

BASIC STROKE PHILOSOPHY:

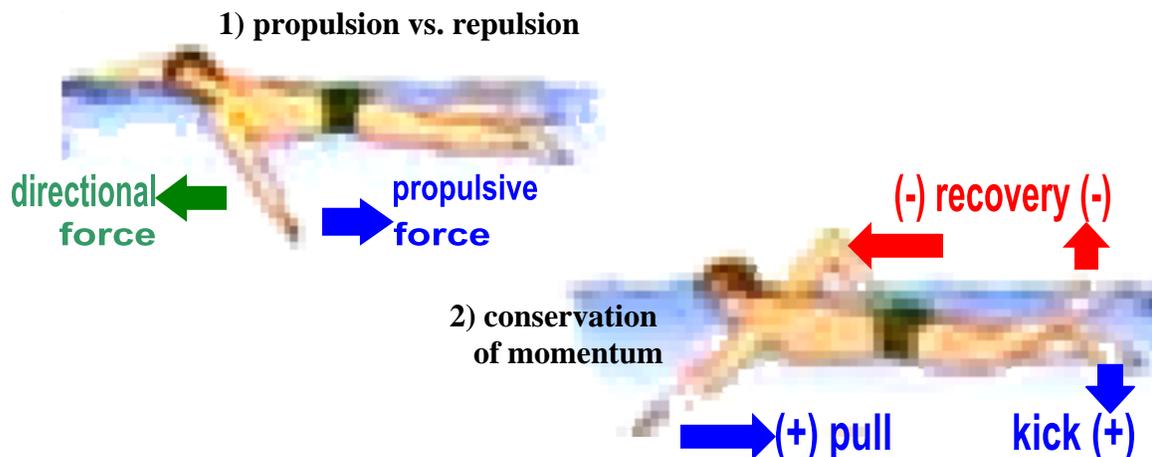
Swimming has long been referred to as a sport for the “*little man,*” and the reason given was the *water was a great equalizer*. As we advanced we learned that swimming could *as well* be a sport for the big man (*all other factors being even, the strongest swimmer will be the winner*), but the fundamental idea of *water being an equalizer* still holds.

Before strength and size are important, even before conditioning is important, *most* important is the “Stroke Technique”. A swimming stroke may vary from one athlete to another depending upon individual differences, but all good strokes are based upon two natural laws of kinesiology:

- 1) **propulsion vs. repulsion,** and
- 2) **conservation of momentum.**

What this means is that everyone will swim a little bit differently, but that in order to swim fast, you must do two (2) basic things: **push** against the water *with more force than the water* pushes against you; and *keep on pushing* against the water.

What will follow is a breakdown of each of the four (4) competitive strokes: Freestyle, Backstroke, Breaststroke, and Butterfly. You will need to take these basic guidelines and add to them what works best for you. Still, one should always consider the two natural laws. Some swimmers swim fast *in spite of* some little stroke thing they may do, *not because of* it. If a stroke violates one of these principles, then *be careful of what you copy*.



FREESTYLE

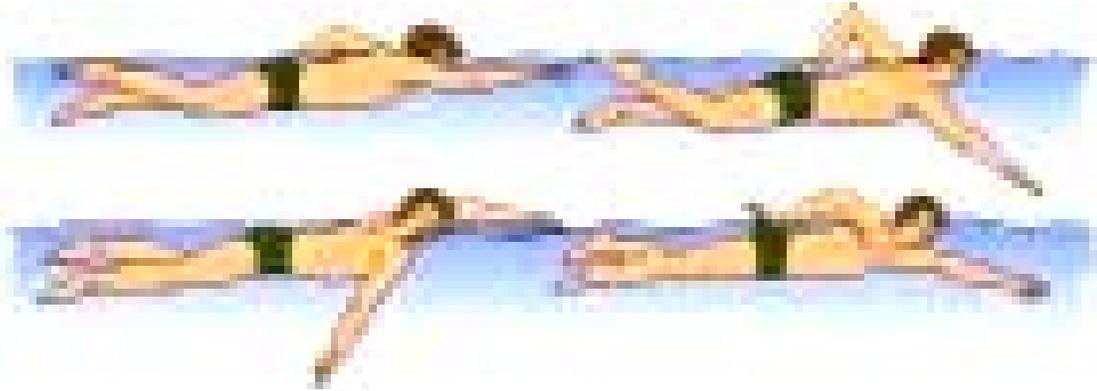
Freestyle is the fastest of the four competitive strokes because it maximizes the two natural laws of “propulsion” and “conservation of momentum”. The alternating style of stroke and kick allows for constantly occurring positive forces to conserve momentum, with the arms being able to double the positive forces during “*Catch-up*”. The body’s flexibility at the shoulders, elbows, and wrists allows each hand to “*search-out undisturbed water*” located away from the body’s drag, providing both “*lift*” and “*direction*”.

I. The Rules:

...forward start shall be used ...any body position, stroke and kick is permitted ...turn requires that some part of the swimmer’s body contact the end wall ...finish requires completion of the required distance

II. The Position of the Body:

The body should be stretched and at a slightly lying angle (shoulders higher than hips) to the surface of the water. The legs kick below the surface of the water, with the hips kept to a minimum roll. The shoulders ride to the surface, rotating on an axis formed by the head and backbone. The shoulders should alternate, recovering high above the surface and pulling beneath the surface. The head should remain still and facing forward, with the eyes open and the surface breaking at the brow line. Breaths should be taken from alternating turns to the side, breathing every three, five or seven strokes and off the top of the recovering shoulder.



III. The Pull:

The stroke is a non-symmetrical stroke, allowing at least one hand to be in the water at all times, thereby conserving momentum. The hand sweeps in a wave motion, directing forces backward for propulsion, but avoiding the straight-line of the body's direction. This places the hand in "*undisturbed water*" and provides a better medium of resistance. We refer to this motion as "*searching for good water*".

- A. Contact the surface just forward of the head, with the fingertips spread only slightly, and the palm cupped down. Reach the fingertips forward while rolling the shoulder forward, allowing the hand to travel as far forward as you can reach at a depth of three to four inches below the surface.
- B. Turn the thumb down and away from the mid-line of the body until the hand catches the water at a depth of 8-12 inches below the surface. Take hand lower than elbow.
- C. Bend the elbow up, until both hand and forearm are exerting pressure against the water. Fingers and hand are an extension of the forearm, sweeping the water out and back.
- D. Pull by leading the elbow with the hand, rolling the shoulder deep until the hand passes that shoulder. The arm action then becomes a pushing motion, sweeping the hand back toward the mid-line of the body and under the abdomen, deep. Finish the stroke as the shoulder rolls up, flexing the wrist and waving the water past the outside of the hip.
- E. Recover the elbow from the surface, thereby slipping the hand from the water, close to the body and without any resistance. Shoulder should roll high and out of the water with the elbow leading higher than the hand. Allow the hand to sweep easily past the high elbow until the fingertips easily contact the water just past the head.
- F. Keep hands moving. The hand recovering will move more quickly through the air than will the hand pulling water. This enables the one hand to begin the next pull while the other hand is still finishing the previous pull. This brief period of both hands pulling at once is "*catch-up*", and is desirable.

IV. The Kick:

The kick is a six-beat flutter, allowing for the conservation of momentum. The legs alternate up and down to a depth of 8-12”.

- A. Kick from the hip, driving the leg down while allowing the water to slightly bend the knee, then forcefully straighten the knee as you complete the down kick.
- B. Kick up to the surface, letting the water straighten the leg, thereby providing a directional component.
- C. The down kick provides mostly lift while the up kick provides only direction (with some drag). A splash only moves air and wastes energy, providing neither lift nor propulsion. For these reasons, concentrate on the down-kick,
- D. Keep the hips just below the surface, allowing them only a slight body roll. Strive for a “six-beat flutter”, where each leg kicks three times for each arm cycle.

V. The Turn:

The “flip” turn is the fastest method, touching the wall with only the feet and cutting down the length of the swim by taking maximum advantage of your height.

- A. Gauge the beginning of your turn by sighting the T-bar on the bottom of the pool, or more preferably the cross on the wall.
- B. With the last stroke, “*jackknife*” the body, reaching your hands together toward the feet and pressing your face and chest to your knees and thighs. This motion will carry your turn even closer to the wall.
- C. Raise your hips up out of the water and bring your legs over the top by straightening your back while stretching for the far wall. Let your knees bend slightly and begin to rotate as your legs come over.
- D. Block the hands to the turning wall as your hips come up out of the water, then parry both hands towards the opposite wall as your legs come down.
- E. Let your feet contact the wall at about 14” below the surface, then flex the ankles and knees forcefully as you spin onto your stomach.
- F. Push-off below the surface and stretch, striving for distance underwater.
- G. Remember—don’t crush your body against the wall, reach the wall with your “*long legs*”. As you come off the wall, think: 1) Stretch, 2) Kick, 3) Pull x 2, and Last of all- Breathe!

VI. Freestyle Stroke Drill

Step 1 – Right Arm Only, Long Dog Paddle. Push off on stomach, left hand at thigh. Reach right hand as far forward as possible, stretch. Pull right arm through sweep searching for “good water”, finishing at thigh. Recover right arm underwater, with fingertips leading recovery under the body. Breathe to the left, use strong flutter kick.

Step 2 – Repeat for left arm, same as Step 1.

Step 3 – Long Dog Paddle, Both Arms (alternating). Combine Steps 1 & 2 into an alternating stroke. Breathe *bi-laterally*, and remember to stretch and finish. Let the shoulders roll with the stretch and finish.

Step 4 – Same as Step 3, only now begin the recovery with the elbow. Lead the elbow out of the water, then slip the arm back under for the forward recovery underwater (*that being the “Long Dog Paddle”*).

Step 5 – Same as Step 4, only now recover the elbow high until the wrist breaks the surface. Then slide the hand forward, just below the surface (3-6”). *Feel the lift.*

Step 6 – Same as Step 5, only now recover the elbow until just the fingertips drag the water alongside the body. Touch the thumb to the shoulder, then reach forward.

Step 7 – Progression; Repeat each of Steps 1-6 for three strokes.

Step 8 – Sprint Freestyle.

BACKSTROKE

As mentioned earlier, freestyle, is the fastest stroke in competitive swimming. If a swimmer could turn over onto his back, and still move his arms and legs in exactly the same pattern as freestyle, then backstroke would be just as fast. Although it is not physically possible to do such a thing, the principles of propulsion and momentum remain the same. The closer a swimmer can approximate freestyle while on his back, the faster his backstroke.



I. The Rules

...swimmer must start from in the water... any stroke and kick is permitted. the body must remain on its back with the hips not passing beyond the vertical except while executing a turn... and must return past vertical before the feet leave the wall.. must contact each wall... finish requires completion of distance without resting or pushing from the bottom...

II. The Position of the Body

The body should be stretched and at it a slightly lying angle to the surface of the water. The legs kick below the surface, the hips are flat and just barely below the water's surface, while the shoulders ride just to the surface. The Shoulders should rotate around the axis formed by the head and backbone (*as if turning on a rotisserie*) and the head should remain still (*even at times under the water*) with eyes looking back over the brow. Breaths should be taken at rhythm, every two to four strokes, as the head comes to the surface.

III. The Pull

The stroke is again a non-symmetrical stroke, allowing one hand to be in the water at all times, thereby conserving momentum. The hand moves in a "Question ? Mark" pattern in order to supply as much direct propulsion as possible during its *search for "Good Water"*.

- A. Contact the surface with fingertips, little finger first, then roll the pulling shoulder while turning palm down, pressing the hand to a "catch" at 8-12" below the surface.
- B. Bend the elbow up, until the hand and forearm begin to apply pressure against the water (arm wrestling). Fingers are pointing out and pushing water towards the feet.
- C. Pull by leading the elbow with the hand, keeping the shoulder deep until the arm passes the shoulder. The arm action then becomes a pushing motion, allowing the shoulder to come up and extending the elbow, pushing hand past hip, and lastly turning the palm down with a press and thumb extension.
- D. Recover with arm coming straight overhead (elbow straight, shoulder rolls high). Little finger leads while opposite shoulder rolls down for opposite arm pull. Allow little finger to enter just comfortably outside the shoulder line.
- E. Keep hands moving, do not allow one hand to wait for the other (catch-up).

IV. The Kick:

The kick is again a six (6) beat flutter, again allowing for conservation of momentum, and slightly more shallow than freestyle flutter.

- A. Kick from the hip, allowing the water to straighten the knee as you drop the kick down.

- B. Then, allow the water pressure to bend the knee slightly as you begin the up kick. Forcefully straighten the knee as you complete the up kick (as in kicking a ball).
- C. It is the up-kick that provides propulsion while the down-kick has a slight repulsion factor. Emphasize the up-kick, and allow the ankles to bend freely, as would the *fins of a fish*.
- D. Keep the hips just below the surface level and fairly stationary, to balance the lower body with the shoulder roll. As an arm begins its recovery, that leg kicks forcefully down.

V. The Turn:

- A. Count the number of strokes you take from the Flags to the wall (three to seven).
- B. On last stroke, recover arm across your chest and roll onto your stomach. Somersault one-half flip, bending at the waist then *opening the jack-knife* onto your back.
- C. Stretch your legs and feet toward the turning wall... Allow the body to slip sideways through the water, past 90° back...Reach hands together and stretch for far wall.
- D. Plant feet and push off while rolling onto back. Use exaggerated Dolphin Kick while fingertips foil to the surface.

VI. Backstroke Stroke Drill:

- Step 1- Dolphin off of wall, palms overlapped with arms stretched overhead. Use fingertips to foil to surface, then flutter kick remainder of length.**
- Step 2- Kick flutter, with arms at side. Exaggerate shoulder roll and push water toward feet using only wrist flexion (the wave).**
- Step 3- Kick flutter, head held still. Extend one arm perpendicularly, expose the shoulder and hold for three (3) kicks (fly the flag).**
- Step 4-Same as Step 3, only alternately drop the elbows below the surface at 9:00 and 3:00 o'clock positions. Emphasize bending elbow "up" when pushing water past feet (arm wrestling).**
- Step 5- Same as Step 3, only super-pronate the arm so that the arm so that the palm contacts the surface flat (10:00 & 2:00). Rotate the shoulders to place the hands under the body, then pull (flat hands).**
- Step 6- Tuck the body with knees to chest, shoulders and head as high as possible. (sit in the bucket). Kick shallow, quick flutter, and spin the arms as rapidly as possible (scum buckets)**
- Step 7- Repeat each of steps 1-6 for three (3) strokes. (Progression).**
- Step 8- Sprint Backstroke**

BREASTSTROKE

Though breaststroke is the slowest of the four (4) competitive strokes, for many people it is the most natural way to swim. A symmetrical stroke, it has both arms pulling together, under the water, and recovering simultaneously, still under the water. The legs kick together in a sweeping motion much like a frog, and when timed to alternate with the pull of the arms, the stroke is smooth and constant.

I. The Rules,

... forward start shall be used... body shall remain on the breast with both shoulders in the horizontal plane... requires both hands be pushed forward from the breast simultaneously on or under the surface water... kick requires the feet be drawn up with the knees bent. The feet must be turned outward during the propulsive part of the kick. All movement of the legs and feet shall be simultaneous and in the same horizontal plane... the turn requires a simultaneous two-hand touch...the finish requires contact with the end, with both hands simultaneously.

II. The Position of the Body:

The body is on its breast, shoulders higher than hips and head positioned straight and up. Flexibility is important in the lower back, neck, and hips. Some portion of the head must break the surface of the water at some point during each stroke cycle.

III. The Pull:

The breaststroke differs from the other three strokes in that the pull is really more of a “**scull**” than a pull. The object of the motion is to create lift and direction from the pressure differences created by the hands as they pull through the water.

- A. From their extended position, the hands turn thumbs lower than little fingers and push down and to the outside to a position wider than the shoulders and at about 9” deep.
- B. The hands “gather” the water by scooping the little fingers down and turning the hands in to press towards each other.
- C. As the hands approach the mid-line of the body, they begin to extend forward, still with the thumb high attitude. The hands “shoot” forward to their extended position.

IV. The Kick:

The kick we want is the “piston squeeze” where we force water backwards off of the inside of the legs and feet. When the legs can go no further back, they snap together, squeezing the water from the thighs, knees, calves, and finally the feet, thereby creating a jet of water to the rear, pushing the body forward. It is the legs that supply power in Breaststroke, while the arms supply direction and lift. This is the opposite of the other three strokes.

- A. Draw the heel toward the buttocks, keeping the heels high and allowing the knees to spread slightly.
- B. Turn the toes out and extend the legs to the side. Try for a width that places the knees outside of the hips and ankles out wider than the knees. The feet should be turned out, and the swimmer should feel a stretch in the inner thighs and groin, with water pressure upon the insides of the legs and feet.
- C. Push the water backward, keeping the feet high and wide. The natural flexibility of the body will draw the legs together as they travel backwards. Try to kick a straight line as far as you can, then...
- D. ...when the legs feel as they can go back no further along the straight path, snap them together in a forceful squeeze. Force the water from between your calves and finally your feet. This is the jet.
- E. As the legs come together, hyper-extend the knees and squeeze the legs tightly. This will provide a legal dolphin motion, raising the hips for the next kick.

V. Timing:

As the hands push out, the feet should begin to draw up. The hands gather as the feet extend out and the hands press as the feet begin their travel backward with the piston. The arms should shoot while the legs are still in piston, then the arms stretch and glide while the legs squeeze. The arm cycle is of a shorter duration than the leg kick, so it is important that the swimmer not rush the next pull. Leave the arms extended, and stretch until the legs finish their dolphin, then begin the next cycle.

VI. the Turn:

Use a “bulkhead” turn that contacts the wall with both hands simultaneously and level. Avoid grabbing the “gutter” as it will not always be available in all pools and causes the swimmer to pull the body out of the pool, thereby traveling further than necessary.

- A. Gauge the turn for three strokes prior to the wall. Try to reach the wall with the arms fully extended and stretch to the wall off of the last pull.
- B. As the fingers contact the wall at water level, bring the elbow of the inside arm back forcefully and into the side of the body. Let the body’s momentum bend the elbow of the outside arm and draw the knees up forcefully into the stomach, pressing the heels into the buttocks.
- C. Throw the head back over the inside shoulder, cut through the water with the little finger leading the flat, inside hand to an extended position. Push the body off of the wall with the outside arm, bringing it to the inside arm with a “freestyle recovery”. This motion will draw the feet up to the wall.
- D. As the feet push off of the wall, stretch the arms down the lane and twist onto the stomach.
- E. As the momentum first begins to subside, pull both arms forcefully through a “butterfly” pattern. Pull the head and shoulders down with the motion, finishing the hands flat to the thighs.
- F. Again, as the momentum first begins to subside, recover the arms close to the body, raising the head and shoulders with the motion. With this upper recovery, **KICK!**, with only a slightly more narrow kick than the normal stroke.
- G. Strive for distance off of the wall, but remain acutely aware of the point at which momentum begins to decrease. Time the first pull to occur just as momentum begins to drop, and break the surface with the head during the “push” of the arm stroke.



VII. Breaststroke Stroke Drill:

- Step 1 – Push off wall on back, arms extended together, and stretched out over the water. Point toes of left foot (plantar) and keep left leg stretched along mid-line of the body. Kick right leg, ONLY! Drop heel, turn toes out and reach the foot wide. Then kick the leg up to the surface, hyper-extending the knee at the end of the kick, and GLIDE! (Right Leg Kick)**
- Step 2 – Same as step 1, only stretch right leg and kick left leg, ONLY! (Left Leg Kick)**
- Step 3 – Push off walls in steps 1 and 2. Kick legs alternately, right left, right, left. (Eggbeater)**
- Step 4 – Push off wall on stomach, hands extended to thighs, fingers pointing out. Raise heels to palms, clutch and hold for a 1 count. Then, kick the feet of the hand hold and glide. Breathe just before the kick, while hands are holding heels. (Heel to palm)**
- Step 5 – Push off wall, take “down pull and recover”, then – pull with hands only, DO NOT USE ARMS. Use a normal breaststroke kick. The kick will take longer than just the hand pull, DO NOT RUSH. Concentrate on the hands, pitch the water out, catch it in the hands and press it together. Pitch thumbs down, catch little finger down, and then GLIDE! While the legs squeeze. (Pitch and Catch)**
- Step 6 – Push off wall as in step 5. Push the hands to “push-up position”, flexing upper body up out of the water. Hold position with figure-8 sculls for a 3 count, then reach hands forward under the water surface. Bring body forward with a dolphin motion, kick legs in a dolphin kick. (Scull Up & Dolphin)**
- Step 7 – Repeat each of steps 1-6 for three strokes. (Progression)**
- Step 8 – Sprint breaststroke.**

BUTTERFLY

Fly is the most impressive of the four (4) strokes, as it combines power and grace in a fluid motion resembling the dolphin or porpoise. A symmetrical stroke, both arms pull together, under the water, and then recover together, over the top of the water. The legs kick together, melding into one kicking instrument resembling the powerful tail of dolphins or whales. Both arms pulling together generates more force than in any other stroke, with the simultaneous recover causing a loss of momentum only partially corrected by the leg drive. The result is a stroke which powers out of the water, then flows back below the surface to be followed by yet another emergence.

I. the Rules:

...forward start shall be used...body shall remain on the breast with both shoulders in the horizontal plane...requires that both arms simultaneously pull backward under the water, then simultaneously recover over the water...kick requires that both legs and feet move up and down simultaneously in the vertical plane...the turn requires a simultaneous two-hand touch...the finish requires completion of the required distance and contact with the finish end with both hands simultaneously.

II. the Position of the Body:

The body is on its breast, with the shoulders and hips oscillating along a sine wave according to pull and kick. The head breathes to the front just prior to the arm recovery (*flexibility through the torso and hips is important*).

III. the Pull:

The butterfly pull is described as a “**key-hole**” or “**coke-bottle**” or imaginatively as the “**female form**”. The hands should transcribe the same path as in freestyle, “*searching for good water*”, but will do so at a point wider from the mid-line due to the shoulders staying level, unable to roll as much as in the non-symmetric freestyle.

- A. From their extended position, the hands turn the thumbs out and sweep out to a point wider than the shoulders and about 12” deep...
- B. Turn the little fingers in and press the water to a point 8” deep, 6” apart and under the hips...
- C. Turn the thumbs out and push the water past the hips, finishing with the hands past the hips and palms up.
- D. Recover by pulling the elbows out, letting the hands slip from the water as they follow. Bring the elbows high and as far forward as they will go comfortably.

- E. Sweep the hands close to the surface, out past the elbows and forward until the fingertips touch the water just past the head...
- F. Extend the elbows and roll the shoulders forward, forcing the hands to reach out to an extended position, just below the water's surface.

IV. The Kick:

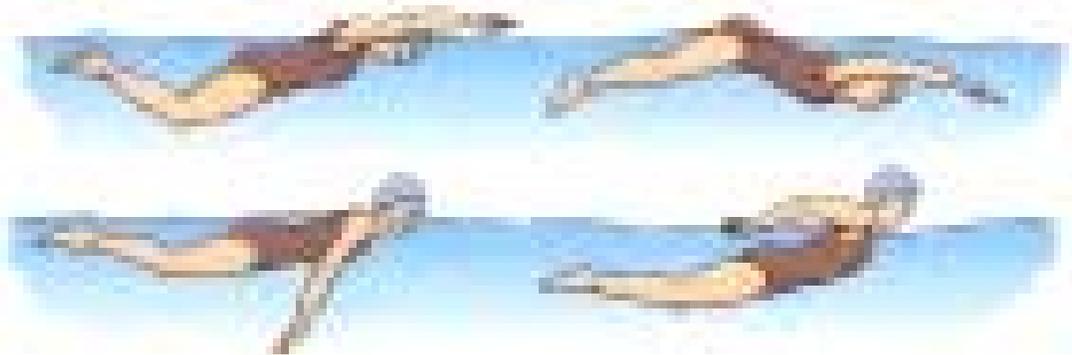
Use a *“dolphin”* kick with the fly, where the legs are held together, side by side, and kick in an up and down flexing motion. Use two kicks per arm cycle (*“double dolphin”*), where the balance kick comes as the hands extend at the end of recovery and the power kick (more forceful) occurs as the hands press past the hips.

- A. As the hands begin to pull, the shoulders rise up, kick the hips down, following the hips with the legs. Let the knees spread slightly but keep the ankles together.
- B. When the shoulders roll down, kick the hips up, following the hips with the legs held together.
- C. As the hands press and the shoulders ride up, force the hips through the hand wash with the power kick. Force the hyper-extension of the knees at the bottom of the follow-through to produce the *“dolphin motion”*.
- D. *Kick up* as the arm recovery buries the shoulders and raises the hips.

V. The Turn:

Again, use a *“bulkhead”* turn, as we did in breaststroke.

- A. Gauge the turn three (3) strokes prior to the wall.
- B. As the fingers contact the wall, tuck the inside elbow and let your momentum bend the outside elbow on the wall. Draw knees up and press heels into buttocks.
- C. Throw head back low to the water, cut the inside hand and bring outside arm over the back of the head. Push off wall with feet as your arms stretch and body spins onto stomach.
- D. Use repeated dolphin kicks to gain distance off the wall. Increase depth of kick until momentum begins to subside, then take first arm pull.



VI. Butterfly Stroke Drill:

Step 1 – Push off wall on side, bottom arm extended, top arm with hand at thigh. Kick dolphin kick on side, directing water to first one side wall, then back to directing water to first one side wall, then back to opposite side wall. Concentrate on using stomach and butt to move hips, opening the knees as the legs kick forward and closing off the knees as they kick back.

Step 2 – Swim fly using right arm only. Stay on breast with double dolphin kick, extend left arm to the front, and breathe straight ahead. (Right Arm Only)

Step 3 – Same as step 2, only extended right arm and pull left arm only. (Left Arm Only)

Step 4 – Push off wall, then stroke right arm only, three times; both arms three times; left arm only, three times; both arms three times; then again: right arm only x3. (3x3x3)

Step 5 – Same as step 4, only stroke by twos: 2 right, 2 both, 2 left, 2 both, 2 right, 2 both, 2 left, 2 both. (2x2x2)

Step 6 – Same as step 4, only stroke by ones: right arm, both arms, left arm, both arms, right arm. (1x1x1)

Step 7 – Repeat each of steps 1-6 for three (3) strokes. (Progression)

Step 8 – Sprint butterfly.