Chapter 1 - Technique

Before you get on the water for any kind of paddle training, we need to talk about the foundation of stand up paddling, stroke technique. There is no point in training hard throughout your SUP season if you are using improper technique and creating bad habits. Not only will you be paddling inefficiently, you will greatly increase your risk for injury and overtraining when using poor technique.

If you are a somewhat experienced stand up paddler, you have probably seen the classic stroke breakdown videos, articles and information available with a quick Google search. There is a version of the stroke breakdown below. What you have probably not seen or read about are the other details of paddling technique that include body positioning on the board, stroke rate, rhythm, power and technique adaptation. These details can help you reach your goals and pull away from your competition.

Video stroke analysis is one of the best ways to examine any flaws in your technique and monitor technique improvement. The Elite SUP Training Package at the link here provides video stroke analysis and one-on-one coaching. The stroke analysis and one-on-one coaching for technique improvement will help set the foundation for all of your training on the water.

If you don’t want the analysis and one-on-one coaching, you can have a friend film you, read the information in this section, and make improvements to your technique on your own. Whichever you choose, it is much easier to catch bad paddling habits and fix them before you begin a full training program. If you have already started a training program, or have been paddling for years, it is never too late to improve and work on your technique!

Stroke Breakdown

Do Not “PULL” The Water. The fact is, we are not ‘pulling’ the blade through the water as we paddle. Instead, we are planting the blade in the water and bringing ourselves up to the stationary blade. Imagine a cross-country skier planting their poles and bringing themselves forward to the poles. The poles do not drag through the snow but remain firmly in place. This visualization will help you implement proper technique. Your stroke has four phases. Each phase is as important as the next. They all work together to help you paddle like a fluid machine.
1. Reach
Reach is the distance you are reaching forward to put your blade in the water. Reach as far as possible each time you stroke. In my experience, reach is sometimes over-stressed when discussing paddle stroke. You need to reach only as far as you feel comfortable. SUP athletes may reach too far and find themselves off balance when their blade hits the water. Losing your balance is counter-productive to developing a fluid and powerful stroke.

On the other end of the spectrum is not reaching far enough. I refer to this mistake in technique as “T-Rex Arms”. Have you ever seen a T-Rex? They have short stubby arms that couldn't possibly reach very far. Make sure you are attaining full extension with your bottom arm, while relaxing the grip on your paddle and the rest of your body. A tight grip with a tense body will not allow you to reach as far as possible. Your top elbow should be bent during this phase. Bring your top hand to your ear to get the motion for bending the elbow.

As in most activities, a lack of mobility will restrict your movement and prevent you from getting maximum reach, rotation and power. Read the section, Mobility, on page**#mobility##, for details on how to improve this area of fitness.

PRO TIP
In flat water, reach your paddle to the front of the stroke and mark your board with a piece of tape where the paddle enters the water comfortably. This is your baseline reach. Make an effort to reach to this mark on your board in your technique and training sessions. If your reach is too short, work on extending your reach past the tape with each practice session.

2. Catch
The Catch is the part of the stroke when the blade enters the water. Allow the blade to completely enter the water before you begin your power phase. The catch should be as clean as possible with little splashing. Visualize sticking the blade into mud as the motion you will need to get a solid and clean catch.

3. Power Phase
This is where you are applying power to your stroke. Use your entire body for this part of the stroke. Remember that your arms are much weaker than the rest of your body. Use the rotation of your torso, hips and shoulders to drive your paddle while keeping your knees bent and
engaging your legs to produce power. Think about falling onto your blade by bending at the waist and “bowing” to fall forward onto your blade. Watch any YouTube video of Olympic Nordic skiing for an example of the bowing motion described.

Some coaches will say that you need to get the blade out of the water at your feet to keep a positive blade angle and not decelerate the board. However, it has been found that the power generated when your hand is close to your body (just past the feet), outweighs any deceleration from a negative blade angle. Therefore, bring your paddle back to the point at which your bottom hand hits your leg. The effectiveness of going further back in the stroke has been scientifically measured in Olympic canoe paddling and I find it works for SUP as well.

**PRO TIP**

Think of your arms as “rubbery” to get them to relax during this phase. This should help you to concentrate on engaging your bigger muscle groups, such as your legs, core and back, for more power output. Lightly grip your paddle with just the tips of your fingers to work on using bigger muscles, not your arms, during slow technique practice.

3. **Exit**

After the power phase you will be releasing the paddle from the water. Similar to our catch, we want as little splashing as possible. Feathering the blade is helpful in creating a smooth release and setting yourself up for the next catch. You can achieve feathering by dropping your top shoulder, by “breaking” your wrist inward (imagine the motion of trying to touch your forearm with your middle finger), or a combination of both.

4. **Recovery**

Relax your entire body during the recovery phase. This will help create a rhythm and allow your body to reach as far forward as you are comfortable to set up the next stroke. Use the recovery phase to concentrate on your breathing and technique. This phase is as important as the other phases even though the paddle is not in the water and you are not exerting yourself. The ‘rhythm’ of your stroke can affect your entire technique and should be dialed in during this phase.
This is your foundation. The outline above is the basic foundation of paddle stroke technique. This is not the one and only way to paddle. Each paddler has a different body type, fitness level, experience and equipment that will affect the way in which he/she paddles. Observe a group of professional baseball players, golfers or runners. No two athletes hit a ball or run the 200 meter sprint using the exact same technique. Individuals employ different techniques to perform the task for their sport. Paddling is no different.

Use this technique breakdown along with the rest of the information in this chapter and adapt it to find your optimal technique. Later in this section, we discuss stroke adaptation to external factors such as wind and chop, timing in the race, and drafting. Keep these basic fundamentals in mind but remember that they are only a baseline from which to work.

PRO TIP

I recommend that you work on your fitness separately from your SUP technique. Allow yourself several times each week to focus only on technique. During your technique training sessions you are not working to make fitness gains. Slow down. You should be paddling at an intensity of no higher than Zone 1* or less than 70% of your maximum heart rate effort in the very beginning and then slowly increasing intensity as you progress. Technique work is designed to build a foundation for stand up paddle efficiency. You want to put in the least amount of effort for the most amount of reward. The more efficient your paddle stroke, the faster and longer you can paddle with less fatigue and injury.

*We will discuss the very important training intensity zones on page training intensity zones below.

Training Intensity

Training at the appropriate intensity is a key element to improving your performance and staying injury free. Harder is not always better. A majority of workouts should be performed at an easy to medium intensity with short intervals of high intensity. Use the information in this section to help gauge your intensity during your training sessions.

Determining the proper intensity for workouts can be difficult for stand up paddle athletes, especially beginners. Putting a quantifiable number on our level of exertion can properly gauge
each workout and ensure we are paddling with the prescribed intensity. Describing a workout as “hard” or “easy” is not sufficient for accurately measuring intensity.

**Determining Intensity**

Intensity can be measured in several ways described below:

**Stroke Rate.** Stroke rate, also called cadence, is the speed at which a paddler enters and exits their paddle from the water. While stroke rate isn’t a direct indicator of intensity, it is often closely tied to the intensity of the workout.

- A low rate usually produces a slow speed and is anywhere from 15-35 strokes per minute. This rate is typically in Zone 1 intensity for active recovery, warming up and cooling down.
- A medium rate is around 36-44 strokes per minute. This is a rate typically used for active recovery toward the low end and for a medium race pace, Zone 2 to 3, intensity toward the upper end.
- A fast stroke rate is anywhere from 44-60+ strokes per minute. This rate is typically used for race pace or sprinting, or can indicate poor connection (slapping the water) or not applying power effectively. A fast stroke rate can be performed anywhere between Zone 2 to 4 intensities.

Don’t get tied to the numbers used for the examples above. Stroke rate is highly variable between paddlers based on their equipment, experience, body type, conditions in which they are paddling, and the total distance they are paddling. Using the *Speedcoach® SUP* for stroke rate measurement will help get an understanding of the stroke rate ranges that work best for you.

**Heart rate.** Heart rate is our body’s response to the work that we are doing, and can be a good indication of intensity if proper judgment is used. Aside from effort, heart rate will also be
impacted by overtraining and sickness. Measuring your heart rate regularly will help identify intensity during exercise as well as indicators of when to take a break. There is a lot of information available regarding training zones based on heart rate. I'll go through a protocol in the next section to estimate your lactic threshold heart rate.

**Board speed.** Board speed is typically recorded using GPS devices. It is important to realize that your board speed can be highly variable and influenced by outside factors. We can produce a lot of power/intensity and have a low board speed when paddling into chop, wind or current. The opposite can be true when you have a high board speed but produce a low amount of power/intensity (such as paddling downwind). While heart rate monitors are a more accurate reflection of physical effort, the measurement of board speed increases in value if you paddle in conditions free from wind or current or when repeated intervals are conducted over the same stretch of water in the same direction.

**Stroke rate/length.** Stroke rate is the number of strokes performed by a paddler per minute. Distance per stroke is the distance taken from when the paddle blade enters the water and is then repeated. It has been shown that stroke rate does typically increase as a response to both increases in speed and intensity. Keep in mind that stroke length can be affected by either current or wind. We could also produce a low stroke rate paddling into the wind, but the power could be through the roof.

**Heart Rate Training**

Now that you know why we use heart rate to measure intensity, let’s take a look at the specifics of using heart rate measurements. In the week-by-week *SUP Training Program*, specific heart
rate parameters and perceived levels of exertion are established for workouts to help gauge effort and maximize training benefits. Heart rate training zones are generally expressed as a percentage of maximum heart rate (MHR) or as a percentage of the lactate threshold (LT). Determining max heart rate is difficult and not as good of an indicator for intensity as using lactate threshold. Therefore, the training zones used in this SUP Training Program are based on a lactate threshold heart rate.

**What Is Lactate Threshold?**

Lactate threshold is the point during exhaustive, all-out exercise at which lactate, a by-product of exercise, builds up in the bloodstream faster than the body can remove it. Anaerobic metabolism produces energy for short, high-intensity bursts of activity lasting no more than a few minutes before the lactate build-up reaches a threshold. The point where lactate can no longer be absorbed and, subsequently, accumulates is known as the lactate threshold.

When an athlete’s lactate threshold is reached, it can cause fatigue and reduce the power of muscle contractions. At this point an athlete is forced to slow down or back off his/her intensity. Training to gain a higher lactate threshold allows an athlete to continue at a high-intensity effort with a longer time until exhaustion (1). This is the reason we use targeted high intensity intervals in all of the Race Ready SUP Training Programs. Lactate threshold is considered a good way to predict athletic performance in high-intensity endurance sports, and is why we will use it to determine your training zones.

**Determining Training Zones**

The most accurate method for determining lactate threshold is through laboratory testing. To save a trip to the lab, you can determine lactate threshold heart rate through on the water paddling tests that offer relatively accurate results.

To determine your lactate threshold as a percentage of your heart rate, you will need a heart rate monitor and calm, flat paddling conditions. Keep in mind that your lactate threshold heart
rate will fluctuate due to changes in your fitness. It is best to retest these training zones every three to four months in order to maintain accurate training intensity scales.

**Testing Protocol**

Be sure to warm up 10-15 minutes before testing. The field test is going to be an individual time trial for a total of 30 minutes. Your effort should be hard, but not so hard that you slow down at the end.

After warming up, start your time trial. Paddle for 10 minutes at a solid effort and then restart your heart rate monitor or create a new lap in your timing settings. Paddle for another 20 minutes at the same consistent pace. The average heart rate for the last 20 minutes of your 30 minute time trial is your lactate threshold heart rate (LTHR) estimate.

**Putting It All Together**

Not only can gauging the intensity of your workout with LTHR alone be difficult, but it can also make you too reliant on your heart rate monitor. During training, use the Borg Rating of Perceived Exertion and combine it into your training zone scale below. This will help give a complete and accurate gauge for your training intensity. The Borg Rating of Perceived Exertion (RPE) is widely used to provide a subjective reflection of the physical response during exercise and enable an athlete to regulate effort to gain the maximum benefit (12).

Using the information below, calculate your training zones based on your LTHR from the field test. Finally, use the *Training Zones* chart to get a complete picture for determining your different training zones. These training zones will help monitor training effort and ensure you do not go too easy or burn yourself out.

**Training Zones**

**Zone 1**

**Easy** - Less than 75% LTHR - **Active Recovery**
Research indicates that after a hard workout, a very easy workout can accelerate recovery more than complete rest. Easy aerobic training stimulates circulation which speeds up the healing of tissues that have been damaged by intense training. For this purpose, it is important to maintain an intensity that is enough to increase blood circulation and trigger a growth hormone release, but not intense enough to increase the damage you are trying to recover from. Don’t paddle hard when this training zone is prescribed, you will be doing more harm than good!

**Zone 2**

**Moderate** - 76-90% LTHR - **Aerobic Endurance**

Training at this intensity overloads the slow-twitch muscle fibers, increasing endurance. Since these fibers produce most of the energy and power for any paddle event lasting over four minutes, workouts at this intensity should comprise most of your training.

At low intensities, fat is the primary fuel for exercise. This is important for body-fat reduction but it is also important when training for events of two hours or longer. The body stores 1,000-2,000 calories as carbohydrate, but even the leanest athlete stores thousands of calories as fat. Carbohydrate will always run out before fat. Therefore, fat is the ideal fuel for long distance racing. Training at this intensity increases fat burning and decreases carbohydrate burning.

Athletes training for shorter events with higher intensity need to perform much of their training at this level to stimulate improvements in the slow-twitch fibers. Performing aerobic workouts at too high intensity reduces the effectiveness of harder workouts on subsequent days by fatiguing and/or depleting carbohydrate stores of the fast twitch fibers.

This zone should feel easy, but don’t mistake the ease for a need to go harder. For many paddlers, the most difficult part of following a structured heart-rate training program is keeping the intensity low enough on the easy days. Staying in Zone 2 when the training protocol calls for it is critical to your success. Going too hard in Zone 1 and 2 is the number one cause of overtraining.
Zone 3

**Race Pace** - 91-100% LTHR - **Lactate Threshold**

The effort in this zone can be comfortable, but should not be easy. Conversation is possible, however, not as easy as Zone 2. This zone is sometimes referred to as tempo training because the body is still functioning aerobically. This might be described as your race pace depending on your level of training and experience. The more you train, the easier it should be to stay in this zone. You will not train in this zone everyday, but it will be an important zone to use to monitor your progress.

Zone 4

**Sprint** - 101%+ LTHR - **VO2 Max**

While aerobic conditioning is important to paddling performance, situations arise in races where the energy cost far exceeds your aerobic capacity. These situations call for high levels of anaerobic energy production followed by a period of recovery. Training for short durations in this zone will help prepare you for these demands. Even in a long distance race, you must use this zone to sprint at the start of a race and position yourself in the pack of paddlers you are trying to beat.

In addition to increasing your sprint power, training at this intensity will improve your overall efficiency. Workouts in this zone will take longer to recover from but will provide great benefits if done properly. Again, these benefits can be quickly erased if too much time is spent in this zone or not enough recovery is allowed. Follow the **Race Ready SUP Training Program** and listen to your body to make sure you do not negatively affect your performance.
Types of Training

Interval Training

A good portion of the Specific Preparation Phase explained in the next section and the Race Ready SUP Training Programs involve interval training. This kind of training is built on alternating short, high intensity bursts of speed with slower, recovery phases in a single session.

Interval training is beneficial because it works both the aerobic and anaerobic energy systems in the same workout. During high intensity efforts, the anaerobic system uses the energy stored in the muscles (glycogen) for short bursts of the activity. This system works without oxygen and produces lactic acid as a by-product. As lactic acid builds during intense intervals, a paddler enters oxygen debt. It’s in the recovery phase that the heart and lungs work together to recover this oxygen debt and break down the lactic acid. By performing high intensity intervals that produce lactic acid during practice, the body adapts and burns lactic acid more efficiently during exercise. This results in exercise at a higher intensity for a longer period of time before fatigue or pain slows you down. Now you see why interval training is going to be your new best friend!

Fartlek Training

Fartlek, which translates to “speed play” in Swedish, is a training method that blends continuous training with interval training. In other words, when you complete fartlek workouts you are varying pace between fast segments and slow segments. This type of training is different from traditional interval training which involves specific timed segments. For some paddlers, traditional interval training can be monotonous and boring. Staring at the GPS for each timed interval can take away the fun of enjoying time on the water. Fartlek training is a more unstructured approach to training that can have the same benefits as interval training.

To perform a fartlek workout, pick a dock or buoy in the water and sprint until you pass the mark. The key is to go for a sprint every 5 to 10 minutes and sprint for 30 to 90 seconds around Zone 3 or Zone 4. The exact duration and volume of a fartlek workout should be based on the
phase of training you are in. Find the details on when to do fartlek training in the *Race Ready Training Programs* and in the *Periodization* section of this eBook.

**Interval Pacing**

It is critical to correctly perform each interval to receive the maximum benefits of interval and fartlek training. Don’t start a one minute interval at 100% effort, only to crash 20 seconds into the piece. Perform each interval in a way that allows you to give steady power and finish at full effort. As intervals get longer or more intense, pace yourself and start each interval knowing you need to save energy to prevent burnout. However, don’t save so much energy that you barely exert yourself.

Not only do you need to pace the intervals individually, you must also pace a training session as a whole. For example, if you have a workout of eight intervals, don’t perform the first four intervals at such a high level that you have no energy left for the last four intervals. Interval training is a good way to practice pacing over long and short durations of effort.

**Don’t get tricked by our heart rate monitor.** Focus on power output and effort in each interval rather than the number on your heart rate monitor. If you start an interval too hard, your heart rate will stay high for the entire interval, even if effort and pace go down. You might think you are going hard because your heart rate is high, however, power actually peaked in the first 10 seconds while effort and speed continue to decline throughout the interval.

The fine balance of pacing is all a part of training smarter and will become easier the more you practice. Pay attention to your heart rate, but not too much, and the way you feel during interval training. Over time your pacing will become second nature, and you will be able to maximize the benefits of interval and fartlek training. Use the graph below to see how a proper interval session should be completed.

**Basic 9-Week SUP Training Program**
This program is designed for a beginner paddler who is preparing for a 3-6-mile race. Use this program to train for a race or adapt the program to form your own.

This basic program will get you from the couch to racing in your first three to six mile race. The 9-week program includes an accelerated base development phase to help establish technique and build physiological paddling adaptations. Base development is followed by targeted interval training as well as built in tapering and peaking phases to help prepare for your race the smart way and reach peak performance.

I can give all of the best information and detailed workouts available, but you are the only person who can gauge your health and well-being. Listen to your body and don’t be afraid to take days off when you are feeling fatigued or injured. Complete three sessions per week instead of four, cut back on the volume and intensity or eliminate the cross training workouts. This is a beginner program but changes can be made to fit your needs.

Check out one of the Race Ready SUP Training Programs for a more detailed look into a structured SUP training program.
Base Development Phase

Week 1

The objective for the base development phase is to work on technique, establish stroke connection and develop an aerobic base. Concentrate on easy paddle sessions focusing on form as described in the beginning of this program.

**Monday:** 2 miles at Zone 1.
- The focus this week is on using proper form and getting a feel for the water. This is the beginning of your paddle training after coming off of a rest phase. Pace yourself and gradually build.

**Tuesday:** 3 miles at Zone 1.

**Wednesday:** Rest.
- Remember that rest is critical to your training success. Do not overdo it at the start of your program and take these days off. If you need to do something consider yoga or easy biking.

**Thursday:** 3 miles at Zone 1.
- Paddle mile 1 at Zone 1.
- Paddle mile 2 at Zone 2.
- Paddle mile 3 at Zone 1 working your way up to Zone 2 for the last ½ mile.
- Focus is still on technique. You have been off of the water and need to establish a good base of technique for the remainder of your training.
Friday: Rest.

Saturday: Cross training.

-This should be an aerobic cross training session in Zone 1-2 for 45-60 min. You do not need to paddle more than 3 times this week as your joints, tendons and muscles need time to adapt to paddling on the water.

Sunday: Rest.

**Week 2**

**Monday:** 3 miles at Zone 2.

**Tuesday:** 3 miles at Zone 2.

**Wednesday:** Rest.

**Thursday:** 3 miles.

- Paddle ½ mile at Zone 1.
- Paddle 1 mile at Zone 2.
- Repeat.

**Friday:** Rest.
Saturday: Cross training at Zone 2 for 45-60 minutes.

Sunday: Rest

**Week 3**

**Monday:** 3.5 miles at Zone 2.

**Tuesday:** 3 miles at Zone 2.

**Wednesday:** Rest.

**Thursday:** 3 miles at Zone 2.

**Friday:** Rest.

**Saturday:** 3.5 miles.

- Paddle mile 1 at Zone 1 with focus on technique.
- Paddle mile 2 at Zone 2.
- Paddle $\frac{1}{2}$ mile at Zone 1.
- Paddle 1 mile at Zone 2.
**Sunday**: Rest.

**Week 4**

Congratulations, you made it to the first rest week! This is the first rest week following the three weeks of building volume/intensity, one week recovery, work to rest ratio. If you felt worn out on week three then consider a 2:1 work to rest ratio instead. Your first three weeks were completed with gradually increasing volume and little to no intensity built into the program. It is important to rest and recover during week four. If you are feeling good then continue to train this week. If you have any nagging injuries or feel worn down, take this week off or scale back the volume/intensity.

**Monday**: 3 miles at Zone 1-2.

- Focus on technique. Work on any weak areas you discovered in the first 3 weeks of training.

**Tuesday**: 3 miles at Zone 2.

**Wednesday**: Rest.

**Thursday**: Cross training at Zone 2 for 45-60 minutes.

**Friday**: Rest.

**Saturday**: 3 miles at Zone 2.

**Sunday**: Rest.
Week 5

**Monday:** 3 miles at Zone 2.

**Tuesday:** 3 miles.
- Paddle 1 mile at Zone 2.
- Paddle ½ mile at Zone 1 working up to Zone 2.
- Repeat.

**Wednesday:** Rest.

**Thursday:** 3.5 miles at Zone 2.

**Friday:** Cross training at Zone 2 for 45-60 minutes.

**Saturday:** 4 miles at Zone 2.

**Sunday:** Rest.

Week 6
Monday: 3.5 miles at Zone 2.

Tuesday: 3 miles at Zone 2.

Wednesday: Cross training at Zone 2 for 45-60 minutes.

Thursday: 4 mile paddle.
- 1 mile at Zone 2 with 30 seconds at Zone 3 at the end of each mile.
- Repeat 4 times.

Friday: Rest.

Saturday: 4 miles at Zone 2.

Sunday: Rest.

Week 7

Monday: 3.5 miles at Zone 2.
**Tuesday:** 4 mile paddle.

- Mile 1 - Zone 2
- Mile 2 - Zone 2 for the first ½ mile, slowly building up to Zone 3 during the second ½ mile.
- Mile 3 - Zone 2
- Mile 4 - Zone 2 for the first ½ mile, slowly building up to Zone 3 during the second ½ mile.

- Do not go too hard on your ½ mile build. Practice pacing so that you finish the ½ mile at max power in Zone 3.

**Wednesday:** Cross training at Zone 2 with 8-10 fartlek intervals of 30-60 seconds in Zone 3.

**Thursday:** 4 miles at Zone 2.

**Friday:** Rest.

**Saturday:** 4 mile paddle.

- 10 minutes at Zone 2 with last 30 seconds at Zone 3 working up to Zone 4.
- Repeat 4 times.
- Finish any remaining distance at Zone 2.

**Sunday:** Rest.
Week 8

Monday: 3.5 miles at Zone 2.

Tuesday: 3 miles at Zone 2.

Wednesday: Rest.

Thursday: Cross training at Zone 2 for 45-60 minutes.

Friday: Rest.

Saturday: 4 miles at Zone 2.

Sunday: Rest.

Week 9

Monday: 4 miles at Zone 2.

Tuesday: 2 miles at Zone 2 or rest if you need to.
Wednesday: Rest.

Thursday: 3 miles at Zone 1-2.

Friday: Rest.

Saturday: Race Day!