



# **INTRODUCTION to TheraPilates® and Yoga *for Bone Building & Injuries***

**with  
Sherri R. Betz, PT, GCS, PMA®-CPT**



## INSTRUCTOR BIOGRAPHY:

**SHERRI BETZ, PT, DPT, GCS, CEEAA, PMA®-CPT** is a 1991 graduate of the LSUMC School of Physical Therapy, a doctor of physical therapy, a Board Certified Geriatric Specialist, and a PMA® Certified Pilates Teacher. Sherri actually began her movement career as a national gymnastics competitor and as a group fitness instructor and personal trainer in the 1980's. Inspired by the work of a physical therapist in one of the clubs where she trained, Sherri pursued a degree in physical therapy.

Her love of movement education has been integrated into her physical therapy practice at a rehabilitative level and at a fitness level. Utilization of Pilates methods, yoga, and Gyrotonic® with a specialty in the treatment of the pelvic girdle and manual therapy of the spine and pelvis are integral in her practice as a physical therapist.

Sherri was elected as the **Vice-President of the Pilates Method Alliance** and served on the PMA Board of Directors from 2003-2009. Sherri is the Chair of the PMA Research Committee and the Chair of the PMA Certification Board to protect the integrity of the credential and to improve the quality and safety of Pilates instruction.



Selected to serve on the Board of Directors of **American Bone Health**, on the **FORE** (Foundation for Osteoporosis Research and Education) Professional Education Committee, on the **NOF** (National Osteoporosis Foundation) Exercise and Rehabilitation Advisory Council and as the Chair of the APTA Geriatric Section's **Bone Health Special Interest Group**, Sherri speaks internationally on behalf of these organizations on the topic of geriatric exercise, bone health and Pilates-based rehabilitation.

Sherri is passionately devoted to improving awareness about bone health through development of professional and consumer education as well as through promotion of low-cost community exercise programs for fit and frail older adults.





# Safe Pilates for Bone Health

with Sherri Betz, PT, GCS, CEEAA, PMA®-CPT

**Osteoporosis** is defined by low bone mass and micro-architectural deterioration of bone tissue leading to enhanced bone fragility and a consequent increase in fracture risk. (25% or greater bone loss)

### 3 Main Causes for Fracture in Bone:

- 1) Decreased bone mass or “Skeletal Fragility”
- 2) Impaired repair of the microdamage caused by normal wear and tear of bone, especially cancellous or trabecular bone
- 3) Falls

**Osteopenia**-Mildly reduced bone mass; a risk factor (10-20% bone loss)

**Osteoblasts**-Bone cells that function in building bone

**Osteoclasts**-Bone cells that function in breaking down old bone

**Cortical Bone**-Compact, contained in the long bones and outer layers of bone, 80% of skeletal mass, slow metabolism

**Trabecular Bone**-Cancellous or sponge-like, surface area is great, very metabolically active, high rate of turn over, 20% skeletal mass, makes bones light but strong. Contained in vertebral bodies and neck of femur.

### Most common fracture sites:

Hip (Femoral Neck), Vertebral Bodies, Wrist and Ribs

### Staggering Statistics:

There are more deaths caused by osteoporosis than cancer of the cervix and breast combined. A woman’s risk of hip fracture is equal to her combined risk of breast, uterus and ovarian cancer.



*Bone is living  
dynamic; creating  
our blood cells”*

*“1 in 2 women & 1 in 4  
men over age 50 will  
have an osteoporotic  
fracture in their lifetime*



## Bone Mineral Density:

Refers to the amount of mineral contained within a certain amount of bone: *1 gram of mineral for every square centimeter of bone = 1.0g/cm<sup>2</sup>*

## Bone Mineral Density Testing:

Recommended that women get a baseline BMD test done on a **DEXA** machine at age 40 especially if risk factors are high



## Interpretation of (DEXA) Bone Mineral Density Reports:

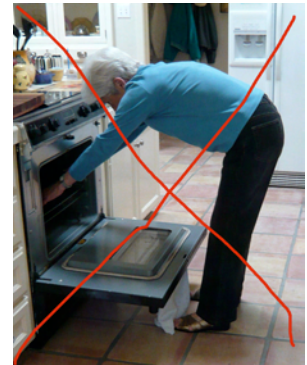
**Tscore** - Tells where the patient stands as compared to a young adult population for average peak bone mass

**Zscore** - Tells where the patient stands as compared to same age and sex normal population for average peak bone mass

**For every 1 point drop in Standard Deviation below the mean, fracture risk doubles! -1=2x risk, -2=4x risk, -3=8x risk, -4=16x risk**

## FRACTURE PREVENTION:

- 1) Avoid all flexion, deep sidebending, and deep rotation of the spine
- 2) Sit up tall when coughing and sneezing - Do not bend forward!
- 3) Stand to the side of the oven and bend at the hip to reach into the oven
- 4) Keep your spine straight when putting on your shoes
- 5) Bend at the hips when you lean over the sink to brush your teeth or wash your face
- 6) Do not try to open heavy or stuck windows
- 7) Keep your spine elongated and straight when lifting heavy objects especially from the floor
- 8) If an object cannot be lifted correctly in Neutral Spine alignment, don't lift it!
- 9) Avoid the Yoga Pigeon Stretch/Pilates Hip Stretch



## TREATMENT OPTIONS: Medications, Nutrition, Exercise

### EXERCISE GUIDELINES:

- 1) Protect Spine from Fracture!! (First Priority!!)
- 2) Learn to Hip Hinge (Bend at hips instead of waist)
- 3) Learn Neutral Spine - up and down from floor to and from quadruped
- 4) Avoid all flexion (forward bending), deep sidebending and deep rotation (twisting) with Osteoporosis and Osteopenia of the spine
- 5) Practice Standing on 1 Leg (when you brush your teeth 2x per day!)
- 6) Learn to breathe with good rib movement and deep lower abdominal contraction
- 7) When all of the above are mastered begin bone building exercises



Forward Bending creates excessive pressure on the front of the spine



Normal Vertebra

*Normal bone in spine (vertebra)*



**Wedge Fracture-**  
usually from rounding the back

*Wedge fracture*



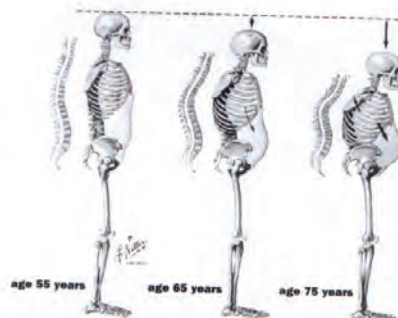
**Crush Fracture-**  
overhead lifting or spontaneous

*Crush fracture*



### RED FLAGS:

- 1) Height loss of more than 1" (6cm or 2.4 inches predictive of vertebral compression fracture)
- 2) Previous Fracture
- 3) Family History (70% contributing factor)
- 4) Presence of Kyphosis (greater than 7cm occiput wall distance OWD is strongly predictive of fracture)



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## EXERCISE FOCUS: Spinal Alignment and Elongation:

**Standing Posture:** Stand Tall with elongated spine



**Thoracic Extension:**



**Foam Roller:** Massage and Arching Stretches

**Foam Roller:** Snow Angels



**8-9" Ball:** Rolling up the spine, thoracic extension at individual vertebrae



**Seated Thoracic Extension with Ball**

## Balance and Fall Prevention:



**Single Leg Stance & Heel Raises**



**Single Leg Knee Bends**



**Dynamic Weight Shifts**

## Leg Strengthening:



**Lunge Progression**



**Marriage Proposal**



**Squats**

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## REFERENCES:

- 1 Bansal, S., Katzman, W. B., & Giangregorio, L. M. (2014). Exercise for improving age-related hyper kyphotic posture: a systematic review. *Arch Phys Med Rehabil*, 95(1), 129-140.
- 2 Barker, KL. (2014). Physiotherapy Rehabilitation for Osteoporotic Vertebral Fracture (PROVE): study protocol for a randomised controlled trial.
- 3 Bird, M. L., & Fell, J. (2014). Positive long-term effects of Pilates exercise on the aged-related decline in balance and strength in older, community-dwelling men and women. *J Aging Phys Act*, 22(3), 342-347
- 4 Bone Health and Osteoporosis-A Report of the Surgeon General. US Dept. of Health and Human Services, Public Health Services, Office of the Surgeon General, Rockville, MD; 2004
- 5 Briggs AM, et. al. Paraspinal muscle control in people with osteoporotic vertebral fracture. *European Spine Journal*. 2006 Nov.
- 6 Davis CM. *Complementary Therapies in Rehabilitation*, 2nd. Ed. Slack Publishing, 2004
- 7 Hu J, Zhao, Chen J, Fitzpatrick J, Parpra B, Campbell TC. Bone density and characteristics in premenopausal and postmenopausal Chinese women. (Part of the China-Cornell Project) *lifestyle character- Osteoporosis Int*. 1994 Nov;4(6):288-97.
- 8 Lindsay R, et al. Risk of new vertebral fracture in the year following a fracture. *JAMA*. 2001 Jan17;285(3):320-3.
- 9 National Osteoporosis Foundation. *America's Bone Health: The State of Osteoporosis and Low Bone Mass in Our Nation*. Washington, DC: National Osteoporosis Foundation; 2002.
- 10 Pilates, JP. *Return to Life Through Contrology*. Pilates Method Alliance: Miami, FL, 2003 (originally published 1945), pg. 6.
- 11 Sinaki M (2013). Yoga spinal flexion positions and vertebral compression fracture in osteopenia or osteoporosis of spine: case series. *Pain Pract*, 13(1), 68-75.
- 12 Sinaki M, Mikkelsen, BA "Postmenopausal spinal osteoporosis: Flexion versus extension exercises." *Arch Phys Med Rehab* 1984; 65:593-596.

## WEBSITES:

[www.AmericanBoneHealth.org](http://www.AmericanBoneHealth.org)  
[www.FORE.org](http://www.FORE.org)  
[www.NOF.org](http://www.NOF.org)  
[www.OsteoFound.org](http://www.OsteoFound.org)  
[www.TheraPilates.com](http://www.TheraPilates.com)

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# Posture Cues and Exercises

## **GOALS and SKILLS for *INTRODUCTION TO PILATES FOR BONE BUILDING AND INJURIES CLASS***

### **Class # 1 – *Posture & Breathing Skill Goals:***

1. Breathe with good rib movement and with abdominal wall firm. (page 12)
2. Be able to perform the hip hinge or "Chair Pose" with the Dowel continuously touching the 3 points of contact. (p. 13)
3. Establish your optimal postural alignment using the 7 Standing and Centering Cues with "relaxed" low back muscles. (pp. 14-15)

### **Class # 2 - *Leg Alignment Skill Goals:***

1. Keep arches lifted with 60% of weight on the outside of foot and 40% to the inside. When knees bend keep them aiming over the 4th and 5th toes no matter where the foot is pointing. (p. 14)
2. Practice heel raises with tennis ball between heels, then try on one leg. (p. 16)
2. Practice the 3-foot stride Marriage Proposal Lunge. (p. 18)
3. Practice the Single Leg Knee Bend. (Stand against the doorframe if you need support) (p. 17)

### **Class # 3 - *Core Control Skill Goals:***

1. Transition to the floor in neutral spine and good leg alignment ideally using the Marriage Proposal Lunge transition (p. 19)
2. Quadruped weight shifts with neutral spine (pp. 19-20)
3. Side to Side and Pelvic Clock finding neutral with ease and relaxed low back muscles (pp. 22-23)
4. Bridging with spinal articulation and if possible stable pelvis at top with marching (p. 24)
5. Dip the Foot in the Pool- with no abdominal bulge, keeping pelvis and spine still (p. 25)
6. Bent Knee Opening and Assisted and Single Leg Circles- keeping pelvis and spine still (p. 26-28)
7. Sidelying and Clamshells with stable pelvis and low back relaxed (p. 29)
8. Prone Hip Extension with stable pelvis, knees straight and low back relaxed (p. 32)

### **Class # 4 - *Shoulder Girdle Stability and Mobility Skill Goals:***

1. Good Spine and Rib Cage Alignment (pp. 14-15)
2. Practice Taut Towel Pulls with placement of the shoulder blades and collarbones on the rib cage (p. 34)
3. Placement of the humeral head posteriorly in the socket (using Towel p. 34)
4. Keeping the shoulder blades down and forward when reaching overhead
5. Aiming the socket of the shoulder upwards and wrapping the shoulder blade/ arm pit around the ribcage when reaching overhead
6. Keeping the upper trapezius (neck muscles soft/relaxed when using the arm)
7. Arms like a parenthesis especially in weight bearing
8. Pulling the shoulder blades wide and forward when in weightbearing of the upper extremities



### **Class #5 - Spine Mobility & Dynamic Stability Skill Goals:**

1. Mobilize the mid thoracic spine on the 8" Massage Ball or Foam Roller regularly and remember to mount safely. (pp. 35-38)
2. Follow the mobilization with prone 3 part thoracic extension (p. 39)
3. Use a pillow under ribs and pelvis to protect your ribs with low bone density
4. Avoid endrange spine motions with low bone density
5. Practice Pelvic Clock and Side to Side to increase mobility of lumbar spine (pp. 22-23)
6. Practice Book Opening to increase mobility of thoracic spine (p. 41)
7. For advanced core control, practice Side Lift and Prone Pelvic Lift (pp. 31-33)

### **Class #6: Review and put it all together in one class!**

#### **To follow up from the 6 week series, the next step options are:**

1. Repeat the Intro Class if you feel that you need more practice and feedback.
2. Go into the Level 2 Mon/Wed 8:45am or 10:00am twice weekly classes, or Tues 10am TheraPilates® for Bone Building Mat Classes held one time weekly.
3. Take the Level 2 Thursday 10:15am Yoga for Bone Building at TheraPilates®.
4. Take the Level 2 Pilates Mat Class at 11am on Saturdays at TheraPilates® (Drop-In \$15, Package of 10 \$120)
5. Take a Private Lesson from one of the TheraPilates® Pilates Teachers if you need more individual instruction or feedback on the exercises.
6. Book a physical therapy session with one of TheraPilates® licensed physical therapists if you have pain or injuries that did not get better with the classes.
7. Take a couple of private sessions to prepare for the TheraPilates® Reformer & Apparatus Classes: Limited to 5 People and classes occur Mon - Sat. Check the schedule online at [www.therapilates.com](http://www.therapilates.com)

*NOTE THAT "CLASSES" ARE GROUP SESSIONS AND "APPOINTMENTS" ARE EITHER PRIVATE PILATES OR PRIVATE PHYSICAL THERAPY 1 HOUR SESSIONS.*

*Feel free to call us at 831-476-3100 or email us at [info@therapilates.com](mailto:info@therapilates.com) if you have any questions. Best of luck on your journey to vibrant health and movement!*

Sincerely,  
Sherri

Sherri Betz, PT, GCS, PMA®-CPT  
Director of TheraPilates® Programs

**BREATHING TYPES: (Assess in Standing)**

Diaphragmatic ☐  
(Abdominal/Belly)



Upper Thoracic ☐  
(Pump Handle)



Lower Thoracic ☐  
(Costal)



Assess your dominant style of breathing by having a partner observing your breathing style preferably when you are unaware. Then take a deep breath to assess dominant style.

Assess your ability to use the following 3 breathing styles:

1. Are you able to take a *Diaphragmatic Breath* with expansion of low abdomen without movement of the pelvis or spine?
2. Are you able to take an *Upper Thoracic* (Pump Handle) breath with expansion of sternum and upper thoracic spine without neck tension or upper trapezius over-recruitment?
3. Are you able to take a *Lower Thoracic* (Costal) breath with expansion of lower ribs bilaterally without neck tension or upper trapezius over-recruitment?

**RIB EXPANSION: (Assess in Standing)**

Rest \_\_\_\_\_ ☐ Inhalation \_\_\_\_\_ ☐ Exhalation \_\_\_\_\_ ☐



To assess resting position, take a 2-3 deep breaths and exhale in a relaxed manner. Measure circumference at Xiphoid Process, T7, and Base of Scapulae at rest. Record score. Now, inhale as deeply as possible expanding the ribcage laterally into the arms/armpits. Record Inhalation score. Then exhale as fully as possible. Record Exhalation Score. Normal or Optimal is 2" expansion of lower ribs from rest position to full/deep inhalation.

## MAT WORK

### Chair Pose in Neutral Spine



**Relaxed  
Posture**



**Forced  
Correction**



**Best  
Correction**



#### BODY POSITION

Tie a 36 inch dowel or broomstick to your back with elastic band or straps around the chest underneath the armpits and around the waistline

Throughout the movement maintain contact with **head**, **mid-back**, and convex aspect of **sacrum** against dowel

Stand or sit in neutral spine with feet parallel to each other

#### MOVEMENT/BODY POSITION

Pretend that you are going to sit back in a chair (It is safer to actually have a chair behind you in case you lose your balance)

Aim your knees straight over the 2nd toe

Reach up as far as possible from fingertips to coccyx while keeping your shoulders down and back  
Maintain lots of space between ears and shoulders

Elongate your spine from head to coccyx

Keep the abdominals drawn in

Hold for 3 deep costal breaths

Rest and repeat 2-3 times

#### WATCH FOR

Loss of neutral spine

Loss of contact with **head**, **midback** and convex aspect of **sacrum** against stick

Scapular elevation

Head looking up

Poor alignment of lower extremities

# Ron Fletcher's

## 7 Standing and Centering Cues



### Foot Centers

Encourage



Avoid



Avoid



1. Tripod Foot Centers, find subtalar neutral, pronate and supinate, avoid collapsing of arch. 40% weight on inside of foot. 60% of weight on outside of foot.

### Magnets

Encourage



Avoid



2. "Magnets" image between heels, shins and thighs (great for ankle control) Stand more often with feet together to activate postural muscles. Perform heel raises with feet together.

### Bolts

Encourage



Encourage



Avoid



Avoid



3. Pelvic Bolts:

Pubis to mid-sacrum  
Greater Trochanters  
Avoid tucking pelvis and tailbone under.  
Avoid arching pelvis and lifting tailbone up. Avoid squeezing buttocks. Keep pubis and tailbone level with back muscles relaxed.

# Ron Fletcher's 7 Standing and Centering Cues



## Girdle of Strength

Encourage



Avoid



Avoid



## 4. Girdle of Strength:

Lift ribcage off pelvis especially from the sides. Keep ribcage centered over pelvis. Keep lumbar muscles relaxed.

## Shoulder Girdle Placement

Encourage



Avoid



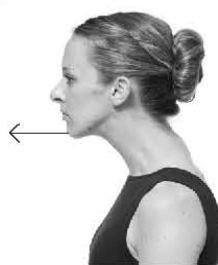
5. "Placement" of the shoulder blades and collarbones resting on the ribcage.

## Head and Neck Placement

Encourage



Avoid



Avoid



6. Draw the throat back and lift the ears up towards the ceiling. Lengthen the back of the neck.

## Fletcher Percussive Breath™

Encourage



Encourage



## 7. Percussive Breathing:

Lateral Costal: supports core control

Diaphragmatic: relaxing

Upper lung: avoid, increases neck & shoulder tension





## INTRO to TheraPilates® for Bone Building & Injuries Manual

### TENNIS BALL MASSAGE

Roll tennis ball longitudinally between metatarsals slowly from heel to ball of foot.



Rolling Massage



Parakeet/Wrap: MTP Flexion



Inch Worm

### HEEL RAISE

Begin with tennis ball between ankles to practice subtalar neutral alignment.

Bilateral Correct Alignment with Tennis Ball Heel Lift



Unilateral Correct Alignment



#### Remember:

1. Keep Ankle Subtalar Neutral Alignment
2. Keep Knee Straight
3. Keep Pelvis Level: avoid anterior translation, hiking, or shifting laterally
4. Maintain Rib to Pelvis Alignment: avoid rib shift anteriorly, laterally or posteriorly and torso lean
5. Maintain Shoulder Girdle Organization: avoid elevation, ab/adduction and keeps arms crossed
6. Maintain Head Alignment: avoid forward head or jutting of chin
7. Repeat 10x with good balance: avoid touching legs together, touching lifted foot to floor, excessive torso movement, hopping or flailing arms
8. May use chair back rest and or cane for balance assistance. Strongly encourage students to attempt exercise without assistive devices (float hand 2" off of chair back rest or hold dowel/can 2" off floor for safety)



## INTRO to TheraPilates® for Bone Building & Injuries Manual

### MAT WORK Balance Series

#### BODY POSITION

Standing  
Send all your weight to your left foot  
Lift your right knee and hip to a 90 degree angle  
Left foot pointed straight ahead and aligned with patella  
Maintain neutral spine  
Draw scapulae towards waist  
Lift ribs away from pelvis  
Move head towards the ceiling to lengthen cervical spine  
Keep pelvis level

#### MOVEMENT/BREATHING

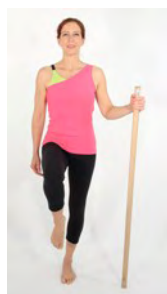
Inhale  
Exhale and send your right leg forward until the knee is straight  
Inhale and bend the knee, returning to center  
Exhale send your right leg to the side until the knee is straight  
Inhale and bend the knee, returning to center  
Exhale and send your leg back until the knee is straight  
Inhale and bend the knee, returning to center  
Repeat sequence 3 times

#### VARIATIONS

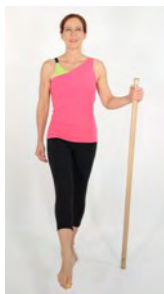
- 1) Hold a chair back or stick for support
- 2) Do the whole series with the standing leg bent
- 3) Small Knee Bends of the stance leg
- 4) Stand on unstable surface

#### WATCH FOR

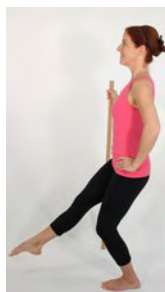
Anterior or posterior pelvic tilting  
Excessive lumbar extension  
Dropping pelvis on one side  
Bending stance leg  
Scapular elevation  
Foot pronation  
Knee valgus



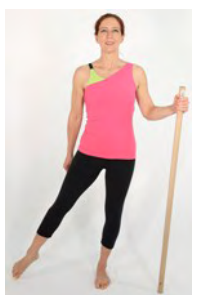
Start



Flexion



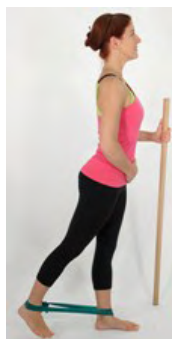
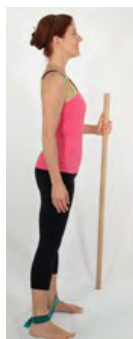
Bent Standing Leg



Abduction



Extension



Resistance Bands



Single Leg Knee Bends



## **MAT WORK Marriage Proposal Lunges**



### **BODY POSITION**

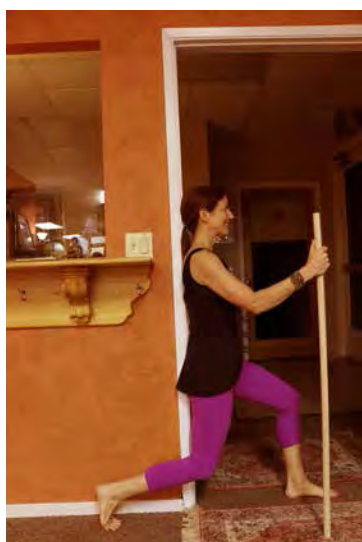
Hold or tie a 48-inch dowel or broomstick against your back with elastic band or straps around the chest underneath the armpits and around the waistline.

Throughout the movement maintain contact with **head, mid-back**, and convex aspect of **sacrum** against dowel.

Stand in neutral spine with feet parallel to each other

### **MOVEMENT**

- 1) Step 3 feet forward in parallel alignment.
- 2) Lift and lower back heel stretching the calf and hip flexor of the back leg.
- 3) Perform a small "secret" knee bend of the back knee keeping pelvis level and torso perfectly still. Avoid dropping the pelvis of the back leg.
- 4) Now keep the back knee straight and bend the front knee slightly without moving the torso forward.
- 5) Then perform a 1/4 bend straight down and back up.  
Progress to 1/2, 3/4 and Full by touching the knee to the floor (only if well-controlled and not painful).
- 6) Repeat with opposite leg forward.



**Modification against doorframe**

### **WATCH FOR**

Loss of neutral spine  
Dropping pelvis or rounding back  
Leaning trunk forward  
Scapular elevation  
Knee moving forward past toes  
Foot pronating  
Collapsing Ankle  
Poor alignment of lower extremities  
Short stride length



## **MAT WORK**

### **Transitions in Neutral Spine**



#### **6-Weight Shifts**



#### **7-Opposite Shld Flex/Hip Ext**



#### **BODY POSITION**

1) Hold or tie a 36 inch dowel or broomstick against your back with elastic band or straps around the chest underneath the armpits and around the waistline.

Throughout the movement maintain contact with **head, mid-back**, and convex aspect of **sacrum** against dowel.

Stand in neutral spine with feet parallel to each other

#### **MOVEMENT**

2) Step 3 feet forward in parallel alignment.

3) “Marriage Proposal” Lunge: Bend your knees and descend as if you are sliding down a wall. Aim your knees straight over the 2nd toe.

4) Bring the front knee back to a tall kneeling position without moving the spine or pelvis.

5) Sit back towards your heels.

6) Move to quadrupedal balancing the dowel on your back.

7) Reach opposite arm and leg up without losing the neutral spine position.

8) Reverse the positions and return to standing.

Repeat with opposite leg forward.

#### **WATCH FOR**

Loss of neutral spine

Loss of contact with **head, mid-back** and convex aspect of sacrum against stick

Bending trunk forward

Scapular elevation

Head looking up

Knee moving forward past toes

Foot pronating

Poor alignment of lower extremities

## **MAT WORK**

### **Neutral Spine in Quadruped**



**Quadruped Weight Shifts**



**Opposite Shld Flex/Hip Ext**

#### **SETUP**

Quadruped with shoulders over hands and hips over knees.

Pelvis and head in neutral position, spine in neutral curves, scapulae depressed, axial elongation.

Place dowel over spine in contact with head, mid-thoracic spine and sacrum

#### **MOVEMENT / BREATHING**

Inhale to prepare, expanding lower ribs postero-laterally, allowing abdomen to gently expand as well.

Exhale, moving one shoulder into flexion, reaching the arm forward, while moving opposite hip into extension, reaching the leg back — lengthening into axial elongation and keeping ribs engaged with pelvis.

Inhale, returning to quadruped, again lengthening into axial elongation and maintaining neutral pelvis and spinal curves. Repeat with other arm and leg

#### **VARIATION**

Lift one limb at a time

Lift same arm and leg with minimal hip or shoulder rotation

*Props:*

Hands and/or knees may be on rotating disks, foam rollers, balance boards, gym balls and any combination thereof.

Another option is to be quadruped over gym ball (ball under trunk)

#### **CUEING**

Axial elongation

Scapular depression and abduction

Integration of ribs with pelvis

#### **WATCH FOR**

Loss of axial length or neutral spine

Dropping into cervical or lumbar extension especially at L3

Scapular "winging" and elevation

Loss of abdominal support

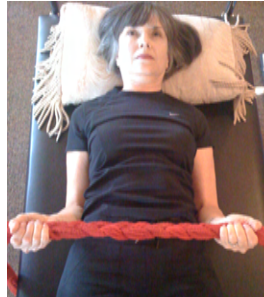
## **MAT WORK**

### **Fletcher® Towelwork**

**Shoulder Setting: Preparation for all upper body work:**



**Seated**



**Supine**

Hold Towel about 20" apart palms up. Imagine that you are holding a serving tray. Sit tall in optimal postural alignment. Inhale to widen collarbones and roll humeral heads back and down in the sockets. Exhale and pull Towel until it is gently taut while maintaining the humeral head and scapular position. Open collarbones. Avoid "squeezing" or adducting scapula. Repeat 10x.

### **Taut Towel Pulls:**

Hold towel at double the distance of your shoulder girdle with palms down and back of the wrists flat. Elbows are slightly bent with arms in a parenthesis shape. Keep shoulders down and inhale to lengthen the spine then exhale and pull the towel from your back. Keep your neck relaxed and wrists firm. Repeat 5x with the towel in front of your hips, 5x with the towel at your collarbone height and 5x with the towel overhead. Now raise your arms to the overhead position, by initiating the lift of your arm from your back. Draw your armpit down and forward to lift. Hold the towel over the crown of your head, turn your armpits to face forward and imagine opening your armpits and pressing the deepest part of your armpit forward. Keep the shoulders down away from your ears and your upper trapezius (on top of your shoulders) muscles relaxed. Then, slide the shoulder blades up and down on your back 5x.



**At Hips**



**At Collarbones**



**Overhead**

**Quadruped or Plank:** Place the heels of your hands on the towel just under your shoulders, press the palm where your fingers attach to the floor so that your hand slopes down towards the fingers. Hold the shoulder blades wide on your back and arms in a parenthesis shape with elbows slightly bent and creases of the elbow facing each other. Pull gently apart and feel the outside of your armpits working to hold your shoulders wide on your back.



**Quadruped or Plank**

*Fletcher Towels may be ordered online for \$40 at  
[www.fletcherpilates.com](http://www.fletcherpilates.com)*





## INTRO to TheraPilates® for Bone Building & Injuries Manual

### MAT

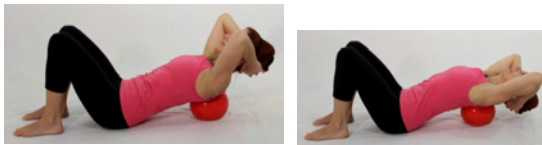
#### 8" Ball Thoracic Extension



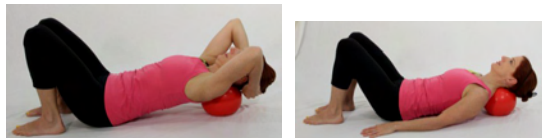
Lower Thoracic Extension



Middle Thoracic Extension



Upper Thoracic Extension



Cervical: Suboccipital Release



Thoracic Extension Seated in Chair

#### SETUP

Sit with buttocks centered in front of 8" Air-Filled Ball

Lean back on your hands

Keep chest lifted and spine in neutral and carefully slide hands directly apart

When your mid-thoracic spine contacts the ball, immediately place your hands behind your head to support your neck and keep your buttocks resting on the floor

#### Body Position

Start in a neutral spine with midback resting on the ball and hands behind the suboccipital region to support and lengthen the neck

Keep elbows wide and ribs engaged with pelvis

#### EXERCISE

##### Movement

Begin rolling back and forth over the thoracic spine only. Do not roll into the lumbar spine-this is usually painful and can be damaging!

Maintain neutral spine and mild abdominal contraction throughout rolling movement.

As you roll over the thoracic spine, notice where you have tension or "sore spots."

When you find one, stop at that segment and place your buttocks on the floor.

Inhale and extend your thoracic spine over the ball without losing the engagement of the ribs with the pelvis.

Exhale and return to the neutral position. Repeat 5-6 times and roll up to the next segment. Or just work your way slowly up the spine at each segment.

##### Breathing

Inhale to melt back over the ball as if you are wrapping your spine around the ball

Exhale, allowing the ribs to descend to return

Imagine that your sternum is like a see-saw on top of the ball

#### WATCH FOR

Pulling head forward

Rounding the upper back like a "crunch"

Scapular elevation

Cervical or lumbar extension

Ribs flaring

Chin jutting towards the ceiling

Buttocks lifting off the floor

## NOTES



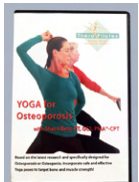
**The Osteoporosis Exercise Book: Building Better Bones, 2nd Edition** was written to help you incorporate safe mat exercises into your bone-building program. The exercises will help build bone density of the spine and hip, improve posture, balance, flexibility and mobility from beginner to the advanced level exerciser. Learn to avoid movements that increase the risk of fracture. Includes photos, nutritional recommendations, fracture prevention and some of the latest research findings on Osteoporosis. Over 100 photos, 104 pages.

**By Sherri R. Betz, PT**



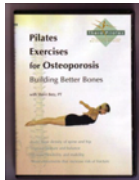
**TheraPilates® Mat for Bone Building & injuries DVD** Updated Mat Program based on the latest research and specifically designed for osteoporosis or osteopenia. Incorporate safe and effective Pilates-based Mat exercises to target bone and muscle strength! Safe and challenging exercises target the bones of the spine hips and wrists. Includes Standing Posture and Balance exercises, Fletcher Towelwork®, Foam Roller and 8" Massage Ball exercises, Abdominal Strengthening without Flexion.

**57 minutes**



**Yoga for Osteoporosis DVD** was based on the latest research with carefully selected poses for osteoporosis or osteopenia. Incorporate safe and effective Yoga poses to improve bone and muscle strength! Learn to modify your yoga practice with the best selection of poses designed for those with bone loss. Safe and challenging poses target the bones of the spine, hips and wrists. Includes: Balancing Poses, Standing & Posture Poses, Leg & Spine Strengthening Poses, Sun Salutation Modifications, Savasana & Meditation.

**57 minutes**



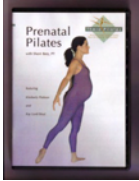
**Pilates Exercises for Osteoporosis DVD** was designed by physical therapist, Sherri Betz to help you incorporate safe Pilates exercises into your bone building program. Many Pilates exercises can be unsafe and contraindicated for those with low bone density. By modifying the wonderful exercises of Joseph Pilates and incorporating sound PT principles, you will learn the best exercises to build the bones of the most vulnerable areas of the hip & spinal vertebrae.

**57 minutes**



**Pilates for Seniors: The Osteoporosis Workout DVD** was developed for Seniors or those who have difficulty getting up and down from the floor for exercises. Explanation of anatomy, proper breathing, spine positioning and deep abdominal contraction precedes the workout. All exercises done in seated or standing position. Includes instructions for safely getting down to and up off the floor without risk for fracture and a few exercises suggestions for exercises that can be done in bed.

**64 minutes**



**Prenatal Pilates DVD** was developed by Sherri Betz, Physical Therapist, using guidelines from the American College of Obstetrics and Gynecology. Introduction to proper breathing, spine alignment, transversus abdominus contractions, diastasis recti, and abdominal anatomy followed by a prenatal mat class. All 3 Trimester modifications are demonstrated with precautions and contraindications for a safe workout.

**1 Hour 22 mins**



**Dealing with Acute Low Back Pain DVD** was developed by Harry Benich, MPT, to enhance the progress & effectiveness of a physical therapy program for patients with Acute Low Back Injuries. Due to shrinking health insurance reimbursement, PTs are often limited in the time they have with patients and often the treatment programs cannot be completed, restoring patients to full pre-injury status. Included are several principles and basic skills that most patients with spine/lumbo-pelvic injuries should learn to prevent further injury and allow rapid healing to occur!

**55 minutes**



**Pre-Pilates for Rehabilitation DVD** was designed to introduce you to the Pilates principles of breathing, spinal alignment, core control, shoulder girdle alignment, postural re-education, and overall body awareness. Let us help you exercise without increasing your pain. Featuring Sherri Betz, PT and Michele Franzella, PMA®-CPT.

**40 minutes**



**Pilates Reformer for Osteoporosis DVD** was designed especially for Pilates devotees who have osteoporosis or osteopenia. Included are safe and challenging exercises that target the bone of the spine, hips and wrists. Bone safe practices intro begins the DVD. Great Reformer Selections Include: Footwork with Variations, The Sleeper, Abdominal Strengthening without Flexion, Flowing Long Stretch Series movement sequences. Enjoy your newfound balance, posture, alignment and core control!

**66 minutes**

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**www.TheraPilates.com 1-888-229-5334**

**TheraPilates® Physical Therapy Clinic**

**920-A 41st Avenue Santa Cruz, CA 95062 Ph (831) 476-3100**



- 1. THE OSTEOPOROSIS EXERCISE BOOK, 2nd Ed.**
- 2. THERAPILATES® MAT FOR BONE BUILDING DVD**
- 3. YOGA FOR OSTEOPOROSIS DVD**
- 4. PILATES FOR OSTEOPOROSIS DVD**
- 5. THERAPILATES FOR SENIORS DVD**
- 6. PRENATAL PILATES DVD**
- 7. DEALING WITH ACUTE LOW BACK PAIN DVD**
- 8. PRE PILATES FOR REHABILITATION DVD**
- 9. REFORMER FOR OSTEOPOROSIS DVD**

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Cell Phone: \_\_\_\_\_ Email Address: \_\_\_\_\_

Number of Osteoporosis Books :	_____	x 19.95 =	_____
Number of TheraPilates Mat DVD's:	_____	x 24.95 =	_____
Number of Yoga for Osteoporosis DVD's:	_____	x 24.95 =	_____
Number of Osteoporosis DVD's:	_____	x 24.95 =	_____
Number of Senior DVD's:	_____	x 24.95 =	_____
Number of Prenatal DVD's:	_____	x 24.95 =	_____
Number of Low Back Pain DVD's:	_____	x 24.95 =	_____
Number of Pre-Pilates DVD's:	_____	x 24.95 =	_____
Number of Reformer DVD's:	_____	x 24.95 =	_____

8.5% Tax (CA): \_\_\_\_\_

Shipping & Handling- \$6 for 1-2 items \$12 for 3 or more items:

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**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip Code** \_\_\_\_\_

**Or send Check or Money Order Payable to:** **TheraPilates**  
**920-A 41st Avenue**  
**Santa Cruz, CA 95062**



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## **INTRO to TheraPilates® for Bone Building & Injuries Manual**

### **Evaluation:**

**Please write 3 things you found valuable about this course:**

**Please write 3 suggestions or things you would like to change about this course:**

**Please write 3 expectations, goals, skills or information that you would like to gain from this course:**

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**Title: Intro to TheraPilates® for Bone Building & Injuries**  
**Presenter: Sherri R. Betz, PT, GCS, CEEAA, PMA®-CPT**

**RELEASE & WAIVER**

I, \_\_\_\_\_ voluntarily desire to participate in physical and rehabilitation and/or exercise training classes conducted by TheraPilates Studio located at: 920-A 41<sup>st</sup> Avenue Santa Cruz, CA 95062 and understand and agree to the following:

1. I assume full responsibility while voluntarily participating in a training class at my sole risk and shall abide by any rules and regulations for use of the Facility which may be promulgated from time to time by its owner or TheraPilates.
2. I am aware that there exists the possibility of certain conditions occurring during or following training and/or exercise. These include, but are not limited to: mild light headedness, fainting, abnormalities of blood pressure or heart rate, ineffective heart function and in rare instances, heart attack or stroke. The reaction of the cardiovascular system to such activity cannot be predicated with complete accuracy.
3. It is strongly recommended that I receive a medical clearance from my private physician prior to starting an exercise training program. This program is not designed for persons with known heart disease with or without functional impairment.
4. I expressly agree that I have been informed that the program involves possible risks and all exercises shall be undertaken at my sole risk and that neither TheraPilates, nor the Facility at which the program is being conducted, nor the officers, directors, employees or agents of either shall be liable to me nor any other person, for any claims, demands, injuries, damages, actions or causes of action, whatsoever, to my person or property arising out of or connected to my services, facilities, and exercise classes or the Facility where the same is located, and I do hereby release and discharge TheraPilates and the Facility thereof from all claim, demands, injuries, damages, action, or causes of actions and from all acts of active or passive negligence on the part of TheraPilates or the Facility, their servants, agents or employees.
5. I have been offered a copy of this document.

**I HAVE READ THE ABOVE STATEMENT AND  
UNDERSTAND THE CONDITIONS**

Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Witness: \_\_\_\_\_ Date: \_\_\_\_\_

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## **Pre and Post Test Questions for TheraPilates® for Osteoporosis:**

1. Bone loss that results in a T-score of -1.8 would fall into which of these categories?
  - a. osteoporosis
  - b. osteopenia
  - c. osteoporotic
  - d. skeletal fragility
2. What ratio of women over age 50 are at risk for an osteoporotic fracture?
  - a. 1 in 5
  - b. 3 in 4
  - c. 1 in 2
  - d. 1 in 4
3. What ratio of men over age 50 are at risk for an osteoporotic fracture?
  - a. 1 in 3
  - b. 1 in 4
  - c. 1 in 5
  - d. 1 in 6
4. If a person has one osteoporotic fracture of the spine, that individual's risk of having another spine fracture in one year increases by how much?
  - a. 30%
  - b. 50%
  - c. 100%
  - d. 500%
5. What are the most common fracture sites in the spine?
  - a. T4, T5, T6
  - b. T6, T7, T8
  - c. T10, T11, T12
  - d. T7, T12, L5
6. In the 1984 Sinaki & Mikkleson study, subsequent fractures occurred in what percentage of those who performed only extension exercises?
  - a. 53%
  - b. 67%
  - c. 16%
  - d. 89%
7. What movements are contraindicated for clients/patients with osteoporosis or osteopenia of the spine?
  - a. flexion, extension, sidebending
  - b. flexion, sidebending, rotation

- c. extension, sidebending, rotation
  - d. flexion, sidebending, extension
8. Which of the following exercises is safe for the osteoporotic or osteopenic client to perform?
- a. Swan Dive 1
  - b. Spine Stretch
  - c. Rollup
  - d. Hundred
9. The first goal of any program for osteoporosis is to learn:
- a. bone-building exercises
  - b. hip hinges
  - c. fracture prevention techniques
  - d. neutral or optimal spine
10. What are the ways to identify osteoporosis?
- a. thoracic kyphosis-Occiput to Wall Distance
  - b. height loss
  - c. family history
  - d. Rib to Pelvis Distance
  - e. all of the above
11. Which of the following Pilates exercises is contraindicated for the person with low bone density?
- a. Open Leg Rocker
  - b. Leg Circles
  - c. Side Kick
  - d. Leg Pull
12. Osteoporosis is a systemic skeletal disease characterized by:
- a. decreased cortical bone
  - b. increased trabecular bone
  - c. decreased bone fragility
  - d. increased bone fragility
13. What is the best type of exercise for osteoporosis?
- a. Weightbearing exercise or weight training
  - b. Jumping or Plyometrics (Volleyball, Football, Soccer)
  - c. Endurance exercise (Running, cycling, swimming)
  - d. Yoga, Pilates and Tai Chi
  - e. It depends on the age of the client
  - f. It depends on the bone density of the client

# Calcium-Rich Foods

## Green Leafy Vegetables (1 Cup Cooked)

•Collard greens	350 mg
•Wild Greens	350 mg
•Broccoli	150 mg
•Kale	179 mg
•Spinach	278 mg
•Turnip Greens	229 mg
•Beet Greens	165 mg
•Bok Choy	230 mg
•Mustard Greens	160 mg
•Rhubarb	348 mg
•Parsley (raw)	122 mg
•Dandelion Greens	147 mg
•Okra	220 mg
•Rutabaga	100 mg

## Sea Vegetables

•Hijiki	610 mg
•Wakame	520 mg
•Kombu	305 mg
•Agar-Agar (Dry Flakes)	400 mg
•Dulse (Dry)	567 mg
•Nori (1/4 cup)	300 mg

## Beans and Legumes (1 cup cooked)

•Tofu-firm (Calcium-sulfate/Cl) 4 oz	400 mg
•Tempeh 4 oz	172 mg
•Garbanzo Beans (chickpeas)	150 mg
•Black Beans	135 mg
•Pinto Beans	128 mg
•Corn Tortilla	60 mg
•Black-eyed Peas	210 mg
•Great Northern Beans	130 mg
•Lima and White Beans	160 mg
•Navy Beans	120 mg
•Soybeans	200 mg





**Fish**

•Canned mackerel- 3 oz	260 mg
•Perch	115 mg
•Salmon-canned w/bones	200 mg
•Salmon-cooked	130 mg
•Sardines-canned w/ bones	340 mg
•Shrimp-cooked	95 mg
•Oysters	80 mg
•Clams	60 mg
•Lobster-cooked	55 mg

**Grains**

•Bran Muffin	115 mg
•Corn Bread	115 mg
•Corn Tortilla	60 mg
•Cold Cereal-fortified (average)	250 mg
•Oatmeal-1 cup	20 mg
•Instant Oatmeal-fortified,1 cup	100 mg
•Amaranth-cooked, 1 cup	275 mg
•Quinoa-cooked, 1 cup	80 mg

**Nuts and Seeds**

Sesame Seeds- 1 oz.	280mg
•Ground sesame seeds (Tahini) 3T	300 mg
•Almonds- 1 cup	200 mg
•Sunflower Seeds- 1 cup hulled	174 mg
•Brazil Nuts- 1 cup	260 mg
•Hazelnuts- 1 cup	282 mg
•Walnuts– 1cup	280 mg
•Soy Nuts (dry roasted)-1 cup	370 mg
•Poppy Seeds- 1 T	125 mg

### **Mineral Waters**

•Perrier	140 mg
•San Pellegrino	200 mg
•Gerolsteiner	300 mg
•Mendocino	380 mg
•Contexeville	451 mg
•Apollinaris (Schweppes)	91 mg
••Evian	78 mg
•Black Mountain	25 mg
•Arrowhead	20 mg
•Fiji Natural Artesian	17 mg
•Crystal Geyser	8.3 mg
•Calistoga	4 mg

### **Dairy**

•Skim Milk 1 cup	300 mg
•Nonfat yogurt 1 cup	294 mg
•Low fat cottage cheese	150 mg

### **Other Sources of Calcium**

•Blackstrap Molasses 1 T	137 mg
•Orange juice, fortified	210 mg
•Rice Milk, fortified	240 mg
•Soy Milk, fortified	160 mg
•Dried Figs- 5 medium	135 mg

### **Herbs**

- Kukicha (Twig Tea- 6x Ca+ of Milk!)
- Yellow dock leaves/roots
- Dandelion leaves/roots
- Plantain leaves
- Nettle leaves
- Raspberry leaves/canes/berries
- Mugwort leaves
- Red Clover blossoms

*Used with Permission from Christiane Northrup's Women's Bodies, Women's Wisdom*



## ***Sherri's Osteogenic Salad!*** ***Eat every day!!***

Arugula  
Carrot Sticks  
Broccoli  
Sliced Apples  
White Mushrooms  
Cherry Tomatoes  
Canned Chickpeas  
Canned Beets  
Grated Parmesan or Romano Cheese  
Tamari Roasted Almonds  
Fresh Dill  
Fresh Parsley  
1 cup Cooked Brown Rice  
Toasted Sesame Oil  
Marukan Rice Wine Vinegar (Yellow Label)  
Or Nakano Rice Wine Vinegar (Original Flavor Red Label)



***Toss all items, sprinkle with Sesame Oil and Rice Wine Vinegar  
and enjoy!***

Since the research shows that the protective effects on bone produced by vegetables, salads, and herbs are not merely due to their metabolic alkalinity, scientists are now theorizing that the bone-boosting effects are due to pharmacologically active compound(s) in the herbs and vegetables. Future research will undoubtedly uncover the compounds responsible, but fortunately, we don't have to wait to reap the bone-saving benefits. All we need to do is enjoy lots of onions, garlic, parsley, dill, tomatoes, cucumbers and green leafy salads.

References:

Muhlbauer RC, Li F. Effect of vegetables on bone metabolism. *Nature* 1999 Sep 23; 401(6751): 343-4.

Muhlbauer RC, Lozano A, Reinli A. Onion and a mixture of vegetables, salads, and herbs affect bone resorption in the rat by a mechanism independent of their base excess. *J Bone Miner Res* 2002 Jul; 17(7): 1230-6.

# Vitamin & Mineral Suggested Supplementation

## **B VITAMINS**

<b>Thiamine B<sub>1</sub></b>	<b>100 mg</b>
<b>Riboflavin</b>	<b>10 mg</b>
<b>Niacin B</b>	<b>130 mg</b>
<b>Niacinamide</b>	<b>30 mg</b>
<b>Pantothenic Acid B<sub>5</sub></b>	<b>450 mg</b>
<b>Pyridoxine B<sub>6</sub></b>	<b>50 mg</b>
<b>Cobalamin B<sub>12</sub></b>	<b>250 mg</b>
<b>Folic Acid</b>	<b>2 mg</b>

## **C, D, E VITAMINS**

<b>Beta Carotene</b>	<b>25,000 IU</b>
<b>Vitamin C</b>	<b>2000 mg</b>
<b>Vitamin D3</b>	<b>400-2000 IU</b>
<b>Vitamin E (d-alpha tocopherol)</b>	<b>400 IU</b>

## **MINERALS**

<b>Calcium (Citrate or Malate)</b>	<b>1200-1500 mg</b>
<b>Magnesium</b>	<b>600-750 mg</b>
<b>Potassium</b>	<b>90 mg</b>
<b>Zinc-Picolinate</b>	<b>15-25 mg</b>
<b>Manganese Picolinate</b>	<b>15 mg</b>
<b>Boron Picolinate</b>	<b>2-6 mg</b>
<b>Copper</b>	<b>1 mg</b>
<b>Chromium</b>	<b>150-200 mcg</b>
<b>Selenium picolinate</b>	<b>100-200 mcg</b>
<b>Molybdenum picolinate</b>	<b>100 mcg</b>
<b>Vanadium picolinate</b>	<b>100 mcg</b>

*Recommended by Christiane Northrup, MD*

## NOTES