PILATES CONDITIONING FOR SURFING
UTILIZING THE BASI BLOCK SYSTEM

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Abstract

Surfing is a dynamic sport which places many demands on the body. For many who participate in it, surfing is more than just a sport; it is an integral part of their life. Muscle and joint injuries can be linked to carrying bulky surfboards, prone and knee paddling, and the postures related to actual wave riding. This research focuses specifically on prone paddling and the stress it puts on the shoulders. Many of the requirements of a good surfer are inherent to the Pilates method of exercise: awareness, balance, flexibility, control, center, endurance, efficiency, precision, strength, flow and harmony - aspects which are often overlooked in traditional fitness regimes. Most traditional strength exercises also pay little attention to the intrinsic musculature that stabilize the shoulder and scapula and externally rotate the arm - which is exactly what surfers need most for their shoulders.
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Introduction

Surfboards and the human body have some similarities in design. Most surfboards contain a midline called the *stringer* (a thin piece of wood running from nose to tail that increases the strength of the board). Situated deep in the center of the surfboard, the stringer performs a similar function for the board as do our core muscles (transversus abdominis, multifidus, pelvic floor and diaphragm) for our bodies. The stringer stabilizes the board and increases its overall strength.

Also, a surfboard has *rocker*, describing how much curve the bottom of the board has from nose to tail. Increasing the rocker improves maneuverability, but at the expense of speed—a steeper curve creates drag. The spine also has essential curvatures that help improve maneuverability and strength. As with rocker in a surfboard, too much curvature in any direction will impede functionality.

There is true art and science to shaping a surfboard and the most minute adjustments create changes in function, again not unlike the human body. Surfers can benefit greatly from learning how to strengthen their inner stringer and find the perfect balance to their alignment as it relates to all of the muscles and joints in their body.

*Photo by Glen Inskeet : www.surfline.com*

Effects of Prone Paddling on the Shoulder

When paddling, most surfers find their spinal extension coming mostly from the thoracolumbar
junction at T12-L1. The abdominals tend to be weak, while the middle and low back extensors tend to be hypertonic. The cervical spine is forced to spend prolonged periods in extension and will be forced into further extension if the surfer lacks the ability to extend through his or her thoracic spine. The fact is, surfers need to be able to hold the upper chest off the board for prolonged periods of time. If they are unable to do this because of poor range of motion or because they lack strength in their back extensor muscles, they will be more likely to incur an overuse injury in the shoulder joint.

During a typical surf session, the majority of the time is spent lying prone on the stomach, paddling. In the paddling stroke, the top arm comes into almost full flexion (raised high in front) -- calling on a full range of motion to get sufficient reach. To propel forward, the arm then pulls back (extension) against the resistance of the water. The hand is held in a palm down position the whole time, with the upper arm in internal rotation. It is necessary to go through these motions in order to paddle effectively. However, it is important to recognize the inherent imbalances than can result in repeating this motion over and over.

There doesn't seem to be any correlation between fitness levels in surfers and shoulder problems. In fact, many surfers cross-train. Currently, it is estimated that there are 1.7 million surfers in the United States and over 18 million world-wide, with almost 90% being male. The two most common exercises men like to perform are push-ups/bench press (pectorals) and pull-ups/lat pull-downs (lattisimus). Both of these are perfectly good exercises, but they only reinforce the imbalances in the shoulder that a surfer is already facing, creating tight pectorals and lattisimus and weak external rotators.

The rotator cuff is a group of four small muscles that stabilize and set up the shoulder for a full range of motion (see illustration #1). These muscles act like adjustable wires that hold the arm in the socket of the shoulder blade and position the upper arm so that the shoulder can move smoothly. Two of these rotator cuff muscles (infraspinatus and teres minor) and the posterior deltoid are the only muscles that turn the upper arm externally (palm facing forward). If these muscles are too weak to overcome the pull of the internal rotators, (pectorals and latissimus dorsi among others), or if these internal rotators are too tight, problems are likely to occur.

Common shoulder overuse issues include: bursitis, tendonitis, impingement and frozen shoulder. These are examples of problems that can occur when there is an imbalance between the rotator cuff muscles and the other muscles that surround the shoulder.

Impingement syndrome, or shoulder bursitis, occurs when there is inflammation between the top of the humerus (arm bone) and the acromion (tip of the shoulder). Between these bones lie the tendons of the rotator cuff and the bursa (see illustration #2), a tiny fluid-filled sac that functions as a gliding surface to reduce friction in the joint. Impingement syndrome is when the structures get inflamed and swell and it hurts to move the shoulder. If this condition is left untreated, the structures are likely to calcify, leading to frozen shoulder.
Muscles that act on the shoulder joint

- Subscapularis – medial rotation and adduction of the arm
- Supraspinatus – abduction of the arm
- Infraspinatus – lateral rotation of the arm
- Teres Minor – lateral rotation of the arm
- Pectoralis Major – medial rotation and adduction of the arm
- Latissimus Dorsi – medial rotation, extension and adduction of the arm
- Teres Major – medial rotation, extension and adduction of the arm
- Medial Deltoid – abduction of the arm
- Anterior Deltoid – medial rotation and flexion of the arm
- Posterior Deltoid – lateral rotation and extension of the arm

Pilates Conditioning Program

A Pilates conditioning program that focuses on balancing the compensations a surfer faces should include:

Specifically relating to the Shoulder

- Improve range of motion and stability of the scapulae.
• Address any imbalances between internal and external rotator-cuff strength.

• Stretch lattissimus dorsi and pectoralis major.

• Improve range of movement of the infraspinatus, teres minor, rhomboids, levator scapula and thoracic spine extension.

• Increase strength and control of the mid to upper back extensors and external rotators of the shoulder: infraspinatus, teres minor, lower trapezius, rhomboids and serratus anterior.

Other considerations

• Improve awareness of the position of the head and cervical spine as it relates to the rest of the spine, especially while in spinal extension.

• Improve hamstring flexibility and control.

• Increase core strength and spinal/pelvic stability by strengthening transverse abdominis and multifidus and improving ability to disassociate between hips and pelvis.

• Work towards balancing out any disparity between hips from popping-up and riding surfboard with same foot forward position.

• Improve range of dorsiflexion of ankle joint.
Case Study

Gary Irving is a 39-year-old male who has been surfing an average of four days a week since the age of 14. He is a professional surf film maker and spends numerous hours throughout the week carrying and filming with heavy cameras (almost exclusively using his right shoulder). The rest of his work hours are spent at a desk editing footage. In addition to doing private Pilates sessions two days a week, he also works out with a personal trainer lifting weights.

Gary initially began doing Pilates at Body in Motion in Aptos, California with Dominique Lesperance in March of 2002 because of a low back injury with increased pain after surfing. In the six years since beginning Pilates, his back issues have subsided completely and he has been able to resume surfing regularly with no pain. In 2007, he started having pain in his right shoulder, the side on which he carries and holds his camera. Similar to his previous back injury, he had increased pain immediately after surf sessions. Since there was no injury or trauma to the shoulder, it appeared to be a chronic injury due to poor posture and shoulder mechanics. He presented with pain and weakness when he lifted his arm but had very good range of motion in the shoulder otherwise.

We began with some basic range of motion exercises and continued working on scapula-humeral rhythm and shoulder/scapula stabilization exercises. We then progressed to focusing on improving the strength of the external rotators of the shoulders and upper back extensors of the spine. He had considerable tightness in his lattisimus dorsi and pectoralis major and his shoulders, especially his right shoulder, were internally rotated. We focused on stretching the large muscle groups including the pectorals and lattisimus and strengthening and balancing the strength between the internal and external rotators of the shoulder. All sessions incorporated exercises for the entire body in a balanced, uniform manner, rather than focusing exclusively on the shoulder. As a result, Gary's shoulder is no longer causing him pain and he continues to do Pilates two times week as well as surf four times a week.
Example Workout (Intermediate Level) utilizing the BASI Block System

Warm-up

  Warm up Series on Cadillac

  Roll-up w/ roll-up bar

  Mini roll-ups

  Mini roll-ups w/ oblique

  Roll-up top loaded

  Roll-up bottom loaded

Footwork

  Footwork on the Wunda Chair

Abdominals

  Hundred on Reformer

  Abdominals w/ Legs in Straps Series on Reformer

Hip/Strap Work

  Leg Springs on Cadillac- Single Leg Supine

Spinal Articulation

  Bottom Lift on Reformer

  Bottom Lift w/ Extensions

Stretches

  Pole Series
Shoulder Stretch

Overhead Stretch

Shoulder Stretch 1 & 2 on Ladder Barrel

**Full Body Integration 1**

Up Stretch Series on Reformer

Up stretch 1 & 2

**Arm Work**

Shrugs on Chair

Triceps Press Sit on Chair

Shoulder Push on Reformer

Shoulder Push Single Arm

Arms Kneeling Series on Reformer

**Full Body Integration 2**

Long Stretch

**Additional Legs**

Hamstring Curl on the Reformer (Long Box)

**Lateral Flexion/Rotation**

Mermaid

Side Lifts over Box

**Extension**

*Long Box Series*
Conclusion

Surfers rely heavily on the use of their shoulders during paddling. It is important for them to not only have good strength and endurance in the shoulder girdle but also proper alignment and mechanics in order to avoid potential injury. Without the use of correct mechanics and muscle recruitment patterns to balance the muscles of the shoulder, there is an increased possibility for problems to occur in the shoulder at some point. Learning to access and strengthen the smaller muscles that stabilize and mobilize the scapula and humerus is key to promoting the health and functionality of the shoulder joint.

Pilates is unique among exercise forms in that there is special focus placed on alignment and stabilization prior to executing any exercise. This precise attention to detail and recruitment of deeper stabilizing musculature is why Pilates remains so effective at healing and preventing injuries and helping athletes maintain longevity in their sport.
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