Equipment Challenge: Buoyancy vs. Drag  
*Presented by: Lori Templeman*

**COURSE DESCRIPTION**
Planning to use equipment in class but don’t have enough for everyone? This teachable format allows two types of equipment to be used simultaneously. Safe and effective use of drag and buoyant equipment will be discussed and directly compared in the pool. Which type of equipment is “preferred”? You decide by evaluating the pros and cons of each!

**BUOYANT EQUIPMENT**
Buoyant equipment is made of foam, lightweight, and floats. If you push buoyant equipment down against the water, it will pop up once released.

Buoyant Equipment Types: Noodles, foam dumbbells, kickboards, beach balls, cuffs, Nekdoodle

- Specific to the aquatic environment – Nomenclature is important!
- Buoyant equipment types: Hand buoys (foam dumbbells), kickboards, noodles, cuffs & mini cuffs, beach balls.
- The larger the equipment size/surface area, the more resistance – more stability required to control it.
- The type of muscle contraction while submerged changes with the addition of buoyant equipment – concentric (toward the pool bottom) and eccentric contractions (toward the surface).
- When analyzing an exercise, determine the muscle that shortens to move the equipment toward the pool bottom. That is the targeted muscle group!
- All equipment increases drag to some degree.

**Buoyant Equipment Pros:**
1. With a single movement, typically only one muscle of the pair is targeted, allowing for both concentric and eccentric muscle contractions to take place, just like on land. The eccentric contraction is where the muscle lengthens with control.
2. Foam equipment can also provide flotation for suspended movements. This allows different working positions and reduced impact difficult to accomplish on land. Buoyant equipment used for flotation does not assist/resist, but adds neutral buoyancy.
3. Buoyant equipment can be used for stability and support for participants working on stability and balance.

**Buoyant Equipment Cons:**
1. Some muscle groups are difficult to train without putting your body into very odd or upside down positions. (Deltoids, abductors, iliopsoas, & erector spinae difficult to target with buoyant equipment).
2. Anytime this equipment is submerged the shoulders are “loaded” with resistance and stabilization of the shoulder girdle must be maintained. Shoulders tend to shrug toward the ears when fatigued.
3. Constant gripping may cause tension in the wrists. It is important to take breaks between sets to give your shoulders and grip a rest.
DRAG EQUIPMENT
Drag equipment is typically made of plastic or fabric. It does not drop toward the pool bottom or pop up toward the surface. It produces all concentric contractions. Resistance can be increased/decreased by changing the size & surface area.
Drag Equipment Types: Paddles (fans), webbed gloves, fins, Hydrotone bells, AquaLogix Aquabelles.

Drag Equipment Pros:
1. Resistance is felt in all directions when it is submerged, promoting muscle balance. Drag equipment produces all concentric contractions.
2. The load on shoulders is diminished with drag equipment, allowing for longer periods of use and more comfortable gripping.
3. Intensity can be altered by increasing/decreasing the speed and force of movement.

Drag Equipment Cons:
1. Like buoyant equipment, the size will top out. The surface area can only get so large before it is impossible to stabilize effectively. If it becomes cumbersome and difficult to control, the equipment must be downsized.
2. Force must be applied to get the most from the resistance.

Side Note: Rubberized and weighted equipment are also common types. They also allow for concentric and eccentric contractions and work very similar on land.

“EQUIPMENT ADDICTION”
Do your participants suffer from this?
Signs and symptoms include:
1. Strong desire to use equipment for the entire class.
2. Grabbing or requesting the largest, highest resistance equipment possible
3. The mindset that equipment is needed for a safe & effective workout

How do you handle this?
1. As an instructor, educate the participant about over-use injuries.
2. If they insist on using it, recommend they do not perform the same movement patterns and tempo you are teaching (a brief speech at the beginning of class may be required).
3. Ask if they would go grab dumbbells and go into a zumba, step, or spin class – performing all the choreography with them in your arms? Probably not.

For more information, refer to Mark Grevelding’s Article: “Equipment Addiction”.

Bibliography

akwalori@hotmail.com  Fitness Temple – Lori Templeman
POOL PRACTICAL: Buoys Vs. Paddles Comparison

3 Ways to execute this format:

1. Half the class on one side of the pool uses drag equipment. The other half uses buoyant equipment. Run through a round of exercises. Participants then trade equipment with someone from the other side. Repeat a 2nd round of exercises, allowing everyone to work with both types of equipment.

2. Participants choose a partner. Person A grabs drag equipment and Person B has buoyant equipment. After one set of each exercise, participant A swaps equipment with B for the 2nd set. This allows them a direct comparison between buoyancy and drag.

3. Participants hold one piece of buoyant equipment in one hand, drag in the other. Perform one set of each exercise, then switch arms. This technique can provide an educational moment. Participants can directly experience the different feel and feedback provided from each type simultaneously. Exercises can be performed unilaterally or bilaterally.

Upper Body Exercises:

1. Sweeps (transverse shoulder abduction/adduction)
2. Triceps (elbow flexion/extension)
3. Arm Swings (Shoulder flexion/extension)
4. Lat Pull-down (Shoulder abduction/adduction)
5. Punches (pushing/pulling)
6. Figure 8 – both directions
7. Shoulder Rotation
8. Paddle Wheel – both directions
9. Stirring – both directions

Lower Extremity Version: Perform with fins and mini cuffs. Option #1 will work best due to additional time needed to change lower body equipment.

Lower Body Exercises:

1. Leg Curls (knee flexion/extension)
2. Side Leg Raise (hip abduction/adduction)
3. Cross Country Ski (hip flexion/extension)
4. Grounded Football Punt w/ shoulder extension (hip flexion/extension)

Additional Challenges:

1. Incorporate balance challenges by varying stance: Wide, narrow, tandem, single leg, etc.
2. Add a lower body cardio movement between sets for grip and shoulder rest & recovery. This can be done while partners swap equipment.
3. Teach the exercises with symmetrical, reciprocal (alternating), or unilateral (single arm) joint actions.

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