The whitewater slalom kayak forward stroke.

By Toby Roessingh

A good forward stroke is a basic tool all whitewater paddlers should have. What good is a car without a gas pedal? Steering will only take you where you want to go if you have the capacity to accelerate in your new direction. Likewise, in paddling, we use strokes that pull the boat in a forward direction far more than any other, so it's important to do them effectively and efficiently. Here are some of the important things to remember in doing so.

Rotation

Rotation has become a buzzword in paddling technique of late, but very few people rotate in a way that is effective or efficient. The idea of rotating to generate more power with each stroke is a very good one. What we are after is to recruit more muscles (specifically the abdominals and lower back muscles) for our pull. This idea is made better by the fact that these core muscles are the ones most resistant to fatigue and hence, if it is with these muscles that we generate most of our power, we will be able to maintain good technique more easily for longer.

So, how do we accomplish this? There are a variety of analogies and drills that are used to help paddlers visualize the movement. Sit on the ground with your feet out in front of you and cross your arms. Now, try to move your right elbow as far left as possible, and then vice versa. Notice that there are two kinds of rotation that allow you to accomplish this. First, you can rotate your shoulders, probably so far as to bring your elbow in front of you. To rotate your elbow further, you must rotate from at the waist. With good flexibility, you can rotate until your upper back is about 90 degrees from your legs and your right elbow is past your left leg.

Wind-up, catch, un-wind

Each stroke should consist of three distinct phases. You will notice that the last phase of each stroke (un-wind) also constitutes the first (wind-up) of the next. The wind-up is the rotation we are talking about above. From the first drill, rotate as far as possible in one direction. Now, relax your torso and shoulders. You should notice that the body naturally "un-winds" to a neutral position. To carry the body further in this direction is to "wind-up" on the other side. The trick of the forward stroke is to place the paddle in the water, or "catch", between the "wind-up" and "un-wind" movements. So, we stretch around in one direction, place the paddle in the water, and it naturally comes back as a forward stroke! "Not so simple," you say, "there are other things to consider." Indeed, there are.

The catch

Between winding and unwinding, we place the paddle in the water in the front of the boat. This is called

the catch. In order to un-wind properly, we must ensure that, before we do, we have completely inserted the paddle blade into the water, making a good anchor from which to pull on. The paddle blade must also be vertical for the catch so that, as we un-wind, we pull back, and not down, on the blade.

Stroke extension

Stroke extension is a key to having efficient forward stroke technique. We wish to place the paddle blade in the water as far forward as possible so that each stroke can be as long as possible (without going beyond our hip, which we will discuss later.) In addition to torso rotation, we get stroke extension by stretching out our forward arm and shoulder before we take every stroke. This happens at the same time as the "wind-up" discussed above. Note that, during the "un-wind" phase, we are also going pull on a forward stroke with our arm and upper back muscles somewhat, returning our arm and upper back from the stretched-out position as we pull.

The vertical forward stroke

For anyone who has some working knowledge of physics, you should understand the concept of torque. One way a torque is created is by applying a force to an object away from its center of mass. The further away from the center of mass the force is, the greater the torque. (For those of you to whom physics is a foreign language, this is why longer wrenches work better.) For our discussion, the force is the forward stroke. It is taken parallel to the direction of travel of the object (the boat). The torque is created by the fact that we cannot pull along the direction of travel of the boat, because the boat is in the way! The further away from the boat the stroke is, the more torque is created. In the context of a forward stroke, torque is bad because it causes the boat to turn when we are interested in going straight. For this reason, we wish to take our forward stroke right along side the hull, where the torque will be minimized.

This is all accomplished by taking a relatively vertical stroke. What you will find is that, if you wind-up and un-wind properly and your stroke is too horizontal, it comes off as a sweep stroke, coming away from the boat as it comes back. This is a known way to turn. When we are going in a forward direction, any turning momentum generated must be "pushed back" with the next stroke, and therefore, constitutes wasted paddler energy.

Stroke recovery

Whitewater can be highly unpredictable in terms of what it will do to your boat. In an effort to be able to quickly counteract whatever it does to us, we should like to keep a paddle blade in the water as all times. So, it then makes sense to minimize the time your paddle is out of the water, known as recovery time, between strokes. Having minimal stroke recovery also means you can have a higher cadence and hence go faster, important in sticky situations and for racing.

There are a few things to consider here.

We want to take our paddle blade out of the water by the time it gets to our hip - for two reasons. First, any pulling you do from this point back is mostly pulling the paddle blade face up, not back, and therefore, doesn't result in as much force as we'd like in the forward direction. Secondly, as we pull past the hip, our top hand tends to come across the front of the boat. The result is that it takes longer to set up for the next stroke on the other side – greater recovery time. Note that, in practice, in order to get the paddle out by the time it reaches our hip, we have to stop pulling on it when it reaches our knee.

Let's return to the "wind-up, catch, un-wind" idea for a moment. I mentioned that the "un-wind" for one stroke is the "wind-up" for the next. So, effectively, we only have two stroke phases – the "wind-up" and the "catch." As soon as you catch for one stroke, drive your top arm forward to wind-up for the next. This way, when you finish one stroke, you will immediately be prepared to place the next in the water. This is key to minimal stroke recovery.

To sum, a good forward stroke should look like this – we place the paddle blade as far forward as possible using torso rotation and arm and upper back extension. The paddle enters the water and we "un-wind", letting our torso return to neutral, pulling on the blade as it travels right next to the boat. When the blade gets to our knee, we start to slice it out of the water. As the paddle blade passes our hip, it comes out of the water. Our top hand is already forward and ready for the catch on the other side, as the "un-wind" we just did has brought this shoulder and arm to the front of the boat and wound our torso in the opposite direction.

Try these drills

- Try to paddle in a straight line with a flat (side-to-side) boat using only one paddle blade. Begin with 2 or 3 strokes per side and work your way up. You will find that, in order to go straight, you cannot pull back beyond your hip with your forward stroke. You will also find this easier when your stroke is carried right next to the boat.
- Allow yourself a very long (1-2 seconds) recovery period between forward strokes. Work on having maximum extension and rotation at the beginning of every stroke and taking your paddle blade out of the water as soon as you have used up the "wind."
- Use your new, improved forward stroke to do pieces of hard paddling about 15 seconds long. Once the boat is up on a plane, concentrate on very short stroke recovery and keeping an even bow which does not move up or down, or side to side, with every stroke. You will be pleasantly surprised by how fast the boat goes, with little effort, when you are doing everything right.

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