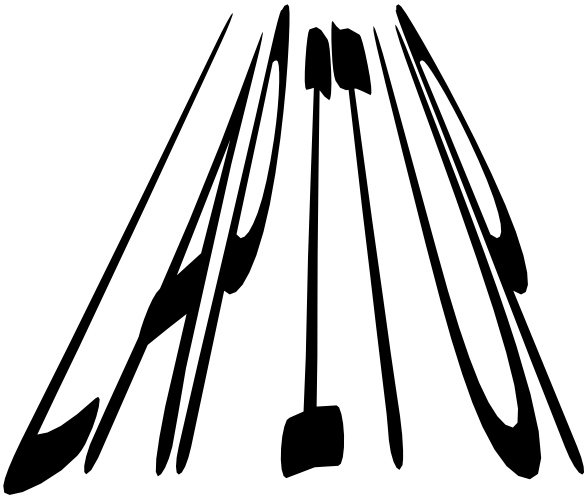


Hand book for Warringah Masters Swimming Inc.
Compiled by Noel Peters

Some facts …

- Club was formed – late 1982
- Club was registered – early 1983
- Earliest membership list surviving – May 1984 (65 members)
- Ten members on that list were still enrolled in 2002
- Currently one club swim each week – Sunday morning 7:30 till 9:00 am
- Originally our club colours were blue and red – in January 1992 Narrabeen Masters Merged with us and their colours of light blue and white were added to the hues of our track suits
- Our club emblem was designed by founding member – John MacDiamid

Compiled by Noel Peters between 1997 and 2000, added to and Changed on various occasions till this present compilation in early 2008.

This booklet was intended as a self reference note book to remind me of the principles of, and need for planning training programs that keep my swimmers interested and happy.

Apart from my tuition from Masters Swimming coaching level one instruction, and several correspondence courses from ASCATA and the Australian Coaching Council, I have accessed and used information from printed publications and from Internet pages.

Although I never made notes regarding the authors at the time and do not remember the detail of whom and when. I subsequently apologise if anyone is offended.

CHECK OUT THESE TIPS FOR SMOOTHER SWIMMING IN YOUR LANE

LANE LEADING

Who should lead the lane? Nothing makes a set run smoother than a good lane leader. The first swimmer in the lane must understand the set and all the intervals, be able to see and read the pace clock and have a good sense of pace. If you typically take it out fast and fade, you are better off swimming behind a team mate who will pace the set better. The lane leader should use common sense and realise that the way he/she swims the practise affects everyone in the lane. The other swimmers need to support their lane leader, correcting errors and electing new leaders at the correct time. All swimmers should allow at least 5 seconds after the preceding swimmer leaves before pushing off.

PASSING

With a number of swimmers in your lane, the need to pass another swimmer during a swim session is almost inevitable, especially in distance sets. The key to keeping the lane running smoothly and help all the swimmers focus on the practise is to determine the passing strategy for the lane before the set begins. Communicate with your lane mates and determine what will work best with everyone in the lane! Passing in the middle of a lap in a crowded lane is dangerous and not recommended. Instead, we recommend using this common set of guide lines:

It is best to make the pass at the end wall rather than in the middle of a lap. Here's how …

… **A** wishes to pass **B** …

- **A** gently taps the feet of **B.**
- At the next turn , **B** pulls over to the right corner of the lane and stops.
- **A** makes a flip turn at the centre of the lane.
- **B** starts swimming again, behind **A**.

In general when circle swimming[1.] in practise, swimmers should make their turns towards the ***right corner*** of the lane. As soon as the swimmer ahead of you finishes his turn and goes by, your should swim towards the ***centre*** of the lane , make your turn to the ***right*** of the cross on the wall, and push off on what is now the ***left-hand*** side of the lane. If everyone does their turns this way, we will avoid colliding with each other.

With regard to resting on the wall in the middle of a swim, - swimmers should hang on the wall in the *extreme right corner* of the lane. This will allow the following swimmers to continue and make their turns at the lane centre without interference.

Also when finishing your set swim, be sure to finish as far to the right as possible so that the swimmers behind you have room to finish to the wall.

One of the secrets of swimming efficiently is knowing how to relax. Good swimmers go farther and faster in the water with less effort than novice swimmers. Why? … Because they are comfortable in the water. They relax and extend their bodies fully to get the most out of each stroke

1. … Circle swimming indicates swimming on the left side of the lane.

ARRIVING LATE AND LEAVING EARLY

With the busy lifestyles we all lead, it is almost unavoidable that one of us will arrive late to our training session occasionally. When arriving late, you will want to consider that the practise has been designed from warm up through cool-down, and when you hop into the action midway, you will not be getting maximum benefit from the practise. Late arrivers can potentially disrupt the flow of a lane if they are not considerate of those busy in the program.

Here are a few things to help you integrate into the practise smoothly when arriving late:

- Talk with the coach to find out what set the lane is doing and how far through the set they are. Do not expect the swimmers to stop and explain it to you.
- Wait till the swimmers are resting at the wall to announce your arrival. Do not surprise them by just hopping in and swimming with them.
- Swim at the tail end of the lane and warm up slowly while raising your heart rate. Once you are up to speed and the interval allows, adjust your position within the lane to one most appropriate for your speed.
- Like arriving late, early departures are just part of our tightly scheduled days. Before the set begins, let your team mates know that you will be leaving early. This is particularly important if you are leading the lane. Those behind you will want to make sure they understand the set, the intervals and the send off times.

STARTS AND TURNS

Negotiating the walls properly leads to a smoother running lane. Imagine it is Wednesday morning, you are feeling great, and you've found great a rhythm. The lane is crowded, but has run smoothly through the first half of the main set. Then it happens: a traffic jam at the wall. There are people all over the lane and no place to turn. The swimmer in front of you just about clipped you coming out of his turn. You begin to think it would be safer on the freeway right now! You've lost your focus, your count, your rhythm and your enthusiasm, and the rest of the practise is a waste.

How can this be avoided? Follow these guidelines for negotiating the walls in your lane and you will encounter less traffic hazards.

Pushing Off: The leader of the lane should always be on the wall at the far left side of the lane, ready to push off into the swimming lane. The other swimmers should move to the left side of the lane as their turn to push off approaches and as the people ahead leave. Watch the pace clock and push off 5 seconds after the person in front of you.

Turning: As you approach the wall for a turn, once the people ahead of you have passed by, cross over to the right hand side of the lane. Make your turn to the right of the centre line and push off along what is now the left side of the swimming lane. If you experience crowding at the walls and there is a limited number of swimmers in the lane, consider leaving with 10 seconds interval between swimmers. Tumble turns (Flip Turns) are recognised as the norm for freestyle swimming although open turns can be equally efficient.

Finishing: As in turning, finish as far to the right of the lane as is possible. Leave space so that the swimmers behind you have an opportunity to finish to the wall.

Passing: Communicate a passing strategy within your lane before the set begins. The same

strategy will not work in all lanes. If you stop for any reason in the middle of the set, stay at the far right corner of the lane, out of the way of other swimmers.

MODIFYING THE PRACTISE

Generally the coaches frown upon modifications to the practises since they have designed each with certain goals in mind. However, swimmers are free to adjust the sets as they wish.

Nevertheless when only some or one of the swimmers in a lane is making adjustments, there can be problems. All the swimmers in a lane need to discuss any modifications before beginning the set, and they need to agree on the new plan. If it is inevitable that people will be swimming modified sets but sharing a lane, they all need to use the proper passing techniques to avoid collisions.

That said, the people who are following the coached practise should get priority within the lane over the others.

ATTITUDE

Following the guidelines above will help make training sessions more beneficial and enjoyable for everyone. It is also important to have a good attitude about the practises and your lane mates. If you train early in the morning, it is reasonable that you may sometimes be less than happy during practise. However, there is no reason to take it out on your team mates. If you are looking for conflict … please don't get in.

If you have a question regarding lane etiquette, please ask your coach!

All Masters swimmers should be familiar with the concepts of warm-up, stretch and cool-down. It should be emphasised that the reason for warming prior to training or competition is to allow your muscles to function more efficiently.
A warm muscle stretches more readily and contracts more effectively, therefore minimising the risk of injury to itself. A cool-down allows for gradual cooling of muscles , which minimises stiffness and the tendency to injury thereafter. Stretching done in a gentle, 'non-bouncing' way aims at enabling the full length of muscles and tendons to be used in training and competition. Warm-up, stretching and cool-down are recommended as an integral part of every training session.

Some Swimming Terminology

CRUISE INTERVAL

The **cruise interval** is the time that allows you to swim 100 metres freestyle at least ten times comfortably, with a low heart rate, when you have 7 – 10 seconds rest between each 100. For example, a 1:30 cruise swimmer is a swimmer who swims 100's comfortably in 1:20 – 1:23 and departs (has a send-off) on a 1:30 interval. For this swimmer , 1:30 is called the cruise send-off interval or cruise interval. (I.e. On the white board … ? X 100 on 1:30.)

DETERMINE YOUR CRUISE SPEED AND CRUISE INTERVAL

Have yourself timed and swim 10 X 100 metre swims with a rest interval of 10 seconds between each swim. From the elapsed time deduct 90 seconds to derive your swimming time. Divide this time by 10 to derive your **Cruise Speed**. This is the minimum pace you should maintain during your training sets unless directed by the coach to swim otherwise. To your cruise speed add 10 seconds to find your **Cruise Interval**. This is your *cruise send off interval.*

Note: **Cruise send off intervals for longer (and shorter) distances** are calculated by extrapolating the 100 cruise over the specified distance. The 1:30 cruise swimmer will swim 50's on 0:45 (1:30 ÷ 2), 200's on 3:00 (2 x 1:30) and 400's on 6:00 (4 x 1:30).

Cruise send off intervals are often adjusted by adding or subtracting seconds from it. Also, seconds are added to or subtracted from the cruise intervals, not for each 100 in the distance Example of "cruise – 5 secs." : The 1:30 cruise swimmers "cruise – 0:05" intervals are as follows: 100's on 1:25, 200's on 2:55, 400's on 5:55.

WARM UP

The warm up is almost always some version of 400 metres or more. Swim this very easy in what should feel like slow motion swimming. Stop to stretch when-ever you need. This is the time to adjust goggles, caps and what ever. Swim slowly and silently and think technique.

DRILL and/or KICK SETS

These sets are usually an extension of warm-up. There are rarely interval times associated with these sets, so you may focus totally on stroke technique without concerning yourself with speed or rest. Again, stretch as necessary and pay close attention to your body position and form. Allow your heart rate to increase slowly. You should take 10 – 15 seconds of rest between each part of the Drill Set.

MAIN

The main set ranges in length from 1,000 to over 2,000 metres. To modify the main set (or any set of any workout) for less distance, you may either decrease the distance in the repetitions or decrease the number of repetition. For example: a set **10 x 100** can be modified to **5 x 100** or **10 x 50** to arrive at a set of one-half the distance.

COOL DOWN

An easy cool down swim at the end of your workout is necessary to allow your heart rate to return to normal before you leave the water. This can consist of any easy swimming or any in water activity or maybe some easy stretching on the pool deck. The only stipulation is that your cool down should be unstressed and relaxing.

If your water time is limited, avoid the temptation to eliminate the warm-up and/or drill sets. They are important for injury prevention, better stroke technique and the flow of the workout. Equally important is to leave time for a cool down at the end of your workout.

PATTERN REPEATING

Often the workout will give you a pattern of strokes and/or drills and/or kicking to do over a given distance. Note that the pattern does not always equal the distance of the swim. You are being asked to repeat the pattern over the distance. Foe example the following set:

1 x 300 as 50 free / 25 back / 25 breast : is asking you to swim the pattern of 50 free / 25 back / 25 breast as many times as necessary to complete 300 metres. In this case it is 3.

DESCEND

Descending sets asks you to swim each repetition faster than the previous. For example, the following set: **6 x 50 Descend 1 – 6** … asks you to swim six 50's with each one faster than the previous. If the set read : **6 x 50 descend 1 – 3, 4 – 6** … you are asked to descend the first 3 and the second 3 of the set. The fourth 50 would be slower than the third. The third and sixth are the fastest of the set. Unless specified, the interval stays the same, giving you a bit more rest as your swimming time descends.

BUILD

Building is different from descending in that the swimmer's goal is to increase speed within the single swim distance. For example, the following set: **3 x 100 build** … asks you to swim each 100 starting easy (with perfect technique) and increase speed within each 100 to a fast finish (maintaining perfect technique throughout). As you have guessed, the goal in a "Build" set is to increase speed (build) while maintaining good stroke technique.

TRANSITIONAL IM (sometimes called Medley Build or Progressive IM noted on the white board as TIM, PIM or MB)

These are IM repeats that work on the stroke transitions of the Individual Medley. The four transitions are fly - back. Back - breast, breast - free and free- fly. The following set: **4 x 100 Transitional IM** would be swum #1) 50 fly / 50 back, #2) 50 back / 50 breast, #3) 50 breast / 50 free, #4) 50 free / 50 fly. The following set: **8 x 50 Transitional IM** would be swum as #1) 25 fly / 25 back, #2) 25 back / 25 breast, #3) 25 breast / 25 free, #4) 25 free / 25 fly. The PIM set is repeated with #'s 5 to 8.

A variation of Transitional IM's is **Progressive IM Form** (PIM form or PIM stroke). This is done in multiple sets of fly/back - back/breast - breast/fly (Ie. No free).

IM SWIM

This set is described as an IM with even lengths freestyle. For example, a **200 IM Swim** would be swum as 25 fly / 25 free / 25 back / 25 free 25 / breast / 25 free /25 free / 25 free.

A **150 IM Swim** would be swum as 25 fly / 25 free / 25 back / 25 free / 25 breast / 25 free.

SWIMMING DRILLS

DRILLS COMMON TO ALL STROKES

DPS – Distance Per Stroke

Swimming all strokes to get maximum distance per stroke. With free and back, emphasise a long body line, hip and shoulder rotation to minimise resistance. With breast and fly, keep the body line long in front of your stroke. Keep your rhythm steady and swim in the front quadrant of all strokes.

FIST SWIMMING

Swimming with hands completely in a fist. Concentrate on body position, using your forearm in the catch and optimum elbow bend throughout the stroke. When you return to swimming with an open palm, your hands will feel as big as kickboards! (so they say) - think distance per stroke.

SCULLING

Sculling is performed by sweeping your hands through the water , holding your elbows still. Your hands are acting like propeller blades, and subtle changes in hand pitch and speed will change your body position and speed. There is no recovery motion. When you are treading water, you are sculling your hands through the water to hold yourself up and counteract gravity. To propel yourself down the pool, simply change your hand and forearm angle to be perpendicular to the pool bottom and parallel with the pool walls. Keep your elbows high at the surface of the water, and sweep your hands underneath like a windshield wiper. Note that your swimming strokes are a combination of sculling motions that allow you to hold the water as your large core body muscles act as the engine.

KICKING

Freestyle, (Front Crawl) … Kicking without a kickboard in a streamlined position will allow you to perform your kick in the same body position of the stroke. In this position you may breath forward with a small sculling action or breath to your side by taking one arm stroke when needed.

Kicking head up with a kickboard is a good conditioning drill as the head up position lowers you hips and legs and forces you to kick harder, giving your leg, gluteus and stomach muscles a good work-out. Grab your kick board by the front with forearms resting on the board and chin at water level, maintain a firm even kick.
Using swim fins (Flippers) will improve poor ankle flexibility. If using fins, it is recommended that you use short training fins not long bladed scuba style fins.

Kick on side … Kick on your side with your bottom arm (the one closest to the bottom of the pool) extended straight out in front from your shoulder line. Keep your palm facing down and your hand extended about 15 – 20 centimetres under the water. The top arm (the one on the surface of the water) should be relaxed at your side with your hand on your thigh. Your top arm should be out of the water from your shoulder to your wrist. Maintain a head position as though you were swimming freestyle, with you head in line with your spine. Press your armpit towards the bottom of the pool to get your hips at the surface of the water. Your extended arm should feel weightless.
For Backstroke, kick on your side as described above, but with your head facing up in the

position for backstroke. You may also kick in the streamlined position with both hands in front of your head, arms straight and upper arms squeezing your ears.

Breaststroke, kick with a foam kickboard that will allow you to maintain a good body position for breaststroke. Without a board keep your hands extended at your side. Try to maintain the same "dolphin" undulation when you kick as you would when swimming the full stroke. You may also do breaststroke kick on your back. When breaststroke kicking with your arms extended at your sides (either prone or supine) try to touch your heels to your fingers.

Breaststroke kick in a streamline position emphasises the glide of the stroke.

Butterfly, go for it either on your side on your back or in the prone butterfly position. Kick from the hips and the torso. This is a great "abs" workout. Make your kick part of your "whole body dolphin" action.

SWIMMING GOLF

While swimming 25 or 50 repeats calculate your "score" for each length by counting your strokes in both directions (one hand entry equals one stroke) and adding it to your time. For example: If you swim 25 freestyle with 20 strokes in a time of 0:25 you would have a score of 45 (20 +25 = 45). Descend your score by taking less strokes and/or completing the 25 in less seconds with each successive 25.

To control your head movement in the water, try to maintain an imaginary straight line that runs from the top of your head to the base of your spine. Never lift or drop your head from that imaginary axis, even when you turn your head to breathe.
Remember – rotate not lift!

FREESTYLE DRILLS

CATCH-UP DRILL

When swimming Catch-up freestyle, pull with one arm at a time and touch your hands in a streamlined position out front between each alternating arm stroke. Keep your extended hands about 20 centimetres under the surface of the water for improved body position. Concentrate on swimming in the front quadrant and keep a long streamlined body line.

You can progress to simply exchanging hands in the "passing zone" extended in front. You begin your catch and pull as your recovering hand passes your ear and is about to enter the water at the completion of recovery. This is usually referred to as "Front Quadrant Swimming" … Both your recovering hand and your stroking hand are in the water in front of your shoulders and head at the same time … I.e. "in the front quarter".

SINGLE ARM (CATCH UP) DRILL

This is catch up drill performed with a non stroking arm held in front and catch up stroking performed with the other arm. Change your stroking side at regular intervals or after each pool length.

FINGER TIP DRAG (FTD)

This drill is swimming normal freestyle while dragging your fingertips along the surface of the water during recovery. Focus on a high elbow recovery with your recovering hand close to your body. This ensures proper hand and elbow position for re-entry. Your recovering hand should enter the water directly in front of your head. You should also check your body position during this drill focusing on good side-to-side rotation. FTD can be incorporated with single arm catch up drill to emphasise high elbow recovery.

TRIPLE SWITCH (triple hand, 3 x 3)

This drill is similar to the single arm catch up, - but you take three CU strokes each side as you switch from side to side. Focus on long strokes during these three strokes, and quick hips to initiate and complete your rotation from one side to the other

SINGLE ARM DRILL

Single arm freestyle swimming can be done in either of two ways.

Preferred – With the opposite (non-working arm) at your side breathe to the side of the non-working arm. The secret of success with this drill is to complete your breath before stroking. Concentrate on the catch and initiate body rotation with the core body muscles. Take this drill slowly … technique is more important than speed.

Old-School **–** With the non-working arm extended in front breathe to the side of the working arm. Focus on high elbow recovery, hand entry and hand acceleration.

RHYTHM DRILL

Single arm freestyle with the non-working arm at your side (see *Preferred* method) executing 2 right arms and then 2 left arm strokes. This takes some practise, but may very well become your favourite freestyle drill once you master it. Focus on rhythm and timing from the hips. Remember to take your breath with an arm extended out in front. If you swim this drill comfortably and well your technique is close to perfect.

BACKSTROKE DRILLS

SINGLE ARM (R, L) DRILL

Single arm backstroke is always done with the opposite or non-working arm at your side. Allow the non-working arm to be completely relaxed, and do a half-recovery if it feels natural. Concentrate on full hip and shoulder rotation and a great body position.

RHYTHM DRILL

Single arm backstroke alternating 2 right arms and 2 left arms. Do a half recovery with the non-stroking arm if necessary. Focus on rhythm (early hips) and a good body position.

HESITATION DRILL

Swim normal backstroke but as your arm begins recovery - pause and hold the recovering arm at a 30 degree angle out of the water. You should already be rotated to your other side and your stroking arm should be in the perfect "catch" position (hand 20 centimetres under - water with palm turned out and downward slightly with a high elbow) if your timing is right. Make sure your hips are still at the water surface in this position. After holding for 2 or 3 seconds complete the stroke and pause on the other side to repeat the drill.

CATCH-UP DRILL

As with the freestyle version, pull with one arm at a time all the way through the stroke. The non-working arm should be extended out in front in a good streamline position. You should not actually touch hands when switching strokes from one side to the other, but allow your arm to complete its recovery through the hand entry before pulling with the other arm. Again this drill is great for working on body position (hips up and full side to side rotation).

GALLUP DRILL

This drill for backstroke focuses on arm speed. Kick on your side for a count of 6 – 8 seconds holding the recovery hand not at your hips but about 15 to 20 centimetres out of the water. Lower the recovery hand back into the water by your hips and then explode with 3 quick powerful strokes. Snap your hip rotation and maintain good body position. After 3 strokes repeat on the other side.

FREESTYLE AND BACKSTROKE OVERVIEW

Freestyle and backstroke are referred to as the **long axis strokes** as you are rotating on the long axis of your body (head to toe) while swimming. Hence many of the same drills can be used for both strokes and/or combined into one drill. Backstrokers - IM'ers and all "novelty stroke" specialists are encouraged to mix backstroke into freestyle sets.

Backstroke and freestyle mix sets can make great low heart rate aerobic training sets.

LONG AXIS COMBO DRILL

This drill allows you to feel the similar rotation of backstroke and freestyle. Alternate four strokes of backstroke with four strokes of freestyle with 4 to 6 kicks in each side lying position. Drive the rotation of your strokes with your hips. Keep a light easy rhythm – don't muscle the water.

LONG AXIS COMBO SWIM

Performed in the same manner as the drill except that the 4 to 6 kicks in the side lying position are eliminated. When doing the LA Combo swim don't try to muscle your way through the water but take it slow and easy. Think of slipping through the same hole in the water and maintain good body alignment and keep your stroking long and relaxed.

4/6/8 – COUNT DRILL

This drill can is used for both freestyle and backstroke. Kick on your side for a count of 4, 6 or 8 kicks (or counts). Take one full arm stroke to rotate to your other side for another 4, 6 or 8 kicks or count and continue through the set. While on your side, focus on correct body alignment. During freestyle, when executing the switch begin by lifting the elbow of the arm on the water surface (top arm) and recovering it over your body. The extended arm (bottom or leading arm) stays extended to maintain a streamlined body position, until the elbow of the recovering arm has passed over your head. This will ensure that hand and forearm is in the correct position for re-entry. Then execute a quick switch to your opposite side. Use core body muscles to rotate while maintaining a hold of the water with your bottom arm.

BREASTSTROKE DRILLS

TWO-COUNT GLIDE DRILL (Long Glide Breaststroke)

Hold the streamline *(stretched)* position of the stroke for a full count of two (one thousand and one – one thousand and two). Keep your head down and in line with your spine. Be sure not to pause your hands under your body, only in the extended position. Then start the pull *slowly,* pitching the hands outwards until they are shoulder width apart, and then accelerate your hands through the power phase (the in-sweep) continuing all the way through to the recovery and glide.

It's a good idea to combine this drill with underwater pull-outs to increase the feel of gliding in the streamlined position.

TWO KICKS / ONE PULL DRILL

Hold the streamline for a second kick in each stroke. While doing the second kick allow your hands to separate slowly to press your head and chest lower into the water . Keep your chin down and look at the bottom of the pool. This will prepare you for a more powerful in-sweep and recovery. Use the sequence – kick – pull – kick – glide / kick – pull – kick – glide.

Remember your recovery action in breaststroke should be done with "vigour".

TWO PULL / ONE KICK DRILL

Take a powerful pull swinging the hips forward and under your torso and then throw your hands into the recovery/streamline while making an exaggerated dolphin kick. Repeat the powerful pull but kick with a breaststroke kick. Alternate between the two kicks. Notice that the hip motion should be identical with the dolphin kick and the breaststroke kick.

PROGRESSIVE SCULLING

To work toward the correct breaststroke pull pattern (heart shape) with coordinated breathing. In the streamline position start to swim breaststroke with a small sculling action of the hands. Progressively increase the size of the scull till a normal breaststroke pull is achieved, with the pull ending approximately at the shoulders, bringing the hands and forearms inwards and under the upper chest and chin.

BUTTERFLY DRILLS

SINGLE ARM FLY DRILLS

Traditionally, this drill is performed with one arm extended and one arm stroking. Focus on kick timing of "kick your hands into the water" and "kick your hands out of the water". Accelerate the pull and snap your hands through the finish and into the recovery. While doing single arm fly drills you may breathe either forward or to the side.

An alternate way of swimming the single arm fly drill is to leave the non-stroking arm at your side. This drill works on connecting the finish of the butterfly stroke with the recovery. You will have the feeling of "throwing your arm away". Always concentrate on "getting in front" for an effortless butterfly stroke.

You have three drill options for the recovery portion of the stroke and are usually combined with full stroke swimming.

Thumb-Tip Drag: Bend your elbow and keep it high. With your palm facing rearwards towards your feet, stick your thumb down and drag it along the surface of the water. This drill helps keep your hands and elbows in the proper position at the hand entry.

Super Dolphin: Over emphasise the "dolphin" undulation of the stroke. During the recovery, reach straight up to the sky with your arms, and look up. Drive your upper body as high as possible, then dive forward as your hand enters out front, driving your hips upward. Feel the rhythm of the arms with the kick.

Standard Recovery: Keep the elbow slightly bent, and sweep the hand low over the water during recovery. Drive your head more forward than upward. Breathe with your head in line with your spine, don't lift your head any further than is necessary to inhale. Practising this drill simulates the stroke without tiring the swimmer unduly.

Three Kick / One Pull:

Extend the arms out front in the streamline position and take three full kicks. After the third kick, take one powerful pull in time with the kicks. Recover the arms to the streamline position and repeat.

BREASTSTROKE AND BUTTERFLY OVERVIEW

Breaststroke and butterfly are known as the **short axis strokes**. are called so because you are rotating on the short axis of your body, through your hips. Like free and back, the core muscles of the body are the engine. Your arms and legs serve the dual purpose of acting as extensions to apply the force, and to lengthen the body as it passes through the water.

SHORT-AXIS COMBO DRILL

This is the drill that allows you to feel the "short-axis" rhythm that is similar with breast and fly. Alternate three strokes butterfly with three strokes breaststroke with a continuous dolphin kick and body action. Concentrate on "landing in front", and exaggerate the press in front that allows the hips to rise. Keep the dolphin undulation pace constant.

PROGRESSION DRILLS

Drill progression can make drill and kick sets more interesting and also emphasise the specific benefits of the set. Some examples are:

Progressive catch up drill swum as a 100 metres set in a 25 metre pool, the progression would be – 25m x one arm only catch up – 25m x other arm only c/u – 25m x 3 strokes left arm c/u then 3 strokes right arm c/u – then 25m x full stroke catch up.

The 100 metre set can be repeated as many times as you desire.

Kick to swim drill as with the above drill this is swum in 100 metre sets as 25m x 6 kicks on one side then one stroke followed by six kicks on other side - 25m of 4 kicks and one stroke, then 25m of 2 kicks and one stroke and the final 25m is swum as a long stroking front quadrant freestyle. Indicated on the white board as 6 x 6, 4 x 4, 2 x 2 , swim.

Do as many of these sets as you like.

You can make up sets like these to suit yourself – for example you can use the long axis combo drill by swimming the 1st 25 as 7/3 front crawl – the 2nd 25 as 7/3 back crawl – the 3rd 25 as long axis combo drill and finish with 25m of long axis combo swim.

… How do you get the most out of training alone? … Well here's how! … Before you leave home write yourself a swim program to follow. If you find that difficult just try to remember on of the sets you have swum on a Sunday morning lately. When you get to the pool follow your program diligently and you will have a better workout exercise wise and you will enjoy it more

Basic Principals of Swimming.

Part of the charm of swimming is the constant variety it offers. But, since all the four strokes Involve propelling oneself through the water as efficiently as possible; it is not surprising that they share basic elements.

The late Dr James 'Doc' Councilman, perhaps the world's foremost authority on swimming technique outlines five principles that all swimming strokes have in common. It is important to keep these in mind as you learn to swim better and faster. To refresh your knowledge these five principles are examined below.

1 … Streamline your body.

In order to move through water more efficiently, you should try to create as little drag as possible. To do this you must keep your body flat in a flat or horizontal position. If you are swimming freestyle or backstroke, for example, and you lift your head too high to breathe, your hips and legs will drop and you will be moving forward at an angle, creating unnecessary resistance (Figure 1). The same is also true in respect of the lateral position of the body. Lateral movement of the hips or legs will also create unnecessary resistance. So for the same reason you must avoid excessive lateral movement from side to side, or

wriggling of your hips or legs back and forth. The less drag you create, the less energy you will need to propel yourself forward. Try to feel the water flowing around you. Think of yourself as a smooth, sleek sea creature gliding effortlessly through the water.

Figure 1… Dropping your hips and legs creates unnecessary resistance.

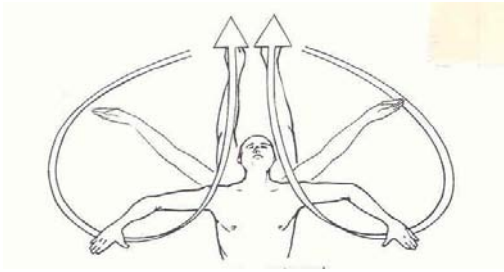
2 … Obey Newton's Law

Sir Isaac Newton's third law of motion states that for every action there is an equal and opposite reaction. In swimming this means if you wish to move forward, you have to push backward. Many swimmers believe that if they push directly back in a straight line they will move forward most economically. However this is not the case.

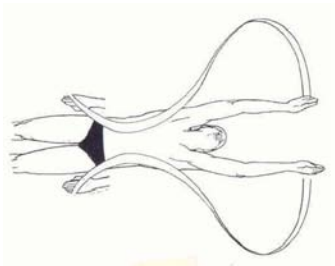
Why? Doc Councilman explains by comparing swimming with running: a runner pushes against the ground almost directly backward and as a result, is pushed almost directly forward. This happens because the ground does not move when he pushes against it. When a swimmer pushes his/her hand against the water, however the water naturally moves in the direction the hand pushes it. If she continues as to push backwards in a straight line, the swimmer is pushing water that is already moving backward. Thus, she receives almost no additional propulsion. *To solve this problem she must move her hands in an elliptical pattern to find still water to push against*. This is true for every swimming stroke Figures 2a, b, c, and d, illustrates the elliptical pull pattern of the four strokes.

Figure 2 a. The freestyle pull pattern seen from underneath.

2b. The backstroke pull pattern as seen from the side.



2c. The breaststroke pull pattern as seen from underneath.



2d. The Butterfly pull pattern as seen from underneath

3 … Use the proper pull

When learning, one of the most important things to concentrate on is using the most effective pull. Most beginning swimmers either drop their elbows or use a straight arm pull.

The dropped elbow pull is the least efficient. As Figure 3 indicates, a swimmer using this pull has very little leverage and exerts forces backwards only from the middle of the stroke. At the beginning, most of the force is applied downward, where as at the end, most of the force is applied. The result is that the swimmer expends a lot of energy for very little forward propulsion.

Figure 3. … The Dropped-Elbow Pull

The Straight Arm Pull (see figure 4) is a little better. But the same mechanical problems are present: most of the force is exerted downward or upward, rather than backward. This tends to make the swimmer bob up and down, and in the process creates additional drag.

Figure 4. … The Straight Arm Pull

The most effective pull of all types is illustrated in Figure 5. It begins with the elbow only slightly bent. The elbow increases its bend until it is in a vertical position, directly **below** the swimmer. As the stroke continues backward, the amount of bend in the elbow decreases steadily until the end, when the elbow is almost straight *(except in breaststroke).* Notice the elbow is carried in a high position throughout the pull. As she begins to bend at the start of the pull, the upper arm rotates inward. In this type of pull, the downward and upward forces are minimised and the backward pull is maximised. Thus the swimmer is propelled smoothly through the water.

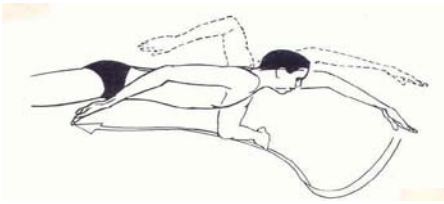


Figure 5. … The Correct Pull.

4. … Position your Hands Efficiently

There are two things to keep in mind about the position of the hands while swimming: how they enter the water and how you hold them during the pull. Your hands should enter the water by knifing cleanly through it. If you slap the water, air bubbles will form around your hands, decreasing the efficiency of your pull. Likewise as your hands leave the water they should be as streamlined as possible so they do not exert an upward force, which will push you down.

How should you hold your hands and fingers while swimming? … When I first learned to swim, *I* was taught to cup my hands during the pull. But research by Councilman using a wind tunnel demonstrated that this is one of the least effective ways of holding your hands while swimming. Why? … Because it decreases the hands surface area and thus reduce the efficiency of the pull. The best way to hold your hands is flat, with the fingers firm but relaxed and spread slightly apart.

5. … Apply Propulsion Evenly

When swimming you must try to move forward at an even pace. This is termed the continuity of movement principal. If you are continually stopping or slowing down, you will spend much of your energy trying to overcome inertia each time you start up again. The cost of overcoming inertia can be considerable. Think of how much energy a weight lifter has to use to lift a heavy barbell off his shoulders – and how little he needs once the weight is in motion. Or consider how much force is needed to push your car after it has run out of petrol. Once you have gotten the car moving, much less force is needed to keep it moving. The same principal applies to swimming. This explains why freestyle is the fastest stroke: because in it there is a constant application of propulsive force. So keep this principal in mind as you swim, - apply force evenly. You will find that doing so you will make your swimming more efficient, much easier and more enjoyable. .

Conclusion

Keeping these five points in mind you are now ready to tackle the four major swimming strokes. As you endeavour to master them, remember to use the five basic principals.

1. **Streamline your body.**
2. **Obey Newton's Law.**
3. **Use proper pull.**
4. **Position your hands efficiently.**
5. **Apply propulsion evenly.**

Don't expect to perfect all the strokes in a week or a month or even a year. It will take time. But you will find that you re improving noticeably. As you master each new technique, learn to execute it almost automatically, and move on to the next skill. You will feel more comfortable and less tired, and you will have a sense of flowing with the water instead of struggling against it. To master good swimming skills it is necessary to practise good technique at all times, turn swimming into a mind game each and every time you swim, - think technique, - swim technique!

I have been swimming more than seventy years, and I am still learning. Admittedly I never had any coached tuition till after I had turned fifty and indeed, that is part of the fun, part of the challenge! "You can teach an old dog new tricks." Whether you are an old dog or a puppy, it's a great feeling to know that there is always more to learn, and that you can still improve, still swim better and faster, whether you are thirty, forty, seventy or even eighty.

Pool Turns…

Since most masters swimmers are exclusively pool swimmers, we are constantly being forced to reverse direction every 15, 20, 25 or 30 strokes in a 25 metre pool. It therefore makes sense to find a fast, energy conserving way to turn our bodies around so we can maintain our race pace or keep our workout flow intact and efficient.

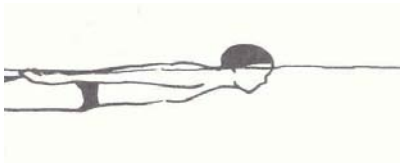
There are essentially two types of turns; the open turn, which may be used in all four swim strokes and always in breast and butterfly strokes, and the tumble turn (AKA - the 'flip turn') used in freestyle and back stroke, and particularly when speed is important.

For the purpose of this article this discussion will be limited to freestyle turns only.

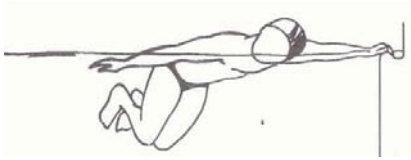
The Open Turn

The open turn is the easiest to learn and also allows ample time for you to catch a breath. There are two things to remember when doing open turns… 1. Keep your body as low as possible in the water during inhalation. 2. The hand you use to reach the wall should always be opposite the side of the body that is initiating the turn and leading from the wall.

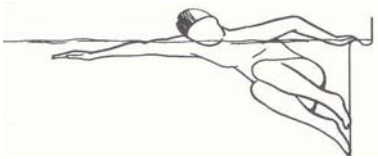
Approach the wall with your eyes open and your face just under the water's surface Maintain your normal stroke technique as you approach the wall. Take your last stroke about one body length away from the wall, roll on your side as you reach for the wall with your bottom arm. Try not to shorten your stroke and maintain your kick to uphold your momentum and lead you into the turning pivot.



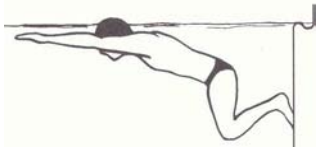
The Pivot: To begin your turn, grab the pool edge or gutter, with your extended hand or in the case of a high wall with no gutter – put the palm of your hand flat to the wall at about water level, so you can steady yourself at the turning point. As your hand reaches the wall, flex your elbow and bring your body close to the wall, allow your opposite shoulder to drop, and rotate 180° so that you are facing in the opposite direction to that which you came in. As you rotate, bend your knees and swing your feet and hips directly under your body. Lift your hips just enough to inhale quickly as your weight shifts.



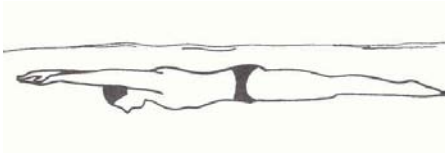
Planting your feet: As your feet touch the wall, let go with your hand and swing it over your shoulder and drop it about 30cms under the water's surface to join your leading arm. This leading arm should remain extended away from the wall throughout the turn.



The Push – Off: Have your toes on the wall rather than be flat-footed and drop your push-off hand over your head to join the other hand. Allow your torso to drop below the surface as you go into your best streamlined position – elbows locked and arms fully extended in front of your head – drive your legs hard to initiate forward glide.



The Glide: Don't resume stroking immediately after your turn, let your momentum carry you as far as possible. When your momentum subsides, start to flutter kick. Wait until you start to surface before taking your first stroke. Pull with your bottom arm (non-breathing side) and do not take a breath until you have completed at least one full stroke cycle.



Your glide off the wall should be perfect streamline.

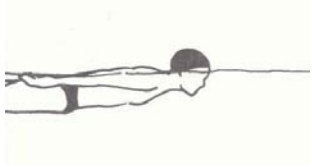
Tip: Concentrate on perfect turns each any every time you turn during workouts.

Note: Not breathing on your first stroke from the wall allows you to re-align and streamline your body so that the first inhalation does not cause drag by body misalignment.

The Tumble Turn

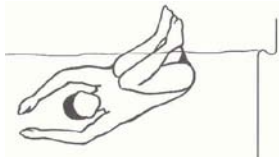
A tumble turn (flip turn or racing turn) is the fastest and most powerful way to change direction when swimming freestyle.

The approach: When your leading arm is about a half to one metre from the wall, tuck your chin to your chest and take your last stroke. Your arms should at your sides when you begin to somersault. For extra speed and power to the wall you may like to do a couple of dolphin kicks at this point.

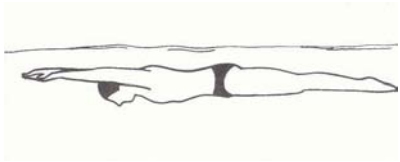


The Tumble or Flip: To begin to somersault, scoop water away from your hips with the arm opposite the side to which you are going to turn, bend your torso forward, tuck you chin to your chest as your knees bend and heels and feet emerge from the water.

The Pivot: As you snap your feet over your head in the somersault, twist your trunk to one side. On completing the tumble straighten out of the tuck and extend your feet to the wall. Plant them on the wall about shoulder width apart and extend both arms in front of you.



The Push Off: During the push off continue to twist and extend your body to glide face down in a prone position, recover to the surface, begin to flutter kick and get back into your stroking rhythm as soon as your momentum begins to slow.



As with an open turn … Your glide off the wall should be perfect streamline.

How you can help yourself during training sessions …

Practise and perfection of your turns …

After receiving initial instruction from a coach or coaching manual about race turns and whether you choose to tumble turn or open turn, I believe the best advice to swimmers is to practise your turns continually when ever you are swimming, Only repeated practise can instil in your mind the opportune time to attack the wall and begin to tumble. Depending on the length of your swim session it can offer many occasions to perfect your turn. Eg. a continuous 2,000 metre swim can offer 78 chances to practise your turns in a 25 metre pool. When you're training remember every turn is a perfect practise turn.

Even when finishing a repetition you can still practise your tumble by not planting your feet on the wall but rather carrying through to the pool floor or ledge and finish facing the wall.

Regarding Starts _

Both off the blocks and wall starts (backstroke) … Any club member who is concerned with improving his or her racing status (I.e. lowering swim times) by improving and practising starts, should be sufficiently inspired to seek instruction and practise on their own account, ultimately for their own benefit. This is not to say that instructions during club training sessions on Sundays should be discontinued – No, this should remain a regular part of our programs.

Regarding Breakouts _

Similarly to turning, breakouts can always be incorporated in any session – eg. when setting a set of say 8 X 25 (or 8 X 50) free the coach can set the first 4 as breakouts. If a swimmer wishes to do this of his own accord during a set he only needs to allow 10 seconds interval between him/her and the preceding swimmer instead of the usual 5 seconds (or lead the lane).

Race Turns _

Similarly you can practise you race turns by allowing a 10 second interval between you and your preceding swimmer and attacking the turning wall from about 5 metres out to execute a perfect race turn with 2 or 3 effort strokes off the wall. Do this without fear of swimming over the person immediately in front of you, or lead the lane.

Personal Notes ...