Use and Training guide

You are the owner of something new in swimming. After over 70 years of swimmers learning and training with 'flat' floats, Torpo® has been designed and developed to take swimming to a new level. Please cherish your Torpo and hand it on to the next swimmer or Swimming Club if you finish with your use of it.

Introduction

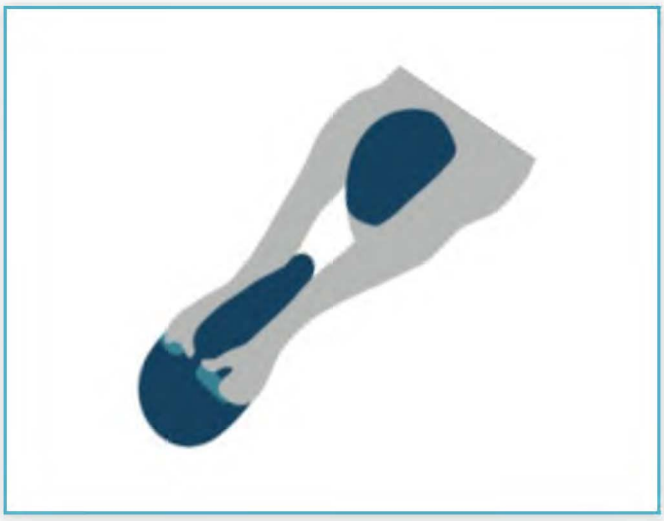
Torpo is a revolutionary new swimming training float aimed at kicking practise to replace the traditional 'flat' kickboard. It has benefits to all the four main strokes and in fitness uses beyond just swim training. The shape of Torpo primarily improves sideways body roll in the front crawl stroke. It also benefits butterfly and breast stroke by allowing kicking drills not possible with a traditional float.

The Torpo Community

Torpo is not just a float, it is the start of a new Community. It takes science and quality design into swimming. The Torpo shape float is just the start. Become part of it. Follow its journey. You can be part of the Torpo Community by following @torpouk on Facebook, Instagram and Twitter. You can also see how Torpo works on our media channel torpo kicktraining on YouTube and Vimeo. Over time there will be training videos to help you get the most out of Torpo.

The Training Bit

How to hold Torpo:
Torpo can be held in many ways. For most uses rest both hands on top of Torpo or with hands at the side and with any combination of your fingers in the handholds. The thumbs should be kept
loose and pointing forwards.



You will find that with the resistance of water, you will not need much grip to hold it in place. Get used to adjusting your hold from all four fingers of each hand in the handholds to only one or two fingers, allowing more control as shown in the diagram. On your back, turn your hands around so that your fingers are on top of Torpo and pushing down.

Here are some basic training ideas for Torpo. We recommend that drills (other than breaststroke) are varied, with fins and without.

Front Crawl / Freestyle

Standard kick:
Use Torpo like a standard kickboard. You'll quickly see the benefits to your core, shoulders and arms as you keep stable and flat by engaging core muscle groups. Try streamlining by keeping your head in the water, rotating the body and head to breathe.

This should ease strain on the lower back from extended kick drills. To reduce shoulder strain, place hands either side of Torpo with only one or two fingers in the handholds. The diagram shows body roll and sideways breathing with a single arm drill.

6 beat kick - benefit from Torpo's perfect roll instability by kicking at a 45 degree angle and sideways breathing. Use the gradation lines (on advanced Torpo) or a half roll to accurately keep 45 degrees. (This is the best angle for body rotation during breath-in and arm extraction. This drill develops muscle and mental memory of the 45 degree kick position). Roll to opposite side for next 6 kicks. This drill also develops breathing from both sides.

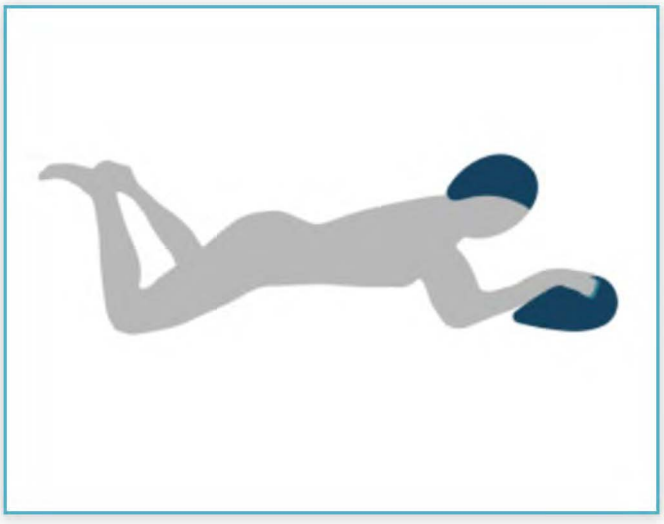
12 beat kick - as above but with 12 kicks each side.

45° side - complete each length keeping accurate 45 degree body position and side breathing. Switch sides after each length.

Single arm - with one hand on top of Torpo, the other arm moves as in the usual freestyle stroke. Switch arms after each length, or even after a set number of strokes (e.g. 12).

Breaststroke

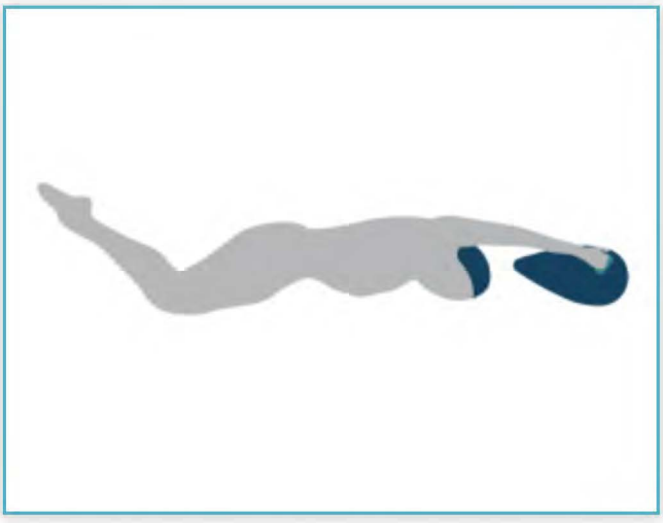
Use Torpo for leg only breaststroke drills. Its reduced drag and natural balanced shape allow precise upper body movement and can help enhance body vertical movement whilst breast leg kicking. Aim for the same vertical body movement as in the normal breaststroke.



Vertical extreme breast drill - exaggerate the vertical movement of the upper body and arms, using Torpo to help this upwards and downwards movement.

Butterfly

Use Torpo for leg only butterfly drills. With both hands on Torpo in front, practise a two beat fly leg kick between each breath. Focus on body movement letting the body follow Torpo through the arms, head, shoulders, hips and feet into each kick. Each time, a mini dive of Torpo with the body following and a two beat kick.



Fly drills can be varied to a one beat kick per breath or multiple kicks per breath deeper under the water. Side drills at a 45° angle flykicking continuously whilst breathing up to the side. This can be done with both or a single hand in front on Torpo.

Backstroke

Torpo can be held in front whilst on the back and kicking. This is slightly less fatiguing than the usual no float, both arms extended kick. It especially gives more buoyancy to weaker swimmers, whilst still allowing back kicking drills.

Other uses

Tumble turn drills - Find a space for each swimmer away from the wall. Extend arms fully whilst holding Torpo, then pull Torpo tight into the stomach to execute fast forward roll followed by full arm extension. This drill can help develop a forward roll and faster roll which can then be used with or without Torpo near a wall for the full Tumble turn practise.

Torpo may be used for other swim training uses or water based exercise. Torpo is great for children. It's fun design in the junior versions (available soon) make learning enjoyable. It is excellent for all kicking drills, but also adds fun to the training process so often missing from swim practise, especially when using the flat kickboard. 'Social kick' is still possible with swimmers heads up whilst doing kicking drills and catching up on club gossip; though your coach may not be happy!

Some suggested uses:
'Waterpolo' front crawl: Use Torpo like a waterpolo ball, between the arms but not held, with a head up controlled body with big freestyle leg kick, great for leg and core strength.
Aquaerobics: Torpo may be used partly or solely for these water-based fitness classes. Its natural rotation yet longitudinal stability make it ideal for these exercises.

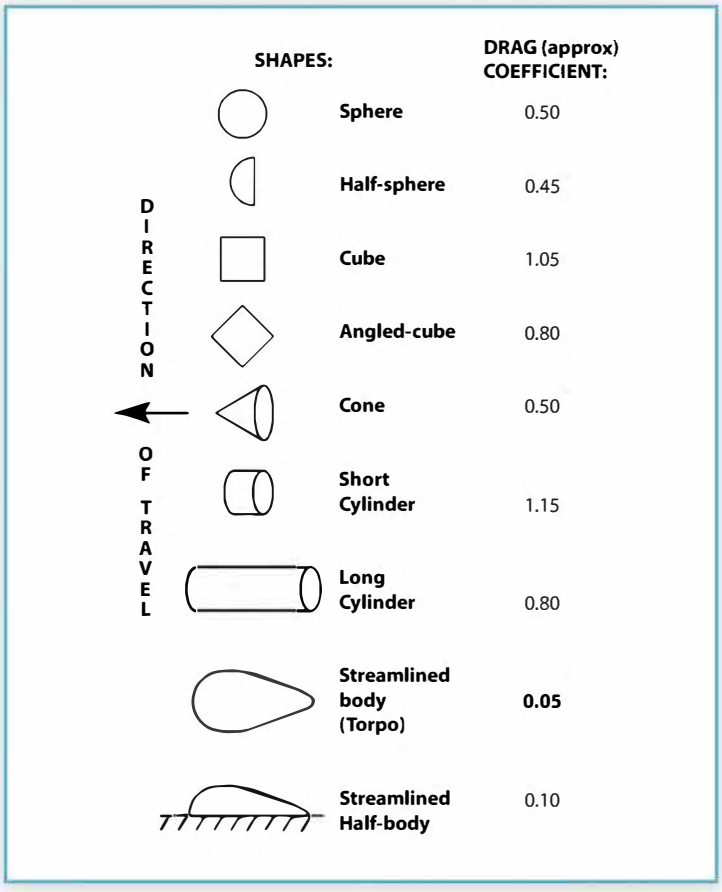
The Science/Technical bit (The Science of Swimming)

The understanding of Hydrodynamics isn't high on the list of interests of most swimmers, despite being keen to improve. Yet such a theoretical and hence practical understanding of how water acts on the swimmers body will give far larger gains than just repetitive training. Though there are aerobic and anaerobic benefits of quantity training in swimming, for increased speed over short and long distances, the swimmer must improve technique in order to see significant gains. To have better technique, swimmers should employ training methods which increase efficiency in the water. Such efficiency is largely about reducing drag and maximising output from every effort expended.

As you see from this diagram, 'form' (or frontal) drag varies depending upon the shape of the object facing the water.

And consider this equation about drag:
$Fd = 1/2pV^2ACd$ where:
Fd = Drag (form) Force on a swimmer
p = water density
V = velocity of a swimmer's body
A = frontal area of a swimmer's body
Cd = coefficient of drag

So, simply, because you cannot change the density of the water whilst you're in it, or the shape of your body, you can only change the speed that you swim and the area and shape of your body which is presented to the water. Hence you can kick and pull the water with your arms harder to swim faster. But you can also reduce your frontal area (A) facing the water and streamline your shape (Cd).



From this you can deduce the lower the drag coefficient (the better the technique), the higher the velocity. Note how a streamlined shape like Torpo has the lowest drag coefficient of all the shapes shown here. This helps it as a training aid, but it also shows you the importance of streamlined body shape in reducing drag on the swimmer. The V^2 in the formula shows that drag increases by the square of the swimmers speed, or more simply, the faster you swim the more important it is to reduce your frontal area and be streamlined to reduce drag. *(For more information on this subject and the scientific study of swimming, we recommend the book 'Swimming Science' edited by G. John Mullen).

Good quality teaching and coaching is fundamental to reducing drag; as is repetitive guided training. Use of a variety of aids can also help the swimmer by developing a better (horizontal) body position, becoming more streamlined, reducing frontal area and to gain a 'feel' for drag created by the water. Pool swimmers generally swim the range of strokes, whereas triathletes and open-water long distance swimmers predominantly focus on front

crawl/freestyle. Yet all swimming benefits from improved technique, be it raw speed for pool sprinters or stroke efficiency for longer distance swimmers and triathletes.

Body rotation and kick in any freestyle swimming in crucial to both efficiency and speed. Whereas the modern sprinters have developed a flatter stroke, the kick is crucial to the speed and the body must control the rotation of the arms and the shoulders. This stroke is not efficient over longer distance because it creates more drag. Yet power overcomes this at the margin in order to improve speed over a short distance.

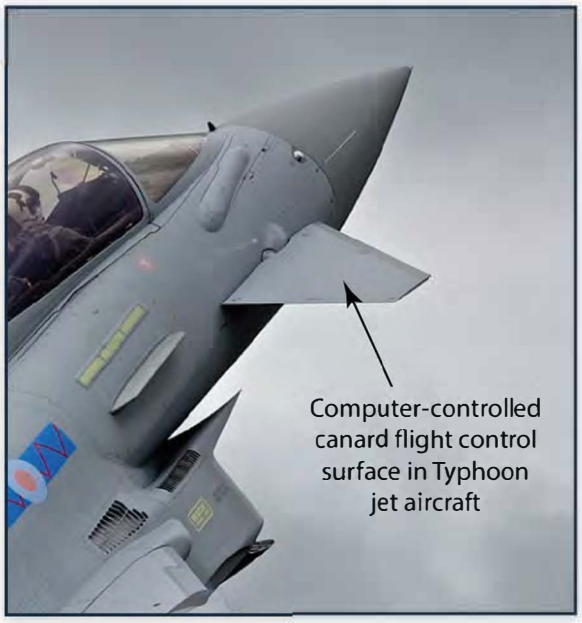
In longer freestyle events, body rotation and streamlining is vital to the efficiency of the stroke and hence speed over longer distance. And to improve rotation, the body must move as one from control of the head down to the feet. So for triathletes and long distance swimmers, the kick may be more to flatten the body position, hence reducing drag. It will also help body rotation to lengthen the stroke (increasing distance covered per stroke) and presenting a lower torso frontal area as the upper body and shoulders rotate (again reducing drag).

So, the freestyle kick should not be solely downwards, especially in longer distance swimmers. Generations of swimmers have learnt with 'flat' kickboards, developed in the 1940s, which inherently stop rotation. Such flat kickboards are important for young and inexperienced swimmers, giving balance whilst they learn to kick. Yet as swimmers develop, this balance or stability becomes a hindrance when developing the rotation which is vital in an efficient stroke. There is now a training aid which encourages rotation, in addition to helping improve core strength and having a low drag coeffiecient which allows use in all strokes. This is Torpo ®

Torpo works by being perfectly unstable in the rolling motion side-to-side, like a 'Swiss Ball' is in the gym. It allows swimmers both inexperienced and highly competent to roll whilst kicking as in a front crawl stroke. It will help young swimmers to roll more freely and develop a better leg kick and body motion as they improve their swimming. Rotating to 45-60 degrees is easy with Torpo, helping swimmers learn the correct body roll angle by mental and muscle memory whilst training with Torpo. So when the full stroke is performed, a more accurate and natural body roll ensues. It can also help the advanced swimmer, opposing hip roll which balances the swimmer whilst rolling the upper body.

Like a Swiss Ball, it will also help develop greater core strength as the swimmer has to control the unstable rolling motion with core muscle strength. This appears subtle at first when using Torpo, although more pronounced with greater use. Even an Elite swimmer could feel the benefit to the core on initial use.

The idea for Torpo was inspired by the way modern fighter jet aircraft are designed. These aircraft are designed to be 'unstable', allowing fast roll rates whilst controlled by computers with small 'canard' flight control surfaces.



Similarly, Torpo is designed to be unstable so the swimmer controls roll during front crawl kicking drills, as would be done during the full stroke. In front crawl swimming, this enhances hip and shoulder rotation, minimising drag and improving speed. It means kicking drills teach correct body movement from a young age up to elite levels.

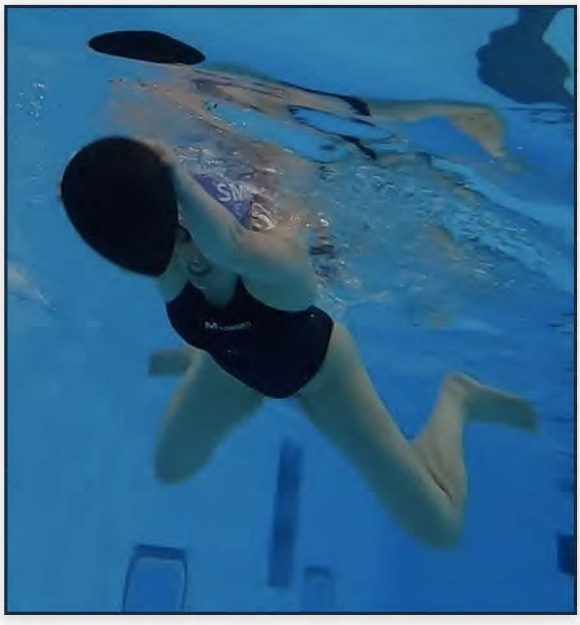
There are many muscle groups which benefit from Torpo's instability. In the side of the body these include the latissimus dorsi and the serratus anterior. In the back from the pelvis up to the neck, the erector spinae, there are three groups of controlling muscle. In the neck and shoulder area are the deltoid and trapezius muscles. In the stomach the rectus abdominis and abdominal oblique external muscles work to control body roll and core strength. And in the chest the pectoralis major are controlling the arm movements.

The natural teardrop design of Torpo reduces drag significantly against a flat kickboard. It allows greater streamlining, hence more speed whilst kicking. This then enhances the effect of the kick closer to the kick whilst swimming front crawl. Though if increased resistance is required for the kicking drill, Torpo can be held vertically which will produce drag akin to a ball.

Shoulder impingement and lower back pain is frequent in regular competitive swimmers especially when kick-training over large distances. Torpo encourages 'head down' kicking with side breathing, as would be done in the front crawl stroke. Whereas the flat kickboard is often used as chat time with head up, Torpo will force swimmers to maximise their drills.

The flat kickboard is mostly inclined causing significant drag. This also places lift on the board forcing the arms and shoulders up. Whilst Torpo may not entirely solve these issues, the biomechanics of Torpo with improved arm and head position may reduce strain on the rotator cuff in the shoulder and the lumbar spinal area and related muscle groups.

In breaststroke and butterfly, Torpo's streamlined teardrop shape has some stability in forward pitching moment, akin to the way a dolphin would move vertically in the water. This allows the breast stroke swimmer to practice the vertical movement gained from the arms during the full stroke, whilst isolating the legs.



A flat float stops natural vertical movement introducing unwanted pitching motion during the drill. Torpo enhances this vertical movement naturally, whilst forcing the swimmer to use core muscle groups to maintain roll stability against its inherent roll instability.

In **backstroke**, Torpo makes back leg drills comfortable whilst encouraging natural roll controlled by core muscle strength. Different hand positions are possible using the ergonomically designed handgrips which make the back drills more pleasurable and effective than such float free drills with arms extended.

We are sure you will enjoy and find new uses for Torpo, we would love to hear. Follow the **@torpouk** Community and share your ideas.

The Safety Bit

Safety information:
The Torpo ® T500 has been safety tested to EN 13138:2014-2

Torpo is sold in different sizes to suit age, gender, body shape and usage as appropriate. We recommend that Torpo is used by swimmers able to complete unaided at least one length of a 25 metre pool or equivalent, aged 8 or over. The Torpo T500 is intended for swimmers aged 12 or over, and weighing over 30kgs.

Young children below this age, new and inexperienced swimmers unable to complete a length of a 25 metre pool or equivalent should use a traditional flat kick board which gives stability whilst learning to kick.

WARNING: Will not protect against drowning. Use only under constant supervision

ATTENTION: N'empeche pas la noyade. A n'utiliser que sous surveillance constante

WARNUNG: Kein schütz vor Ertrinken! Nur unter ständiger Aufsicht verwenden

WAARSCHUWING: Beschermt niet tegen verdrinking. Uitsluitend gebruiken onder bekwaam toezicht

ADVERTENCIA: No protegerá contra el ahogamiento. Usar solo bajo supervisión constante

AVVERTIMENTO: Non proteggerà dall'annegamento. Utilizzare solo sotto costante supervisione

警告:將無法防止止溺水水。僅在持續監督下使用用。