

Description of Swim Qualifications.

The U.S. Navy's swim qualifications consist of three classes of swimmers. Midshipmen shall qualify as Swimmer, 3rd Class by the end of the Fourth Class (Freshman) Year. Midshipmen qualifying as Swimmer, 2nd Class are exempt from further testing. Students qualified at lower than Swimmer, 2nd Class, shall requalify annually. U.S. Navy swim standards are designed to ensure service members are able to endure and survive for extended periods at sea; not for speed in covering distances. Experienced swimmers should practice the prescribed methods described in this document vice methods learned for competitive swimming. If the decision is made to swim in a survival situation, mastery of swimming strokes will increase one's chances of survival by offering the most efficient propulsion with the least expenditure of energy. The energy saved by efficient swimming may be needed later to produce body heat, climb into a raft, or activate signal and rescue devices.

a. 3rd Class Swimmer. A 3rd Class Swimmer is described as a person who can stay afloat and survive without the use of a Personal Floatation Device (PFD) in open water under optimum conditions long enough to be rescued in a man-over-board situation. The 3rd Class Swimmer qualification is the minimum entry-level requirement for all U.S. Navy personnel.

b. 2nd Class Swimmer. A 2nd Class Swimmer is described as a person who can stay afloat and survive without the use of a PFD indefinitely under optimum conditions. The 2nd Class Swimmer qualification is used as an entry-level requirement for Small Boat Operators, Naval Air Crewman, and Rescue Swimmers.

Administering the Third Class Swim Test.

The Third Class Swim Test is composed of two modules. Module One is composed of three separate events, a deep water jump, a 50-yard swim, and a 5-minute prone float. These events can be conducted separately and in any order. Swimmers who successfully pass an event in Module One, do not have to repeat that particular event. Module Two consists of shirt and trouser or coverall inflation. Module One must be conducted before Module Two. Modules One and Two do not have to be conducted on the same day. The prone float and the Shirt and Trouser inflation must occur in deep water (deep water is defined as water too deep to stand with mouth and nose above the surface).

a. Deep Water Jump. Jumps must be performed from a minimum height of 5 feet. Water depth underneath the platform must be a minimum of 8 feet. Swimmers must display the ability to swim to the surface unassisted. The body position must be taught to the standards described below, but the body position will not be graded. All swimmers will be strongly encouraged to maintain proper body position until momentum slows underwater.

b. 50-yard Swim. Swimmers must complete the distance without stopping, standing, or holding onto the sides of the pool. Strokes must be graded as described below.

c. Prone Float. Students must be graded as described below. Students displaying improper breathing during survival floating will be removed from the water within the first minute.

d. Shirt and Trouser Inflation. Swimmers must be graded in accordance with the standards described below. Students displaying problems with shirt/trouser inflation must be removed from the water before becoming exhausted.

Administering the Second Class Swim Test.

The Second Class Swim Test consists of a deep water jump, 100-yard swim demonstrating 25 yards each of the crawl stroke, breaststroke, sidestroke, and elementary backstroke. Immediately after completion of the swim, without leaving the water, students will prone float for 5 minutes and transition to a back float before exiting the water. Satisfactory completion of the Third Class Swim Test is required prior to administering the Second Class Swim Test.

a. Deep Water Jump. Jumps must be performed from a minimum height of 5 feet. Water depth underneath the platform must be a minimum of 8 feet. Swimmers must display the ability to swim to the surface unassisted. The body position must be taught to the standards described below, and will be graded.

b. 100-yard Swim Test. The 100-yard swim must be accomplished without holding onto or resting on the sides of the pool for any time longer than is needed to perform a turn. Walking on the bottom or stopping to float or rest constitutes a failure.

c. Prone and Back Float. Floating must conform to the standards described below. Holding onto the edge of the pool constitutes failure of the test.

Performance Standards for the Third Class Swim Test.

a. Deep Water Jump.

(1) Body position - Waist must be straight, head held with the neck straight, eyes staring forward.

(2) Arms - Arms must be crossed with the hand of the arm closest to the chest pinching the nose with thumb and forefinger and the little finger positioned on the bottom of the jaw beneath the chin. The hand of the arm furthest from the chest grasps the biceps and triceps of the opposing arm.

(3) Legs - Legs must be straight and crossed at the ankles.

b. Breaststroke.

(1) Body position - Body must be face down.

(2) Arms - Any arm stroke acceptable as long as recovery and propulsion occurs underwater.

(3) Kick - Any kick acceptable as long as recovery and propulsion occurs underwater.

(4) Breathing - Swimmer must display continuous ability to lift the head up, get a breath, and return the face into the water with each arm stroke.

(5) Coordination - Any coordination of arms, legs, and breathing acceptable. SWIMMER MUST APPEAR SAFE TO SWIM PRESCRIBED DISTANCE.

c. Sidestroke.

(1) Body position - Swimmer must lie on either the left or right side.

(2) Arms - Any arm stroke is acceptable as long as recovery and propulsion occurs underwater.

(3) Kick - Any kick is acceptable as long as recovery and propulsion occurs underwater.

(4) Breathing - Inhalation and exhalation may be performed at any stage of the stroke.

(5) Coordination - Any coordination between arms and legs is acceptable. SWIMMER MUST APPEAR SAFE TO SWIM PRESCRIBED DISTANCE.

d. Elementary Backstroke.

(1) Body position - Swimmer must be on his/her back.

(2) Arms - Any arm stroke is acceptable as long as recovery and propulsion occurs underwater.

(3) Kick - Any kick is acceptable.

(4) Breathing - Inhalation and exhalation may be performed at any stage of the stroke. Mouth and nose must remain above the surface.

(5) Coordination - Any coordination between arms and legs is acceptable. SWIMMER MUST APPEAR SAFE TO SWIM PRESCRIBED DISTANCE.

d. Crawlstroke.

(1) Body position - Swimmer must be face down.

(2) Arms - Any arm action where one arm pulls while the other arm recovers is acceptable.

(3) Kick - Any kick or no kick is acceptable.

(4) Breathing - Must display continuous ability to lift/turn head up, get a breath, and return the face into the water.

(5) Coordination - Any coordination among arms, legs, and breathing is acceptable. SWIMMER MUST APPEAR SAFE TO SWIM PRESCRIBED DISTANCE.

e. Prone Float.

(1) Body position - Any face down posture is acceptable.

(2) Arms - Any arm action is acceptable, with no forward or backward swimmer movement.

(3) Breathing - Swimmer must inhale from the mouth and exhale from the mouth and nose. Breathing should be slightly above resting rate (approximate 20 breaths per minute). Breathlessness, gasping, erratic breathing or swallowing water is unacceptable.

(4) Coordination - Swimmer's arm and leg actions must keep him/her on the surface at all times. Swimmer must stay in the general starting location; excessive forward or backward movement (swimming) is unacceptable. SWIMMER MUST APPEAR SAFE, CALM, AND RELAXED.

e. Shirt and Trouser Inflation.

(1) Shirt inflation - Swimmer must stay at the surface. Back of shirt must contain a "bubble" of air.

(2) Trouser removal - Swimmer must stay near the surface. Struggling and sinking is unacceptable.

(3) Trouser inflation - Swimmer must stay on the surface at all times (except blow method). Any method to fill trousers is acceptable. Trousers must be filled sufficiently so the swimmer can float motionless.

Performance Standards for the Second Class Swim Test.

a. Deep Water Jump.

(1) Body position - Waist must be straight, head held with the neck straight, eyes staring forward.

(2) Arms - Arms must be crossed with the hand of the arm closest to the chest pinching the nose with thumb and forefinger and the little finger positioned on the bottom of the jaw beneath the chin. The hand of the arm furthest from the chest grasps the biceps and triceps of the opposing arm.

(3) Legs - Legs must be straight and crossed at the ankles.

The strokes for the Second Class Swim Test will be given in the following order:

Crawlstroke

Breaststroke

Sidestroke

Elementary Backstroke

b. Crawlstroke.

(1) Body position - Prone (Face Down).

(2) Arms - Recovery and propulsion of one arm must alternate with the recovery and propulsion of the other arm. Arm recovery must occur out of the water.

(3) Kick - Alternating movement (flutter kick) of legs is required. No set count of kicks to arm pulls. No other kick is acceptable.

(4) Breathing - Must display ability to breathe, and return the face into the water. The breathing must occur with the recovery of an arm.

(5) Coordination - Any timing of the arms, legs, and breathing is acceptable. SWIMMER MUST APPEAR COMFORTABLE WHEN SWIMMING PRESCRIBED DISTANCE.

c. Breaststroke.

(1) Body position - Prone.

(2) Arms - Breaststroke type arm action with simultaneous pull and recovery actions of the arms is required. Arms/hand actions may pull past the shoulders but not to the side of the body.

(3) Kick - Kick must be a breaststroke or frog kick. Flutter and scissors kicks are unacceptable. Kicks where one both feet are pointed during the propulsion are acceptable. Kicking actions may not break the surface of the water.

(4) Breathing - Must display continuous ability to lift the head and breathe during the pulling action of the arms. Face must be in the water during the recovery of the arms.

(5) Coordination - Any timing among the arms, legs, and breathing may occur. SWIMMER MUST APPEAR COMFORTABLE WHEN SWIMMING THE PRESCRIBED DISTANCE.

d. Sidestroke.

(1) Body position - Left or right side.

(2) Arms - Alternating arm actions whereby one arm pulls while the other arm recovers. Arm actions must occur underwater.

(3) Kick - Kick must be a scissor kick. Flutter and breaststroke kicks are unacceptable. Kicking actions may not break the surface of the water.

(4) Breathing - Inhalation and exhalation may be performed at any stage of the stroke. Submersion of the face during the power phase is acceptable.

(5) Coordination - Top arm must recover and propel simultaneously with the recovery and propulsion of either the top or bottom leg. SWIMMER MUST APPEAR COMFORTABLE WHEN SWIMMING THE PRESCRIBED DISTANCE.

e. Elementary Backstroke.

(1) Body position - Supine (Face up).

(2) Arms - Arms may extend beyond the shoulder as long as recovery and propulsion occur underwater. Arm actions that break the surface of the water are unacceptable.

(3) Kick - Kick must be a breaststroke or frog kick. Flutter and scissor kicks are unacceptable. Kicks where one or both feet are pointed during the propulsion are acceptable. Kicking actions may not break the surface of the water.

(4). Breathing - Breathing anytime is acceptable. Mouth and nose must remain above the surface.

(5) Coordination - Recovery and propulsion of arms and legs must be simultaneous. SWIMMER MUST APPEAR COMFORTABLE WHEN SWIMMING THE PRESCRIBED DISTANCE.

f. Prone Float.

(1) Body position - Prone.

(2) Arms - Arms bent at the elbows, sculling only as needed to lift the head for breathing and to maintain the body at the surface. No forward or backward swimmer movement allowed.

(3) Kick - Kicking should be performed only as necessary to keep the body at the surface. No forward or backward swimmer movement allowed.

(4) Breathing - Swimmer must inhale from the mouth and exhale from the mouth and nose. Breathing rate should be slightly above resting (approximate 15-20 breaths per minute).

(5) Coordination - Arm and leg actions must keep swimmer on the surface at all times. SWIMMER MUST APPEAR CALM AND RELAXED.

g. Back Float.

(1) Body position - Supine.

(2) Arms - Arms may be in any position to keep the swimmer from sinking. If needed, sculling is allowed. No forward or backward swimmer movement allowed.

(3) Legs - If needed, slight kicking to keep the swimmer from sinking is acceptable. No forward or backward swimmer movement allowed.

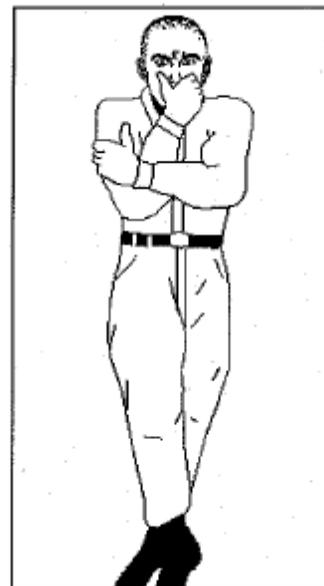
(4) Breathing - Swimmer must inhale from the mouth and exhale from the mouth and nose. Breathing should be slightly above resting rate.

(5) Coordination - Swimmer must be on the surface at all times. SWIMMER MUST APPEAR CALM AND RELAXED.

Deep Water Jump.

Naval personnel may accidentally fall off of a ship or be ordered to abandon ship. Whether accidentally falling or purposely jumping, it is important to make preparations to enter the water properly. The body should enter the water feet first in a vertical streamlined position.

Impacting the water in other than a vertical position may result in serious injury if one strikes floating debris, other survivors, or enters the water from a great height. Proper arm and leg position protect the survivor from impact



with floating debris. Pinched nostrils prevent water from entering the nose and mouth and also prevents aspiration of water due to the gasp reflex when one enters cold water.

Procedures. Stand erect and look at the horizon. Using your right/left hand, pinch your nose with the thumb and forefinger and cup your chin in the palm with the little finger anchored under the chin. Tuck the elbow close to the body. Step off, do not jump. Immediately after stepping off, cross the legs at the ankles. Keep the body vertical by continuing to look at the horizon. Do not attempt to slow the downward momentum by uncrossing arms or legs. Maintain this position after impact with the water and all downward motion stops. When downward momentum stops, orient yourself and immediately swim away from the impact area.

Methods of Clothing Inflation.

In the absence of the PFD, survivors should look for any object floating on the surface that provides enough buoyancy to keep the head out of the water in lieu of removing clothing. The survivor should carefully weigh the pros and cons of removing clothing as clothing can protect against hypothermia and offers protection from marine life, fuel oil, and sunlight. Clothing can be used to some extent as a makeshift floatation device. To be effective, buoyancy obtained from inflating clothing must be properly positioned and preferably not require the survivor to hold onto it with both hands. Ideal buoyancy will support the head above water even in rough seas.

a. Shirt Inflation. A small amount of buoyancy may be obtained by blowing air into a shirt. Tuck the collar inside to help seal around the neck. Tie off the bottom of the shirt or tuck it in, button the top button and blow air into the space between the second and third button. Inflation of the shirt causes a bubble of air to accumulate at the survivor's back between the shoulder blades.

b. Trouser Inflation. Trousers offer considerable amount of buoyancy and can be secured around the neck and waist freeing the hands. Removing the shoes, boots, trousers, and then inflating the trousers requires considerable effort. Survivors should not wait until they are exhausted from treading water or swimming to attempt to inflate trousers. To inflate trousers, use the survival floating technique to remove shoes or boots. Remove low top shoes by placing the toe of one foot on the heel of the other foot and pushing down. Unlace boots and high-topped shoes before performing this maneuver. The swimmer should remember to breathe at a normal pace while removing the shoes and trousers. A common mistake is for the swimmer to keep the face underwater too long, resulting in a build up of carbon dioxide, a depletion of oxygen, and rapid tiring. While survival floating, remove the trousers keeping the legs right side out. Tie the two legs together using a square or overhand knot. Tie the knot as close to the end of the trouser legs as possible. Start by tying the first half of the knot about halfway down the legs. Tie the second half near the end of the legs then place the cuffs between the teeth and cinch up the knot by pulling on the middle of the trouser legs.

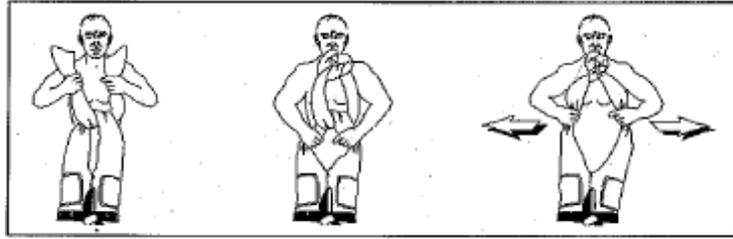


Fig. 6-2 Tying Off The Trouser Legs

There are four methods recommended for inflating trousers; over-the-head, splash, alternate splash and oral inflation. Lifting trousers over the head is the fastest method, but requires considerable effort and good treading water skills. Blowing air through the waist (oral inflation) requires the least effort, but is the slowest method. Splashing requires more effort than oral inflation method but is not as fast as the overhead method.

(1) Over-the-Head Method. While treading water, place the trousers on the surface in back of you, fly open and facing down, waist open with the seat facing up. With one hand on the top of the waistband on each side of the fly, raise the trousers straight over the head by straightening the arms. Once the trousers are out of the water, quickly force them down in front of you until the waistband is underwater. Care must be taken to raise the trousers high enough to force air into the waist on the way down.



Fig. 6-3 Over The Head Inflation

(2) Splashing Method. The trousers may be inflated by splashing air into them. Place trousers on the surface of the water in front of you fly facing down. Place one hand on the waistband and hold it about two inches underwater. Raise the other hand above the surface and with a sweeping motion, splash air into the trousers.



Fig. 6-4 Splashing Method

(3) Alternate Splashing Method. The trousers may be inflated by splashing air into them. Place trousers over the head at the surface of the water in front of you fly facing down. Place one hand on the waistband and hold it about two inches underwater in front of you. Raise the other hand above the surface and with a sweeping motion splash air into the trousers.



Fig. 6-5 Alternate splashing method

(4) Oral inflation. The trousers may be inflated orally while using the survival floating technique. Spread the trousers on the surface in front of you with the fly closed and facing down. Hold the waistband open using both hands. The waistband should be about two inches underwater. Take a breath and submerge, placing the waistband on the forehead. Blow about half a breath into the trousers until full. Blowing all of the breath into the trousers may result in water aspiration.



Fig. 6-6 Oral Inflation

c. Securing the Trousers. When the trousers are inflated, remove the belt and put it through the center loop in back of the trousers. With the fly facing you, put your head through the opening between the legs. Wrap the belt around your waist and secure it. If the belt is not long enough, simply cinch up the waist opening and hold the trousers with one hand.

d. Keeping the Trousers Inflated. The trousers should be kept wet by splashing water on them periodically. If the trousers are allowed to dry out, they may leak. Air can be forced into trousers by placing your mouth against the material and blowing forcefully. Another method to keep trousers inflated is to open the waist and splash air into the trousers.

Staying at the Surface Without Flotation Devices.

The ability to remain on the surface of the water without a flotation device, in a position that allows comfortable breathing without tiring is an important skill to learn. The facedown method is effective for personnel who are wearing restrictive or negatively buoyant organizational clothing. The techniques of resting on the surface of the water using the minimum amount of energy necessary to continue breathing can be used to catch your breath following vigorous swimming or to conserve energy.

a. Survival Float.

(1) Body position. Place the face in the water; chin at chest, with the back of the head just breaking the surface. The upper back and shoulders are underwater, horizontal to the surface, and the arms are at the surface with the elbows bent and hands separated slightly. Bend the waist with the hips underwater, lower than the upper body, and the legs dangling beneath. Variations for individual buoyancy can be accomplished by adjusting the legs by drawing them up toward the chest or extending them out and adjusting the arms by extending them or drawing them in towards the chest. These actions balance the floater around the chest, the center of buoyancy. A common fault for swimmers to cock their head back, lifting the chin off their chest. This "face forward" position causes the hips to shift lower and the body to assume a more vertical position.

(2) Breathing. The swimmer should pivot at the neck, lifting the chin off of the chest until the mouth clears the surface. The waist should remain bent, keeping the shoulders in the same near horizontal position to the surface. As the mouth clears the surface, the swimmer exhales quickly and forcefully through the mouth and nose. The inhalation is performed through the mouth and consists of a deep full breath of air. After the inhalation is completed, the head is lowered to the resting position (chin to chest). It is important for every breath to be a good, complete exchange of air deep into the lungs. A common fault is for swimmers to breathe off the top of their lungs. This "shallow breathing" causes swimmers to fatigue rapidly. The breathing cycle (breaths per minute) must be compatible with the amount of oxygen required to supplement the expended effort. A momentary pause (one to five seconds) occurs while the face is underwater. No attempt should be made to hold a breath for any set period of time; breathe as needed. The breathing cycle will gradually slow down after vigorous activity declines. Energy spent supporting the head above the water

while taking several breaths is energy wasted, floaters should place their face back into the water as soon as they have accomplished a good air exchange. A common fault in breathing includes straightening the waist rather than pivoting at the neck when inhaling. Straightening the waist alters the body position to a more vertical position requiring more effort to breathe.

(3) Coordination. Support the head while breathing with a broad sculling motion of the arms. The sculling motion of the arms is coordinated with the breathing to provide maximum lift when needed. The arms remain near the surface and move on a plane parallel to the surface. The hands press outward (palms facing out) with the hands tilted approximately 45 degrees, thumbs down. Exhalation begins about the time the mouth clears the surface. The scull continues as the breath exchange is completed. The hands press out to a point near the width of the shoulders. At this point, the palms are rotated facing inward, thumbs up, and returned to the starting point. Swimmers who have positive buoyancy (float with back of head on the surface with lungs full and body in proper position) should scull only when supporting the head while breathing. Negatively buoyant swimmers or swimmers wearing negatively buoyant equipment may need to scull continuously or use the legs for additional support while breathing.

b. Back Float. The back float is effective only in calm water, and can be hazardous in rough seas. If a wave breaks over the face when one is lying on his/her back, water may enter the nostrils causing the floater to aspirate water. To perform the back float, lie on your back. Leg heavy individuals can lay flat by bending at the knees or extending the arms over the head. Individual body composition, organizational clothing or equipment often makes the floater negatively buoyant. In these cases gentle kicking of the legs and sculling of the arms may be required to keep afloat.

Survival Swimming.

a. Terminology. The following definitions will assist then reading the descriptions of the survival strokes:

(1) Catch - A recovery movement of arms or legs executed just before the power phase in which the arm or leg is initially positioned to make contact with the water to begin the power phase.

(2) Power Phase - A movement(s) of arms or legs of a swimming stroke which generates propulsion through the water.

(3) Recovery - A movement(s) of arms or legs of a swimming stroke which returns the arm/leg to the power phase.

(4) Timing - The coordination of movements necessary to perform an efficient swim stroke.

b. Breast Stroke. The breaststroke is generally considered the best survival stroke when one must swim in open water. The advantages of this stroke include good forward visibility, controlled breathing (the ability to take a breath during the trough of a wave and to return the head into the water during the crest) when swimming in choppy seas; a powerful kick which wearing boots or shoes, and an efficient energy conserving glide.

(1) Body Position - The start and glide position is facedown and streamlined with the waist straight, legs together and extended, and arms stretched in front of the head with palms approximately 6 to 8

inches below the surface. The head is positioned with the ears between the upper-arms and the waterline near the hairline.

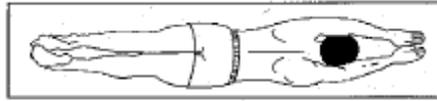


Fig. 8-1 Breaststroke Body Position

(2) Arm Action (power phase) - Starting from the glide position, angle the hands slightly downward, turning the palms outward about 45 degrees to the water's surface. With the arms straight, the palms are sculled out until the hands are positioned wider than the shoulders. This is the "catch" position. From this position, bend the elbows and pull with the hands downwards and outward until they pass under the elbows with forearms vertical. From this position, rotate the wrists, sculling the hands inward, upward, and slightly aft until the palms are below the chin facing each other and nearly touching. The elbows should be higher than the hands and lower than the shoulders for effective propulsion. Elbows should point outward, not aft, and should not be allowed to move beyond the shoulders.



Fig. 8-2A Arm Action Power Phase

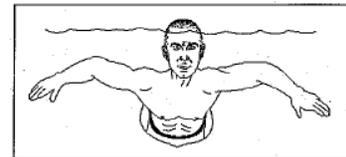


Fig. 8-2B Arm Action Power Phase

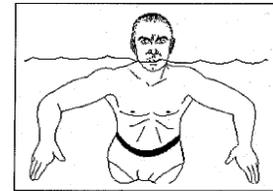


Fig. 8-2C Arm Action Power Phase

(3) Arm Action (recovery) - Recover the arms immediately after the power phase. After the hands are sculled in together, move the elbows inward, towards each other. After this motion, with palms angled toward each other, extend the arms forward to the glide position rotating the wrists until the palms are down.

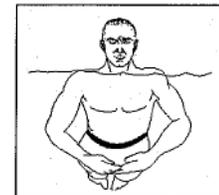


Fig. 8-2D Arm Action Power Phase

(4) Kick - From the glide, the leg recovery begins by bending the hips and knees and bringing the heels up toward the buttocks. Once heels are at the buttocks, gradually separate the knees and heels until the knees are separated about hip-width and the feet are outside the knees just below the surface. To perform the power phase, rotate the ankles outward to engage the water with the soles of the feet and with a continuous "whipping" action, press the feet outward and backward, returning the legs to the glide position. The propulsive action of the legs should begin slowly and speed up to the completion of the kick. The strongest propulsion is accomplished by drawing the feet as far forward as one can without losing proper body position.

(5) Breathing - The head is lifted at the beginning of the power phase of the arms. The head should be lifted with only the neck muscles, just high enough for the mouth to clear the water for a breath. The head is returned into the water, face down, during the recovery and glide. Inhalation should occur from the mouth, and exhalation should occur from the mouth and nose. Exhale slowly and steadily mostly through the mouth from the arm recovery until just before the head lifts for the next breath. At this point, explosively exhale the last breath of air and lift the head again for the next breath. In rough seas, the exhalation and inhalation can occur after the head surfaces to ensure that the swimmer does not aspirate water.

(6) Timing - Following a glide held just long enough to prevent the loss of forward momentum, arms and legs perform alternately. As the arms begin their power phase, the legs begin their recovery propulsion. Reminding swimmers to "pull and breathe, kick and glide" assists in developing proper coordination.

c. Sidestroke. The sidestroke is useful when towing equipment, a victim, or to swim if on arm is injured. It provides good sideward visibility but very little forward visibility. The sidestroke kick, called the scissors kick, is less effective when wearing boots because of the loss of ankle movement. It does not offer good breath control when swimming in rough seas.

(1) Body Position - To perform the sidestroke, lie on either the left or right side. During the glide, the head, back and legs are straight with the legs fully extended and together with the toes pointed. The bottom arm is extended in front of the swimmer parallel to the surface with the palm down, in line with the body, a few inches below the surface of the water. The top arm is fully extended aft with the hand above the thigh. The head lies with the face just high enough to clear the mouth and nose above the water. The bottom ear rests in the water close to the shoulder. The head and back are kept in line throughout the stroke.

(2) Arm Action - The arms work alternately with different motions for both. While the top arm executes its power phase, the bottom arm executes the recovery phase and vice versa.

(3) Top Arm - Recover the top arm by drawing the forearm along the body until the hand is approximately in front of the shoulder of the bottom arm. Keep the palm down and angled slightly forward. During the power phase, push the top hand downward slightly and then aft, close to the side of the body, as it returns to the glide position. Start the power phase with the wrist flexed and finish with the wrist extended such that the palm is always facing toward the feet.

(4) Bottom Arm - From the glide position, rotate the bottom arm slightly placing the palm down and angled slightly outward. From this "catch", bend the elbow and sweep the hand downward slightly and aft until the hand almost reaches the upper chest. After this power phase, without hesitation, recover the arm by rotating the shoulder and dropping the elbow. Move the hand under the bottom ear until the fingers point forward. Slide the bottom arm forward, rotating it such that the palm is down for the glide position.

(5) Kick - The kick is called the scissors kick because the legs separate fore and aft, on one plane, like a pair of scissors. The recovery of both legs begins after the glide position by flexing slightly at the hips, bending the knees, and drawing the heels slowly towards the buttocks. Care must be taken during this movement to keep the knees close together, not allowing the bottom knee to drop down. To prepare for the power phase, the legs separate fore and aft. The top leg moves forward, knee leading, until the thigh is approximately 45

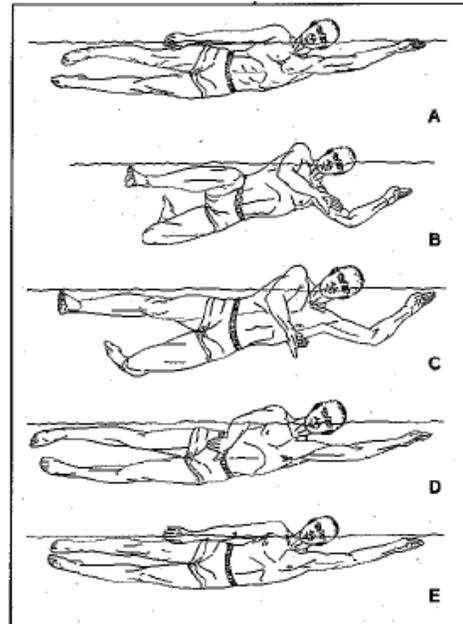


Fig. 8-6 Sidestroke Timing

degrees to the body. The foot is flexed, pointing up toward the knee. The bottom leg extends aft, slightly to the rear of the swimmer's trunk, with the knee bent and the foot pointed. Just before the power phase the legs are separated similar to a giant stride. From this position both legs press backward returning to the extended position. As one moves the top foot backward, the ankle moves from a flexed position to a toes-pointed position. The power of the scissors kick is delivered by pushing back on the water with the bottom of the top foot and the top of the bottom foot. After the power phase, do not let the feet pass each other and keep the toes pointed to streamline during the glide.

(6) Breathing - Breathe with each stroke. Inhale through the mouth during the recovery of the top arm and legs and exhale from the mouth and nose during their power phase.

(7) Timing - The recovery and power phase of the top arm and legs work alternately to the recovery and power phase of the bottom arm. Following a glide, held just long enough to prevent the loss of forward momentum, the top arm and legs begin their recovery while the bottom arm begins its power phase. After the power phase of the top arm and the legs, the recovery of the bottom arm is complete, and all motion is stopped as the swimmer glides.

d. Elementary Backstroke. The elementary backstroke offers the swimmer an effective kick while wearing boots and an energy-conserving glide. Disadvantages include difficulty seeing where one is going and the inability to control one's breathing in rough seas.

(1) Body Position - To begin arm and leg actions one lays in a streamlined back glide position. The body is face up in a near horizontal position with the back of the head resting in the water. The waist is straight, hips and thighs near the surface slightly lower than the head and shoulders, and the arms extended along the body with palms against the thighs. The legs are fully extended with the toes pointed.

(2) Arm Action (recovery) - Beginning from the glide position with arms at sides, bend the elbows and draw both hands up towards the shoulders as if drawing a line along both sides of the torso with the thumbnails. Keep hands and arms just below the surface of the water. Continue to draw the hands along the sides of the body until they reach the armpits. From the armpits, point the fingers outward from the shoulders with palms facing back toward the feet. With fingers leading, extend the arms out sideward until the hands reach upward no farther than the top of the head. Imagine a 12-hour clock with one's head at 12:00, one's feet at 6:00, and one's arms as the hands of the clock, the left arm extends no further up than 2:00 and the right arm extends no further up than 10:00. Recovery motions should be executed slowly with emphasis on reducing drag.

(3) Arm action (power phase) - When arms and hands reach the 10:00 and 2:00 position, the palms and inside of the arms push aft in a broad sweeping motion, elbows straight or slightly bent returning arms to the glide position. The power phase must be strong enough to smoothly propel the body forward.

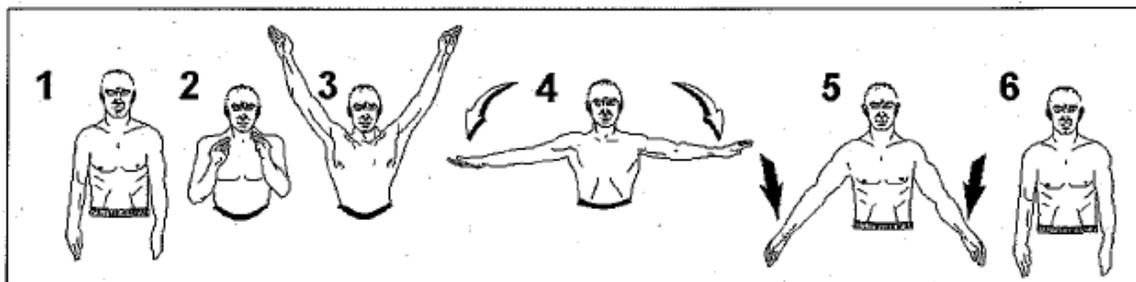


Fig. 8-11 Elementary Backstroke Arm Action

the ankles and turn the feet outward to position for the "catch". Recovery motions should be smooth and continuous.

(5) Kick (power phase) - The power of the kick is generated by pushing aft with a rounded motion with the inside of the calves and the soles of the feet. At the end of the kick the legs are returned to the toes-pointed glide position. The kick starts slowly and speeds up at the finish.

(6) Breathing - Inhalation occurs with the recovery of arms and legs, and exhalation occurs with the power phase and glide.

(7) Timing - Following a glide, held just long enough to prevent the loss of forward momentum, arms begin their recovery just before the legs. The power phases of the arms and legs occur in unison. After the power phase, arms and legs rest in a streamlined position as the swimmer glides.

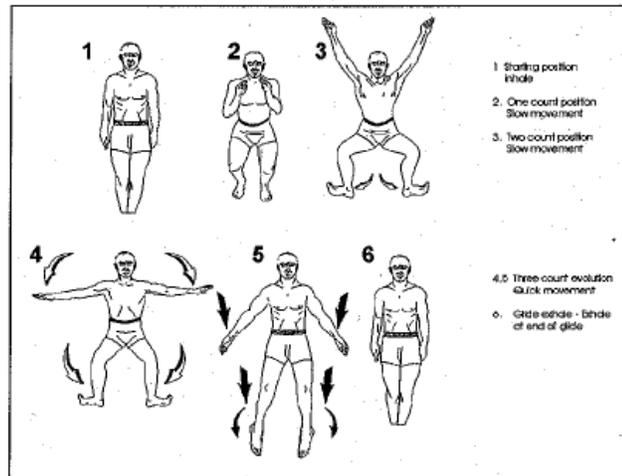


Fig. 8-14 Elementary Backstroke Timing

e. Crawlstroke. The crawl stroke is the fastest of all strokes and is effective in survival situations when speed is required. It may also be utilized if one's legs are injured. The crawl stroke offers poor forward visibility and is fatiguing to swim with operational clothing.

(1) Body Position - The body is prone, near horizontal, and chest down. Depending on one's buoyancy, the head should be positioned with the waterline between the eyebrows and hairline. Personnel with little buoyancy may need to lower the head to raise the hips to straighten the body to improve kicking efficiency. The legs are extended aft, feet together, toes pointed, held just below the surface. Body roll, a rotation around the midline extending along the whole body, is an important aspect of a proper crawl stroke. Body roll results from the high recovery of an arm, the down sweep of the other arm and the sideways force of the kick produced when the legs roll with the body. Body roll assists a relaxed high elbow recovery, improves arm propulsion, helps maintain efficient body position, and aids effective breathing.

(2) Arm Action (power phase) - Viewing the swimmer from above, the left hand traces a lengthened "S" shape in the water and the right arm traces a reverse "S". The arm speed accelerates as the hand travels through the "S" shape, with the fastest speed at the bottom of the "S" which is the end of the pull. After the body is rolled and the arm is fully extended during the recovery, flex the wrist (palm facing aft) and sweep the hand down and slightly out, just outside the shoulder. This position is where the swimmer first "catches" the water and is the top of the "S". The elbow should be higher than the hand at the start of the pull and should remain higher throughout the arm pull. As the arm action continues, the elbow bends to a maximum of 90 degrees and the hand and arm sweep back toward the feet with the hand passing just under and near the chest along, but not crossing, the centerline of the body. During this motion, pitch your hand inward and keep your wrist nearly straight. This segment of the arm action is the diagonal part of

the "S". The last part of the "S" is performed by straightening the arm and pressing the hand straight back toward the feet while moving it along the side of the body. Bend the wrist back to keep the palm pushing toward the feet. Keep this press going to the full extent of the reach with the power phase ending when the thumb touches the thigh.

(3) Arm Action (recovery) - Recovery motions should be smooth and relaxed to rest the arm and hand muscles and to produce even, continuous movement. After completion of the power phase, the elbow is bent and lifted from the water high enough to clear the hand from the water, little finger first, palm rotated toward the leg. The elbow is then moved forward towards the head with the forearm hanging down. When the elbow lines up with the shoulder, the hand is swung forward, and the arm begins to straighten. Before the arm fully extends, with the elbow bent slightly, enter the hand into the water in front of the shoulder, index finger first, with the entire arm rotated in such that the thumb is turned down. The elbow should be kept higher than the rest of the arm and should enter the water last. At this time the body is rolling along its axis on the same side as the recovering arm, assisting a smooth entry of the arm into the water in preparation for "catch" of the power phase.

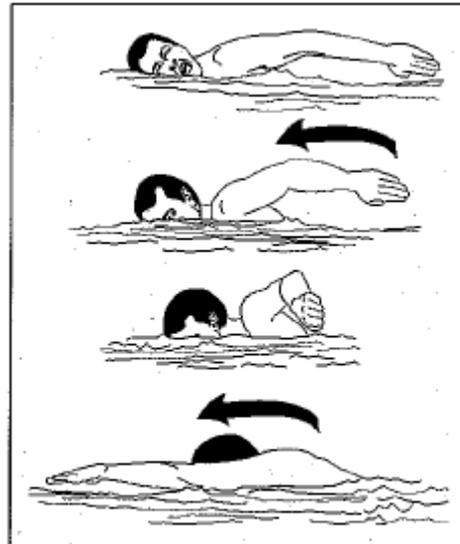


Fig. 8-17 Crawl Arm Action Recovery Phase

(4) Kick - Legs kick up and down or "flutter" with the heels just breaking the surface of the water and the legs rolling with the body. The kick originates from the hips and thighs with the knees straight or slightly flexed depending on what phase of the kick they are in. Ankles are loose and relaxed throughout the kick. Maintaining loose ankles throughout the kick is a crucial component of an effective kick. Legs work alternately, when one leg is kicking down, the "downbeat", the other leg is kicking up, the "upbeat".

(5) Kick (power phase) - The downbeat is the power phase of the kick. The downbeat begins at the hip with the thigh kicking downward while the calf and foot are still moving upward. For most of the downbeat, the knee is slightly flexed. Propulsion occurs when the leg is straightened. Straightening your leg initiates a motion, which continues through the whole leg and ends with the feet. At the end of the kick, with the feet turned slightly inward, the foot snaps downward, generating a motion as if one were kicking a soccer ball.

(6) Kick (recovery) - The upbeat is the recovery phase. The leg stays nearly straight during the upbeat. The leg is raised toward the surface until the heel just breaks the surface in preparation for the downbeat. The distance the feet separate during the kick depends on the length of the swimmer's legs with normal feet separation ranges being 12 to 18 inches. The number of kicks per arm cycle varies. The number of kicks is measured for one arm cycle; the time one arm starts to pull to the time it starts to pull on the next stroke. Generally more kicks per arm cycle occur during faster, shorter swims and less kicks per arm cycle for longer, slower swims. Most common are two to six kicks per arm cycle.

(7) Breathing - Breathing occurs by turning the head and inhaling during the recovery of one arm. Breathing should not include a pause or hesitation of the arm action. Swimmers may breathe with each arm cycle, every 1 and 1/2 arm cycles alternating sides or every other arm cycle. The swimmer should choose a breathing cycle that meets the physical demands of the swim and is comfortable to perform. Begin the turn of the head as the arm on the breathing side starts to pull. The mouth clears the water at the end of the pull, and inhalation occurs at the start of the arm's recovery. The face is returned to the water when the arm recovers forward. When inhaling, the swimmer should keep the forehead slightly higher than the chin with the opposite ear in the water. This head position allows the swimmer to breathe in a trough created as the head moves through the water. Body roll further assists the swimmer to turn the head to breathe. Exhalation occurs slowly through the mouth and nose between head turns and is completed underwater. When the mouth surfaces, inhale from the mouth. Inhaling large amounts of air is unnecessary as the opportunity to breathe occurs frequently with each arm stroke.

(8) Timing - The arms stroke continuously, the legs kick continuously, breathing occurs with the recovery of an arm and the body rolls to the left and right matched with the recovery of one arm and the down sweep of the other arm.