

Disclaimer: This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.

## PRESENTATION

## EVALUATION

## TREATMENT

- Pre-menopausal women on:
  - Tamoxifen **or**
  - GnRH agonists **or**
  - Aromatase inhibitors and GnRH agonists
- Post-menopausal women or men with hormone receptor-positive breast cancer on aromatase inhibitors

- Baseline BMD
- 25-OH vitamin D<sup>1</sup>
- Inquiry of new osteoporotic fractures (low impact)

GnRH = Gonadotropin-releasing hormone  
BMD = Bone Mineral Density  
IU = International Units

25-OH Vitamin D<sup>1</sup> normal ( $\geq 30$  ng/mL) and BMD normal (T-score  $\geq -1$ ) and no new low impact fracture

25-OH Vitamin D<sup>1</sup> abnormal ( $< 30$  ng/mL)

BMD abnormal<sup>3</sup> (T-score  $< -1$  to  $-2.4$ ) and any 25-OH vitamin D<sup>1</sup> level<sup>4</sup> and no new low impact fracture

BMD abnormal<sup>3</sup> (T-score  $\leq -2.5$ ) and any 25-OH vitamin D<sup>1</sup> level<sup>4</sup> and no new low impact fracture

Any BMD with new low impact fracture

**A**

- Repeat BMD and 25-OH vitamin D<sup>1</sup> in 2 years **and**
- Reinforce universal recommendations<sup>2</sup>

- Ergocalciferol 50,000 IU once weekly for 8-12 weeks, then switch to over the counter vitamin D3 1,000-2,000 IU daily to maintain 25-OH vitamin D<sup>1</sup> level at 30-50 ng/mL **or**
- Over the counter vitamin D3 1,000-2,000 IU daily **and**
- Recheck 25-OH vitamin D<sup>1</sup>, calcium, and albumin on the next visit **and**
- Reinforce universal recommendations<sup>2</sup>

- Reinforce universal recommendations<sup>2</sup> **and**
- Repeat BMD and 25-OH vitamin D<sup>1</sup> every 1-2 years **and**
- Consider medical therapy or referral to bone health specialist based on risk factors (assess by FRAX<sup>®5</sup>)

See [Page 2](#)

<sup>1</sup> 25-hydroxyvitamin D, also known as 25-hydroxycholecalciferol, calcidiol or abbreviated as 25-OH Vitamin D, the main vitamin D metabolite circulating in plasma

<sup>2</sup> Universal recommendations:

- Elemental calcium 1,000 – 1,200 mg/day from all sources
- Avoid tobacco (see [Tobacco Cessation Treatment algorithm](#))
- Vitamin D 800 – 1,000 IU/day
- Limit alcohol and caffeine
- Weight-bearing/muscle - strengthening exercises (see [Physical Activity algorithm](#))

<sup>3</sup> Abnormal BMD: osteopenia, T-score between  $-1.0$  and  $-2.4$ ; osteoporosis, T-score  $\leq -2.5$

<sup>4</sup> If vitamin D level is  $< 30$  ng/mL, replenish with supplementation prior to initiating medical therapy for osteoporosis. See Box A for recommendation on repletion.

<sup>5</sup> FRAX<sup>®</sup> - Fracture Risk Assessment Tool at [www.shef.ac.uk/frax](http://www.shef.ac.uk/frax)

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## EVALUATION

## TREATMENT

BMD abnormal<sup>1</sup>  
(T-score  $\leq$  -2.5) and any  
25-OH vitamin D<sup>2</sup> level<sup>3</sup>  
and no new low impact  
fracture

- Refer to bone health specialist **and**
- Reinforce universal recommendations<sup>4</sup>
- The following medical therapies can be initiated as appropriate:
  - Bisphosphonates<sup>5</sup>:
    - Alendronate 70 mg PO weekly, **or**
    - Risedronate 35 mg PO weekly or 150 mg PO monthly, **or**
    - Ibandronate 150 mg PO monthly or 3 mg IV every 3 months, **or**
    - Zoledronic acid 5 mg IV once a year (use institutional order set) **or**
  - Denosumab<sup>5</sup> at 60 mg subcutaneously every 6 months (use institutional order set) **or**
  - Anabolic therapies (teriparatide<sup>6</sup> or abaloparatide<sup>6</sup> or romosozumab<sup>7</sup>) can also be considered if the patient's T-score is  $< -3$ ; should be considered and managed by the bone health specialist
- Repeat BMD and 25-OH vitamin D in 1 year
  - If BMD stable (same T-score or improvement), continue with medical therapy and consider drug holiday after 5 years of therapy. (Caution – denosumab should not be stopped without transitioning to another bisphosphonate as patients can experience rebound bone loss and subsequent fractures with abrupt cessation)
  - If BMD abnormal, refer to bone health specialist

Any BMD with new  
low impact fracture

- Start universal recommendations<sup>4</sup> **and**
- Refer to Bone Health Specialist
- Anabolic therapies (teriparatide<sup>6</sup> or abaloparatide<sup>6</sup> or romosozumab<sup>7</sup>) can be considered if the patient also suffers from low impact fracture or with T-score  $< -3$ . Should be considered and managed by the bone health specialist.

BMD = Bone Mineral Density  
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<sup>1</sup> Abnormal BMD: osteopenia, T-score between -1.0 and -2.4; osteoporosis, T-score  $\leq$  -2.5

<sup>2</sup> 25-hydroxyvitamin D, also known as 25-hydroxycholecalciferol, calcidiol or abbreviated as 25-OH Vitamin D, the main vitamin D metabolite circulating in plasma

<sup>3</sup> If vitamin D level is  $< 30$  ng/mL, replenish with supplementation prior to initiating medical therapy for osteoporosis. See Box A on [Page 1](#) for recommendation on repletion.

<sup>4</sup> Universal recommendations:

- Elemental calcium 1,000 – 1,200 mg/day from all sources
- Avoid tobacco (see [Tobacco Cessation Treatment algorithm](#))
- Vitamin D 800 – 1,000 IU/day
- Limit alcohol and caffeine
- Weight-bearing/muscle - strengthening exercises (see [Physical Activity algorithm](#))

<sup>5</sup> Due to the risk of osteonecrosis of the jaw, recommend baseline dental exam and continue with regular dental exams

<sup>6</sup> Not on MD Anderson formulary; dispensed by specialty pharmacy

<sup>7</sup> It is a monthly injection given in the provider's clinic or infusion center

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## SUGGESTED READINGS

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## DEVELOPMENT CREDITS

This survivorship algorithm is based on majority expert opinion of the Breast Survivorship workgroup at the University of Texas MD Anderson Cancer Center. It was developed using a multidisciplinary approach that included input from the following:

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