

Analyze Your Exercise

By C. Krafft Vol 3, 2012

So often we run to class and instruct with the usual exercises here is some important information worth your review. It will make you think about the exercises and why we do what we do.

Dynamic Constant (isotonic)

The amount of resistive force encountered determines the amount of muscle force applied. More resistive force requires more muscle force. The water, compared to the air is twelve times more resistant. Adding gloves, hand bells, etc. increase the resistance. The resistive force (water) remains constant throughout the exercise movement. However, the effective muscle force is higher in some positions and lower in other positions due to the mechanics of human movement. Free Weights would also provide a dynamic constant resistance.

Dynamic Variable (isotonic)

The dynamic variable is the same as the dynamic constant, in that the amount of resistive force encountered determines the amount of muscle force applied. It is DIFFERENT than dynamic constant, in that the resistive force changes throughout the exercise movement. The use of dyna-bands, tubing, weight stack machine with levers, cams, or linkage systems and specially designed air pressure equipment provides dynamic variable resistance.

Isokinetic Contractions- the joint is moving at a constant angular velocity, a constant movement speed, and a matching resistive force. The amount of muscle force applied determines the amount of resistive force encountered. More muscle force produces more resistive force. This type of contraction is only possible with isokinetic equipment such as hydraulic resistance machines and electronic resistance machines capable of varying the resistance and maintaining a constant angular velocity.

Isometric Contractions-Static

Isometric contractions are an important component in training the stabilizing muscles. An isometric contraction occurs when the resistance is an immovable object such as a wall or weight training equipment, or the opposing muscles group. No visible movement occurs.

Objective of Exercise Analysis/ Safety and Muscular Balance -

Our Responsibilities to Our Patrons:

“_Proper exercise routines that do not aggravate existing conditions (carpal tunnel, lordosis, kyphosis, tendinitis, rotator cuff strains, or shoulder problems) or cause overuse injuries.

“_Be aware of injuries, ask questions about injuries, give options, get feedback..

“_Proper exercise routines that improve muscular imbalance, and reduce the risk of injuries, that help compensate for job related muscular imbalances, and allow the patron to achieve a higher quality of life.

“_Sometimes it is beneficial to concentrate on exercises that combat muscle imbalances caused by modern life. More back, external rotators, traps and rhomboids.

Forces- How to determine where is the force? (Bouyancy, Resistance and Gravity)

When using equipment in the water ask these:

1. Does the equipment float and requires significant force to push underwater? (Buoys, noodles, balls, kickboards, cuffs, foam blocks)

If the answer is yes than buoyancy dominates motions that are up and down in the water. The force is always up. When moving side to side or front to back, resistance dominates the motion and the force is always against the direction of the movement. **Remember isometric contractions are also important with buoyancy.**

2. Does the equipment sink and requires significant force to keep it up in the water?

If the answer is yes than gravity dominates motions that are up and down in the water. The force is always down. **Remember isometric contractions are also important with certain gravity based exercises.**

IF there is side to side motion, resistance dominates.

3. Is the equipment neutral with surface area? (Gloves, Fins, Frisbees, paddles)

If the answer is yes than Resistance dominates motions in the water. The force is always against the direction of motion.

More Subtle Questions?

How does a flotation belt effect aqua exercises?

It doesn't change the muscles worked. Only less effort is required to stay afloat. The belt is

attached to you. You do not have to exert effort to hold on to it.

What is the main difference in muscle work between suspended (Level II) and deep water exercises versus shallow water exercises? **Hip activation is**

important in the deep water, ankle and foot in the shallow. Have participants walk around the room normally first and then on their heels

without pushing off with their toes. They should have to use the hip more to move the leg.

What changes with bands, surgical tubing, and leashes? Resistance in along the equipment towards the center and the force increase the more the equipment is stretched.

What muscle groups are worked during push-ups on the gutter? **Triceps and Isometric Trap III.**

Facing gutter Trap III., Tricep and Pec Minor Ecc.con.

Facing away Trap III, Tricep and Anterior Deltiod Ecc. Con.

NO PEC MAJOR IN THIS EXERCISE

How to determine which muscles are primary movers (Force versus Gravity)

Which muscles are primary movers and the type of contraction the muscle is

undergoing depend on the Force, the Direction of the force, and the change in the muscle length.

**Gravity is Down,
Buoyancy is Up, Resistance is Against the
Direction of Movement.**

Many people memorize which muscles are being worked by land based free weight exercises and their names where gravity acts on the weight. They forget when they change their orientation, environment, or equipment they change the type of force, the direction of the force, and whether the muscle is lengthening, shortening, or is an isometric. **IF you hold on to the sides of your chair and push down so you raise your butt off the chair, the Trap III muscles are isometrically holding you up like buoys in the water would.**

Example Bicep Curl

On land with weights

Force is gravity

Force is down

Bicep Eccentric

Bicep Concentric

In water with gloves

Force is resistance

Force is against direction of motion

Bicep Concentric

Tricep Concentric

In water with buoys

Force in buoyancy

Force is up

Tricep Eccentric

Tricep Concentric

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1. Show an add-on Pattern with any cardio type move.

2. Using a the Bicep Curl Example outline the Analysis for water for a Pectoral Fly Exercise.

3. What force dominates with floating equipment?

4. How does a flotation belt affect aqua exercises?

5. What type of muscle contraction has no visible movement?

6. Name 3 exercises that combat the muscle imbalances caused by modern life?