Intro to Pilates:

"The mistreated body eventually exacts its repayment in full with interest in the form of leaving business men their fortune to contemplate, but denying them the benefits and enjoyments of good health". Joseph Pilates 1934

A. Joseph Pilates

1. Creator of Pilates method, originally named "Contrology"
2. Born 1880 with asthma, he had multiple illnesses resulting in muscle weakness
3. Studied yoga, martial arts, Zen meditation, circus arts, boxing, gymnastics, Greek and Roman exercises and worked with physicians and nurse (wife- Clara)
4. Developed a method of physical and mental conditioning for self rehab.
5. During WWI, he rehabilitated patients who were injured by rigging springs above their beds to allow them to exercise in bed
6. He came to New York in 1923, and began training and rehabilitating dancers
7. Initially Pilates developed a series of mat exercises and later developed equipment frequently used (universal reformer, Cadillac, high barrel, and Wunda chair)
8. Still a lack of supportive literature in rehabilitation (1)

B. Theory

1. Philosophy: (2)
    a. Develop the body uniformly (emphasis on "balance")
    b. Correct wrong postures
    c. Restore physical vitality
    d. Invigorate the mind
    e. Elevate the spirit
    f. "Core control is the essence of controlling human movement "(1)
    g. Powerhouse: (2) abdominals, back, butt (sometimes inner thighs) working together- this is the basis for all movements
2. Pilates associated with motor learning and trunk control: (1)
    a. Task-oriented
    b. Goal is to create efficient movements with emphasis on strengthening the "core"- TA and Multifidis
    c. To correct inefficient movements, exercises and equipment can be used to eliminate gravity and re-train the body until the new movement is automatic

Evolution of Pilates

3. Flat back vs. neutral spine
4. Addition of individuals knowledge into Pilates has changed and updated
5. Rehab specific:
    a. Assistive movement
    b. Dynamic stabilization
    c. Functional re-education

C. **Main Principles**

1. Control:
    a. Muscles working in synergy
    b. Control through the ROM
2. Breath
    a. Consistent breathing
    b. Each mat exercise has a specific breathing pattern assigned to it
    c. Kathy Grant: (Pilates master first generation) breathing categories:
        1. Accordion breathing: lateral breathing into ribs
        2. Percussive breathing: inhale as in accordion breathing, percussive breathing to exhale (forced expiration)
        3. Hide and seek breathing: inhale and exhale without noticeable movement of the rib cage or belly
3. Flowing movement:
    a. Rare to hold movements
    b. Emphasis on fluidity of movements (allowing the body to move freely)
    c. Finish each movement with control and precision
4. Precision:
    a. Similar to control with spatial awareness element
    b. Focus on specific muscles that should be working and relaxation of all other muscles
5. Centering:
    a. Tightening the deep abdominal muscles (TA) during all exercises
6. Stability:
    a. Torso stability with extremity movements
7. Range of Motion:
    a. Requires the body to move to its fullest length leading to increased flexibility
8. Opposition:
    a. Using opposing muscle groups to stabilization the torso while moving (ex: pulling the scapula down to lift the arm)

"***I must be right. Never an aspirin. Never an injured day in my life. The whole country, the whole world, should be doing my exercises. They'd be happier."*** Joseph Hubertus Pilates 1965 (age 86).

Pilates Fundamental Principles

- Breath
- Control/Concentration
- Precision
- Flow/ rhythm
- Opposition/length
- Flexibility and development of supple muscles
- Whole body movement and balanced strength development
- Centering/Stability
- Repetitions

Breath

Breath in Pilates is used to enhance the work that is occurring in the body.
Joseph Pilates insisted on full breathing- filling the lungs up completely and exhaling completely in order to purify the air in the lungs.
The exhale is used to enhance trunk stability by activating the deep abdominals.
Lateral costal or accordion breathing is used during exercises which is the outward motion of the ribs on the inhale and the inward motion or "pulling together of the ribs" on the exhale. This allows the air to come in without losing stability of the obliques and transverse abdominus and emphasizes the tightening of these muscles on the exhale.

Control/Concentration

Mindful control over muscular movements (mind/body connection) refers to the consciousness and focus that the exercises should be given while practicing the Pilates repertoire.
Muscles that are not needed in a particular movement should not be contracting.
For example, the pelvis should not automatically posterior tilt (rectus abdominus contraction) when the abs are tightened, this recruitment should be a conscious decision.
Another example is that the upper trapezius muscles should not fire because the arms are lifted over the head. If the upper trapezius muscles raise, this should be the goal and a conscious decision of the mover during the exercise or movement.

Precision

The exercises should be performed precisely.
The movements should be clean and smooth.
Precision is achieved though isolation of the muscles that are moving, and stabilization of the rest of the muscles in the body.
The end result should look smooth and choreographed like the movement of dancers.

Flow/Rhythm

The Pilates exercises were designed to flow from one to the other in a smooth progression.
The exercises should be sequenced in a logical manner that allows the person to gently warm up the spine and extremities, and then gradually increases in intensity.

The exercises should increase in difficulty throughout the workout.
Exercises should include all parts of the body.
Progression of exercise should only occur when easier exercises have been perfected.
Exercises should ideally not be broken up as in a gym when moving from one machine to another. Although this is hard to achieve in a rehab setting, it is possible when developing home exercise programs to incorporate flow into the workouts.

Opposition/Length

Pilates describes opposition in terms of rolling up and down the spine.
The guiding principle is to create length in the spine rather than compression.
As one rolls down the spine, the focus should be on lengthening the spine and reaching up to go down. As the motion takes the body back, one should be reaching forward to go back. In posture this translates to stretching the back of the neck up to look forward and/or down.
Creating length through the body and the spine really help decompress and improve posture.
The idea of "growing tall" can be used throughout the Pilates repertoire to align, strengthen, and stabilize as well as avoid compression in the body.

Flexibility

Pilates exercises are designed to increase the flexibility in muscles as well as build strength.
Joseph Pilates believed that all muscles in the body need to be balanced in terms of flexibility in order to access strength.
He also thought that without flexibility, one could not create smooth rhythm of movement.
The exercises incorporate flexibility but will only be possible if control of the stabilizing muscles exists.

Whole body movement and balanced strength development:
Pilates exercises are designed to work every muscle of the body without increasing muscle bulk.
This is achieved by using only gravity, the body, and light spring resistance during the exercises.
The goal is to create stability in order to freely and efficiently move the arms and legs.
Note: this is the same idea used in neurological rehab to gain maximum function of the arms and legs.
Each workout session should include exercises in several positions to create the best results: supine, prone, kneeling, side lying, seated, and standing.

Centering/Stability

The focus of all exercises is centering. Centering is what creates stability in the body.
Centering refers to the focus on the Pilates Powerhouse which can include: abdominal obliques, transversus abdominus, Multifidus, glutes, adductors, pelvic floor, and diaphragm.

Repetitions

Exercises in the repertoire are never repeated more than 10 times.
The usual number of repetitions is between 4 and 8 for any one exercise.
The theory behind low repetitions is to limit fatigue and therefore unwanted accessory muscle contractions and loss of control during the exercises.

Using exercises in sequence decreases the need for a high number of repetitions.
It is the quality of the exercise, not the quantity that makes the exercise successful.

Pilates Concepts

- **Thoracic shelf**
- **Overload**
- **Articulation of the spine**
- **Table top position**
- **Abdominal scoop**
- **Neutral Spine vs. Flat back**
- **Neck Positioning**

1. **Thoracic shelf**
   Thoracic self refers to the placement of weight across the shoulder blades and thoracic spine when in lifting hips, as in bridging, or in lifting the hips overhead. Weight should be maintained across the scapulae and the thoracic spine and not transferred to the cervical region. Arms can be lifted in a frame with the scapulae resting on the floor beside you, creating stability.
   The goal is to keep the shoulders relaxed and creates a stable base of support.

2. **Overload**
   Overload refers to muscle contraction in areas that are not being consciously recruited for the exercise at hand.
   This is seen most frequently in the cervical spine with tightening of muscles in the neck or overuse/tension of the upper traps.
   It is very important to make the clients conscious of this as it can lead to strain and/or injury.
   Placing a thin folded towel under the head can sometimes relieve strain that might otherwise occur.

3. **Table Top Position**

   Table top position refers to a supine position of 90/90 with the shins parallel to the ceiling.
   This position is used as the start point of many of the Pilates exercises.
   By default, the lumbar spine flattens more in this position than when the legs are down.
   It also is a challenge for those patients with very weak abdominals as they cannot hold the legs up without over extending the L/S.

4. Abdominal Scoop

Abdominal scoop refers to the ability to draw in and hollow the stomach.

This is done on an exhale and will flatten the spine if supine, or round the spine in seated or standing.



In prone position, it will lift the belly by tightening and pressing the pubic bone into the floor.

Abdominal scoop is used to emphasize and/or activate the abdominal muscles.

5. Torso Stability

Throughout all exercises, the torso needs to be stable.

When a person does not have sufficient strength for an exercise, it is easy to notice movement in the trunk while the legs and arms move.

If this occurs, it makes the movement less precise and often will keep the exercise from effecting the body in the desired way.

If the torso cannot be stabilized, the instructor should make the exercise easier by confining the movements and re-focusing on the abdominal muscles.


Proper torso stability Improper torso stability

6. Neutral Spine

Neutral Spine refers to the spine when it is in a position with its normal curves in place.

Exercises performed in neutral spine transfer to spinal positions that are commonly used in everyday life. They are harder to maintain (than flat back) without changing the spinal position.

Supported neutral spine refers to the use of a prop to give the spine more support without changing the normal spinal curves (usually towel under the lumbar or cervical spine).

Correct neutral spine positioning.

7. **Flat back positioning**

Flat back refers to the position of the spine when the curves have been flattened by nature of position or abdominal contraction. This position can be used to ensure avoidance of extension loading of the spine while doing more difficult Pilates exercises.

Flat back is also used as an introductory position for strengthening because it is easier to maintain than neutral position.

Lastly, flat back provides feedback in supine due to the contact with the surface under the spine.

Flat Back position

8. **Neutral Pelvis**

Neutral pelvis refers to the position of the pelvis when the ASIS are in the same plane as the pubic bone.

9. **Neck Positioning**

The neck should stay “unstressed” during all Pilates exercises. This is achieved by keeping the chin tucked in, the back of the neck long, and no dropping forward of the head. It is helpful to imagine a space the size of a tennis ball between the chin and the

chest in order to keep the neck long. In quadruped, plank, and prone positions the back of the neck should remain long and the chin slightly tucked so that the head does not jut forward (as in a typical “forward head posture”).

Upper ab curl

Quadraped

Modified plank

Full plank

10. Thoracic Shelf

Thoracic shelf refers to the area across the shoulder blades and upper back.

This should be where the weight of the body rests during bridging exercises and all overhead exercises.

If the body is weighted properly, the neck should be free of pressure.

11. Spinal Loading

There are different amounts of load that will be placed on the spine based on the position of the body.

The most unloaded position is the 90/90 (table-top) position with the legs supported.

Seated flexion and bending forward are the most loaded positions used in everyday life.

The acceptable load on the spine during exercise should be determined based on the diagnosis. If there is any question, a medical practitioner should be consulted.

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