practice guideline suggests that HRT should be continued as the benefits may be greater than risks for the majority of symptomatic postmenopausal women who are under age 60 or under 10 years post menopause.[34]
- Teriparatide 20 µg. by daily subcutaneous injection has been approved in Canada for the treatment of severe postmenopausal osteoporosis, severe osteoporosis in men, and for glucocorticoid osteoporosis. Treatment is limited to two years lifetime exposure.

Other Clinical Scenarios[1]

- Glucocorticoid-induced osteoporosis
  - Bisphosphonates (risedronate, alendronate, cyclical etidronate, zoledronate)
  - Teriparatide for patients who fail to respond to bisphosphonates
- Men with low bone mass or osteoporosis
  - Bisphosphonates are a first-line treatment

Management[1]

For all patients, regular weight-bearing, balance and strengthening exercises, smoking cessation, and optimization of total (dietary and supplements) calcium and vitamin D intake are recommended.

For patients at risk of falls, fall-prevention strategies should be implemented.

For patients determined to be at moderate or high risk of fractures based on absolute risk, the physician should consider the benefit to harm ratio when deciding to recommend a therapy, particularly for patients who are not at high risk. When choosing among therapies, the patient's individual risk profile, comorbid conditions, preferences and lifestyle should be taken into consideration.

Monitoring Therapy

There are no randomized trials that directly assess the value of repeat BMD testing with ongoing treatment for reduction of fractures.[35] Although it has been suggested that serial testing may be helpful,[36] for most patients who are undergoing treatment, repeat measurement of BMD is probably not necessary. Attention to patient adherence to therapy is likely to be of more benefit. If follow-up BMD is deemed necessary, it should initially be performed no earlier than three years, and the testing interval can be increased once therapy is deemed effective namely, BMD has improved or remains unchanged. Continued loss of BMD or a new fracture may reflect non-compliance, failure to respond, or a secondary cause of osteoporosis not previously identified.

Discontinuing Bisphosphonate Therapy

The evidence to date is unclear regarding therapy duration or 'drug holidays." In the ten-year extension of the original alendronate Fracture Intervention Trial (FLEX), positive outcomes reported in this study were that subjects continuing to take alendronate for a total of 10 years had significantly fewer clinical vertebral fractures compared with those who received placebo for the last five years, although there were no significant differences in fractures at any other sites.[37] The authors suggested that cessation of alendronate for up to five years after five years of therapy may be safe for patients not at high risk of vertebral fractures.[37] Discontinuing risedronate may result in BMD loss in the first year.[38] A bisphosphonate "holiday" would also be reasonable for those who have not had previous fractures.[39] The bottom line is that there is no definitive answer at this time. The decision to continue or stop bisphosphonate therapy should be determined with the patient.

Estrogen and Combination Therapy

Discontinuing hormone therapy (estrogen) results in increased bone turnover and BMD loss.[40] Combinations of hormone therapy or raloxifene with a bisphosphonate have improved BMD,[41,42] but evidence is also lacking as to whether or not there is additional fracture rate reduction.

Implementation Considerations

- Consider flagging patients 50 years of age and older to screen with the OST tool for possible risk of osteoporosis and need for further (BMD) testing and fracture risk assessment.

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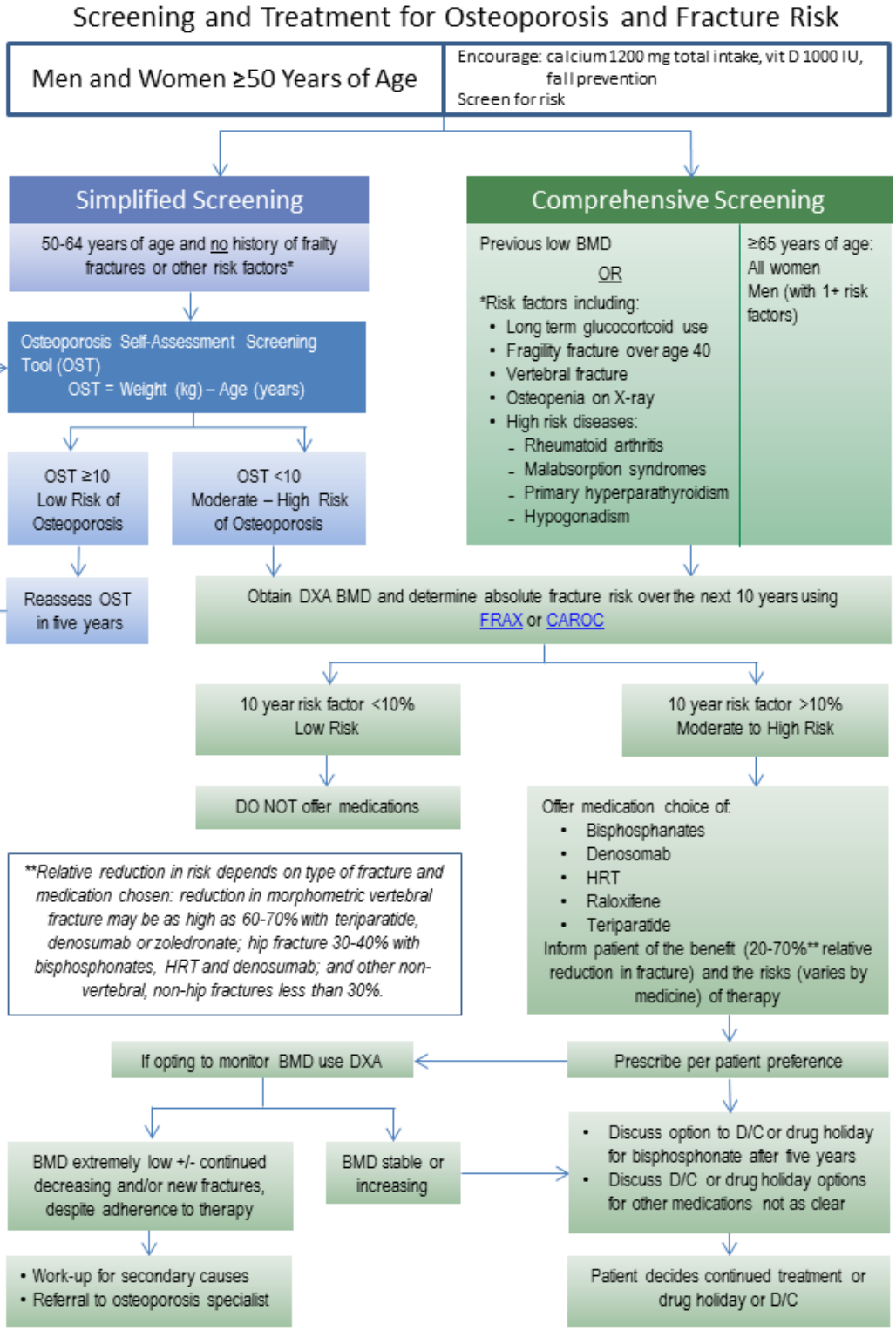
GUIDELINE COMMITTEE

The committee consisted of representatives from endocrinology and family medicine.

February 2016

ALGORITHM


Screening and Treatment for Osteoporosis and Fracture Risk
Men and Women ≥50 Years of Age
Encourage: calcium 1200 mg total intake, vit D 1000 IU, fall prevention
Screen for risk
Simplified Screening
50-64 years of age and no history of frailty fractures or other risk factors*
Osteoporosis Self-Assessment Screening Tool (OST)
OST = Weight (kg) – Age (years)
OST ≥10
Low Risk of Osteoporosis
OST <10
Moderate – High Risk of Osteoporosis
Reassess OST in five years
Comprehensive Screening
Previous low BMD
OR
*Risk factors including:
• Long term glucocortcoid use
• Fragility fracture over age 40
• Vertebral fracture
• Osteopenia on X-ray
• High risk diseases:
- Rheumatoid arthritis
- Malabsorption syndromes
- Primary hyperparathyroidism
- Hypogonadism
≥65 years of age:
All women
Men (with 1+ risk factors)
Obtain DXA BMD and determine absolute fracture risk over the next 10 years using FRAX or CAROC
10 year risk factor <10%
Low Risk
DO NOT offer medications
10 year risk factor >10%
Moderate to High Risk
Offer medication choice of:
• Bisphosphanates
• Denosomab
• HRT
• Raloxifene
• Teriparatide
Inform patient of the benefit (20-70%** relative reduction in fracture) and the risks (varies by medicine) of therapy
**Relative reduction in risk depends on type of fracture and medication chosen: reduction in morphometric vertebral fracture may be as high as 60-70% with teriparatide, denosumab or zoledronate; hip fracture 30-40% with bisphosphonates, HRT and denosumab; and other non-vertebral, non-hip fractures less than 30%.
Prescribe per patient preference
If opting to monitor BMD use DXA
BMD extremely low +/- continued decreasing and/or new fractures, despite adherence to therapy
BMD stable or increasing
• Work-up for secondary causes
• Referral to osteoporosis specialist
• Discuss option to D/C or drug holiday for bisphosphonate after five years
• Discuss D/C or drug holiday options for other medications not as clear
Patient decides continued treatment or drug holiday or D/C