

Lecture — Pilates' Balanced Body Mat Program

In the 1930's, Joseph Pilates designed a program to enhance the performance of dancers and athletes, and it was also used as a rehab program. With modifications, it can be geared more to the general public. Basic principles somewhat resemble Yoga.

Results are accomplished by using mind and body together. Concentration, and smooth, controlled movements are necessary.

Benefits of a Pilates Program —

- Improves and maintains flexibility(full range of motion within a joint and it's corresponding muscles)
- Improves circulation
- Prevents connective tissues from tightening
- Maintain skin elasticity
- Develops muscle tone/strength
- Reduces risk of injury to muscles/joints
- Improves performance during physical activities
- Reduces stress
- Increases trunk stability
- Improves articulation of the spine — forward flexion, extension to the back, and lateral rotation.
- Cosmetic enhancement (longer, leaner look)

General Flexibility Factors —

- Age — Flexibility decreases by adolescence. Elastic fibers (skin, muscle tissues) lose elasticity over time.
- Gender — Women are generally more flexible than men
- Pregnancy — an increase of hormones increases flexibility within joints, which increase the risk of injury
- Joint Laxity — This would mean either the joint capsules are not being provided enough stability either due to lack of agonist strength, antagonist flexibility, or ligament security.
- Muscle Balance — If a set of opposing muscles is unevenly strengthened, muscle balance cannot occur. This reduces flexibility and/or encourages joint laxity
- Activity — Remaining active does help maintain flexibility but: Does the activity you participate in cause you to use full ROM in joints? All joints? Both sides of body?

Proper Pilates Form —

- Move gently, slowly and smoothly
- Maintain a neutral pelvic (1/2" space between low back and floor, abdominals contracted, tailbone on floor)
- Maintain shoulder stability (relaxing scapular, shoulders dropped)
- Slow, deep breathing; inhale through the nose (expand ribcage), exhale through the mouth (compress ribcage); use percussion breathing
- According to Joseph Pilates: "If it's easy, you're not doing it right."

Things to Keep in Mind -

- Warm up before exercising to prevent muscle strain.
- Perform program 3 times a week.
- Intake plenty of calcium, potassium and water (these control muscle contractions).
- Get plenty of rest
- Do not exercise an injured area without consulting a physician.
- Exercise should not be painful.
- The slower the movement, the more effectively the muscles will work.

***Review muscle chart**

Identify all Abdominal muscles: Rectus Abdominus- Vertical fibers from ribcage to pelvic; External

Obliques- like putting hands in side pockets; Internal Obliques- run up from pelvic to opposite ribcage; Transverse- horizontal from pelvic to pelvic; Pyramidalis- Pyramid shape with tip point up to bellybutton.

***Review Copies of "Components of Muscle Tissue" (Wt. Training for Life 4th Ed., p. 12)**

Approx. 600 muscles in your body, 200 bones

Types of Muscle Tissue —

1. Cardiac (heart); Smooth (blood vessels, digestive) — both are involuntary muscles, meaning you cannot control the contractions; they make up 10% of total body weight

2. Skeletal (attaches to the bones) — voluntary muscles, meaning you can control the contractions; make up 40% of total body weight

Muscles are made of **contractile fibers and connective tissues**. The contractile fibers shorten and move joints. They can only pull the bones, not push. Muscle fibers have a bonded structure. They are composed of **Myofibriles**, which contain **sarcomeres**. The Sarcomeres are the functional unit of the muscle. When they contract, they are 20-50% of their normal length. When passively stretched, they are 120% of their normal length.

Types of Connective tissues- (fasciculus, tendon, epimysium, ligament)-When you stretch, rather than stretching muscle tissue, you primarily stretch the connective tissue.

1. Fascia — Bundle muscle fibers together and allows muscle to change **shape**

2. Tendons — Attach muscle to bone; they allow muscles to change **length**. It is continuous with the connective tissue that encloses the entire muscle (**3. Epimysium**),

4. Ligaments — Connect bone to bone within a joint capsule; **should not** try to elongate unless rehabilitating an injury or the joint has a less than normal ROM (Range of Motion). The ligaments provide stability within the joint. Most people should work only to maintain normal flexibility **within** the joint. (exceptions: gymnasts, dancers)

Joint Problems: Arthritis — inflammation of the joint itself

Bursitis — inflammation of bursae (these are sacs where the synovial fluid is produced to lubricate joints)

Types of Stretches —

Static- a held stretch where there is no movement or bouncing (the safest type of stretch)

Ballistic- a moving, bouncing stretch (much more at risk of injury)

Proprioceptive Neuromuscular Facilitation (PNF)- an advanced level of stretching, usually performed with a partner. It is inclusive of a 10 minute static stretch, a 10 second isometric contraction, and a 2nd deeper static stretch for 10-30 seconds. This type of stretching enables you to overcome the "stretch reflex".

Stretch Reflex- As a person attempts to stretch, the tissue's natural response is to protect itself from injury by tightening. The more you are able to relax into the stretch, the more likely you will be able to improve your flexibility. Also, if you stretch often, you will be more successful in overcoming this reflex. Your muscles have memory, so the more often you use them, the more effectively they respond.

Overstretch — a positive term, we need to "overstretch" to improve flexibility (equivalent to the term "overload" in resistance training)

Aggressive Stretching — a negative term, stretching too far or too fast; causing possible injury

Plastic Response- tissues **maintain their increased flexibility** after consistently performing a stretching program for a long period of time

Elastic Response- tissues **return to normal length** soon after a short-lived stretching program is eliminated from your daily routine, the flexibility you developed being **only temporary**

Injury-

Sprain- injury to joint or ligaments

Strain- injury to muscle tissue or tendon

RICE- proper treatment of most injuries(Rest, Ice, Compression, Elevation)

Muscle Response-

Extensibility- Tissue is able to **lengthen** (stretch)

Elasticity- Tissue is able to **return to its normal shape/size** after being lengthened

Excitability- Tissue is able to **receive** an impulse from the brain

Contractility- Tissue is able to **respond** to the impulse

Muscle Balance-

Opposing muscles control movement of the joints. The agonist is the working muscle during the movement. It is the muscle doing the pulling. The antagonist is the muscle resisting the movement, actually lengthening. These muscles work synergistically to maintain normal ROM of the joint.