

## Meta-technique for sprint kayaking

In the previous article, we defined and described the elements of the Basic Sprint Kayak Technique. Now it is time to address the elements of Meta-technique for sprint kayaking (as described by Andrea Pace in 2017<sup>[1]</sup>).

The Meta-technique in sprint kayaking defines what are the physical phenomena without which it is not possible to paddle fast. A. Pace in his 2017 book clearly identifies these phenomena and shows how:

- the best paddlers do use very different styles but never work against any of these phenomena.
- the champions find a way to exploit one or more of these phenomena to gain a competitive advantage.
- the results of average, advanced or even top paddlers are often limited at a certain point due to the paddler's inability to solve a Meta-technique problem in their technique.

The sheer talent of a gifted athlete can be enough to upgrade the Basic technique with all the notions of the Meta-technique and achieve very high technical levels. Often also talented coaches without the theoretical knowledge of Meta-technique have the special 'eye' for these same principles and can help an athlete develop the Meta-technique even further.

But the goal of this text is to help coaches develop the necessary understanding of the Meta-technique in order to:

- teach the young paddlers all the crucial aspects of Meta-technique already since early stages of their careers (in order to smoothen their development later on)
- be able to help also the technically less talented athletes throughout their careers
- unblock the development of athletes who's improvement seems to have stuck (very often, but not always, this happens due to Meta-technique mistakes in their paddling)
- develop a coaching 'eye' that will enable them to help the athlete without the need of constant technique measurements (we will show the methods for quantifying the Meta-technique later on, but the goal is to use them only as a reference and not constantly during sessions).

The components of Meta-technique can be divided into three parts (A.Pace, 2017):

### The boat motions (managing the boat)

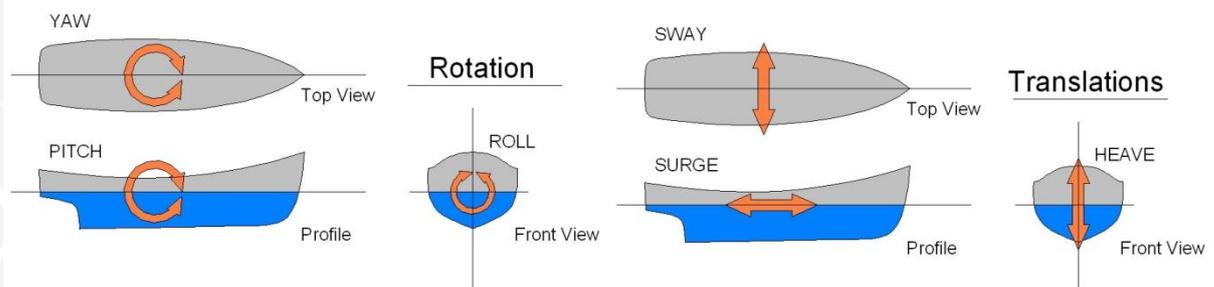
*The motion of the boat represents the cornerstone of all athletic movement in watersports (A.Pace, 2017). As such, it is the most important and sensitive element in the Meta-technique evaluations (A.Pace, 2017). We start optimizing the elements of boat motions first, we address the interaction with water and force transmission only after this. The elements of the boat motions are:*

- **Translational: Sway, Heave and Surge**
- **Rotational: Yaw, pitch, and roll**

The goal of Meta-technique is not to eliminate all the movements except the forward movement. The goal is to optimize this motions into a natural, harmonic, efficient movement of the boat in sync with the:

- Stroke rate and rhythm
- Body movements (propulsion, balancing and compensation movements)
- Boat speed and stroke energy

The understanding of which combinations of boat motions are positive and which not involves a lot of experience and knowledge of hydrodynamics and mechanics.



## The interaction with the water (managing the blade)

The paddle interacts with water by entering and exiting the water in sync with the boat movements. The catch needs to be quick and subtle, to create a large mass of water to grip onto (anchor) without breaking the resistance of the water. The pull should be uniform and without any tugging motions or changes of the blade's angular speed. And the exit should be swift and clean, blade exiting vertically, creating a propulsive force horizontally to direct the boat inertia forward.

Some of the Meta-technique notions of water interaction are:

- **Paddle slip:** how much the paddle tip moved between the exit and entry point, ideally this point should be the same (car analogy: how much do the tires spin on empty)
- **Paddle Radius:** the distance between water and the point of the shaft where the paddle rotates (car analogy: the size of your wheel)
- **Paddle work angle:** the catch angle + the exit angle
- **Paddle speed ratio:** the ratio between the shaft's angular speed during the water phase and the air phase (during the air phase of the stroke the boat inevitably decelerates, so making it short is a good idea)

## The transmission of forces through the body (manage the energy)

After being able to make the boat run smoothly and efficiently and after being able to interact with the water efficiently it becomes important to optimize also the transmission of forces from the blade to the boat (through the body).

Some of the Meta-technique notions of force transmission are:

- **Inertia and the balance of inertias:** during the catch, there is an impact between the inertia of the boat+paddler system colliding with the inertia of the water mass on the blade (the size of this inertial system depends from how well the catch was done); by definition for the pull

phase we need this two inertias to be balanced or the energy will dissipate either in the water (→slip and turbulence) or in the athletes body (leading to stress for muscles, tendons and fascia). The faster we want to paddle the bigger are the inertias involved, thus being able to create a big inertia (mostly by efficient hip and trunk rotation but sometimes even a body sway) is very important especially for lighter athletes (the size of the water inertia on the blade depends from our water interaction ability-see above).

- **The "intrapush" and the "outpush":** the movement of the hip on the pulling side is very important for force transmission. What we call an »intrapush« is when the hip travels backward during the leg press phase, making the body absorb the stroke energy instead of transmitting it to the footrest. The »outpush« is the movement we see when the pressing leg is lowering but it's hip and the pelvis aren't retracting but pushing forward. In the first case the athlete finds himself sitting on the back part of the seat, while in the second case the athlete finds himself sitting on the front part of the seat.
- **Appropriate stiffness of the shoulder and core:** some parts of a paddlers body usually need more mobility (often it is the low back and hip area) while very often some other areas need more stiffness for a good force transmission and posture. These are the shoulder and the whole core area (creating a 'block' out of the segments between the hips and the shoulders).
- **Movement of the pulling shoulder:** during the pull phase the pulling shoulder can move either backward (not optimal), or not moving backward and making instead the opposite shoulder rotate forward (optimal). It causes the energy to go back or it causes to push the boat+athlete and make the system move forward.
- **Angle between the pulling hand and the pectoralis muscle of the same hand:** this angle is ideally constant. If it decreases it means it happened unintentionally (mistake) or the athlete is using this 'trick' to make the stroke lighter (useful in an acceleration phase of the race or in the last meters of a race)

Author: Jernej Župančič Regent

---

### Looking for more?

For our [Technical articles archive](#) see [here](#).

For [Online coaching](#) from TiP coaches see [here](#).

For [Technique analysis and consulting](#) from TiP coaches click [here](#).

For [Training camps](#) in Training in Paradise see [here](#).

---

<sup>[1]</sup> Andrea Pace: Complements to the Base Technique in Sprint Kayaking: Methods of Evaluation, Rome, 2017