

PADDLING TECHNIQUE

Introduction.

The overall aim of improving paddling technique is to paddle more economically and therefore conserve energy for 'burns', or a sprint finish, coupled with a faster cruising speed. Improvements in technique will inevitably lead to a paddler becoming increasingly confident, such that his or her body weight will be totally committed to each paddle stroke i.e. supported by the resistance of the water. Improvements in strength, aerobic capacity and the mental aspects of racing can take years to develop. However, changes in technique leading to significant performance gains can happen relatively quickly. It makes sense to tackle improving technique as the priority whilst improvements in the others will come with proper training and race experience

Force Production.

Good technique utilises more of the larger muscles in the body to produce the stroke. This enables the maximum force that can be applied to increase and therefore increase the speed that can be achieved.

Efficiency.

Good technique allows efficient use of the muscles employed and allows more speed for a given effort or the same speed for less effort. In this way it improves speed endurance.

Compatibility.

In a K2, both paddlers must be compatible, which includes having a similar technique.

Potential.

Good technique enables paddlers to perform to their full potential at whatever level they compete.

FUNDAMENTALS

Posture.

Correct posture is essential for applying maximum power during the stroke in an efficient and effective way and to prevent injury. Sit upright with a straight back and a slight forward lean from the hips. Do not lean back. Knees should be slightly bent and the feet supported by the footrest.

Connectivity.

Good connectivity between the body, boat, blade and the water increases performance. Connectivity refers to the links between the boat, body, blade and water. These links must be "solid" or "locked" to avoid loss of power as the force generated by the paddle is transmitted through the links to the boat.

Power Transfer.

Good posture and connectivity enable the power to be transferred efficiently through the body. It is essential to understand that the boat moves past the blade in the water.

Feel.

The sensory feedback through the various points of contact with the boat and paddle are important for a paddler's learning experience and progression.

BASIC PRINCIPLES



The Catch

- The Catch is the term given to placing the blade in the water and obtaining a good grip of the water (or locking onto the water) at the start of the stroke. The Catch is the basis of the whole stroke. Without a good Catch, work on other phases of the paddle stroke will be less effective.
- During the Catch phase, the blade is driven downwards into the water, using both hands (but controlled by the top hand), well in front of the body (ie ideally, in front of the cockpit by the feet),

quickly and cleanly (ie with little or no splash) and no deeper than the neck of the blade. Imagine trying to spear a fish in the water close to the boat using both hands to drive downwards.

- The entry of the blade should be close to the boat with the paddle shaft almost vertical at the end of the Catch (when viewed from the side) and the face of the blade at 90 degrees to the direction of movement of the boat. This ensures that the paddle blade presents its maximum area to the direction of “pull”. It is important to insert the blade as close to the side of the boat as possible for three reasons. Firstly, it makes the paddle more vertical (as viewed from the front). Secondly, since the wing paddle moves sideways from the boat a wider start leads to a wider finish, which is not good –it is easier to “pull” when the paddle is closer to the boat. Thirdly, the closer the blade is to the boat's centre line at the start of the stroke, the less it will cause the boat to yaw (ie fail to hold a straight course)
- At the Catch the trunk must be fully rotated out which means that the knee on the side away from the stroke should be pushed down almost straight.
- The lower arm is firm and straightened (but not locked out and tense) and drops as the top hand drives the blade down into the water to enable the entry as far forward as possible. This enables the blade to lock onto the water at the start of the stroke. The aim is to place the blade in the water so that it becomes a fixed point to move the boat past. If the lower arm is locked out at the Catch, the shock of entry to the water can cause injury to the elbows and shoulders.
- The trunk and shoulders must not begin to unwind before the paddle blade is fully immersed in the water to ensure that the powerful muscles of the back and shoulders are in their strongest position to apply force to the paddle shaft.



Moving the Boat past the paddle (or Power Transmission Phase)

- This phase begins at the end of the Catch when the blade is fully submerged and locked onto the water. Power is then applied continuously until the start of the exit phase.
- During this phase the power is applied almost entirely using the body and not the arms. Following the Catch, when the body is rotated completely out, it is only necessary to hold the paddle in the desired vertical position while unwinding the torso. The arms simply provide a link between the paddle and the body.
- When the paddle is fully immersed in the water and locked onto the water, the whole upper body (the trunk) can start to unwind (ie rotate) enabling an initial straight-arm pull using the large powerful trunk muscles. During this straight-arm pull phase, the top arm acts as the pivot point (fulcrum) whilst the power is applied through the lower arm by the rotation of the body. (Nb. If the lower elbow bends at the start of the stroke, the power is being obtained from the arms and shoulders and not from the rotation of the body.)
- Maximizing the power generated by the paddle blade is achieved by maintaining a straight lower arm. Keeping the lower arm straight whilst the blade is generating power in the water has two positive effects. Firstly, a straight arm forces torso rotation, which translates into a longer stroke and the use of the larger muscles of the back and abdomen. Secondly, the blade also maintains an optimal front profile.
- The boat moves past the paddle blade, which is “fixed” in the water - the paddle blade does not move back past the boat. The blade is using the water as a “solid object” on which to fix the effort.
- The paddler puts force through the paddle shaft and onto the paddle blade. The paddle blade supports the weight of the paddler as this force is generated.
- The forward paddling stroke is built on this support from the water. The trunk is connected to the boat through the feet on the footrest and the pelvis on the seat, which provides the firm base on which

to develop the stroke. The trunk rotates on the firm base provided by the legs and the pelvis. The whole structure moves as one, keeping an upright posture.

- The arms connect the trunk to the paddle blade but do not work independently.
- Each foot compresses the footrest to gain support for the stroke on that side. In order to maintain the connection with the hip, the leg straightens as the body and hips rotate in order to maintain pressure against the footrest. The force applied to the footrest should equal that applied to the paddle blade for the boat to remain stable.
- The first part of the Power Transmission phase takes the paddle from a slight forward angle (when viewed from the side), through the vertical position, which should be well in front of the body near the front of the cockpit. The vertical position of the blade in the water should be maintained until the blade is level with the hips.
- The leg on the paddling side provides the drive to move the boat forward and to initiate the rotation of the body. The leg is straightened as the foot pushes firmly, but not forcefully, against the footrest in order to transfer the force generated on the blade into forward movement of the boat. The leg drive is continuously applied to the footrest until the blade exits the water. This causes the leg to straighten in order to maintain contact with the footrest as the trunk is rotated and the hip on the paddling side is pushed back into the seat. The leg on the non-paddling side maintains contact with the footrest (or pulls back on a pull-bar) but is flexed at the knee as the hip on that side swivels forward due to the trunk rotation. This flexing and extension of the legs during the Power Transmission phase on each side gives a cycling motion with the knees alternately rising and lowering in response to the rotation of the trunk from the hips. Failure to apply sufficient trunk rotation is usually indicated by this cycling action not being apparent at the knees.
- During this Power Transmission phase of the stroke, when the blade is in the water, the top hand should not change position relative to the shoulder. The top arm should be slightly bent at the elbow as it “pushes” sideways in front of the face, as though throwing a crossing blow, but remains connected to the movement of the trunk. This connection is achieved by locking the wrist, elbows, shoulders and shoulder blades so that, as the body rotates, the top hand (the fulcrum) will be caused to move across in front of the face at eye level but is still fixed in relation to the shoulder (*ie it moves at the same speed without any added “push”*). The stroke will end up with the paddler looking over the top of the forearm with his forward hand in front of the opposite shoulder. The emphasis is on guiding the paddle with the upper hand rather than pushing hard. The high pivot point of the top hand in front of the face is necessary in order to keep the blade vertical in the water throughout the initial part of the Power Transmission phase. The grip of the top hand should be relaxed and the wrist and forearm in line. If the wrist is cocked upwards and the grip is too tight, this can cause repetitive strain injury. If the top hand is allowed to drop below eye level during this phase, it means the blade has gone too deep or too flat (*ie more of a sweep stroke*) or too far back. If it drops below eye level at the end of the phase, the blade has been allowed to travel past the hips resulting in a tendency to lift water at the Exit.
- The force applied to the paddle shaft is directly opposite to the direction of travel. To maintain maximum boat speed, the blade must accelerate through the Power Transmission phase as the leverage increases.
- The blade continues to support the weight of the paddler, stopping him from “sitting down”. If the paddler is allowed to sit back on the seat with his full weight, the boat will slow down. The paddler needs to be committed to each stroke (*ie his body weight should be supported by the resistance created by the blade in the water*).
- The wing blade naturally drifts out to the side but must not be allowed to slip water as this wastes energy and therefore the blade must be kept upright and at right angles to the direction of movement of the boat. Keeping the blade almost vertical minimizes blade slip because the largest possible blade profile is presented in the direction of travel. This requires that the bottom arm stays straight and the top arm remains fairly high in front of the face. While maintaining this position the blade will track slightly away from the boat during the stroke roughly following a line parallel to the wake coming off the bow of the boat.
- The trunk should rotate during the Power Transmission phase but not rock backwards as this would

cause the boat to pitch backwards. Keeping the back firm and straight permits a smooth rotational movement of the trunk and prevents forward and sideways twisting of the spine. The rotation must come from the hips and not just from the upper shoulders.

- The elbow will be slightly bent at the end of the power phase as the hips come level with the blade.
- Allowing the body to pass the blade before its exit from the water results in a less powerful pull being applied and slows the boat down, as the blade can no longer be held at right angles to the direction of movement. It is also less stable.



Exit

- The extraction of the blade is started just after the knees come past the hand and before the hips have passed the paddle blade.
- The force being applied to the paddle during the Power Transmission phase is ended and the paddle is withdrawn quickly and cleanly sideways and upwards from the water – not backwards. This will allow the wing edge to lift out of the water vertically to prevent water being lifted. If the exit is slow the paddle blade will slow the boat down as the forward momentum of the boat drags it forward through the water.
- The shoulders and the elbow should be kept down during this Exit phase. The lower hand quickly lifts the blade vertically out of the water to just above shoulder height by bending the elbow to 90 degrees, taking the knuckles of the hand to ear level whilst keeping the shoulders level (ie do not lift the shoulders when lifting the blade)
- The forward hand remains at eye level and holds the paddle in position whilst the recovery hand is raised to ear level so that the shaft is parallel to the water. It also reaches even further forward (“over-rotation”) as the trunk continues to rotate even after the force has been taken off the blade as the blade exits the water. This gives an apparent pause in the stroke during this exit phase when both blades are clear of the water. The front hand “pausing” at this stage in the stroke is a key requirement of an efficient set up for the next stroke. Although neither blade is in contact with the water, the boat continues to glide forward as a result of the power applied during the previous stroke.
- The Exit phase ends with the paddle shaft held parallel to the water at eye level with the leading arm fully extended and the recovery hand at or just above shoulder level.



Recovery and Air Work (Glide phase)

- This occurs when both paddle blades are clear of the water and the glide phase continues whilst preparing for the next stroke on the opposite side. At the end of the Exit phase the recovery hand is at or just above shoulder height causing the paddle to be held parallel to the water at head height.
- The trunk remains fully rotated (30-40 degrees) forward from the hips towards the side of the next stroke with the back straight and a slight forward lean (ie sitting tall with the chest pushed out). The trunk must not be rocked forwards as this would cause the boat to pitch forward. A common mistake is to rotate the shoulders but not the whole trunk.
- The shoulder and forward arm are relaxed but firm (not stiff) and the arm is extended at eye level with the arm, elbow, wrist and hand in a straight line. If the wrist drops, so that the fingers are pointing into the air, the paddling position is weakened and repetitive strain injury to the wrist can result

- The fingers holding the paddle are relaxed but still control the paddle shaft. If the grip is too tight it will not be possible to extend the leading arm fully.
- The recovery arm now pushes forward whilst the leading blade is still in the air without unwinding the rotated trunk. As it drives forward at or just above shoulder level, the leading blade is prepared for entry by being pivoted in the forward hand as it moves towards the water. If the recovery hand is not pushed forward at eye level, it will be difficult to place the paddle vertically in the water close to the boat.
- The leading arm remains extended and the shoulder drops towards the water as the top hand places the paddle in the water over the extended front hand. The blade is driven down towards the water with both arms and shoulders working together.
- The leading shoulder should not move backwards and the trunk must not be unwound before the paddle has entered the water fully at the end of the Catch.
- During this phase transfer the foot pressure on the footrest.

Summary.

- There is a need for explosive power at the Catch and then good transfers during the stroke achieved by a good leg drive, whole body rotation and taking the weight out of the boat (off the seat) onto the paddle.
- Every paddling session is a technique session. Every paddler should seek advice on how their technique can be improved – from other paddlers as well as coaches.
- When done properly, the blades are only in the water for 700m of a 1000m sprint. It is the glide phase that enables the muscles to relax and recover before the next power phase and thus improves speed and strength endurance (ie the ability to maintain maximum speed and power over the full distance without slowing down)

Practice Drills

- Using your whole body to paddle requires concentration and relaxation. Do not get down on yourself if you cannot seem to make it work right away. Try these new techniques for short sections. This will allow you to grow into better technique gradually, rather than pushing to paddle perfectly right away. Remember, better technique doesn't always feel better initially; sometimes you need to invest in paddling more slowly or less smoothly in order to get better in the long run.
- It helps to imagine that someone has taken a series of poles and driven them into the water down into the bottom on both sides of the boat and the paddler has to grab each one and pull himself by. Then pretend that there is a big old rowing boat in front of the paddler who is trying to push it forward with his feet. Grab the first pole and trying to push the boat forward with the feet. Then grab the pole on the other side and do the same thing with that. This helps to get the forward force on the legs. In paddling you have to transfer your power to the boat and the two places you are touching the boat are your feet and the seat. However, the forward force is coming almost entirely through the feet
- **Practise the Catch by "spearing the fish"**. Imagine there is a fish in the water next to your kayak and it's swimming towards the nose of the kayak and you are going to spear it with your paddle. So the spear is entering the water at an angle. For those of you who move your top hand before placing the pulling blade into the water and pulling it first, think of it this way. You are still trying to spear that fish but it is now swimming towards you. That is how your blade is entering the water, much more vertically and often you might also hear a plopping noise from the blade on entry. So count 1001- that's about 1 second and that's the time you hold the above position where the tip of the pull blade is about to enter the water and spear that fish swimming away from you. This drill is purely about producing a good Catch. Also by pausing for a second, it will test your balance as well so it is okay to have a few wobbles, this just helps develop your core stability further.
- **Catch Practice**. A good way to ensure the blade is placed in the water as far forward as possible is to concentrate on the top hand. If your top hand is placing the blade into the water beside your feet, as if thrusting the blade in a spearing motion, the lower hand will not hurry the Catch. Intuitively, many want to place the blade in the water with the lower hand, which is something to be overcome. Focussing on the role of the top hand at the Catch will also help you relax your lower hand, arm and shoulder, which can actually help extend your reach by a few inches.

- **Practise Counter rotation drill for air work.** Count 1001 to hold the position at the end of the Exit phase. As this is a drill concentrate on the positioning of the hand in front of the face ie the one that is about to become your next pull. Just imagine that this hand is being extended towards the very tip of the bow at around shoulder height and when you think you can go no further, rotate forward by another couple of inches and hold it there again, testing your balance. It is important to ensure that the forward hand does not cross the centre line of the kayak. As that top hand is extended further and further away, you will find that even without thinking about it, the knee on the same side as the hand you are concentrating on has begun to bend. This is because it has to make way for the rotation that is now occurring. Think of this point as a big watch coil spring being wound up ready to be unleashed.
- **Practise rotation.** Many paddlers understand that rotation is important and may feel like they have taken steps to use good rotation, but are still usually only rotating their shoulders or upper torso rather than twisting from the base of the spine. One way to overcome this is to try to exaggerate your rotation on dry land. Try to imagine a steel rod that runs through the top of your head to the base of the spine. Sitting on dry land in an upright position, try rotating left and right along the length of your spine with your paddle resting across your shoulders. You should feel that same pull at the base of your spine when you are paddling. This is the only way you will employ the larger muscle groups during the stroke. It will also give you an idea of some of the muscle groups that are important to address when stretching before and after a workout. When you are learning to rotate, watch out for an exaggerated side-to-side rocking motion in your boat, which actually slows you down. If this is happening, you need to "quieten" your lower body.
- **Top arm practise during the drive phase and recovery.** With your top arm, raise the elbow and wrist up as one horizontal unit. Imagine a chicken raising a wing as a single unit. The key to the "chicken wing" is to align the joints of the shoulder, elbow and wrist so that they are ergonomically sound, as well as to lock in and transmit the rotational power from the torso to the paddle blade. Imagine throwing a punch. To knock down the other guy, you would line up your elbow with your fist and shoulder to get the best horizontal power, whereas throwing a punch with the elbow lower than the wrist and shoulder would be little more effective than a slap to your opponent. You wouldn't do that...you'd lose the fight! So don't do it when you paddle. Many paddlers who suffer from wrist tendonitis may be able to fix their problem by making sure their hand and forearm joints are aligned horizontally.
- **Get the rotation working.** Before you take your first stroke in the water, sit in the boat and holding your paddle horizontal at about chest height begin rotating your torso. Rotation should be slow and smooth do not use jerky movements or try and throw yourself around. Your aim is to warm up your rotation until you are swinging the paddle so that it goes 180 degrees from being parallel with the boat on one side to being parallel with the boat on the other. Gradually speed up, but keep the speed to a medium speed and keep the transition at each end to a smooth movement.
- **Get that entry right.** For 25 strokes concentrate on nothing else but the entry ie
 - Length - Blade enters in front of the feet
 - Depth - Blade is completely buried quickly and no deeper than the depth of the blade
 - Make the Catch a Catch, not part of the power phase. Entry is a spearing motion as part of the Catch and not a slow sinking as part of the drive phase
- **Top hand control.** For 25 strokes slow the stroke right down and focus on the top hand, specifically hold it at eye height until the exit is complete and the paddle shaft is parallel to the water
- **Straight back.** For 25 strokes imagine that someone is standing above you and pulling your hair up and slightly forward forcing you to stretch the spine up and straight
- **Rotation.** For 25 strokes focus on driving the stroke side shoulder back and the off side shoulder forward
- **Leg Drive.** For 25 strokes focus on pushing the boat forward with the drive side foot. As you engage the blade for each stroke, engage the drive side foot. Visualise yourself pushing the boat forward with your foot. It can be helpful to some paddlers to think of the leg pushing on the foot brace as a way to help push the kayak forward past the paddle blade that is "stuck" in the water.