Algorithm for Maintaining Bone Health in Individuals with Non-metastatic Cancers

- Clinicians should be aware that patients with nonmetastatic cancer may have baseline risks for osteoporosis as well as the added risks of treatment-related bone loss due to hypogonadism from endocrine therapy (i.e., oophorectomy, GnRH agonists, chemotherapy-induced ovarian failure, aromatase inhibitors, anti-androgens) chemotherapy or other cancer therapy associated medications (i.e., glucocorticoids).

- All patients should be counseled on intake of calcium and vitamin D, weight bearing exercises, minimizing the risk of falls and bone healthy lifestyle and behaviors such as tobacco cessation and limiting alcohol consumption.

- Osteoporosis fracture risk assessment may include use of FRAX (www.sheffield.ac.uk/FRAX) or other tool.

When one or more risk factor for osteoporotic fracture is present, and there is consideration for use of a bone modifying agent, then evaluate bone mineral density to further quantify fracture risk. The preferred assessment uses Dual X-ray Absorptiometry (DXA) of total spine, hip, and femoral neck.

All patients should be counseled on intake of calcium and vitamin D, weight bearing exercises, minimizing the risk of falls and bone healthy lifestyle and behaviors such as tobacco cessation and limiting alcohol consumption.

**Deferral of Bone Modifying Agent**

If the bone density result does not demonstrate osteoporosis (or if there is not significant osteopenia with additional risk factors) and if FRAX calculation does not exceed 10-year risk of hip fracture at 3% or greater, or 10-year risk of non-hip fracture at 20% and/or bone mineral density is not sufficiently low to trigger use of a bone modifying agent then repeat DXA in 2 years or in 1 year if medically indicated.

**Initiation of Bone Modifying Agent**

Thresholds to initiate a bone modifying agent include:

- If FRAX (10-year risk of hip fracture at 3% or greater, or 10-year risk of non-hip fracture at 20%)
- The BMD (DXA) demonstrates osteoporosis or significant osteopenia with additional risk factors
- The clinical scenario indicates significant risk for osteoporotic fracture (such as history of prior osteoporotic fracture that has not been treated), then initiate a bone modifying agent. The bisphosphonates (oral or IV) or denosumab are the preferred agents dosed for osteopenia or osteoporosis as clinically indicated.

Repeat DXA every 2 years or as clinically indicated*

*Bone mineral density assessment should not be conducted more than annually.

BMD, bone mineral density; DXA, dual-energy x-ray absorptiometry; FRAX, WHO Fracture Risk Assessment Tool; GnRH, gonadotropin-releasing hormone; IV, intravenous.