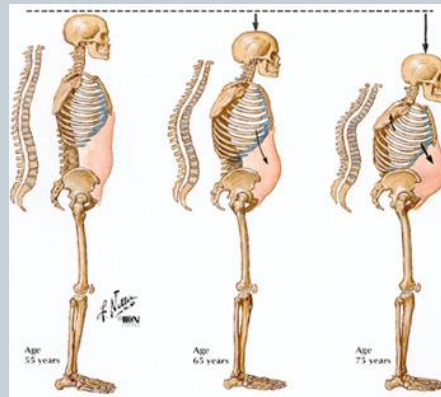


Principles of Osteoporosis Management



2019 REHAB SYMPOSIUM
FRIDAY, OCTOBER 18TH



Laura Fogle PT
Suzanne Artz McIlwee PT, OMPT

Objectives



- Discuss general principles of osteoporosis management (exercises, ADLs, and diet).
- Present treatment of patient with Osteoporosis/ lumbar compression fracture.
- Introduce VH rehabilitation's osteoporosis collaborative.

Principles of Osteoporosis Management

 **WOMEN OVER 50 WILL EXPERIENCE** 
OSTEOPOROTIC FRACTURES. AS WILL     **MEN.**

OSTEOPOROSIS



- There is a fracture every 20 seconds affecting 55% of the US population 50 and over
- It occurs in 1 of 2 women and 1 of 4 men
- Is estimated to affect 54 million persons in the US
- Is more prevalent than coronary heart disease (12.5 million), diabetes (17 million), or heart attack (1.1 million)-reference Surgeon's General report of 2004
- Is more common than breast, uterine, and ovarian cancer combined

**A *systemic* skeletal disorder
with compromised bone
strength that predisposes an
individual to increased
fracture risk**

**NIH Consensus Development Panel on Osteoporosis Prevention,
Diagnosis, and Therapy.
JAMA 2001; 285:785-795**

OLDER DEFINITION OF OSTEOPOROSIS BONE MINERAL DENSITY (DXA) SCAN

Reduction of bone mass,
both quantity **AND** quality so that
bones become fragile and easily fracture

PEAK BONE MASS

The amount of bone we accumulate as a
young adult (generally age 30-35)

**About 90-98% is accumulated
by age 18-20**

Determinants of Bone Mass

Heredity - 60-80%

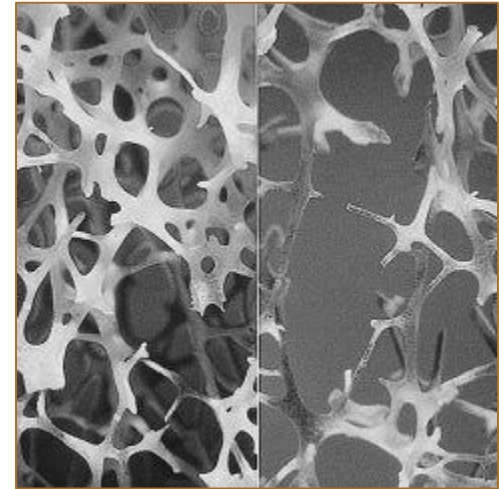
Physical Activity

Nutrition

Ethnicity

- Hormonal Status

Lifestyle Factors



Left: normal bone
Right: osteoporotic bone

All Health and Exercise Professionals Need to be Knowledgeable

- Regarding risk factors and first signs
- Incidence in our client's population

- Management
- Guidelines and precautions



Vertebral Body and Osteoporosis



- Bones of the spine are usually the first to show signs of bone loss.
- Primarily affects trabecular bone.
- Fractures occur with spinal flexion (loads the vertebral body which is composed of trabecular bone).
- Sitting and forward bending puts the most pressure on the vertebrae.

Vertebral Fractures



- Risk for 2nd fracture increases 5 fold
- 1 woman in 5 will suffer a 2nd vertebral fracture within one year of their 1st fracture
- Only 20% of vertebral fractures are symptomatic.

Evaluation

Cluster to Support Likelihood of an Osteoporotic Vertebral Fracture

1. Older than 52 years
2. No presence of leg pain
3. BMI <22
4. Does not exercise regularly
5. Female gender

**2 or more demonstrated high sensitivity to R/O compression fracture

**4 of the 5 revealed a moderate value in ruling in compression fracture

“The Development of a Clinical Decision Making Algorithm for Detection of Osteoporotic Vertebral Compression Fracture or Wedge Deformity.” Roman, et. al., Journal of Manual and Manipulative Therapy, 2010, Vol 18., pg 44-49

CLINICAL CONSEQUENCES OF SPINE FRACTURES

SYMPTOMS	SIGNS	FUNCTION	FUTURE RISKS
Back Pain (acute/chronic) Sleep Disturbance Anxiety Depression Decreased Self Esteem Fear of future: Falls and Fractures Reduced Quality of Life Early Satiety	Height Loss Kyphosis Decreased Lumbar Lordosis Protuberant Abdomen Reduced Lung Function Weight Loss	Impaired ADL's Difficulty Fitting Clothes Difficulty Bending, Lifting, Descending Stairs, Cooking	Increased Risk of Fracture Increased Risk of Death

Source: Papaioannou et al. 2002. Reprinted from The American Journal of Medicine, Diagnosis and management of vertebral fractures in elderly adults. 113(3):220-228 (2002)

**Bone Health and Osteoporosis
A Report of the Surgeon General October 2004**

Hip Fracture



- Most disabling/life threatening
- Older women who fall backward are most likely to fracture a hip
- 1/2 of women with hip fracture die within 1 year
- At 6 months s/p hip fracture only 15% can walk across a room unaided.
- Women are 2-3x's at a higher risk for fx than men

Hip Fracture (continued)



- Mortality rate for men is almost 2 x women's
- 80,000 men per year have hip fractures, 1/3 of these die within 1 year
- Risk factors for hip fracture include needing arms to go from sit to stand and on feet less than 4 hours a day

DEXA Scan Results/Definitions

- Normal: 1 standard deviation (+1 to -1) as compared to young adult mean
- Osteopenia: 1 to 2.5 standard deviation below as compared to young adult mean
- Osteoporosis: >2.5 standard deviation below as compared to young adult mean
- www.nof.org (National Osteoporosis Foundation)

FIRST signs to look for in the clinic



- Postural changes (increased thoracic kyphosis, Dowager's Hump, protruding abdomen)
- Loss of body height
- Wrist, compression, stress, hip, or low trauma fracture
- Loss of teeth due to periodontal disease
- Transparent skin
- Persistent back pain

Diseases that Increase Risk

- Hypo or hyperthyroid
- Congenital disorders
- Burns
- Cushing's Disease
- CA
- Chronic inflammation
- TB
- RA
- Organ transplants
- Eating disorder
- Mental illness
- Ankylosing spondylitis
- Primary hyperparathyroidism
- Liver dysfunction
- DM
- COPD
- Seizures
- Neurological Disorders
- Malabsorption Syndromes
- Kidney Dialysis
- Endometriosis
- Idiopathic scoliosis
- Multiple sclerosis
- Pernicious anemia
- Osteogenesis imperfecta

Medications that increase Risk

- Corticosteroid
- Diuretics
- Heparin
- Methotrexate (CA medication)
- Cyclosporine A (immunosuppressant)
- Long term thyroid meds
- Excessive alcohol
- Anticonvulsants
- Coumadin
- Cholestyramine (Cholesterol medication)
- Antacids with aluminum
- GnRH (hormones for endometriosis)
- Cigarette smoking
- Lithium



Other Risk Factors

- Female
- Caucasian or Asian
- Post menopausal
- Small boned
- Family history
- Delayed puberty
- Early menopause
- Weight below 130 lbs
- Smoking
- Sedentary life style
- Advanced age
- Over exerciser
- Nulliparous (female never having a child)

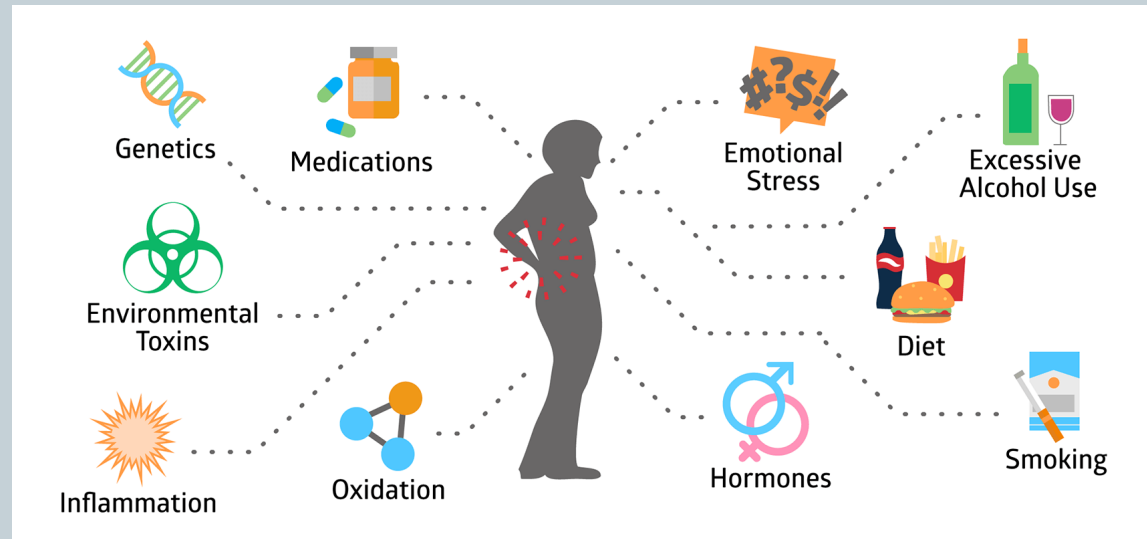
Vertebral
Compression
Fracture



Nutritional Risk Factors



- Eating disorders
- High protein diet
- High alcohol intake
- Low calcium
- High sodium
- Caffeine



TRIANGLE OF MANAGEMENT

EXERCISE****

Psychological

Social

Beliefs about
Health & Illness

Spiritual
&
Religious

Cultural
Issues

Financial
Issues

MEDICATION

DIET

Co-morbidities

Cognitive Condition

Optimum Nutrition for Bone Health

www.nof.org

• Daily Calcium

• WOMEN under 50=1000 mg

age 50 and over=1200 mg

• MEN under age 70=1000 mg

age 71 and over=1200 mg

• Daily Vitamin D

• Under age 50=400 to 800 IU

(international units)

Over age 50=800 to 1000 IU

Some people may have to take more than 1000 IU

• Vitamin D

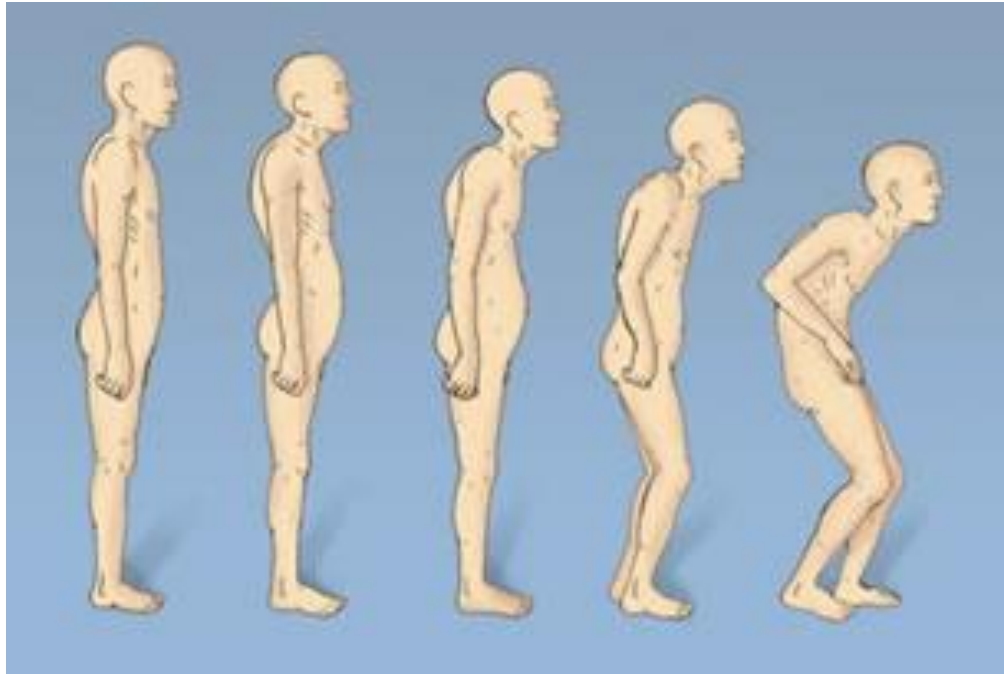
Osteoporosis Education Project has initiated a call for universal vitamin D as the primary basis for osteoporotic fracture prevention.

Vitamin D serum should be at least at 32 ng/ml

Ideal serum level goal is between 50-60 ng/ml

Patients may have to take additional daily doses to maintain





- Prevention of Fracture is the “bottom line”

Focus on Exercise to Reverse the
Patterns of Postural Change

References

- Walk Tall! An Exercise Program for the Prevention & Treatment of Osteoporosis, Sara Meeks, PT
- www.nbha.org
- www.sarameekspt.com
- www.ownthebone.org
- www.therapilates.com
- www.nof.org
- www.betterbones.com
- www.iofbonehealth.org
- www.fragilityfracturenetwork.org

Patient - Paula (Subjective History)



- 74 year-old female
- Acute L1 Compression Fracture
- Past Medical History
- DEXA Scan
- FOTO - 41/100
- Pain at 2/10 presently, flares of 4/10
- 2 weeks post-injury - 8/10



Patient Goals



1. Clean horse stalls.
2. Regain ability to ride and perform dressage.
3. Return to fitness at VH Wellness.
4. Return to household chores.
5. Get up/down off of floor.



Not Paula's X-Ray



Patient (Objective Findings)



- Posture
- Gait
- Balance
- Strength
- Range of Motion (ROM)



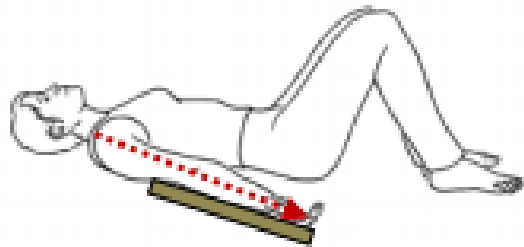
Initial Treatment



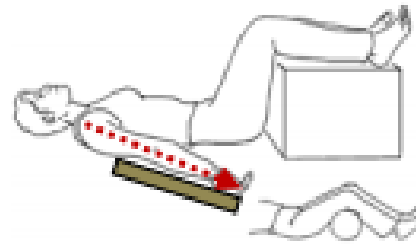
- **Realignment Exercises**
 - Decompression
 - Head Press
 - Shoulder Press
 - Leg Press
 - Leg Lengthener
- **Body Mechanics and ADL's**
 - Bending
 - Sit-to-stand
 - Turning

Decompression & Head Press

DECOMPRESSION EXERCISE

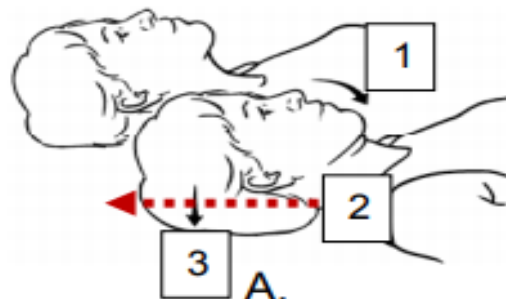


A.

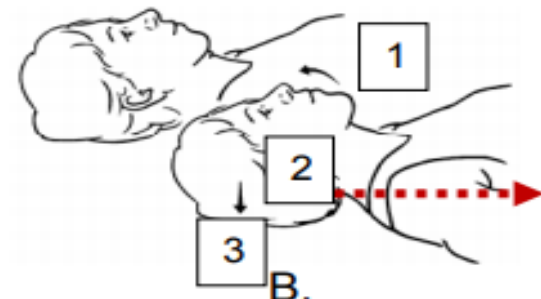


B.

HEAD PRESS



A.

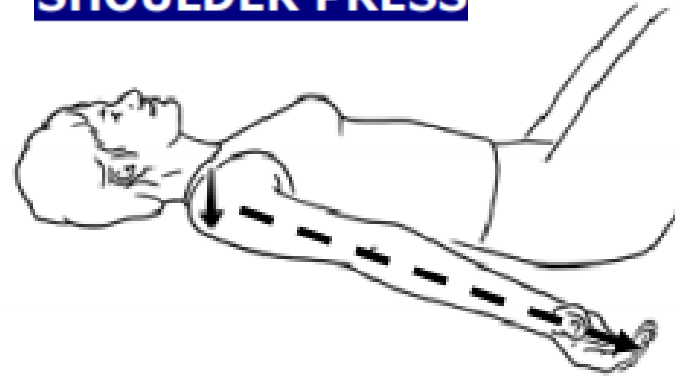


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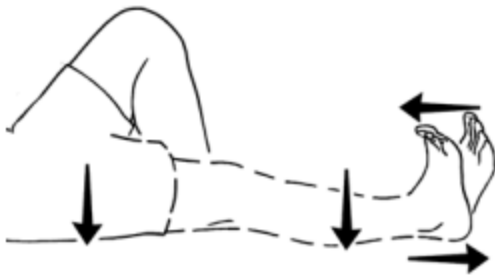
Shoulder Press, Leg Press, & Leg Lengthener



SHOULDER PRESS



LEG PRESS



LEG LENGTHENER



A.



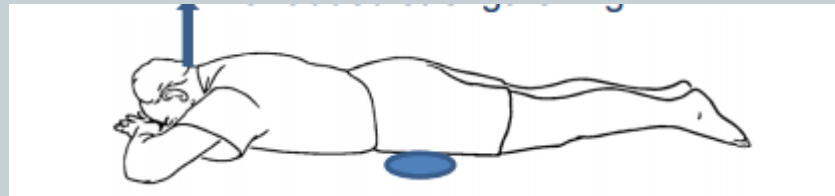
B.

Treatment #2



- Pain - 1/10
- Treadmill Warm-Up
- HEP Review
- Prone Exercises
- Standing Hip Abduction/Extension Machine
- Standing T-band Hip Exercise
- Body Mechanic Review with Hip Hinging (stick)

Prone Exercises



Treatment #3



- Pain - 2/10
- Riding In Car - 1 hour
- Standing - 1.5 hours
- Treadmill Warm-Up – 3.2 mph for 20 minutes
- Reviewed Previous Exercises

Initiated referral for Spinomed IV brace



Treatment #4



- Pain - 2/10
- Reviewed Home Program & Activities
- Prone Scapular Exercises



Treatment #5



- Pain - 1/10
- Wearing Spinomed IV (2 hours a day)
- Cleaned animal stalls
- Excellent body mechanic knowledge



Treatment #6



- Pain - 0/10
- Spinomed and Lumbar Support while riding
- Systematic Progressive Resistance Training Program



Bone, Estrogen, Strength Training (BEST)



Components of the 3 times a week yearly community fitness program

- Warm Up (5-10)
- Progressive Weight Bearing (25)
- Resistance Exercises - large muscle groups (20)
- Resistance Exercises - small muscle groups (10)
- Abdominal Strengthening (5)
- Stretching and Balance (5)

Paula's Fitness Workout (Overview)



- Treadmill Warm-Up
- Leg Press
- Standing Overhead Press (dumbbells)
- Lat Pull Down
- Seated Rowing
- Progressive Wall Sits

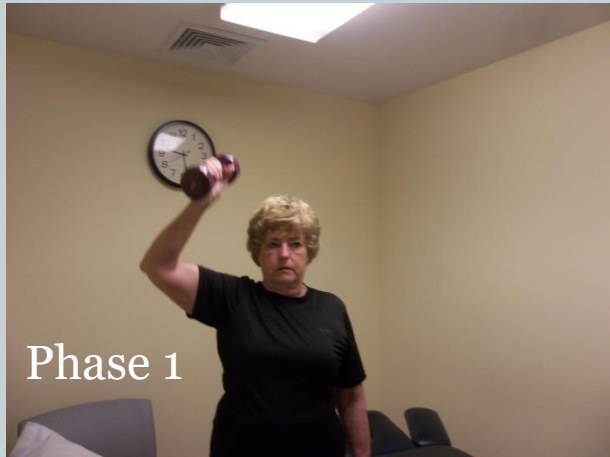
Treadmill Warm-Up



Leg Press



Standing Overhead Press (Dumbbells)



Lat Pull Down



Seated Row



Progressive Wall Sits



Treatment #7 (2 Week Follow-Up)



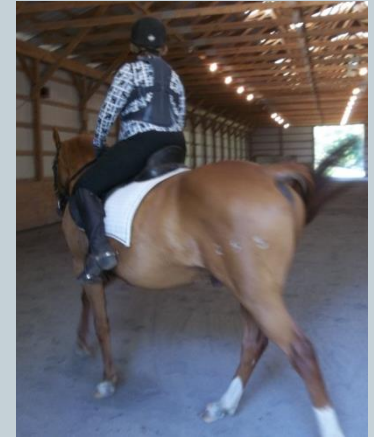
- Pain - 2/10
- Now doing dressage 30 minutes every other day
- Stadiometer (1) - height is unchanged
- Prone Extension Endurance Test (2) - 2 min.
- Loaded Stance Test (3) - 2 min. & 3 sec.



Treatment #8 (One Month Follow-Up)



- Pain - 2/10
- FOTO - 54/100
- Stadiometer - Height Maintained
- Prone Extensor Endurance Test - 3 minutes
- Loaded Stance - 3 minutes



**VALLEY HEALTH REHAB
OSTEOPOROSIS COLLABORATIVE**



**Healthy Bones –
Stand Tall For Life**

VH Osteoporosis Collaborative



- March 24 – 25, 2018 - **Level 1 Meeks Method comprehensive exercise and movement approach to the treatment of osteoporosis** was sponsored by Valley Health.
- Many therapists throughout Valley Health attended this course and became aware of a need to incorporate this valuable training into the services we provide across the system.
- The initial organizational meeting took place on **January 18, 2019.**



Goals of the VH Osteoporosis

Collaborative

(Collaborative Goals)



- To establish an organized and consistent approach to identifying and addressing the needs of Physical and Occupational therapy patients (in-patients, out-patients and home health patients) who suffer from or are at risk for developing osteoporosis/osteopenia ***no matter what their referring diagnosis may be.***

(Collaborative Goals)



- To offer training to the VH Rehab staff that is easily accessible and offers a way for our therapists to effectively treat the physical effects of osteoporosis without requiring them to take a formalized training course.

(Collaborative Goals)



- To compile educational materials for:
 - *patients
 - *caregivers
 - *medical professionals
 - *the community

To assist in their understanding of this disease and how to identify, manage and reduce the effects of osteoporosis on functional mobility and quality of life.



**How did we
achieve these
goals??**

Evaluation Tool

Available in Cedaron > Quick Links > Patient Forms



FILE TOOLS VIEW OSTEOPOROSIS%20EVALUATION[1] (Protected View) - Word

PROTECTED VIEW Be careful—files from the Internet can contain viruses. Unless you need to edit, it's safer to stay in Protected View. Enable Editing

VALLEY HEALTH OSTEOPOROSIS EVALUATION

PATIENT PORTION

Date: _____ Pt label _____

Email address: _____

Bone Fracture History (please check all that apply):

- ___ Hip fracture; Date/age: _____; Fall related? Y / N
- ___ Spinal compression fracture; Date/age: _____; Fall related? Y / N
- ___ Wrist fracture; Date/age: _____; Fall related? Y / N
- ___ Other fracture _____; Date/age: _____; Fall related? Y / N
- Family history of osteoporosis? Y / N ; Who? _____

Please provide the following information:

1. Have you had a bone density test in the last 2 years? Y / N (if yes, please bring results)
2. Have you fallen or had any near falls in the past 3 months? Y / N ;
Explain: _____

3. Do you ever get dizzy or lightheaded? Y / N
Explain: _____

4. Are you up on your feet at least 4 hours per day? Y / N
5. How many hours per day on average do you spend sitting, reading, watching TV, doing needlework, other seated activity? (circle answer) 1
2 3 4 _____
6. Do you have any difficulty with everyday activities such as: Getting in/out of bed, standing up from a chair, dressing, brushing teeth or hair, cooking, taking care of your home? Y / N
Explain: _____

7. Is there anything else you would like to add that you think might help in your treatment?

VALLEY HEALTH OSTEOPOROSIS EVALUATION

THERAPIST PORTION

Pt label _____

Clinician: _____

Date: _____

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Treatment Guidelines



FILE TOOLS VIEW Healthy_Bones_Treatment Guidelines [Read-Only] - Word

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Healthy Bones: Treatment Guidelines
for People with Osteopenia, Osteoporosis or Vertebral Compression Fracture

I. Prevention

- a. Patient Education
- b. Positioning
- c. Body Mechanics
- d. Postural Correction
- e. Body Alignment
- f. Therapeutic Exercise
 - i. Meeks decompression position
 - ii. Core activation
- g. Balance
- h. Gait
- i. Home Exercise Program
 - i. Walking program

II. Acute

- a. Pain Relief Modalities
 - i. Hot, cold, ES, FIC, TENS
- b. Positioning
 - i. Appropriate positioning in bed to include use of pillows for support and to encourage position of spinal decompression, elongation of spine as much as possible
 - ii. No out of bed to chair orders due to increased compressive forces in sitting vs supine, sidelying, and standing
 - iii. Schedule position changes at regular intervals
- c. Body Mechanics
 - i. Logroll technique
 - ii. Sit to stand
- d. Bracing

- e. Advise and train in use of braces that support muscle reeducation (ie, spinomed or osteomed)
- f. Isometric Strengthening
 - i. Initiate 5 realignment exercises (decompression, head press, bilateral shoulder press, leg press, leg lengthener)
- g. Staff Education
 - i. Appropriate positioning
 - ii. Strategies for assisting patient mobility with minimal spinal loading
- h. Dietary Recommendations
 - i. Discuss general guidelines for calcium and Vit D
 - ii. Dietician referral as needed

III. Subacute & Chronic

- a. Modalities for pain relief and soft tissue mobility
- b. Positioning
- c. Body Mechanics
 - i. Review of proper body mechanics for ADLs, home management, etc
- d. Bracing
 - i. Spinomed or Osteomed
 - ii. Lumboloc or Lordoloc – more rigid bracing for heavier work
 - iii. Use of weighted kypho orthosis (WKO) by TechnoTan company as a tool to strengthen spinal extensors
 - iv. Consider Rock tape to thoracolumbar area (consider skin integrity)
- e. Postural Correction
- f. Therapeutic Exercise
 - i. Strengthening
 - 1. Back and scapula per Meeks presentation in SharePoint
 - 2. LE exercises such as QS, GS, standing hip abd/ext, marching, standing heel raises, standing toe raises, wall slides/sits, SL hip abd/ER, standing resisted abd/ext with Tband
 - 3. UE: include rotator cuff

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Halogen > Learning Library



Principles of Osteoporosis Management-SR-EE [Read-Only] - PowerPoint

FILE HOME INSERT DESIGN TRANSITIONS ANIMATIONS SLIDE SHOW REVIEW VIEW

READ-ONLY We opened this presentation read-only from the server. Edit Presentation

1 Principles of Osteoporosis Management
WOMEN OVER 50 WILL EXPERIENCE OSTEOPOROTIC FRACTURES. AS WILL MEN.

2 OSTEOPOROSIS
There is a fracture every 20 seconds affecting 50% of the US population 20 and over
It occurs in 1 of 3 women and 1 of 5 men
It is estimated to affect 24 million persons in the US
It is more prevalent than coronary heart disease (12.5 million), diabetes (17 million), or heart disease (1.3 million)-referenced Surgeon's General report of 2002
It is more common that breast, uterine, and ovarian cancer combined




3 A systemic skeletal disorder with compromised bone strength that predisposes an individual to increased fracture risk


4 BONE STRENGTH
•Bone Density
•Bone Quality
-Architecture
-Mineralization
-Micro damage accumulation

5 OLDER DEFINITION OF OSTEOPOROSIS BONE MINERAL DENSITY (DXA) SCAN
Reduction of bone mass, both quantity AND quality so that bones become fragile and easily fracture
PEAK BONE MASS
The amount of bone we accumulate as a young adult (generally age 30-35)
About 90-98% is accumulated by age 18-20

6 Determinants of Bone Mass
Heredity - 80-80%

Principles of Osteoporosis Management

 **WOMEN OVER 50 WILL EXPERIENCE** 
OSTEOPOROTIC FRACTURES. AS WILL  **MEN.**


Healthier, together.

Click to add notes

SLIDE 1 OF 51

NOTES COMMENTS

113%

Exercise Programs

(Available in SharePoint under “Healthy Bones”)




Phase I Beginner Osteoporosis Exercises for goal [Read-Only] - Word

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Phase I Beginner Osteoporosis Exercises

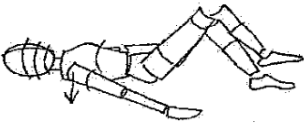
- 1). Decompression**

Position: Lie on back with knees bent, feet flat, arms resting on floor/table, and palms turned upward and out from the side of the body about 35 degrees. Head, neck, and arms supported as needed. Hold 3-10 minutes.



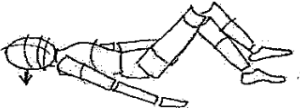
Accomplishes: takes compression off vertebral bodies (spine). Increases tolerance for lying on back. Help relieves back pain.
- 2). Shoulder Press**

Position: start in decompression position. Press shoulders downward towards supporting surface (table/floor). Hold 5-8 seconds. Relax. Repeat 3-5 reps




Accomplishes: Strengthens upper back extensors and scapular retractors.
- 3). Head Press**

Position: Bring cervical spine into neutral position (either tuck chin towards the chest or tilt chin upward). Feel the weight on the back of your head. Press head downward into supporting surface. Hold 5-8 seconds. Relax. Repeat 3-5 reps



Accomplishes: Strengthens neck extensors
- 4). Leg Press**

Position: Straighten one leg down to table/floor surface. Keep leg in alignment with hip. Press entire leg downward (as if making impression of leg in sand). Engage buttock and low back muscles as well as leg. Hold 5-8 seconds. Repeat 3-5 times. Repeat on other leg.



Accomplishes: strengthens gluteus maximus, lower erector spinae, ankle dorsi-flexors
- 5). Leg lengthener**

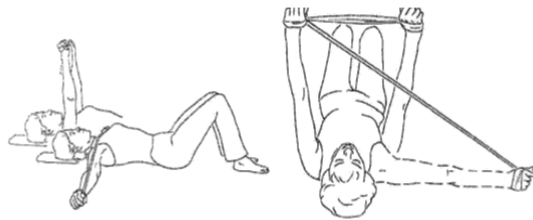
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(supine exercises)

Meek's Theraband Scapular Stabilization Exercises for Osteoporosis

1). Side Pull

Position: Grasp band with both hands. Wrap band around your hand, not your fingers or thumb. With your elbow straight, bring arms up to shoulder height (right angle) about shoulder width apart. Keeping your elbows straight, pull band out to the sides bringing hands down towards the floor/bed. The band should be at chest and collarbone level. Hold 3 seconds and slowly return to starting position controlled. Repeat 10 times.



2). Sash

Position: Grasp band with left hand, place left hand on prominent left front hip bone. Bring right hand with thumb pointed down over left hand. With some tension on the band, pull the band up and in a diagonal direction across your chest/upper body. Continue pulling as able and make a straight line between your left hip and right shoulder. The band should cross the sternum. Hold position 3 seconds and then return slowly to starting position. Repeat 10 times and then switch to the right hand holding the band and left hand pulling upward.

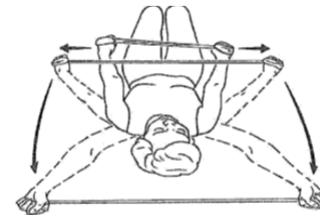


SASH position

Head cradle (alternate position)

3). The Overhead

Position: Grasp band with both hands around hip level with your elbows straight and palms facing down. Put tension on the band by pulling hands apart outward. Keep elbows straight and with steady tension on the band, bring your arms up and overhead as far as you can. Hold for 3 seconds and then return to start. Repeat 10 times.



4). Arm rotation

Position: With hands turned towards face/palms up. Lay the band across the palms of your hands as if it's a ribbon. Grasp the band and bend elbows to right angle (90 deg) while tucking your elbows in close to your side. If you need

(prone exercises)



Prone Osteoporosis Exercises -Beginner to Advance

Prone lying

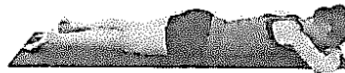
Position: Begin lying on your stomach with your head resting on your hands or a towel roll, looking straight down. Can place a pillow under abdomen for support as needed. Hold position for 3-5 minutes



Prone Pelvic Press

Position: Begin lying on your stomach with your head resting on your hands or a towel roll, looking straight down. Maintain this position and gently press front part of pelvis down into bed or pillow. Make sure to continue breathing during contraction as well as to not fire buttock muscles solely.

Hold 5-10 seconds, repeat 10 times



Prone press up on elbows

Position: Begin lying on your stomach, resting your elbows low to floor or bed. Push up gently on your elbows, causing your upper back to slowly bend upward. Make sure to keep your hips in contact with the floor or bed and maintain a gentle chin tuck throughout exercise. Can use a pillow for support under pelvis region if needed.

Hold 5-10 seconds, repeat 10 times



Prone Press up

Position: Begin lying on your stomach, with your hands placed by your shoulders resting flat on bed or floor. Make sure they are shoulder width apart as well. Gently push against bed/floor with hands bending your back upward. Keep your hips in contact with the floor/bed and maintain a gentle chin tuck. Breathe in as you go up and out before you go down gently sagging your stomach into bed/floor. Can use a pillow for support under pelvis region if needed.

Hold 3-5 seconds, slowly return down. Repeat 10 times



Prone Knee flexion

(advanced exercises)



Osteoporosis Vertical Sequence/exercises for higher functioning patients

Wall slides/sit

Narrow base of support wall slide

Single leg wall slide with stability ball

Angels in Snow

Wall push up

Lift Aways (facing wall, keep arms straight overhead and lift away from wall)

Lift Aways with arm lengthener

Lift Aways with heel raises and arm lengthener

Modified Plank

Hip flexor stretch in standing

Gastroc stretch in standing

Sit to stand in 30 seconds

Walking

Walk 15 steps, 13 steps, 11 steps

Side step

Backwards walk

Cone tap/cone hip circle

Pendulum hip swing

Karaoke/Braiding

Balance

Single leg stance

Tandem

Romberg

Foam roller exercises

Gray Cook Standing theraband exercises for core and lower extremity stability

End of document

Patient Education

Calcium/Vit D Tip Sheet / Body Mechanics and ADL's




Where we are now????



- Ongoing staff training/skills labs in process for clinicians in VH entities
- Needed tools to perform pt evaluations and treatments have been added to the Rehab clinics

Rack Card/Information Brochure in Process



Healthy Bones


Stand Tall for Life – A Program for Osteoporosis Management and Prevention

Healthy Bones is a program designed to reverse the patterns of postural change and restore normal body alignment through education and exercise. Benefits include:

- Improved posture, balance & gait
- Increased bone & muscular strength
- Minimized fracture risk
- Enhanced body image
- Safer return to regular exercise

Participants will receive an evaluation by a Physical or Occupational Therapist and a customized program which may include:

- Pain relief measures
- Muscular stretching & strengthening





- **Meeks II Course**

Hopefully coming in 2020!

Thanks For Listening, Are There Any Questions?

