PADDLE ENGLAND

BOAT BODY BLADE

FLATWATER RACING TECHNIQUE

GUIDE 2

INTERMEDIATE TO ADVANCED

TABLE OF CONTENTS

FOREWORD

The **Boat, Body, Blade** model can be used as a diagnostic tool to spot technique issues and help rectify errors and so improve efficiency. In the following guide, we have tried to simplify the complex subject of flatwater racing paddling technique and create a guide which is stage appropriate for junior paddlers.

This guidance has been put together to provide a framework for coaches to use when working with intermediate to advanced paddlers. It is worth noting that as coaches, we must continue to emphasise fun at this stage and attempt to instil a love of the sport within each session. Each paddler is unique, as is their paddling journey.

While there is no definitive definition of an intermediate to advanced paddler, this guide has defined them as those who have completed their first winter in a stable K1/C1 and have started competing, through to those that have been racing for a few years. As a reference based on the divisional and ranking systems, it could also be defined as Boys & Girls C – A/ Division 6 – 3.

When considering technique with this ability level, specifically juniors, it's important to realise that speed does not necessarily mean technical progression. Some paddlers will have good technical skills but will be physically less developed and so potentially slower than a more physically developed paddler with poor technique.

It is recognised that as paddlers develop and their performances progress, coaches may begin to focus on the outcome over the process. We believe every session should have a technical component to develop and refine technique, especially for junior paddlers. This is a very important stage developmentally and it's far easier to learn and engrain good habits now than correct them as a more advanced junior or senior.

BOAT

The boat needs to be set up correctly so that its trim, the way it runs through the water, is as the manufacturer designed it. The boat should sit/run/glide level to the water surface. This usually means the seat is in the middle of the boat adjustment and the footrest is then moved accordingly to the desired leg length.

If the seat is too far back, the boat will sit tail down and the rear may sink down under acceleration. You would see the boat climb out of the water at the front of the stroke and sink back into the water at the end of the stroke. If the weight is too far forward, the nose will sit low when static and may rise under acceleration but sink between strokes.

The paddler should be the correct weight for the boat. Most kayak manufacturers have a sizing guide for their boats which can be found on their websites.

Image 1: Seat is too far forward. Nose would be down when static

Image 2: A good starting point

Image 3: Seat is too far back. Tail would be down when static

Images 4 and 5 illustrate how we would want to see the boat running smoothly forward. There may be an upward motion which means the boat rises and falls, but the motion is with the whole boat and it's performed smoothly.

Images 4 & 5: Both boats are running flat/horizontally to the water surface

Excessive **Pitch, Yaw or Roll** are areas to be aware of. The boat should not pitch excessively or bob on its tail. It shouldn't roll heavily from side to side either.

Side to side rocking movement which is **off** the paddle in the water, i.e. away from the submerged paddle usually means the paddler is not applying their weight onto the paddle but leaning away from the submerged paddle. Coaches may see a collapse in the side of the body and the paddle side hip actually rising up rather than going down.

Excessive pitching is usually related to the paddlers body moving incorrectly and/or the paddle being brought too far back past the hip. This acts as a break at the end of the stroke and you may see the nose dipping down as the paddle slows the boat.

Click Here for a visual explanation of Pitch, Yaw and Roll or refer to Guide One for a more detailed definition.

Images 6 & 7: Excessive boat roll. The boat is rolling from side to side which creates extra drag and slows the boat. This also causing extra fatigue for the paddler.

A lean one way or another is something to be aware of and an area to avoid or minimise. These can be very common and can be a sign of one or more of the following:

- Nerves - The boat may be too unstable for the paddler and the paddler can only flatten out* on one side to support themselves from capsizing.
- Differing leg lengths - While unusual, it can happen during growth phases.
- Positioning in the boat - A paddler sat diagonally for instance.
- Feet not positioned correctly. This could be a paddler placing their feet at curious angles on the footrest which is often caused by an off centre tiller/rudder.

***Flattening out refers to when an athlete supports themselves by using the back of the paddle on the surface of the water to hold themselves up and prevent capsizing.**

Boat size plays a role in stability. For instance, in modern K1s young female paddlers may find themselves in a boat that is the correct size for their body weight but not necessarily wide enough for their hips, particularly as they mature physically. A common fix for this is adding padding to the seat and/or raising the seat to its maximum height, enabling the paddler to fit into the boat. Unfortunately, this just makes the boat and the paddler more unstable with the paddler sitting on top rather than inside the boat. Coaches should check if this is a conscious choice by the paddler or a boat setup they inherited before seeking to make changes.

Another example would be rudder wires cutting against an paddlers shorts/legs. This can be easily cured with the use of the correct equipment for a paddlers stage of development but may require a change of boat. This is where a coach's input and experience into the correct boat choice can have a significant effect in an paddlers development and overall performance.

Coaches should also consider the positioning of a paddler in a boat. For instance, tall paddlers sitting on the back of the cockpit would not be in the optimum position for the boat to run efficiently in the water. In this position, a paddler would push the nose of their boat into the air as they paddle. Often the cause of this is if a paddler only adjusts the seat (as it's often quicker and easier) and not the footrest as well. Many paddlers are not aware of the consequences of changing just the seat. Coaches should check that the footrest still has adjustment and can move towards the bow of the boat before changing the seat. This will give a paddler the required leg length which enables the seat to be repositioned away from the back of the cockpit and into a more central position as shown in image 2. Whilst this is more common in male paddlers, obviously this can effect females too, but usually with lighter weight it has less of an effect on how the boat runs. However, for either gender it isn't ideal and needs correcting to enable correct boat set up

The following appears in guide 1 but is equally important here for paddlers who are potentially rapidly progressing in both speed and physicality. Paddlers should seek to practise boat skills, especially as they grow as their coordination and balance can be affected. It's important as a coach to ensure athletes have the opportunity of building these skills. It can often be missed out as athletes progress, particularly if they are perceived as an 'early developer'. However, building these essential skills early will help a paddler in the long term.

Games with Aims

Hand Paddling: Either as races or in circles, or follow the leader. Try to get the paddlers to drive their arms down rather than splash their hands back and forth. They can lean forward but their arms must pull down. This encourages balance, coordination and leg drive for stability. Both arms at the same time is the fastest, opposite sides requires more balance.

Throwing and retrieving of paddles: Requires balance to throw the paddle and then hand paddling to retrieve it, and can also include helicoptering the paddles above their heads.

Ball throwing on the water: Encourages balance, body rotation, coordination and then potentially hand paddling to retrieve.

Long paddle pauses: Groups are in a line paddling and the coach counts down 3,2,1 with the aim to see who can glide the furthest. Try to discourage boat bobbing as the boat is near stationery.

Standing starts on both sides: The coach calls "ready/set/go", to practise balance on both sides (most paddlers have a favoured side) and to see if there is a difference in starting capability from side to side (and why), around 20 strokes only.

Draw stroke races: Pulling the boat sideways, line up besides each other and the aim is to stay away from one side (left for example) whilst catching the paddler on the other side (right in this instance), then repeat the opposite side.

Backwards paddling races: Line up and race backwards, expect lot's of crashing so be careful!

Shortest stopping distance: Paddling in a line and the coach calls stop! Quickest to a halt wins. You can extend this by then adding backwards racing to it. Expect lot's of water in boats, a summer activity.

Getting in the boat from the opposite side: Many river clubs only ever get in and out facing one way and paddlers can find it hard to get in the other way around, it is surprisingly common.

BODY

Posture for Set Up

Firstly, let's discuss what we mean by 'rotated forward'. This does not mean leaning forward, or moving forward and down, or rotated backwards - most paddlers can end in this position because they have pulled their paddle too far backwards past their hips. Rotated forward means rotated around the spine (in Guide 3 we will look at body rotation from a slightly different point of view but for most paddlers the spine is the easiest motion to understand and aim for).

The body sits upright, with a straight spine. This helps open the lungs, with the hip and shoulder positioned forward on the paddle side entering the water as depicted in images 8 & 9.

Image 8

Image 9

Forward Arm & Top Hand Positions In Set Up

In the air time the forward arm can have a slight bend in it but not a large break, as shown in image 10. The top arm travels at the same speed as the body, it does not fly forward after the water exit. It needs to be lifted up first before moving forward in the air time as the body rotates again.

The top hand should be no lower than shoulder height and in front of the body (think press up position). The top hand is above and in front of the elbow while the elbow is below and in front of the shoulder, as seen in image 12. The wrist is below the paddle as shown in image 10

Image 10

Image 11 - Top hand at face height

Image 12

The top hand should travel at a constant height and must not go up and down. As such it must not push up and then back down to the knees in an arc or across the body. Image 13 shows what across the body looks like while image 14 depicts the elbow bending and the paddle being too close to the head as it goes across the body. If a paddler displays either of the above, this will break the connection at the shoulder. The top arm must travel at the same speed as the body, if it travels faster you are losing connection with the body where the power resides – any of the above are the easiest way to unload power.

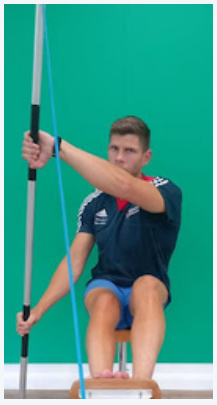

Image 13

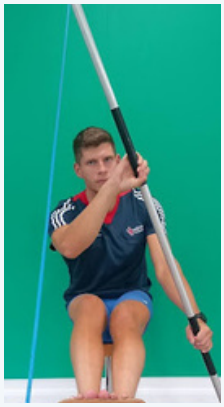

Image 14

Key Points for Set Up

- Rotated body, top shoulder forward, top arm forward
- Forward arm close to horizontal in the air.
- Top hand no higher than face height – preferably shoulder height.
- Top arm/hand in front and above elbow. The elbow below and in front of shoulder with the elbow pointing down.

Leg Drive

The hip of the driving leg goes backwards as the paddle is submerged and locked. This happens because the leg gets longer as it straightens against a fixed footrest. It's important to recognise that when done effectively, this is not simply the knees moving up and down or the ankle moving forward and backward along the bottom of the boat.

Correct leg drive starts with the paddlers feet on the footrest, in the correct position – see image 15. Whether the paddler is pushing with the ball or heel of their foot, this is what starts the leg drive. It is very hard to see in the boat what a paddler is doing with their feet so this needs to be taught where possible on an ergo. The feet must not roll out (push with the outside of their feet) but push through either the balls or the heels of the foot (with boats with foot blocks) to engage the quads and glutes. Paddlers should avoid allowing their feet to wander across the footrest. Feet need to keep together, either side of the tiller bar with heels close together. This ensures that the feet are pointing upwards and not splayed out which causes the knees to move outwards and roll the boat.

Image 15

The aim is to rotate the water side hip by the driving leg pushing backwards and most importantly **with** the connected body, enabling the paddler to pull themselves past the paddle.

The hip should move back at the same speed as the body rotates. Seeing differing speeds between leg drive and body movement often means a disconnection somewhere. Timing and coordination are key here and it is easier to spot on land on an ergo. Additionally, there should be a diagonal force resisting the power from the driving leg across the body to the top shoulder and this is what a strong core is for.
Remember, the legs are the biggest muscles a paddler uses and therefore can provide the most force for the longest period.

Top Tip: The driving leg hip goes backwards

Top Arm

The top shoulder, via the arm applies force/pressure down the shaft resisting the upward force of the water. Paddlers should not push the top arm down and they should aim to keep it at the same height in front of their face.

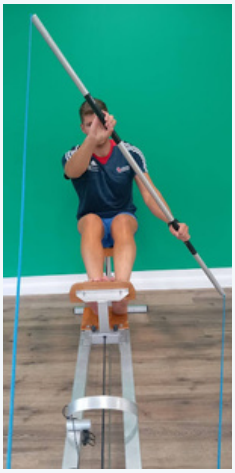

Image 16

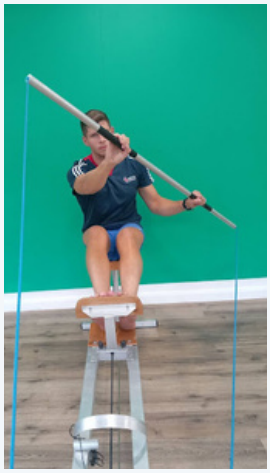

Image 17

Image 18

Image 19

The top arm controls the path of the submerged paddle, resisting the water and the force the body is applying. The top arm should stay in the same relative position as the body rotates. Any movement in the top arm is usually releasing load.

The top arm travels at the same speed as the body until the blade is removed from the water when it can accelerate up out of the water to the set up position. Before this it applies force down the shaft holding the paddle in the water. It does not force the top arm down at the front of the set-up phase.

The top arm controls the path of the submerged paddle. If we look at image 21 the water paddle is nice and close to the boat but the top arm is in a very weak position to apply appropriate force down the paddle shaft and it also causes the elbow to lift.

In image 22 the wide top hand means the paddle about to enter the water is too far away from the boat which would cause it to pivot in the opposite direction. As an outcome, you would see the nose rise and move the opposite way causing drag both front and rear - often called snaking but also known as excessive yaw.

Image 23 is a good starting point. A simple way to help explain these positions is to ask your paddlers, could you do a press up in the shape of Images 21 & 22? Image 23 is a lot easier to hold.

Image 20

Image 21

Image 22

Image 23

Key Points for Top Arm

- The top arm stays in the same relative position as the body rotates. It does not push forward whilst the paddle is submerged
- The top shoulder (via the arm) applies force/pressure down the shaft
- The top arm stays in front of the face as a paddler rotates. The paddler should not push the top arm up or down at the end of their stroke.

Rotation

At the intermediate stage, It is best to simply focus on the body rotating around the spine at the same speed. When a paddler progresses to an advanced stage (see Guide 3) you can introduce the concept that rotation is around the shoulder on the submerged paddle side.

Rotation is often misunderstood as bringing the paddle too far backwards (see image 24). Correct rotation should look like the body rotating forward, overtaking the submerged paddle around the spine. A slight lean forward is ok, but never too far or hunched over. The body MUST move as one. This means at one speed whilst the paddle is submerged and under load. Any limbs travelling faster than the body is usually an unloading of power, either due to poor technique, poor understanding or a lack of ability to contain the load. Additionally, having a blade area that is too large can cause this.

Image 24

Image 25

Top Tips for Rotation:

- **Everything rotates around the spine at the same speed**
- **The body must move as one**

Paddle Exit

You may have heard phrases like 'chicken wings', 'flicks' and 'wobbly or soft wrist' and wondered what they mean. These phrases all relate to the poor exiting of the paddle from the water and describe some of the movements a coach may observe. In the following, we try to explain in more detail what they mean and why they're things to avoid!

Elbow lift or 'chicken wings' is when the elbow is higher than the wrist at exit and leads to lifting the paddle out. We want the elbow to point down towards the water and not behind or sideways as this can lead to multiple issues. Firstly, the paddle gets trapped "inside", between the body and boat and elbow (Image 26). The shoulder then lifts to help the elbow get high enough to lift the paddle from the water which can lead to sore neck and shoulder muscles as well as instability. Secondly, It can also lead to the front arm travelling forward with the wrist below the elbow, causing the paddler to either lean away from that side (images 27 & 28) or fold the spine in an arc (image 29). Neither is good technique to instil.

Image 26

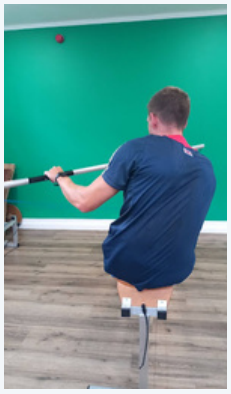

Image 27

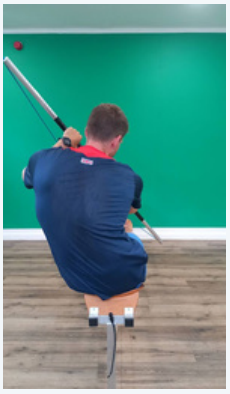

Image 28

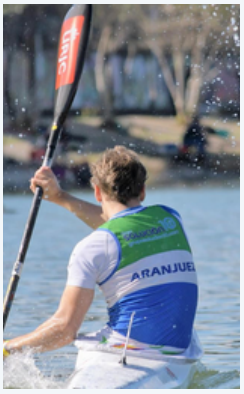

Image 29

'Flicking' is when the wrist bends down as the paddle exits the water, as shown in image 30. The wrist then 'flicks' the paddle from beneath the arm/elbow to above the arm/elbow to catch up the exit arm. This usually means the wrist is over working, lifting water every stroke and using small wrist muscles which get tired easily. More seriously, this action can cause repetitive strain injuries. Additionally, having the elbow higher than the wrist means at some point the wrist will have to overtake the elbow to get above it to set up for the next stroke, placing unwanted strain on a weak joint.

Image 30

Image 31

The paddler should aim to exit the paddle with the back of the hand or 'watch face' rising as the elbow is stationary with the wrist not bending. The paddle should not go straight from exit to moving forward with no set up time.

Images 32 & 33 are positive examples. Image 32 shows the body is rotated forward, the arm is extended forward - in the airtime - and the top hand is in front of the face with the legs about to drive. Image 33 shows the leg has driven the hip & body past the paddle, the arm then breaks to lift the paddle out and the top arm extends in front of face for the next stroke.

Image 32

Image 33

Top Tips:

- **The paddle exits at or before the hips**
- **The elbow breaks**
- **The hand lifts the paddle**

Air Time

'Air time' is the time between stokes and is used to set the paddler up correctly to deliver an effcient stroke. It is the only time when the arms might/may move independently of the body speed. Essentially, the body is fully rotated and in effect stationary therefore the arms start to move position before the paddle enters the water and the body and legs start again. This combined with the boat glide is the paddlers setup time. It is a brief chance to relax and recover. Of course, it's fleeting and very short so paddlers should maximise it by relaxing their hand grip, relaxing their facial muscles before breathing in and starting again.

Image 34

Image 35

Images 34 & 35 show how proficient & stable paddlers can set up just above the water

Top Tips:

- **Extend front/top arm**
- **Rotate and "reach"**

Head Position

Lifting the head up does lots of good things biomechanically. It means a paddlers top hand/arm is in a strong position when resisting the forces from the water. If a paddlers head is down, it leads to their top arm and hand being above the head which is a very weak position. This makes it harder to breathe whilst not providing the opportunity for the paddler to relax and see where they are going.

Additionally, the hands are a fixed width apart so looking down effectively lifts the top hand above the head into a weak position. Looking forward with your head up does the opposite. We want to avoid collapsing - this is when the side of the body folds unloading power off the paddle. This is because the hip on the submerged paddle side comes up, whilst the shoulder on the same side is moving downwards, resulting in a curved spine and loss of load on the paddle - as depicted in images 36, 37 & 38

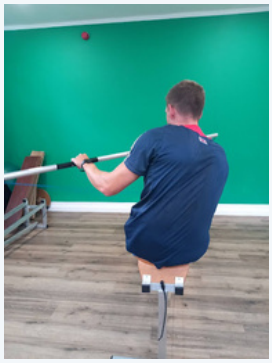

Image 36

Image 37

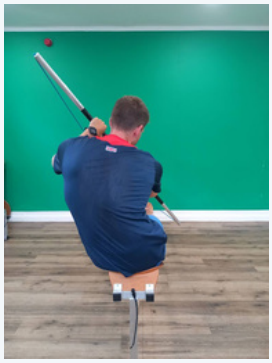

Image 38

If a paddlers head is down, looking at their knees (image 39) - apart from biomechanical losses it isn't good for their stability or their line of sight! As such, encourage paddlers to keep their head looking forward as shown in image 40.

Another observation a coach may see is the tensed jaw. This is very hard to resist under maximum load but paddlers should try to relax their face. This helps release muscle tension in the neck which will lower the shoulders and allow better functional movements. The best make it look easy, relaxed and effortless! (Image 40)

Image 39

Image 40

BLADE

The paddler should aim to enter the blade into the water as cleanly as possible. The blade should not be pulled backwards in the air or hit the water travelling backwards and it should be submerged before force is applied. The arm falls in an arc from set up, however it is very important to enter the blade as far forward as possible with a positive angle*. Images 41, 42, 43 and 44 show the correct sequence.

*Positive angle is defined as: When the angle of the paddle remains at less than 90 degrees **or** when the water blade is ahead of the air blade

This Video provides further insight about the blade.

Image 41 - Set Up

Image 42 - Blade enters at the feet

Image 43 - Stroke finished by the knees

Image 44 - Blade exit at/before the hips

Images 45 and 46 should how cleanly the paddle has entered the water and how it enters at the feet

Image 45

Image 46

BLADE & BODY:

The 'catch', 'entry' or 'lock', refers to the front of the stroke as the paddle enters the water. Both arms apply force down the paddle shaft, note that the bottom arm is not pulling backwards. When this is done well, the blade grips the water and the top hand is the guide for the paddle into the water, not pushing forward or across the body (see images 45 & 46).

The shoulder blades are back and down with elbows pointing towards the water not out to the sides. The catch is made with two hands through downward pressure along the paddle shaft – the top hand remains in a similar position relative to the shoulder and head and does not push forward, up, or across the body. The leg drive and body rotation begin as the paddle touches the water. The angle of the fully submerged paddle is still positive. When observing you would see that the 'top' hand is behind the 'water' hand from a side-on view

Top Tips for Paddle Placement:

- Place the paddle at the front of the stroke as cleanly and as quickly as possible. Paddlers are encouraged to not hit the water with the paddle travelling backwards
- Aiming for no splash! The paddle needs to be fully submerged and not surrounded by air.
- Aim for no holes in the water! – This shows a clean paddle entry
- Maintain a positive paddle angle for as long as possible

Once the paddle goes past vertical the paddle should be exiting or else it is slowing the boat down. This is why we avoid pushing the top arm forward or up as it decreases the time the water blade is at a positive angle and minimises the power phase. You may see paddlers do this due to a weak top arm, or having too big a paddle area which means they can't hold the load from the paddle in the water.

This leads to unloading (the releasing of this load) even if unconsciously. This can be seen in several ways - pushing the top arm up which lifts the bottom paddle out of the water. Bending the bottom arm at the elbow, again this lifts the bottom paddle out of the water and too early. Lastly you may see the top arm moving across the body so there is little downward force into the bottom paddle.

Key Points for Blade

- Enter at the feet
- Finish by the knees
- Exit by or before the hips

SUMMARY

Coaching is incredibly rewarding, hugely challenging and at times, frustrating for all involved! As a coach you have to be able to spot the issue, identify the cause and decide on the best course of action to take to help improve a paddler. In turn, the paddler has to understand what you are saying, interpret that into a new movement/feel and attempt to learn a new movement pattern whilst applying it usually under load and dynamically.

The content in this guide is a tool for coaches to explain the concepts of Boat, Body and Blade. It has been designed to give a coach information, ideas and tips to support their delivery and hopefully becomes a resource to refer back to. It is worth noting that everybody learns in different ways and at differing speeds. Coaches should try to consider the learning styles of the paddlers they are working with and consider the mediums they use when coaching. It is important to recognise that each paddler is unique and will progress at their own pace.

BOAT

Make sure the boat set up is correctly so the boat runs level. To do this, ensure the seat position, footrest and steering are correct and the paddler is comfortable. When observing, look for the boat moving smoothly without excessive pitch, roll or yaw.

BODY

The feet are together, the heels are together and the knees are together. The paddle entry side leg applies pressure on the footrest which drives hip & body rotation. The paddle shaft remains parallel with and in front of the body.

BLADE

Enter at the feet, finish by the knees and exit by or before the hips. Try to maintain a positive angle for as long as possible and seek a quiet entry and exit from the water.