

## Session Proposed Title:

- Survivorship and Bone health.
- Bone health during and after cancer treatments.
- Should improving bone health be a part of oncological rehabilitation?
- **Is bone health a missing link in onco-rehab?**

## Speaker:

Payal Sahni, PT, MPT, DPT

## Speaker Bio:

**Payal Sahni, PT, MPT, DPT**, has been practicing physical therapy for over twenty years with an emphasis in orthopedics. She graduated with her master's in physical therapy in 2000 and completed her transitional DPT in 2012. Dr. Sahni is a Maitland trained certified manual therapist with additional training in IASTM and BFR. Her clinical practice emphasizes her special interests in osteoporosis and TMJ dysfunction.

Payal is a strong proponent of prevention and wellness for health. She has designed various wellness programs including osteoporosis and aquatic wellness, in addition to ergonomics programs for employee health. Dr. Sahni regularly lectures on osteoporosis and serves as the program coordinator of the New York State Osteoporosis Prevention and Education Program through the NYS Department of Health. She has published prior studies on osteoporosis and continues with ongoing research.

## **Speaker Disclosures:**

**Financial:** Payal Sahni has an employment relationship with Helen Hayes Hospital. She receives a speaking honorarium and recording royalties from PESI, Inc. She has no relevant financial relationships with ineligible organizations.

**Non-financial:** Payal Sahni has no relevant non-financial relationships.

## Learning Objectives:

1. Build a foundation of bone maturation & metabolism physiology.
2. Learn about the effects of cancer therapies on bone at cellular level.
3. Identify functional impairments related to low bone mass in a cancer patient.
4. Construct a rehabilitation program to improve bone health in a cancer patient.

## Course Description:

Patients undergoing cancer treatments experience a myriad of physical impairments affecting their quality of life. Oncological rehabilitation has become an integral part of ongoing therapies for these patients and has been the key to improving survivorship. However, accelerated bone loss, which survivors experience as a side-effect of cancer treatments, is mostly overlooked. Since continued loss of bone is a silent process, its first clinical implication is often a fracture. By this time, the window of preventive care has passed and the patient is left with additional impairments and sometimes, chronic pain leading to a further decline in quality of life.

In addition to using therapeutic techniques to reverse physical impairments, strategies to improve bone health can greatly enhance the treatments and prevent debilitating fractures. This lecture will provide

the clinicians with the knowledge of evidence based therapeutic exercises and nutrition for bone health, ready to be incorporated into onco-rehabilitation programs. The clinicians will learn this preventive program development based on FIIT principle and the use of applicable outcome measures to note progress.

### Cover Bullet Points:

- Safe loading strategies to optimize bone formation and build strength during survivorship.
- Cellular effects of cancer treatments on bone density.
- Food as Medicine! Nutrition-based strategies for prevention & treatment.
- Easy to integrate fall prevention essentials.
- Specific framework for exercise: optimal pacing, frequency, duration and time needed to build bone.

### Outline:

#### **How Bone Changes Across the Lifespan**

Review of bone structure, bone cells, development of skeleton, peak bone mass from birth to maturity

Factors affecting bone metabolism

Physiology of bone maturation and metabolism

#### **Cancer and bone density**

Epidemiology of cancer related osteoporosis

American Society of Clinical Oncology BMD recommendations

Preventive care and fracture risk

#### **How do cancer treatments affect bone density**

Bone mineral density testing

Vertebral Fracture Assessment

Fracture Risk Assessment Tool (FRAX)

Blood bone markers

Radiofrequency Echographic Multi Spectrometry (REMS)

#### **Constructing an Evaluation of Osteoporosis**

Risk factor assessment

Demonstration of a posture evaluation

Functional assessment and osteoporosis

Outcome measures

#### **Build Bone, Build Strength, Reduce Falls and Fractures: Constructing a Rehabilitation Program**

Exercise program design based on FIIT principle

Progression of exercise intensity for a cancer patient

Body mechanics

Exercises Precautions

Contraindications

#### **Role of Nutrition & Supplementation**

Calcium and vit D RDA, estimation of intake, sources

Dairy = friend or foe? Plant-based sources of calcium

Supplements - type, how much, how to pick a supplement  
Absorption of calcium supplements

### Case Studies (optional):

- Case studies will be presented in accordance with HIPPA.

### Needs Assessment:

Please explain how this course meets the learning needs of your intended audience today, addressing **each** of the questions below.

1. What is the problem/practice gap that this course addresses? Please answer **at least one** of the below:
  - a. What is the needed change in practice? **To be equipped with tools to recognize bone loss associated with various diagnoses and be able to include bone health education and when necessary, devise a program for patients for prevention of conditions like fragility fractures and associated physical dysfunction.**
  - b. What is the problem in practice? **Bone health education and referrals to evidence based nutrition programs is not standard practice.**
  - c. What is the opportunity for improvement? **Bone loss is associated with a number of medical and musculoskeletal conditions (like cancers) and is often overlooked leading to osteoporotic fractures. A significant number of these fractures and associated loss of function not only drive up the healthcare costs, but also decline the quality of life of affected individuals. Bone health education and evidence based exercise and nutrition programs can make a difference in patient outcomes if they become standard practice and this course will provide a roadmap for that.**
  - d. What are professionals lacking, misunderstanding, or misusing?
2. What educational needs are contributing to the problem? Is it an educational need regarding knowledge, competence, skill and/or practice? Please note: a knowledge need alone is not sufficient.

**There is a gap in basic rehabilitation curricula in teaching program development for patients with low bone mass and osteoporosis. This course will present with research studies depicting that gap and focus on training individuals in evidence based program development to improve knowledge and confidence in treating individuals with osteoporosis.**
3. How do you know these are problems? What evidence supports your assessment of the educational needs and practice gap(s)? Please list references (recently published journal articles, ongoing scientific studies, results of professional surveys, and/or updates to diagnostic criteria, treatment methods, policies, procedures, or best practice) below.
  - **Roberts S, Tompkins BJ, Kennedy AG. The effect of an educational intervention on primary care providers' knowledge, confidence and frequency of patient counselling on strength training and bone density. Musculoskeletal Care. 2022 Sep;20(3):671-675. doi: 10.1002/msc.1611. Epub 2021 Dec 13. PMID: 34897943; PMCID: PMC9543290.**
  - **Lassemillante AM, Skinner TL, Hooper JD, Prins JB, Wright ORL. Osteoporosis-Related Health Behaviors in Men With Prostate Cancer and Survivors: Exploring Osteoporosis Knowledge,**

Health Beliefs, and Self-Efficacy. Am J Mens Health. 2017 Jan;11(1):13-23. doi: 10.1177/1557988315615956. Epub 2016 Jun 23. PMID: 26712535; PMCID: PMC5675183.

- Bailey S, Lin J. The association of osteoporosis knowledge and beliefs with preventive behaviors in postmenopausal breast cancer survivors. BMC Womens Health. 2021 Aug 11;21(1):297. doi: 10.1186/s12905-021-01430-1. PMID: 34380488; PMCID: PMC8359538.
- Lin JK, Parikh RB. Bone Health in Prostate Cancer Survivors: Recent Lessons and Opportunities for Improvement. Eur Urol Focus. 2023 May;9(3):422-424. doi: 10.1016/j.euf.2023.04.005. Epub 2023 Apr 26. PMID: 37117113.
- Jones JM, Tsang DS, Zheng S, Yeheskel A, Catton CN, Cheung AM, Hamilton R, Alibhai SMH. Implementing and Evaluating the Impact of BoneRx: A Healthy Bone Prescription for Men with Prostate Cancer Initiating Androgen Deprivation Therapy. J Clin Med. 2022 May 11;11(10):2703. doi: 10.3390/jcm11102703. PMID: 35628830; PMCID: PMC9144215.

**Learner Engagement Strategies/Tools:** (From proposal guidelines)

1. Which learner engagement activities and learner assessments are going to be used in this program?

<input type="checkbox"/> *Didactic lecture <input type="checkbox"/> *Case studies <input type="checkbox"/> Large group activities <input type="checkbox"/> Small group activities <input type="checkbox"/> Live demonstrations <input type="checkbox"/> *Video demonstrations	<input type="checkbox"/> Learner polls <input type="checkbox"/> Simulations <input type="checkbox"/> *Reading material w/ discussion <input type="checkbox"/> Group quizzes <input type="checkbox"/> *Q&A session(s)	<input type="checkbox"/> Open discussions <input type="checkbox"/> Panel discussions <input type="checkbox"/> Debate <input type="checkbox"/> Hands-on skills training <input type="checkbox"/> Other (please specify):
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2. Which supplemental educational tools will be present in the PowerPoint/participant handouts?

<input type="checkbox"/> *Learner handout material <input type="checkbox"/> *Patient handout material <input type="checkbox"/> *Worksheets	<input type="checkbox"/> *Assessment/diagnosis tools <input type="checkbox"/> *Online resources <input type="checkbox"/> Recommended additional reading	<input type="checkbox"/> Pocket reference cards <input type="checkbox"/> Other (please specify):
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Target Audience: PT, PTA, OT, OTA, Athletic trainers, Personal trainers.

**Additional Docs:**

**Post-Test:**

1. Osteoporosis is –
  - a. T score of 1 or above.
  - b. Condition of weakened bones with increased risk of fracture.
  - c. A condition of increased osteoblast activity.
  - d. An acute and self-limiting disease.

2. Rehabilitation diagnoses commonly associated with Osteoporosis & osteopenia include:
  - a. Neuromuscular disorders, laminectomy, total knee replacement.
  - b. Neuromuscular disorders, shoulder impingement syndrome, gastrointestinal disorders.
  - c. Neuromuscular disorders, fractures, cancer treatments.
  - d. Stress fractures, tonsillectomy, cervical herniated disc.
  
3. Bone loss is a side-effect of-
  - a. Cancer treatments
  - b. Non-steroidal anti-inflammatory drugs (NSAIDS)
  - c. Cancer treatments and NSAIDS
  - d. SSRI's
  
4. Variable risk factors of Osteoporosis include-
  - a. Hormonal imbalance, eating disorders, nutritional deficiencies, long term corticosteroid use, lack of physical activity
  - b. Hormonal imbalance, ethnicity, eating disorders, long term use of thyroid medication, age
  - c. Gender, body type, hormonal imbalance, fractures, lifestyle
  - d. Gender, age, body type, ethnicity, family history of osteoporosis
  
5. \_\_\_\_\_ is the gold standard for diagnostic testing of Osteoporosis.
  - a. Bone mineral density or DXA scan
  - b. FRAX tool
  - c. Biochemical bone markers
  - d. Blood calcium and Vitamin D levels
  
6. Osteoporosis and Osteopenia relate to these T-scores respectively-
  - a.  $\leq -2.0$  and  $\leq -1.5$
  - b.  $\leq -3$  and  $\leq -0.5$
  - c.  $\leq -1.5$  and  $\leq -2.6$
  - d.  $\leq -2.5$  and  $\leq -1$
  
7. A useful tool for pacing used during cancer rehabilitation-
  - a. Rate of perceived exertion
  - b. Repetition maximum
  - c. Heart rate
  - d. Blood pressure
  
8. Special tests and functional outcome measures relevant to a patient with low bone mass include-
  - a. Berg Balance test, Timed up and go test, 5 times sit to stand test
  - b. SLUMP test, impingement sign, Upper extremity hyper-abduction test
  - c. Berg Balance test, straight leg raise, supraspinatus test
  - d. 5 times sit to stand test, Berg Balance test, anterior drawer test

9. For osteogenic stimulation, the frequency, intensity and duration/time (FIT) of resistance exercise must be-
- 3-5 days per week, high intensity, 30-60 minutes at a time.
  - 1-2 days per week, moderate intensity, 15-20 minutes at a time.
  - 2-3 days per week, moderate intensity, 30-60 minutes at a time.
  - 2 days per week, moderate intensity, 45 minutes at a time.
10. In order to estimate daily intake of calcium, patients must be educated how to-
- Measure food before consuming.
  - Buy bone healthy foods.
  - Read a food label correctly.
  - Cook calcium rich meals.

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