MUSCLE IMBALANCE

It is your job as an instructor to be able to analyze your clients’ bodies and their ability to execute the exercises. If they are not able to do the exercise correctly it is likely they are imbalanced. You will need to be able to determine the to determine which anatomy is either tight or weak.

People with muscle imbalances will naturally recruit the over trained muscles and neglect the weak muscles. You will need to be able to analyze which muscles they are over working and which muscles they are neglecting, based on their overall positioning and correct form in the exercise.

Clients with imbalances will recruit the muscles they are used to training and neglect to engage the muscles that are undertrained. If a client is struggling with a position or exercise, you should be able to answer the following questions:
- Which muscles are tight, short or overworked?
- Which muscles are weak, loose or undertrained?

ALIGNMENT

The human body has 360 joints, which we have to keep well aligned, in order to prevent torsion or strain on the joint. At this point in your certification we expect you to be able to effectively teach, cue and demonstrate perfect alignment in each Essentrics exercise. If someone struggles with correct alignment in any exercise you should be able to use the neuromuscular, and joint movement techniques to release tension in the muscles and find safe alignment in every position. The objective is to strengthen the skeleton in perfect alignment in order to effectively rebalance the muscles surrounding the joints.
- Which exercises and positions are especially prone to misalignment?
- If someone struggles executing perfect alignment in a position, which techniques would be most effective to unlock the joint in order to obtain and maintain correct alignment?
- How does having perfect alignment in a position or exercise allow us to effectively isolate and recruit target anatomy?

ENDURANCE & POWER

Strength has two components: power and endurance. You must be able to effectively use the Essentrics techniques to achieve both strength and power. Doing rapid fast twitch movements in short bursts will increase speed, power and agility. Doing slow, controlled movements for an increased duration of time will increase endurance.
- Which techniques are effective in increasing power?
- Which techniques are effective for increasing endurance?
- Are there specific exercises or muscle groups that are designed for power?
- Are there specific exercises or muscle groups that are designed for endurance?
TECHNIQUES:

At this level in your certification you should have a clear understanding of how to use the following techniques to achieve a desired objective.

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<td>Defined as: a technique that involves movement within a stretch</td>
<td>Defined as: a technique used to trigger a response in the nerves and muscles</td>
<td>Defined as: a technique used to position the body to ensure correct load path</td>
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NEUROMUSCULAR TECHNIQUES:
In order to increase strength and mobility in the muscles we need to be able to access the full range of motion in each joint. If someone is tight and cannot move, they will not be able to strengthen with correct alignment and rebalance all 650 muscles.
In level 4, you are expected to use the neuromuscular techniques to release tension in the muscles and correctly align the body for the exercise before you begin the exercise. It is pointless to do a strengthening exercise if you are not engaging the target anatomy for beginning the exercise. Focus on techniques that will position the body in a way that you can effectively target the anatomy to tone the muscles, improve power and increase endurance.
Relaxation:

Relaxation is a deceitfully powerful technique for strengthening. Relaxation enables us to move without tension in the muscles. Without that added resistance, we can stretch further and move deeper into the movement/exercise. Being able to move deeper into an exercise will also allow us to lengthen the lever, and increase the load. For example, if you relax into a windmill, you will be able to lunge deeper and this will increase the load on the legs and core which have to support the body as you pull away from the center.

Relaxation is also an effective technique that allows us to engage the target anatomy. Many clients have muscular imbalances, and automatically recruit their tight overworked muscles instead of the target anatomy. For example, in the arms exercise, many people lift their arms with their trapezius. To effectively target and strengthen the deltoids, and arms muscles, they need to relax their shoulders and neck first. Relaxation can be achieved through cueing, breathing, PNF and use of imagery. Review Classical Stretch Season 11, the Age Reversing Workouts and the Pain Relief Workouts for effective relaxation cues and reference on how to use this technique effectively for strengthening.

PNF- Proprioceptive Neuromuscular Facilitation: *contract-release-relax-stretch*

PNF is an effective way of using the *golgi tendon reflex* to assist in muscular relaxation. The Golgi tendon reflex operates as a protective feedback mechanism to control the tension of an active muscle by causing relaxation before the tendon tension becomes high enough to cause damage. PNF, can be used with almost every muscle during almost every exercise to aid the muscle in relaxation.

**End of the Stretch:**

Going to the end of the stretch is an excellent stretch that should be used for strengthening. As we go to the end of the stretch, we lengthen the lever, increasing the load.

Going the end of the stretch triggers the *myotatic reflex*, a protective mechanism that contracts the muscle to resist stretching. The muscle contraction activated by the *myotatic reflex* will subside after a few seconds, releasing the contraction, allowing you to stretch further. It is important to be aware of the function of this reflex when trying to find the true ‘end of the stretch’. This is an excellent technique to elongate the muscles, and decompress the joints but it must be done slowly to be effective.
ANATOMY STUDY GUIDE

There are many anatomy sources, books, and online or live courses to help you learn the relevant anatomy for level 3. We recommend using the app Essential Anatomy 5, along with the muscle app add on (all together around 40.00$) to study the following muscles, origins, insertions, and actions. Essential Anatomy 5 evidently displays the direction of the muscle fibers so that you can interpret which direction the muscles are moving as the muscles shorten (concentrically) and lengthen (eccentrically). This app also shows videos of specific muscle actions to give you a better idea of the movement involved.

Muscles run in various directions enveloping the skeletal system crossing over one or two joints. It is your job to determine which of the following muscles are mono-articular (crossing only one joint) or bi-articular (cross two joints). While it is important to understand the basic skeletal system to understand which bone the muscle is attached to, it is not necessary to describe the specific bony landmark- you may point exactly where it is attached and indicate which part of the bone. To effectively stretch a muscle, you should know where a muscle starts and finishes. Remember that tendons connect muscles to bone and that tendons and connective tissues are not as flexible as muscles.

Some of the following muscles may belong in more than one of the following category, this is just to help you understand the general idea of which muscle groups belong where. It is the function of the muscle you should be most concerned about.

Application:

- How would each of the following muscles function in an Essentrics Strengthening exercise?
- How would you lengthen a muscle?
- How would you shorten a muscle?
- Which muscles need to release to do an Essentrics exercise/ movement?
- Which muscles need to engage to do an Essentrics exercise/ movement?
SKELETON:

- Cranium
- Clavicle
- Scapula
- Humerus
- Radius
- Ulna
- Carpals
- Phalanges
- Vertebrae
- Cervical Spine
- Thoracic Spine
- Lumbar Spine
- Sacrum
- Pubis, Ilium, Ischium
- Femur
- Patella
- Fibula
- Tibia
- Tarsals
- Metatarsals

TOP THREE MUSCLES

1) Back:

- The Erector Spinae Muscles (I Love Spinach- Iliocostalis, Longissimus, Spinalis)
- Rhomboids, Trapezius
- Splenius Capitis, Spinalis
- Quadratus Lumborum

2) Sides:

- Latissimus Dorsi (partially sides/ back)
- Triceps, biceps
- Serratus
- Rotator cuff muscles, deltoids
- Intercostal Muscles
3) Front:
- Rectus Abdominis
- Transversus Abdominis
- Internal/External Abdominal Oblique’s
- Pectorals
- Diaphragm

BIG FOUR MUSCLES

1) Insides:
- Adductor group
- Pectineus
- Gracilis

2) Outsides:
- Gluteus medius/minimus
- Tensor Fasciae Latae
- Sartorius (outside/inside)
- Iliotibial Tract

3) Front
- Rectus Femoris
- Vastus Medialis
- Vastus Lateralis
- Vastus Intermedius
- Psoas
- Iliacus

4) Back
- Biceps Femoris
- Semitendinosus
- Semimembranosus
- Gluteus Maximus

Secondary:
- Tibialis
- Foot extensors
- Gastrocnemius
- Soleus
- Achilles tendon (not a muscle)
Recommended Videos:
You do not need to memorize the information in these videos, but you should understand the basic concepts.

FUNCTIONS OF THE NERVOUS SYSTEM
The body is controlled by the brain. Every movement we make whether voluntarily, or non-voluntarily starts with the brain. To effectively understand the human body and how we use the neuromuscular techniques in Essentrics we need to understand how the brain works. Remember that the primary function of the brain and nervous system is to protect us and keep us alive.

MOTOR UNIT
So you decide to lift your arm. What happens after that? What happens if you can’t lift your arm- what isn’t happening? Why do our muscles shrink and how do we prevent atrophy?

MUSCLE STRETCH REFLEX
You must be aware of reflexes and how they impact our muscles and joints. This video does not specifically refer to PNF (Golgi Tendon reflex) or the Myotatic reflex but it does describe why these reflexes happen. Understanding how the reflexes work will help you to be able to use the reflexes to control the tension in the muscles.

ANTAOMY OF A MUSCLE CELL
Overview of how the muscle fibres are structured starting at the full muscle down to the most basic unit of contraction. Use this video as a reference when observing the anatomy of muscle fibres to visualize how the muscles contract and shorten. Look closely at which direction the muscle fibres for a muscle run in and you will immediately know exactly how the muscle is designed to function.
MYOSIN AND ACTIN
The two protein filaments that are the basis of movement in our skeletal muscles. Use your fingers to visualize the myosin and actin sliding past one another. Visualize what would happen if there was only a limited movement in this basic cellular level and how that might affect the body.

LIGAMENTS, TENDONS AND JOINTS
Essentrics is a fitness program designed to protect our ligaments, tendons and joints. To protect them, and keep them safe we must learn their function, range of motion and how much movement they are designed for.

Put it all together:
CRASH COURSE: SKELETAL MUSCLES

THE FUZZ SPEECH
After watching the previous video watch this video and think about the movement of the muscles, myosin and actin and how the fuzz applies to this movement. What would happen if there was no sliding action? What would happen if there was only a limited sliding action?
https://www.youtube.com/watch?v=BdRqLrCF_Ys

RECOMMENDED ONLINE COURSES/RESOURCES:
https://www.edx.org/
https://www.khanacademy.org
https://www.coursera.org/
http://www.saylor.org/courses/bio302/

http://www.iMuscle.com