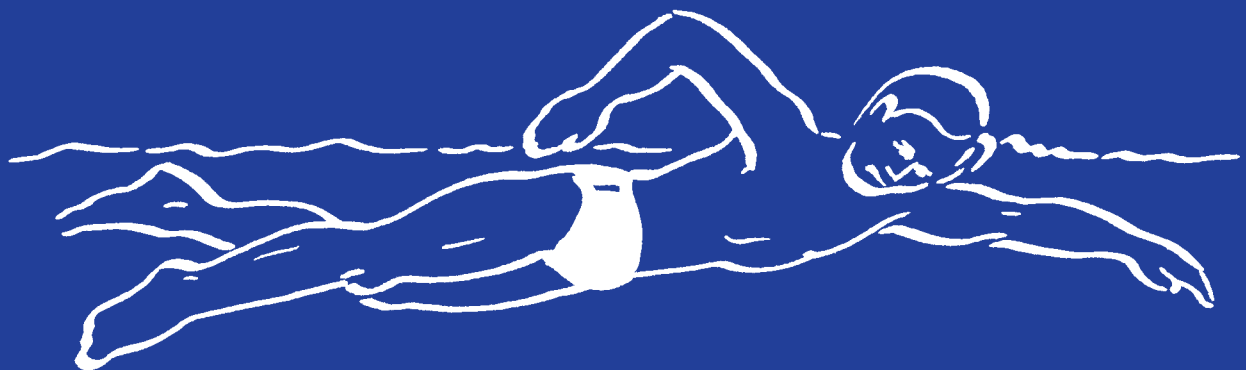




THE ROYAL MARINES

# Swimming





Student Notes



Teacher Notes

Prepared for The Royal Navy in association with The Amateur Swimming Association and The Royal Life Saving Society UK. Produced by Education and Youth Limited, London.

If there is any support you feel The Royal Navy can give regarding this project please contact 0870 333 0423.

### ***Acknowledgements***

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## Message from the Amateur Swimming Association

The objectives of the Amateur Swimming Association (ASA) are twofold and indicate the breadth of interest of the governing body of swimming. They are as follows:

- to promote the teaching and practice of swimming, diving, synchronised swimming and water polo, and to stimulate public opinion in favour of providing proper accommodation and facilities for these;
- to draw up, publish and enforce uniform laws for the control and regulation of amateur swimming, diving, synchronised swimming and water polo championships and competitions in England and to deal with any infringements.

The ASA has one of the most advanced and comprehensive education programmes of any sporting body in the world and has recently introduced the ASA Youth Swimming Award specially designed for teenagers who want to participate in any activity related to swimming from aiming at a high competitive standard to helping others learn to swim.

This module is intended to be a guide to students in secondary schools who wish to follow a detailed course of swimming and lifesaving. Any reader wishing to follow up with an in-depth study of any aspect is advised to consult the list of publications at the end of the module. Those books of special interest to examination students are marked with an asterisk.

Anyone wishing to keep up to date with the swimming world can read *Swimming Times*, the most popular magazine on swimming published in Great Britain.



## Introduction to the module

### Module Objectives:

After completing the Module students should be able:

- to understand the basic principles of the four main strokes used in competitive swimming and in starts and turns,
- to apply this knowledge to improve their performance of the strokes,
- to understand and carry out the skills required to assist others in an emergency situation involving immersion in water,
- to understand and apply the principles of self-preservation in an emergency situation involving submersion in open water.

### Method:

Teachers should provide:

- encouragement, support and motivation to students studying the module,
- facilities for the skills learned to be practised at the level appropriate to the individual student,
- the opportunity for students to gain further technical knowledge as required, through formal teaching or the provision of study aids.





## Skills Development Sheet

The beginning stage of swimming is the exploratory phase, where the swimmer is attempting to learn the correct sequence of movements of all the basic skills e.g. backstroke, breaststroke. A number of errors may be made and swimmers will need feedback to recognise and correct these errors.

During the intermediate phase, skills will be performed more consistently. Co-ordination of arms, legs, breathing and body position will improve, although technique may break down under pressure of distance or time.

At the advanced stage, skills and techniques are automatic, and a swimmer will concentrate on more advanced and detailed aspects of the skill or self-imposed challenges e.g. preparing for tests or competition.

Name of Module	Swimming
Basic Skills	Body position, leg action, arm action, recovery, breathing and co-ordination (pages 7-17)
Strokes	Breaststroke, back-crawl, butterfly stroke, front-crawl (pages 7-17)
Life Saving Life Support	Recognising the casualty (page 24) Action in an emergency (page 25) Principles of rescue (page 25) Principles of life support (page 28)
Training Principles	Power, strength, flexibility, aerobic power, anaerobic power, muscular endurance, speed
Rules	For rules and information contact: Amateur Swimming Association (ASA) (see page 33)





## UNIT 1

### Introduction to the Swimming and Lifesaving Module

Water is not their natural habitat, but most people are able to float in it. Once this phenomenon is experienced, appropriate actions of the limbs will bring about the movement known as swimming. This exhilarating activity is for all, from the very young to the very old, from the frail to the strong, from the physically handicapped to the athletic.

Throughout this country there is ample provision for people to swim and there are many good reasons why everyone should learn to do so, as the following aims will indicate.

#### Survival

There are ever-present dangers near any open water: the sea, rivers, lakes, canals and disused pits. Every year deaths are caused through drowning, many occurring within a few metres of safety. It is important, therefore, that everyone should be able to swim, in order to save themselves in an emergency. This same open water provides opportunities for a wide range of activities such as sailing, surfing, canoeing and skiing, for which swimming is a prerequisite.

#### Recreation

In these days of increased leisure time, the need for involvement in some kind of recreational pursuit, preferably of a physical nature, is generally recognised. Swimming provides the means and it has many advantages:

- a) Ample opportunities are available in swimming pools and leisure centres.
- b) Little equipment is required, simply a costume and a towel.
- c) It is comparatively inexpensive.
- d) It can be enjoyed in company or alone (but the latter only under supervision).
- e) Age is no barrier. Babies together with parents enjoy movement in water and older people can continue to swim when other recreative pursuits might prove too strenuous.
- f) It allows for family participation, including any member who might be disabled.
- g) Membership of swimming clubs provides social opportunities as well as facilities for training and the development of swimming skills.
- h) The acquisition of swimming skills can lead to training as a lifesaver or lifeguard.

#### Therapy

Swimming can be valuable in medical treatment and in general therapy for the following reasons:

- a) The supportive nature of water permits the performance of gentle movement without undue tension, thereby assisting in rehabilitation after injury or illness.
- b) The disabled and physically handicapped may take part because weight bearing is not required. Movement and travel can take place without the use of great strength, and the performer is able to experience and enjoy a freedom of movement not possible out of water.
- c) It is particularly suited to the overweight person whose obesity is not so noticeable in water. The condition itself assists flotation and hence the ability to swim. Through exercise, heart and blood vessels can be strengthened, and in swimming, muscles can be worked and joints moved beyond their normal range. Similar movements attempted on land would be stressful.
- d) Swimming is an enjoyable way of keeping fit. It improves stamina and stimulates the circulatory and respiratory systems, thereby promoting a feeling of general well-being.

#### Competition

Most people swim for reasons already stated. Some improve their skill by means of self-imposed challenges, or by preparing for various tests. For those endowed with special abilities and aptitudes there are many opportunities for participation in swimming as a competitive sport. For such people, coaching, training and swimming events are provided by the many clubs to be found throughout the country.

#### Lifesaving and Life Support

While everybody acknowledges the bravery of a hero who responds effectively in an aquatic emergency, it is essential the rescuer is regularly trained and assessed to ensure that they have the competence and skills to carry out a rescue as effectively as possible with the minimum risk to themselves. It should be made clear that entering the water to attempt a rescue must never be undertaken unless the rescuer is a trained lifesaver. It does not matter how strong a swimmer a person may be, getting into the water to effect a rescue poses a great threat to a rescuer's safety.





## UNIT 2 Safety

A respect for the water and an understanding of associated dangers are necessary for safety just about everywhere. General rules and routines should be borne in mind at all times.

- a) Swimming pool users should be aware of water depths indicated on the pool sides.
- b) There should be no running on the poolside; wet floors can be slippery and consequent falls can cause injury.
- c) Swim hats should be worn by those with long hair, or the hair should be tied securely so that it cannot cover the face and especially the mouth.
- d) Sweets or chewing gum should be avoided. It is dangerous to enter the water with these in the mouth.
- e) Jewellery should not be worn. It can be dangerous if the wearer is in close contact with other people in the water.
- f) After a meal, food should be allowed to digest for at least 1.5 hours.
- g) If goggles are worn they should fit snugly and should be constructed of safe material and conform to BS 5883-1996.
- h) Floats and other buoyancy aids should be treated with care and not thrown about. Inflatable aids should be checked frequently for damage or malfunction. Beginners using them should remain in a safe depth of water.
- i) Care must be taken when diving to ensure that the entry area is clear of swimmers and obstructions and that the water is sufficiently deep.
- j) Diving entries for swimming should be of the plunge style. They should be shallow dives performed from a firm stance into a clear area of water. For early practices the depth of water should be at least 1.8 metres. Only after proficiency has been gained can special racing type entries, as required by competitive swimmers, be made into shallower water, determined by the depth of water at the starting end of the pool and never less than 1.5m deep.
- k) Diving as a sporting form and used in competition requires special training which usually takes place in diving clubs. Entries are made from purpose-built platforms and springboards with the body in a vertical position requiring a water depth of up to 5 metres.
- l) Those responsible for the use of the pool should be familiar with the Normal Operating Procedure and the Emergency Action Plan which all pool operators are required to have in place.

### Swimming in Open Water

Not all swimming takes place in the comparatively safe environment of a swimming pool and there are many water activities for which swimming should be a prerequisite. For those who use open water the following safety code should be observed.

- DO NOT swim alone unless competent help is at hand.
- DO NOT bathe in areas where red flags or other warnings are displayed.
- DO NOT fool about at the sides of rivers, lakes, canals or quays.
- DO NOT venture on frozen ponds.
- DO NOT float out to sea on inflatables; tides can be treacherous even for strong swimmers.
- DO NOT go out in small boats without wearing a life-jacket and telling somebody where you are going and when you are due back.

### Follow the Water Safety Code:

- Spot the dangers
- Take safety advice
- Don't go alone
- Learn how to help

Always wear footwear to prevent injury, discarding it only when swimming.

Wear a brightly coloured swim hat to retain body heat and so you can be easily seen.

Have shelter and first aid equipment available.





## UNIT 3 Strokes

### BACK CRAWL

At the beginning of the last century two forms of backstroke were being performed. Both had leg actions similar in shape and pathway to that of a wide inverted breaststroke but the arm actions differed. In the elementary backstroke the arms were moved, simultaneously, from shoulder level to the sides of the body, followed by an underwater recovery. The continuing quest for speed brought about an alternating arm action and, later, an alternating upward and downward leg kick leading to the development of the back crawl stroke. The modern version of the stroke has the arm action balanced by the leg kick, accompanied by a noticeable body roll and reaction at the hips and feet. The degree of reaction depends upon the performer's physical characteristics, associated with the application of basic techniques.

#### Body Position

The body is as horizontal as possible whilst maintaining an effective leg action completely under water, but near the surface. The back of the head is in the water with the hips high. The knees remain below the surface and the toes just dimple the surface on the up kick (Figure 1).



Figure 1

The position of the head is important because a raised head makes a hips-up position difficult, leading to a type of sitting position in the water. A further requirement is that the body is stretched with legs and feet extended and this depends on flexibility and mobility. Swimmers with stiff ankles find the body position and the leg kick difficult to achieve, while others with good flexibility in legs and ankles will adopt a good position naturally. Competent swimmers use a shallow dish shape which places the shoulder girdle and hips in an advantageous position for the effective use of arms and legs.

#### Leg Action

Efficient back crawl swimming depends on an effective leg kick. It is often described as an alternating up and down kick, suggesting an action in a vertical plane. This might well happen when the swimmer is involved in practices with legs only; however, when the arm action is used, the kick is part sideways, part vertical and then partly to the other side.

Before each kick up to the surface the knee bends, due to pressure of the water against the front of the leg and ankle. It is accompanied by some hip extension and movement of the leg backward, relative to the spine (Figure 2). With the leg at its lowest position the up kick is initiated by the powerful muscles of the hip. Then action passes to the muscles which straighten the knee, accelerating the movement of the pointed foot to the surface (Figure 3). At this time, intoeing often takes place as a consequence of the natural structure of a flexible ankle joint. Full extension of the knee occurs and the action ends in a whip-like movement of the foot. The toes touch the surface if the pace is easy but there is a lot of broken water in hard-paced swimming. The leg remains straight for most of the downward movement with the sole of the foot pressing on the water.

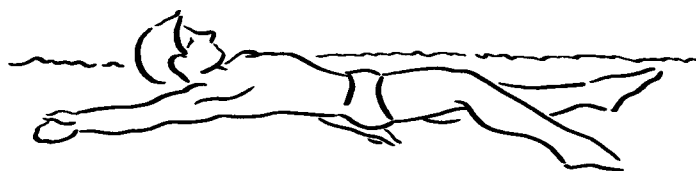


Figure 2

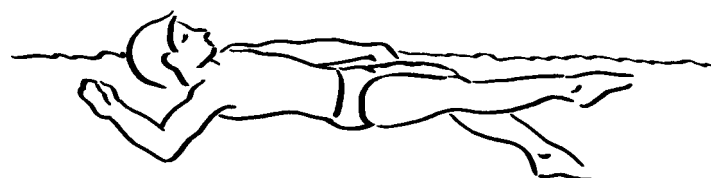


Figure 3

Whether propulsion is obtained depends on foot size, ankle mobility and strength of legs. As one leg finishes its upward action the other leg is at its lowest position with the foot some 30-60 cms (12-24 ins) below the surface. The feet pass close to each other as the legs move upward and downward.

#### Arm Action

In back crawl it is convenient to think of two possible extremes of action:

- bent arm action or **S** pull
- straight arm action

The bent arm action technique is the more effective because it uses a shorter lever permitting a faster action and it has a more effective propulsive force, being closer to the line of progression. The straight arm technique is not truly straight because the hand follows a semi-circular pathway, centred on the shoulder, and it is at its deepest opposite the shoulder (Figure 4). It will be recalled that a long lever moves more slowly than a short one. It will be recalled, also, that every action produces an equal and opposite reaction and therefore only in the middle part of the straight arm action will there be a fully effective reaction. The first and last thirds of the semicircular action will produce reactions to one side or the other. Observation reveals the straight arm action to be deep, relative to the line across the shoulders. Such action is weak considering the effective use of the strong muscles of shoulders, chest and back (Figure 5). This is because the straight arm technique is accompanied by a flatter body position with less roll. For three reasons, therefore, the straight arm technique is less effective than the bent arm one:

- A long lever moves more slowly giving a slower stroking rate
- Mechanically it produces less propulsion
- Anatomically, it tends to place the muscles of the shoulder joint in a weak position for effective action. If there is elbow bend, the elbow tends to lead the hand.



*Pull.* As the arm pulls, the elbow begins to bend, and as the movement continues the arm rotates so that the hand catches up with the elbow. The degree of bend, approximately 90°, can vary between individuals and sometimes between right and left arms. The head remains in line with the body, whilst the shoulder on the pulling side drops to obtain the most advantageous position for the strong pull-push action already mentioned (Figure 8 a-c).

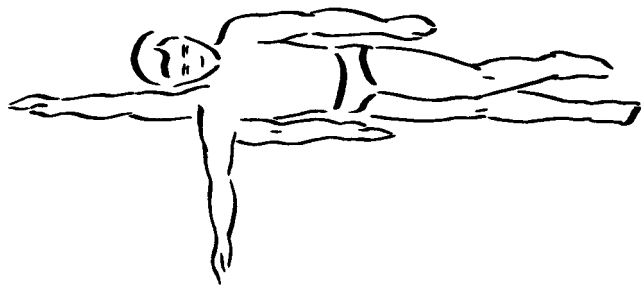


Figure 4

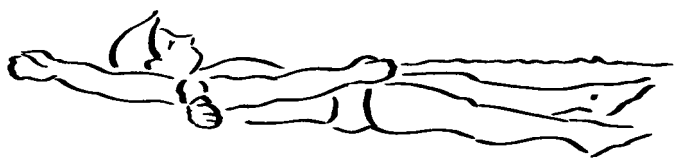


Figure 5

**Entry**

The entry of the hand is similar for both techniques. It is preferable if the little finger enters in advance of the hand and this requires some rotation of the wrist. If the shoulders are not flexible, the back of the hand enters first and when this happens the hand has to turn as it sinks into the water. Generally, the entry is in line with or very slightly wide of the shoulders but skilled performers tend to move nearer the central line (Figure 6).



Figure 6

**Propulsion**

a) Bent Arm Action

*Catch.* The hand turns and shapes early and in skilled performances there is a distinct press down before purchase is gained at approximately 15 cms (6 ins) (Figure 7).

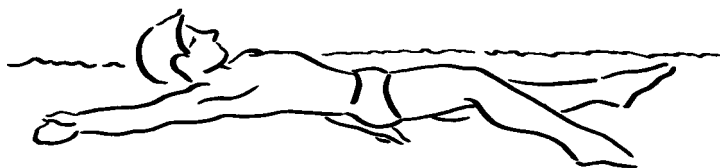
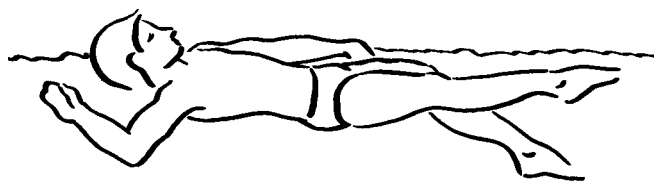
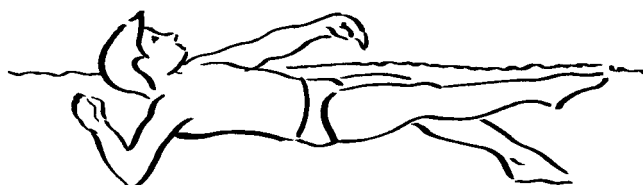


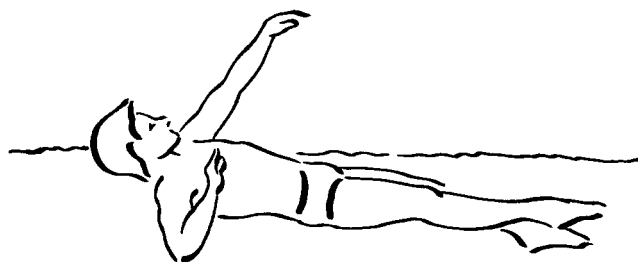
Figure 7



a



b



c

Figure 8





*Push.* Once the shoulder, elbow and hand are level, they are well positioned for a powerful push. The hand continues to face towards the feet until the arm is fully extended. For many swimmers, especially learners, lack of strength may result in the push being weak in all or in part. If the push is complete, it finishes with a fully extended arm below the hips, the palm of the hand facing the bottom of the pool (Figure 9 a - c).

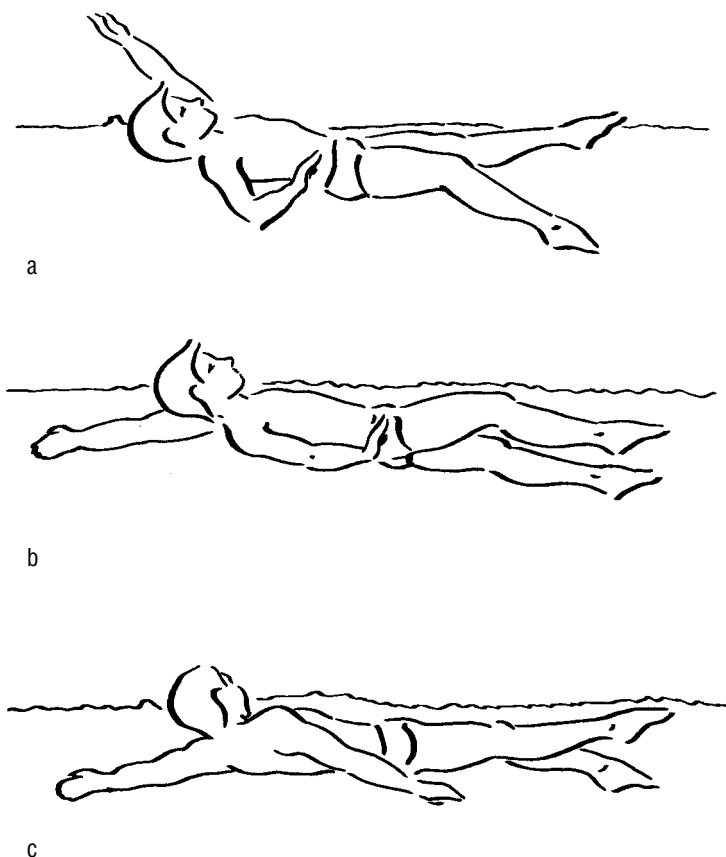


Figure 9

A side view through the whole action shows the hand tracing a pathway rather like a letter 'S' on its side (Figure 10).

#### b) Straight Arm Action

In this action the hand follows a semicircular pathway. After the catch much of the pull is outward as the arm increases in depth, until it reaches shoulder level; it is here that propulsion is most effective. As there is very little bending at the elbow, the remainder of the action, the push phase, tends to be inward towards the hip where it finishes. At no time should the hand be lower than body depth.

#### Recovery

In this phase of the stroke the straight arm is lifted from the water vertically, and returned directly to the entry position (Figure 11 a - d).

There will be variations of the hand position in recovery and in the manner of arm rotation required to allow the little finger to lead for entry. However, the whole action should allow a smooth and flowing transition between propulsion and re-entry. The rolling of the body aids recovery by raising the upper shoulder clear of the water, thereby reducing resistance.

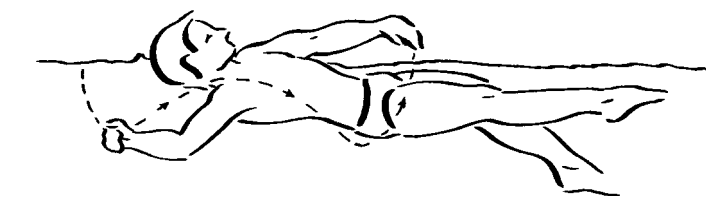


Figure 10

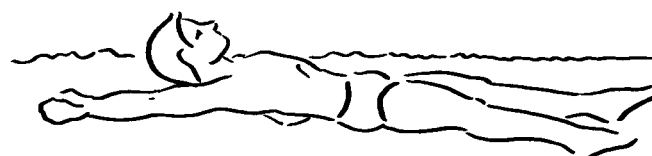
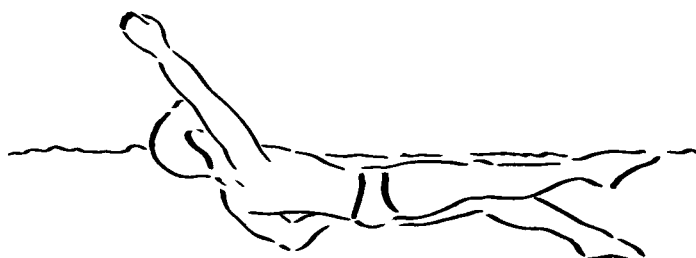
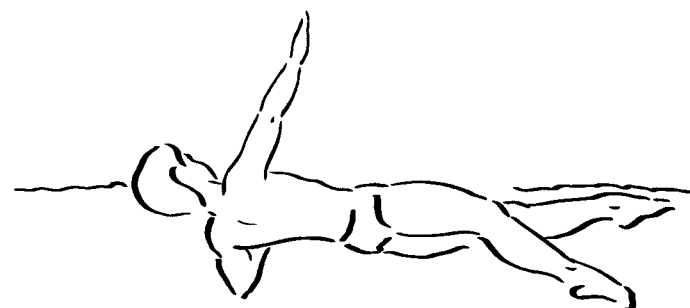
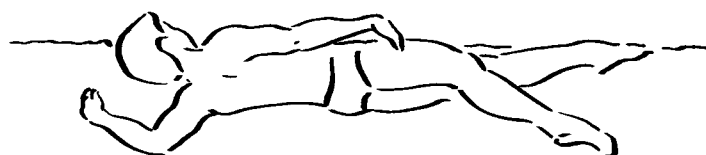


Figure 11

The re-entry of one arm coincides with the full extension of the other at the end of its propulsive phase.

#### Breathing

As the face is out of the water throughout the stroke, breathing should present no problems. However, since it is important to breathe at regular intervals, the method most commonly recommended is to breathe in as one arm enters the water and to breathe out as the other one enters.

#### Co-ordination

The co-ordination of arm and leg action develops with practice. Normally, six beats of the legs occur during one complete arm cycle. The opposite leg kicks downward at the beginning of each arm pull. This helps to balance the body as in walking and running, when one arm swings forward as the opposite foot steps forward, and vice versa.





## BREASTSTROKE

This is the oldest of the four modern competitive strokes and one which is used by swimmers of all abilities. However, for various reasons it is the slowest of the strokes. Firstly, the recovery of the arms and legs beneath the water creates considerable resistance when swimming at speed. Next, the propulsive movements are less continuous than those of the front and back crawl. Finally the relatively high position of the head, especially when inhaling, causes the body to be inclined from the horizontal, producing additional resistance.

Unlike the other competitive strokes, breaststroke derives great propulsive effect from the strong thrust of the legs against the water.

### Body Position

For most effective streamlining a near-horizontal body position is desirable. However, to permit the leg action in breaststroke to take place beneath the surface of the water, some adjustment has to be made to this position. As a consequence, proficient swimmers adopt a position which is slightly inclined from the head to the feet (Figure 1).

In order to maintain as streamlined a position as possible, as the arm pull takes place the legs should remain in a trailing, extended position (Figure 2). Similarly, when the powerful backward kick is propelling the body forward, the arms should be fully extended and the head kept as steady and as low as possible (Figure 3).



Figure 1

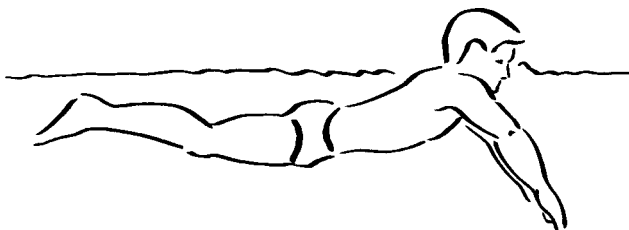


Figure 2

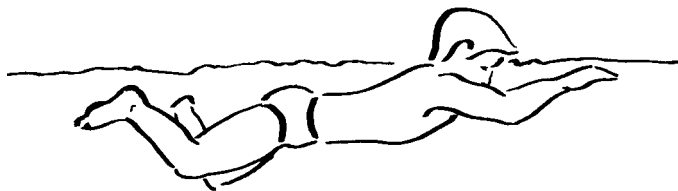


Figure 3

### Leg Action

Two types of leg action are in use:

- The preferred action is a narrow whip-like action used by most competitive swimmers and quite naturally adopted by some beginners
- Recreational swimmers tend to adopt a wide wedge-type action but this is not recommended

### The Whip Kick

#### Recovery

From the extended position the heels are drawn up towards the seat and are about hip width apart. The position of the knees may vary from being fairly close together to a position just outside the body width. The angle between the upper leg and trunk when viewed from the side varies from  $110^\circ$  to  $140^\circ$ . If the angle is greater than this, the propulsive effect is reduced and if it is less, resistance is increased. At this stage the lower legs are in a near perpendicular position with the feet turned outward and the soles of the feet facing uppermost and just below the water surface (Figures 4 & 5).

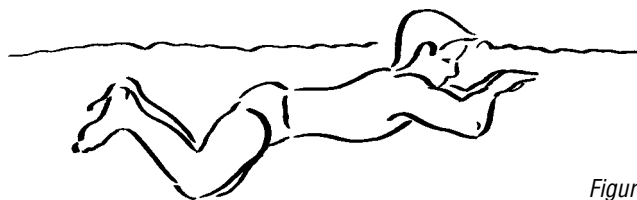


Figure 4

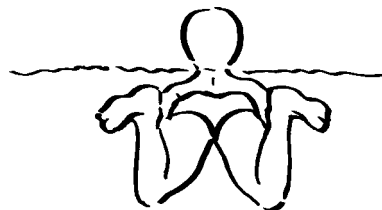


Figure 5

#### Propulsion

The feet are driven mainly backward following a curved pathway as they move towards each other. This is a smooth, powerful and accelerating movement. The drive is first made with the inner sides of the feet and lower legs, using a whip-like action as they thrust vigorously against the water. Then the broad paddles of the foot fix on the water, enabling the body to be driven forward as the legs are extended (Figures 6 & 7).



Figure 6



Figure 7





### Arm Action

The natural stroke has a continuous circling action without any pause or glide. However, the stroke is improved when a short glide is used. The speed swimmer reduces the glide to a minimum, but it is still important that the hands pass through the glide position even if a pause in the action is not apparent. The arm action has two main variations:

- a) A bent arm pull with a high elbow used by most competitive swimmers (Figure 8).
- b) Recreational swimmers and beginners tend naturally to adopt a straight arm pull (Figure 9).

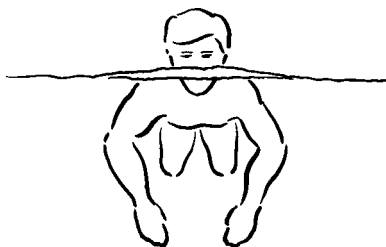


Figure 8

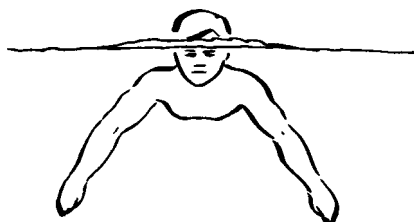


Figure 9

### Breathing

There is a wide choice in the techniques of breathing in this stroke. Although this may not be of any great consequence to the average performer, the position of the head during breathing can influence the stroke considerably.

Some swimmers keep the head raised throughout the full stroke cycle so that the mouth and nose can be clear of the water surface at all times, simplifying the breathing.

This style will certainly cause the hips to drop and will increase frontal resistance considerably.

A better position is that in which the head is held still, with the water level between the bridge of the nose and the hair line. However, the head must be raised to breathe, and if this is assisted by a downward pressure of the arms, an unwanted loss of horizontal poise will result, leading to increased frontal resistance.





The best compromise between the necessity to breathe, and the mechanical disadvantages that ensue, is achieved by smoothly lifting the head by the minimum amount, and inhaling through the mouth with the head being returned to the normal position before the leg drive begins. This is achieved by pushing the chin forward, sufficient only for the mouth to clear the water. Exhalation takes place through the mouth and nose, preferably when the face is immersed.

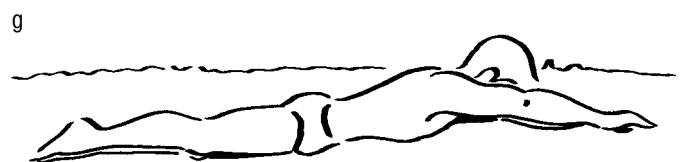
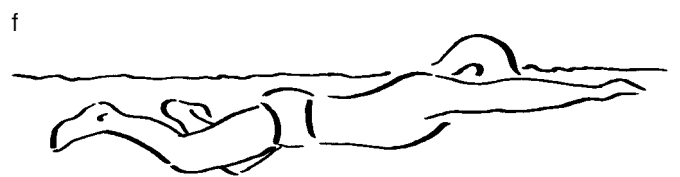
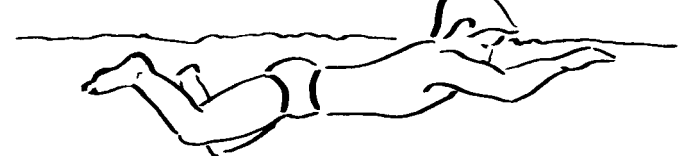
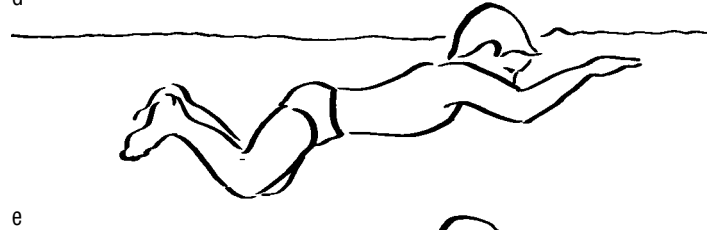
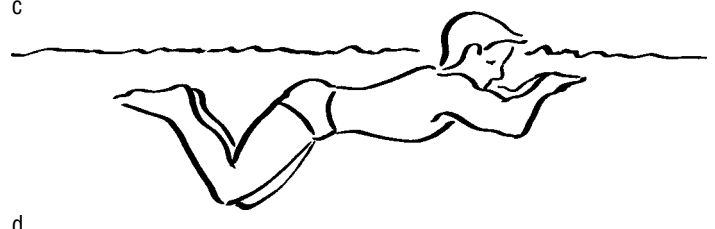
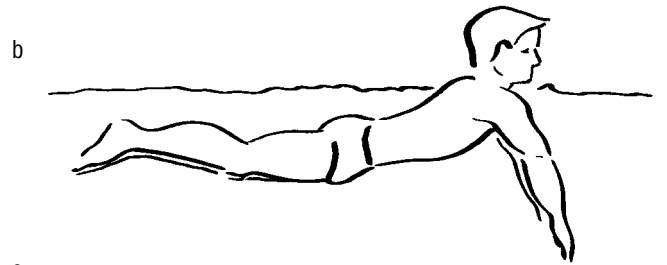
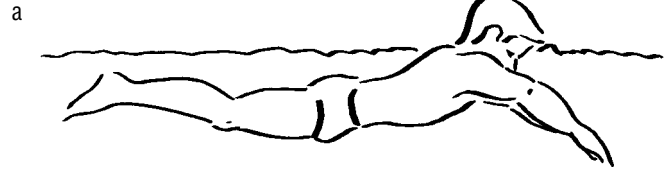
#### Variations in the timing of the breathing are:

- Early breathing.* The head is lifted as the arms complete the recovery phase and inhalation takes place during the glide or at the beginning of the arm pull. This variation has the disadvantages of spoiling the streamlining of the body position and so detracting from the effectiveness of the leg drive.
- Mid-way breathing.* In this pattern of breathing the head is lifted in the mid-way part of the arm pull. Although this is not the most efficient technique it is the one most often used by beginners and recreational swimmers.
- Late breathing.* This is the one invariably used by competitive swimmers, inhalation taking place between the end of the propulsive phase and the start of the recovery phase. It is important that any pause which might occur when breathing is taking place is reduced to a minimum.

#### Co-ordination

The co-ordination of the propulsive actions of the arms and legs is one of continuous alternation, so that as one propulsive movement ceases, the other takes over. The stroke sequence is basically pull, breathe, kick, glide. The length of the glide in the sprint is minimal. The legs are fully extended when the arm pull begins, but before it is completed the legs begin to recover. As the arms recover, the legs continue with their recovery, and as the arms move towards full extension the leg kick should have begun.

*Variations.* Many variations in breaststroke are to be seen. These are dependent on individual strength, mobility and length of limb. For example, some swimmers with strong upper extremities gain a greater degree of propulsion from the arm pull while others derive a greater degree of propulsion from the legs. Variations in rhythm may also be found. Competitive swimmers in sprint events may use an almost continuous stroke in which alternate arm and leg actions can be co-ordinated, to give a more effective propulsion. This is achieved by allowing the beginning of the arm pull to coincide with the completion of the backward thrust of the legs, and by starting the recovery of the legs as the arms are completing their propulsive phase.



**Breaststroke Sequence**





## BUTTERFLY STROKE

The butterfly stroke is the newest of the four competitive strokes, and one which requires a high degree of strength, mobility and watermanship. It is second in speed to the front crawl.

### Body Position

The body should be maintained in a position which is as near horizontal as possible, with the head in its natural position and the water cutting its crown (Figure 1). Since it is important to maintain a streamlined position, the undulation which occurs as a reaction to the arm and leg movements should be kept to a minimum. For this reason, when the inbreath is being taken the head should be raised only sufficiently to allow the mouth to clear the water.

### Leg Action

Both legs move in a simultaneous upward and downward action and their main purpose is to balance the movements of the arms and upper body.

On the downward movement, the hips start to drop, leading the upper legs (Figure 2). The knees then start to bend until they are at an angle of approximately 90°, thus causing the lower legs and feet to rise, with the ankles fully extended. The lower legs are then thrust downward, initiated by the powerful hip flexor muscles. As the legs thrust deeper, the hips rise until the downward kick is completed and the feet have reached a depth of between 50 and 60 cms (Figure 3).

The upkick starts with a powerful use of the hip extensor muscles, and the legs move upwards without bending at the knees. As they do so, the soles of the feet press against the water to create a force which is partly upward and partly backward (Figure 4).

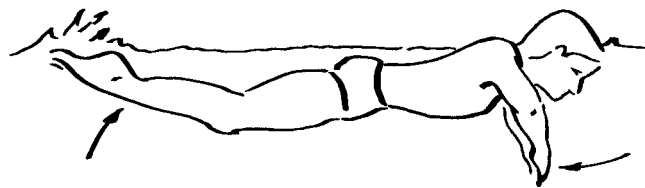


Figure 4

### Arm Action

The arm action is the main propulsive factor, and to be effective strength and mobility of the shoulders are required. The arm movements are simultaneous and continuous.

### Entry

The entry is made with the hands in line with or just wide of the shoulders, the exact position varying with the degree of shoulder mobility (Figure 5).

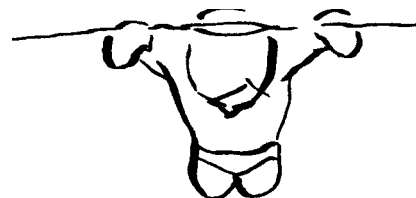


Figure 5

The arms are almost fully extended, with the elbows raised and palms facing downwards. Often the hands are pitched at an angle which allows the thumb to enter first with palms facing downward-outwards.

### Propulsion

*Catch.* The catch is made as early as possible after entry, just below the surface of the water. It is made with the palms facing mainly backwards, but initially there is a downward component which helps to raise the upper body and head. The elbows must be higher than the hands (Figure 6).

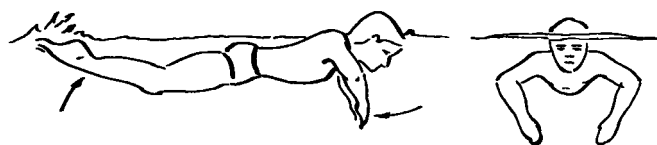


Figure 1



Figure 2

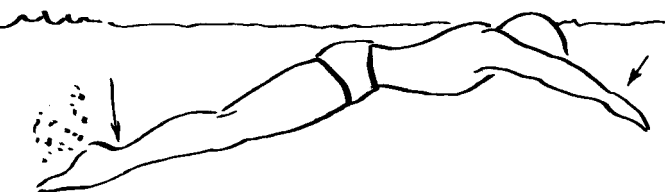


Figure 3



Figure 6

*Pull-push.* The pull and the following push phases provide the main propulsive force.

After the catch, the hands pull downwards, sideways and backwards until they reach a position about 30-45 cms (12-18 ins) deep (Figure 7). At this point the upper arms are in line with the shoulders. It is important that the elbows are above the hands, which have now caught up with the elbows and are about to lead them as the push phase begins. In this high elbow position, the hands point downwards.





The shape of the pull-push action is shown below:



Figure 7

The movement continues without pause into the push phase. The elbows bend so that the lower arms and hands move inwards toward each other while still pressing backwards towards the feet. At all times the hands lead the elbows. From the point where the hands are closest together, the elbows are straightened in a powerful and accelerating movement, with the position of the wrists changing as the hands are pitched for the most effective propulsion (Figure 8).

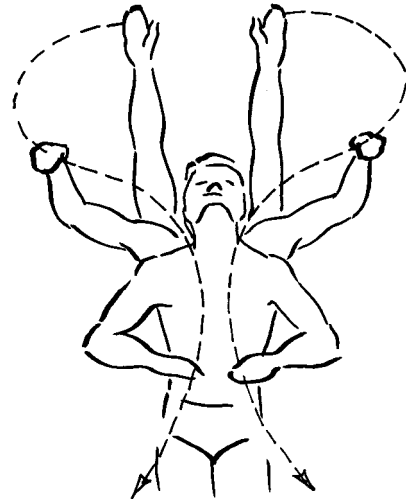


Figure 11

Swimmers who lack flexibility in the shoulder girdle will use a V-pull. This has a wide entry and the first part of the pull is outside the shoulder line following a V-pathway; see below.

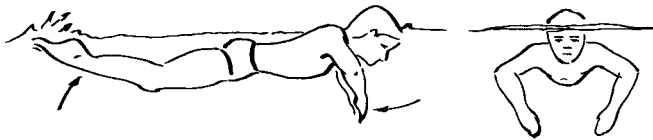


Figure 8

At the end of this push phase the arms are fully extended as they sweep outwards to clear the hips for the transition into recovery (Figures 9 & 10).

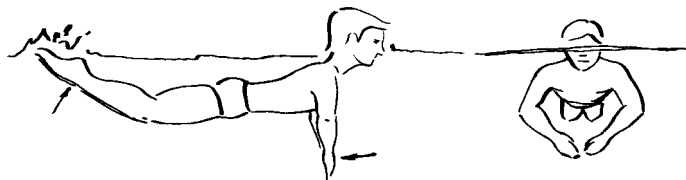


Figure 9



Figure 10

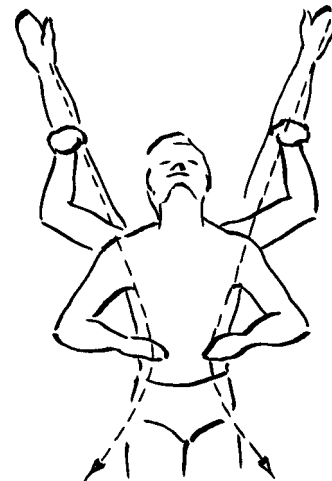


Figure 12

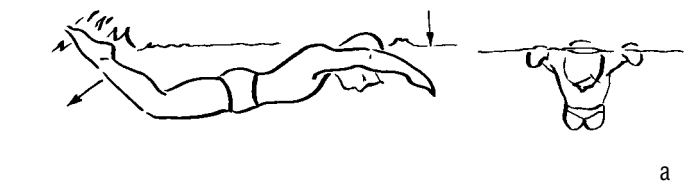
### Recovery

As the hands and arms leave the water with palms facing upwards, they are carried sideways and forwards. Sometimes there is a bending of the elbow to aid the release of the arms from the water. The recovery movement is a smooth relaxed flinging action over the water. As the arms sweep past the shoulders some swimmers have the palms turned down ready for a finger-tip entry, while others retain the thumb-down position for the pitched entry already described.





Figure 13



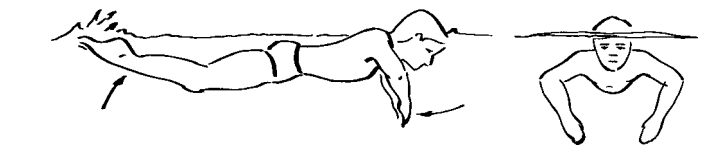
a



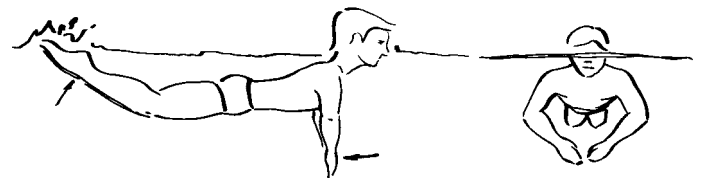
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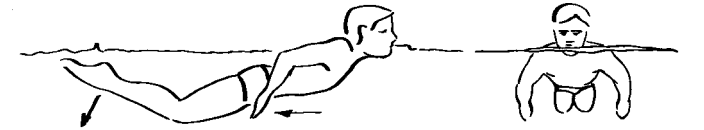
Figure 14



c



d



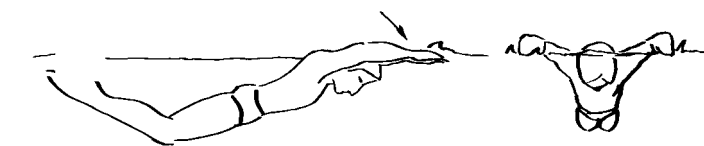
e



f



g



h

### Breathing

In butterfly stroke the explosive type of breathing is most frequently used. This involves a rapid exhalation followed immediately by inhalation. It is a technique requiring powerful use of the respiratory muscles.

As the arms are in the push phase of their action, the head and shoulders begin to rise and some exhalation takes place under-water (Figures 13 & 14). However, the main exhalation occurs as the head and shoulders rise until the mouth is clear of the water, with the chin pushed forward to lead the body. Forceful inhalation follows immediately, and the breath is held as the head is lowered to resume the streamlined swimming position as quickly as possible, with the arms completing recovery.

The positions for breathing can be seen in Figures 15e & 15f.

### Co-ordination

Butterfly is normally swum with two kicks to one cycle of the arms as illustrated sequentially in Figure 15.

The first kick downwards occurs as the hands and arms enter the water. During recovery, the arms, having been in the air, will have caused the hips to sink. The subsequent kick is required to be strong to balance the greater displacement.

The second kick occurs during the powerful and accelerating push phase of the arms. During this movement, the feet react towards the hands. This reaction will be proportionate to the strength and duration of the push, and swimmers with a weak push phase will have a weak reaction.

The first strong kick and the second weaker kick are known as major-minor. Should the second kick be a strong one, of equal force to the first, they are called equal beat. Both these actions have the common feature that the first kick occurs when the arms are forward and the second kick when the arms are well back (Figure 15e).

The distance forward or backward will depend on personal factors of buoyancy, strength, mobility and skill.

Butterfly Stroke Sequence

Figure 15





## FRONT CRAWL

The front crawl is the most mechanically efficient of all strokes because the body is in a position in which force can be directed mainly backwards, powerfully and continuously with the minimum of retardation. This results from an alternating arm action accompanied by a leg action which helps to balance and maintain the body in line. It is mechanically more efficient because it places the strong muscles of the chest and shoulders in the best position to exert a pull in the direction that will produce the most effective reaction.

The front crawl is usually the stroke used in freestyle races, the terms being considered synonymous nowadays. In many places it is the stroke which is taught first although it can present difficulties for some beginners. To swim it correctly the face has to be in the water for most of the time so breathing must fit into the stroke without upsetting the balance of the streamlined body position and the rhythm of the limb movements. However, if the necessary confidence practices have been mastered, learning the front crawl should not be too difficult.

Development of the stroke should be in the order: body position, leg action, arm action, breathing and timing. Each stage should be as efficient as the capability of the performer, at the time, will allow.

### Body Position

The body lies almost horizontal at the surface of the water with the head being neither raised nor lowered, but in line with the body, the eyes looking forward-downward. In this position, the water surface will be somewhere between the eyes and the hairline. The position of the head is important. If raised it will cause the hips and legs to drop, thereby increasing the resistance to forward motion. If the head is lowered into the water (eyes looking straight down) the hips will be raised and the kick could be less effective.

The physical make-up of individuals will affect the ideal position; with poor floaters it will be necessary to develop an efficient leg kick which will produce and maintain a stable body position. This in turn will allow necessary head movements to be made when breathing.

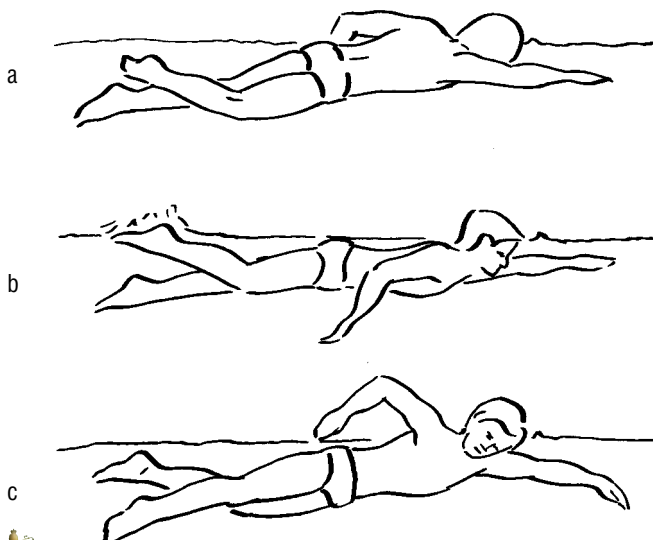
The most suitable head position having been found, its movement should be confined only to the action of inhalation which should be completed with minimum (if any) interference with body balance.

The necessary and unavoidable rotation which takes place around the longitudinal axis of the body allows the strong muscles of the chest and shoulder to act in the most effective manner.

### Leg Action

The leg action is basically an alternating up and down kick, suggesting movement in the vertical plane. This, however, is not strictly true.

As the body rotates, the hips and legs will move similarly and kicking will take place first to one side (a) and then to vertical (b) and then to the other side (c) (Figure 1).



This action is exaggerated in swimmers who roll excessively, by reason of immobile shoulders or difficulty with inhaling in the trough (Figure 2).

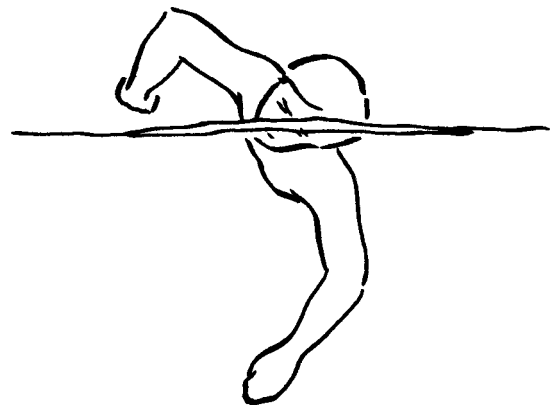


Figure 2

The downward kick starts in the hip and finishes, at a depth of between 30 and 45 cms, with a whip-like action of the foot. The foot is extended to allow the largest possible area of the instep and outer area of the foot to bear upon the water. The leg, now straight, is moved upwards so that the sole of the foot and back of the leg press against the water. The upward movement continues until the heel just breaks the surface, after which the downward movement is initiated.

The legs should pass as closely as possible to each other in a smooth continuous action. As one leg finishes the upward kick, the opposite leg should be at its lowest point. By containing the kick within the body, depth retardation is kept to a minimum.

### Arm Action

In front crawl the arms provide the main propulsive force. The complete action is an alternating and continuous one.

The hand is entered in front of the head, ideally in line with the shoulders. In this position, the arm is slightly flexed at the elbow to allow a downward slant from the elbow to the wrist. The fingertips enter first followed by the wrist and then the elbow until the catch position is reached. This is the point, approximately 15 cms below the surface, at which purchase is made on the water (Figure 3b).

The arm then pulls in a mainly downward and backward direction, with the elbow high (Figure 3c). When the hand and arm are in line with the shoulders (Figure 3d) the action changes from pulling to pushing. The hand is pressed backwards to brush the thigh, at which point propulsion is complete (Figures 3e & 3f).

The recovery of the arm over the water should be smooth and continuous. The arm is first lifted from the water, elbow leading (Figure 3e). The elbow is kept high and the arm relaxed as it is moved forward in a fairly straight line (Figure 3a) to the entry position once again.

Figure 1





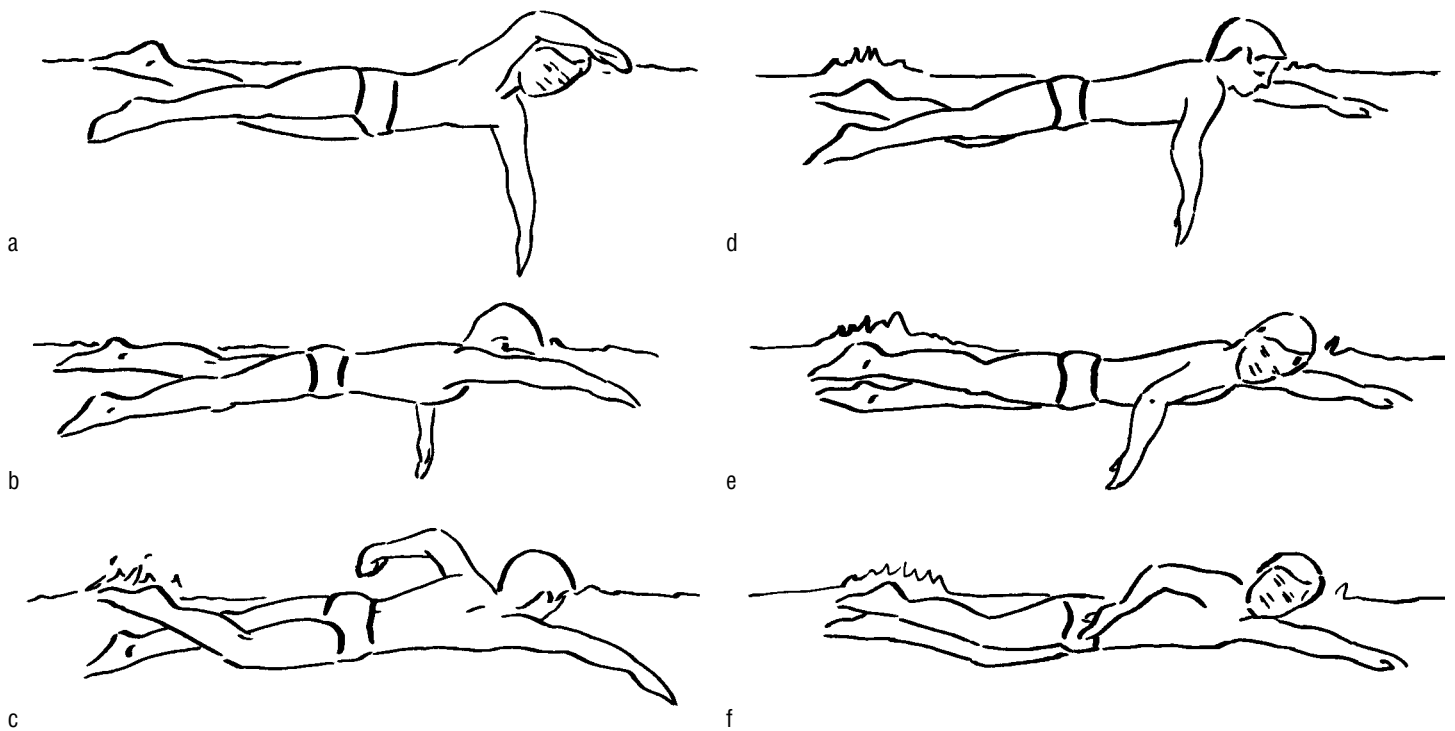


Figure 3

### Breathing

To allow a breath to be taken, the head is turned so that the mouth clears the water. This movement needs to be as smooth as possible and carried out with the minimum of rotation in order to maintain a balanced and streamlined position. Though swimmers may inhale on either side, they usually have a preferred side to which they turn. The timing of the inbreath is very important and normally occurs as one arm is starting to pull and the other arm is about to recover (Figure 4).



Figure 4

The type of breathing used by most swimmers is called trickle breathing. After a quick but full inhalation through the mouth, the breath is held briefly and is exhaled slowly through the mouth and nose into the water when the head has been returned to its normal position (Figure 5). Breathing may be unilateral on one side only or bilateral on alternate sides.

### Co-ordination

The timing of leg and arm actions usually occurs quite naturally. The most common pattern in front crawl is that of six leg kicks to each arm cycle, i.e. the complete actions of both left and right arms. As one arm is pulling, the opposite leg should be kicking downward.

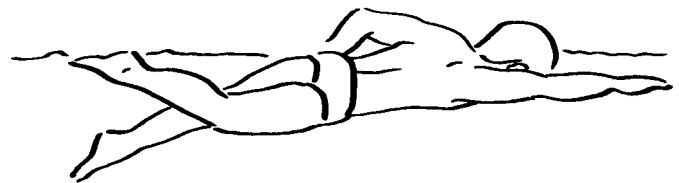


Figure 5





## UNIT 4 Starts and Turns

ASA laws govern the manner in which swimming strokes are swum, and state how the turns and finishes are to be performed. As these are subject to change, it is important that reference should be made to the current issue of 'ASA Laws of the Sport'.

### Forward Starts

The front crawl, breaststroke and butterfly races all normally start with a dive. When the referee is satisfied that all competitors and officials are ready, a single long blast on his whistle is the signal for the competitors to take up position on the back of the starting block or a short pace back from the starting line. By raising his hand, the referee then signals to the starter that he may proceed to start the race.

### The Stance

In competition the stance is the position adopted by the swimmer after the command 'Take your marks' is given by the starter. In this position the toes should be curled over the edge of the starting block or poolside (Figure 1).

Variations in the stance position which are commonly used are the grab start and the track start. In the grab start the swimmer grabs the front of the starting block with the hands (Figure 2). For the track start the swimmer takes up a stance similar to that used by sprint runners (Figure 3).

### Take Off

The angle of take off will affect the height of the flight and the depth of entry, which will vary according to the stroke being swum. The flattest flight, shallowest entry and shortest underwater glide is that used in front crawl races. The angle of entry for breaststroke is deeper than that for front crawl; and in butterfly races the angle required is somewhere between the two. At the signal to start, the swimmer launches himself outward and forward, using a vigorous swinging action with his arms and a strong thrust from his legs and feet (Figures 4 & 5).

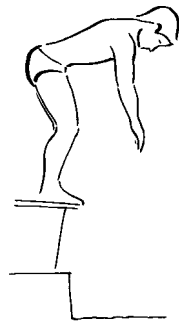


Figure 1



Figure 2



Figure 3



Figure 4

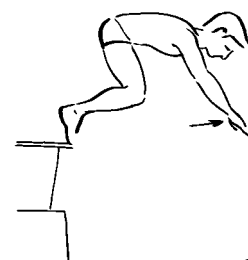


Figure 5

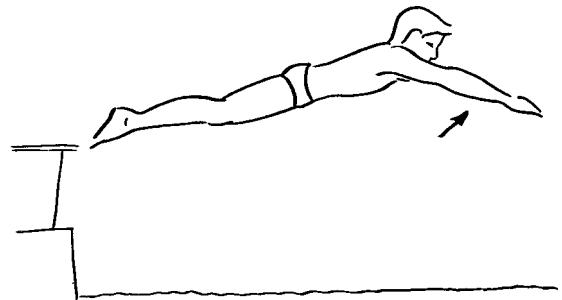


Figure 6a

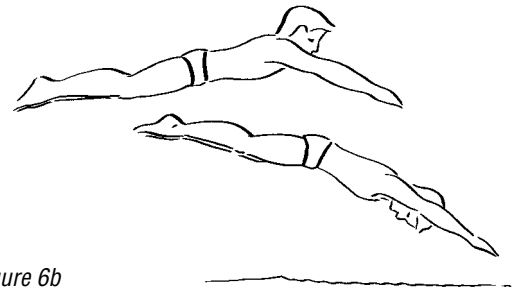


Figure 6b

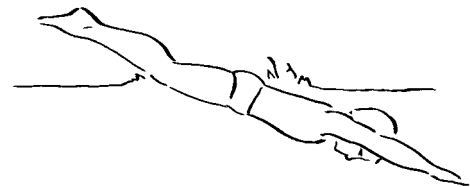


Figure 7

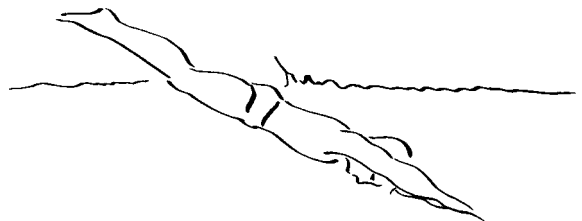


Figure 8

### Flight and Entry

The body leaves the starting place fully stretched (Figures 6a & 6b) to enter the water at an angle appropriate to the stroke being swum (Figure 7). The aim should be to cut the water smoothly and to glide before beginning the first strokes. Fig 8 shows the deeper type of entry which a breaststroke swimmer might use.





## UNDERWATER ACTION

### Front Crawl

As the glide slows down to swimming speed, the need to start the full stroke will occur. First the leg action is introduced, accompanied by a one arm pull to assist the swimmer to the surface where the full stroke action begins.

### Breaststroke

The angle of entry for this stroke is deeper than that for front crawl. This enables the swimmer, while under water, to complete the single arm stroke followed by the one leg kick which is permitted by ASA law (Figure 9 a – f). This law also requires that some part of the swimmer's head must be above the surface before the second arm stroke begins.

### Butterfly

The dive for this stroke is not so steep as that required for breaststroke. ASA law states that the movements of the feet shall be made in a simultaneous manner and also that at the start and at the turn one or more kicks are allowed under water. However, only one arm action is permitted before the swimmer surfaces.

### The Back Crawl Start

The starting position for this stroke is in the water, with the swimmer facing the starting end with hands on the end rail or starting grips, and the feet completely beneath the surface. On the command 'Take your marks', the swimmer takes up a starting position which must be held without movement until the starting signal has been given. At the signal for starting and after each turn the competitor must push off and swim on the back. However, the touch at the turn may be made with any part of the body, and recently it became permissible to turn onto the front in order to perform a somersault turn. The starting position, the take off and the flight are illustrated in (Figure 10 a – c).

### Entry

With the body fully extended, the fingers lead the arms into a streamlined entry. This entry should be a shallow one (Figure 10 d).

### Glide

As with all the front starts, the speed derived from the momentum of take-off is normally greater than the swimming speed. Full advantage should be taken of this by holding the stretched body position (Figure 10 e).

The depth of the glide is controlled by raising or lowering the head, and the leg kick begins (Figure 10 f) as the speed of the glide diminishes to swimming speed. To break the surface, the swimmer pulls through to the side with one arm, keeping the other close to the head in an extended position. Once the face is above the water, the swimmer pulls with the extended arm to start the full stroke.

Figure 9

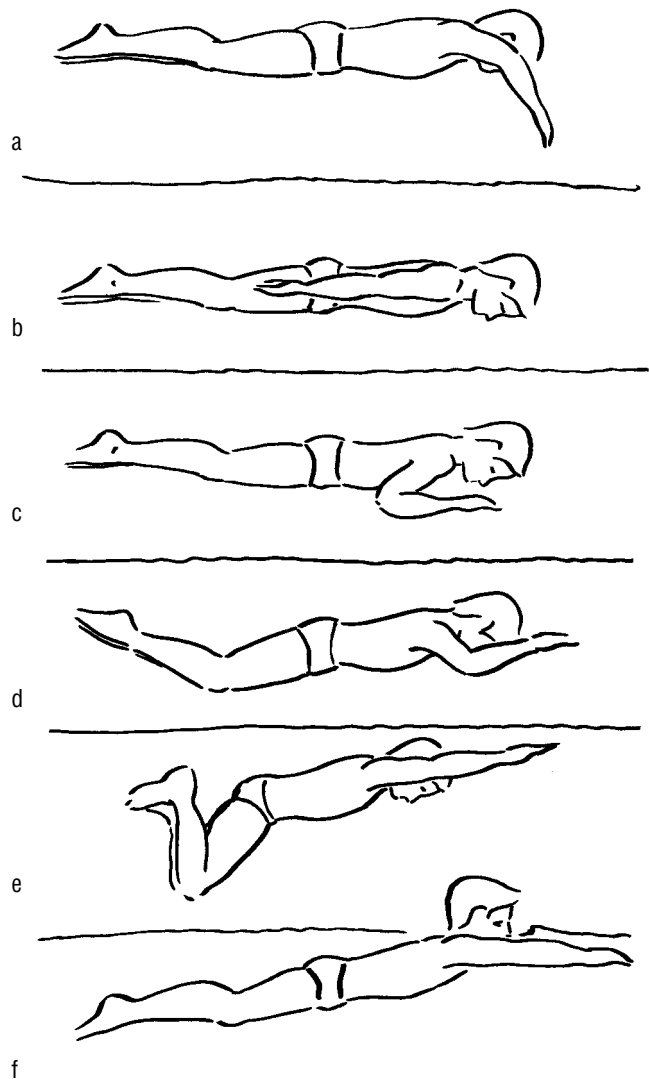
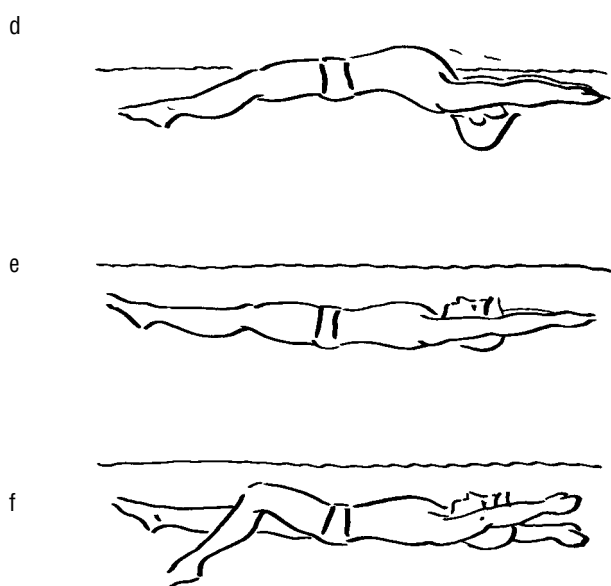
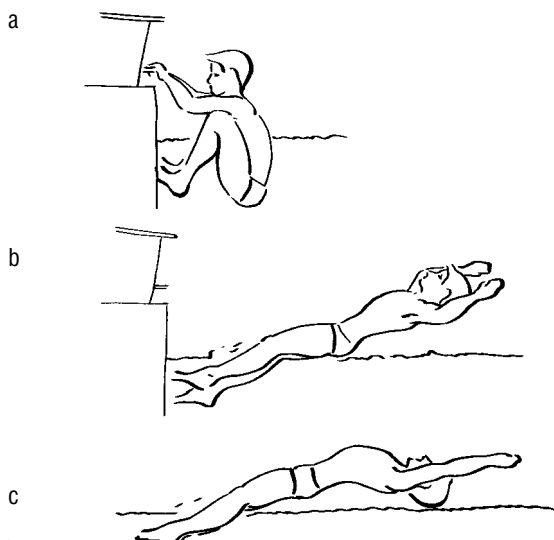


Figure 10



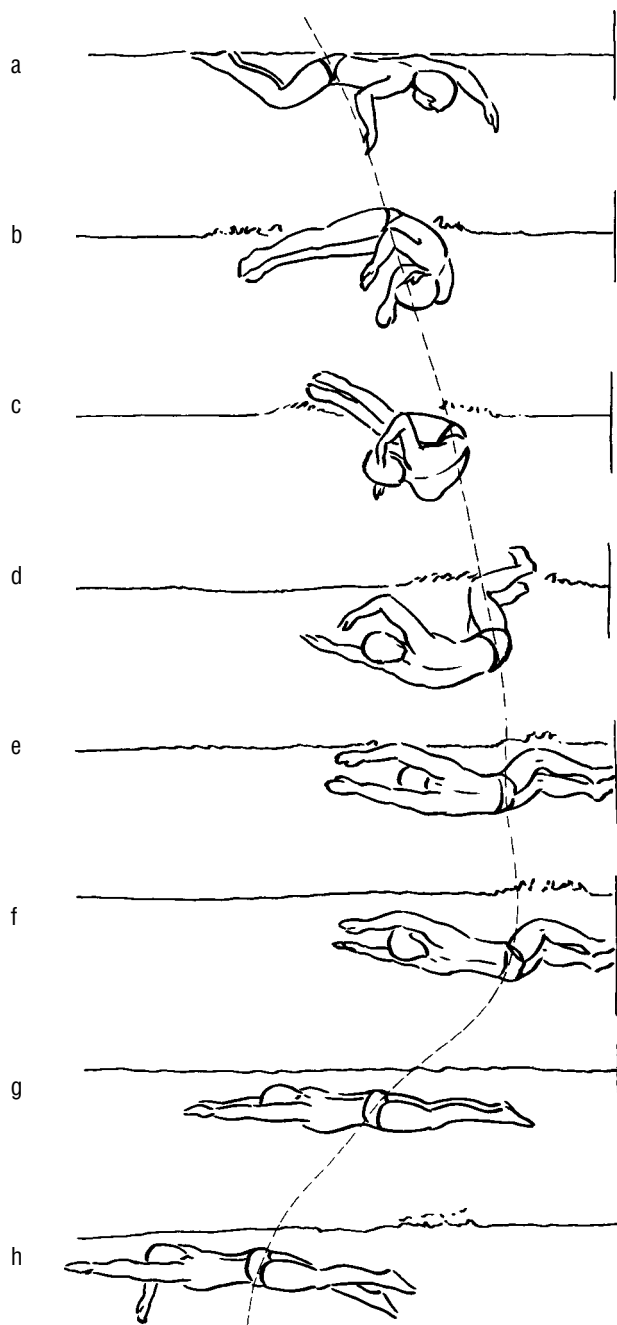


Figure 11

## URNS

### Freestyle

ASA law permits a swimmer to touch the end of the pool with any part of his body. The fastest and most often used turn in freestyle is the 'tumble' turn. To perform this turn the swimmer approaches the wall at speed (Figure 11 a). When about half a body length away, the head leads the body into a piked position, as one arm is about to enter the water in front of the head. The other arm stops at the beginning of the push phase. The leading arm assists the roll until it is in line with the other arm (Figure 11 b) which is then bent and used in a sculling action to aid rotation.

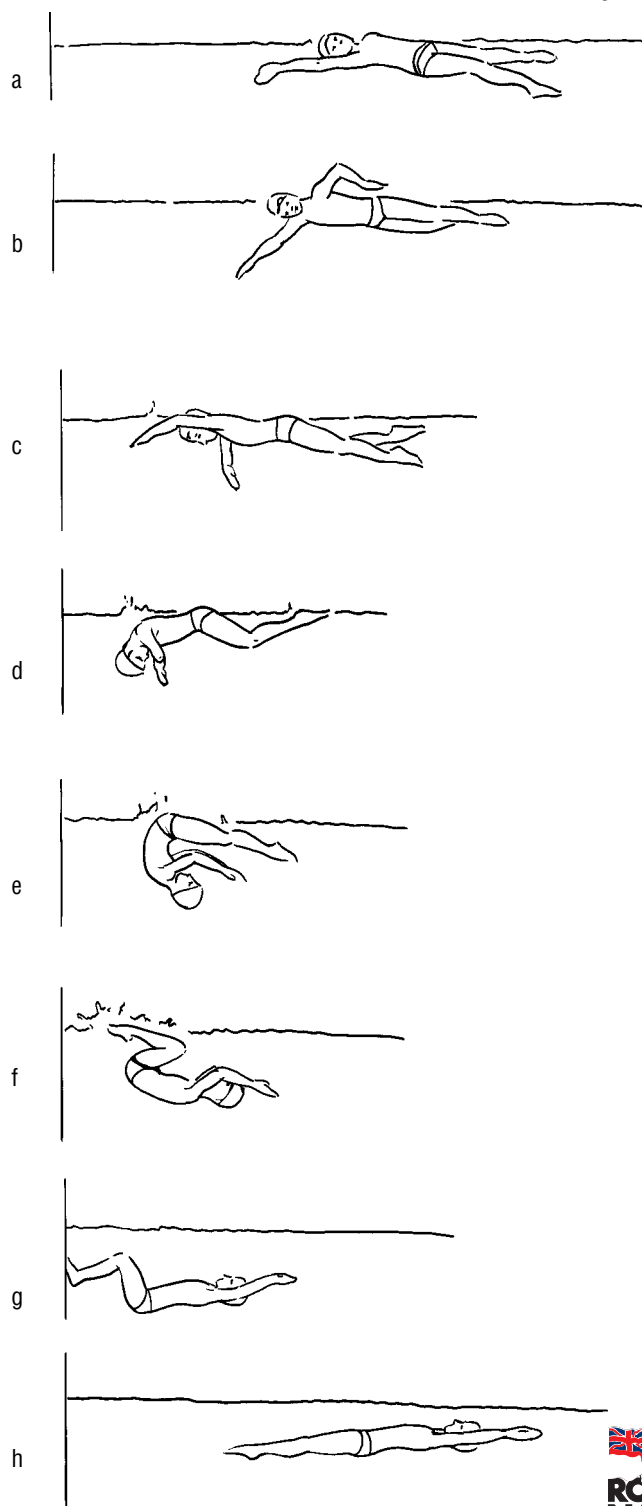
The legs are lifted and thrown over the water to the side of the forward arm (Figure 11 c & d). At the same time the shoulders are turned to place the body on its side, assisted by the sculling movements of the hands. The body continues to move forward during rotation so that the feet are placed on the wall a short distance apart, with the knees bent (Figure 11 e & f). The arms are now extended and – without pause – a strong thrust is made with the legs to drive the body into the glide (Figure 11 g & h). Thereafter, the sequence is the same as that described in the dive entry.

### Back Crawl

In recent years there have been changes to the regulations for the backstroke turn. The following is a description of the newest, most efficient and fastest method.

On the last full stroke before reaching the wall (Figure 12 a), the swimmer crosses the recovering arm over the body so that it enters the water in line with the opposite shoulder and the swimmer rolls over onto the front (Figure 12 b & c). The body pikes at the waist and starts a front somersault assisted by the leading hand (Figure 12 d, e & f). The feet are planted firmly on the wall with toes upward and knees bent at approximately 90° (Figure 12 g). The leading arm is extended in front of the head and the alternate arm moved to meet it. The legs are extended into a streamlined position by pushing hard against the wall. The swimmer leaves the wall in a fully extended streamlined position (Figure 12 h). At this point, experienced competitors use a dolphin kick to reach the surface.

Figure 12





### Breaststroke and Butterfly

The manner in which the turn and push off for these two strokes are performed is similar, with the only difference being in the underwater phase. (At present ASA law requires the touch to be made with both hands simultaneously, though not necessarily at the same level, either at, above or below the water level. The shoulders must also be kept in the horizontal plane.)

The approach to the wall is made at speed and the touch is made with the arms extended (Figure 13 a). As the touch is made the elbows flex, the head and shoulders lift and the knees are bent (Figure 13 b & c). The other arm assists the turn by pushing the body away from the wall. As the pushing arm moves to join the free arm, the knees are bent and the feet are planted firmly on the wall (Figure 13 d). The head is dropped below the surface as the arms are stretched forward and the legs thrust strongly against the wall to propel the body in a streamlined position into the glide (Figure 13 d, e & f).

The depth of push off in butterfly is shallower than that used in breaststroke, but in both strokes the body must be perfectly streamlined as the feet leave the wall. The number of leg actions and arm actions after each turn is exactly the same as for the starts in each of the strokes.

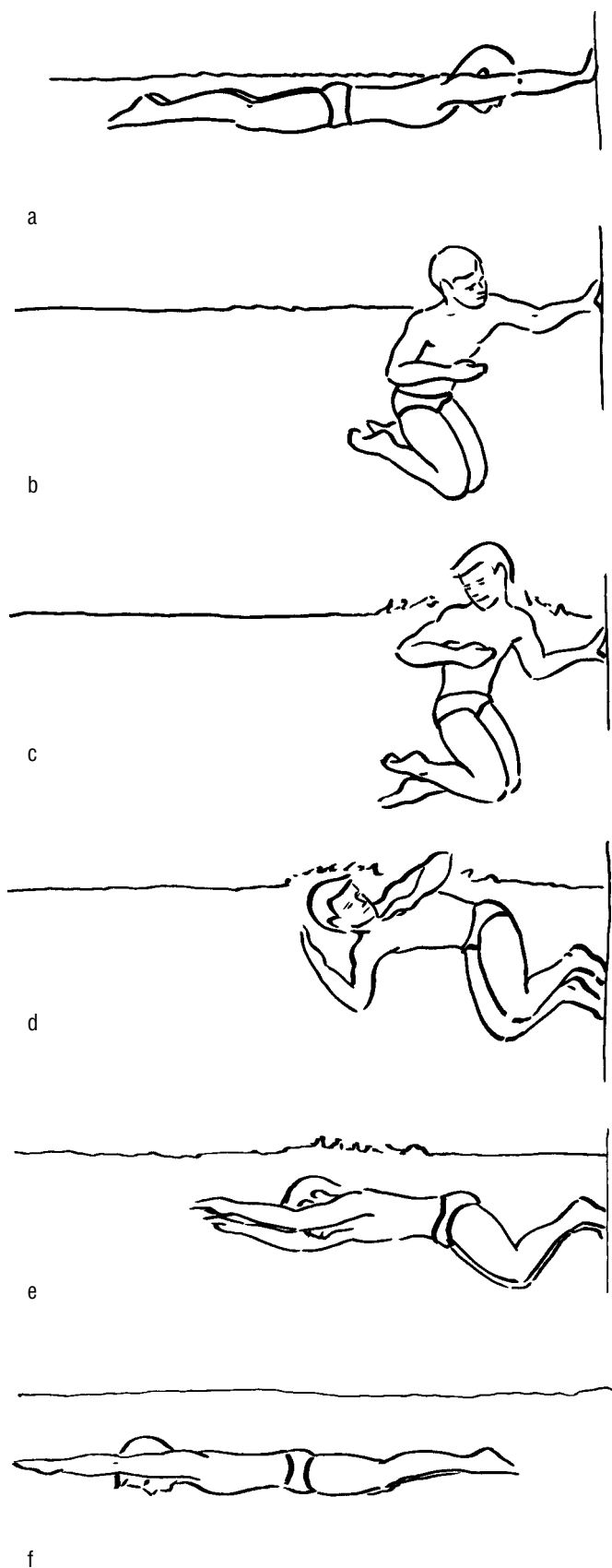


Figure 13





## A message from the Royal Life Saving Society UK

The Royal Life Saving Society is a Commonwealth organisation active in over 40 countries worldwide.

Formed in the United Kingdom in 1891 in an attempt to reduce the annual toll of 2,000 lives lost in drowning accidents, the Society was granted a Royal Charter by King George V in 1924 with a supplemental Charter being granted by Queen Elizabeth in 1959.

The United Kingdom Branch (RLSS UK) remains the largest single organisation dedicated to the teaching of lifesaving and the prevention of drowning in the UK today.

To enable these aims to be achieved, the Society's members spend considerable time doing the following:

- a) Promoting water safety education and life support in the community.
- b) Training lifesavers and lifeguards in the areas of accident prevention, survival, rescue, life support, emergency aftercare and first aid.
- c) Researching the causes and effects of drowning and asphyxiation.
- d) Developing educational resources and technical expertise.

The RLSS UK, together with kindred organisations, has campaigned successfully for the inclusion of swimming and water safety in the curricula for England and Wales. It has developed an awards programme called Rookie, aimed at the 5 to 13 years age group, to provide motivation and an interest in lifesaving in young people. It has also promoted the importance of rescue training for swimming teachers, coaches and outdoor activity centre staff, by developing specific awards to promote training and safety in these areas.

The Society works to co-ordinate lifesaving activities for young people in close liaison with UK branches and other youth organisations. These activities normally take place at local swimming pools, swimming and lifesaving clubs, and schools. To find your local RLSS UK contact, write to:

The Royal Life Saving Society UK  
 River House  
 High Street  
 Broom  
 Warwickshire  
 B50 4HN  
 Tel: 01789 773994  
 Fax: 01789 773995  
 E-mail: [lifesavers@rlss.org.uk](mailto:lifesavers@rlss.org.uk)

The RLSS UK holds regular lifesaving and lifeguarding competitions, culminating in National Championships, to provide a competitive challenge for all age groups.

Members of the Society are entitled to a membership card and personal accident and public liability insurance, and to receive the Society's magazine *Lifeguard*.





## UNIT 5

### Introduction to Lifesaving and Life Support

Everyone involved in any water sport should learn the basic principles of lifesaving and life support. Although over the years there has been a gradual reduction in the number of drowning accidents in the UK, there are still approximately 500 fatalities every year. In a large proportion of these water-based accidents, the victims or casualties are within a few metres of safety.

#### **DROWNING**

Drowning is death caused by asphyxia (insufficient oxygen reaching the tissues of the body) due to immersion in water.

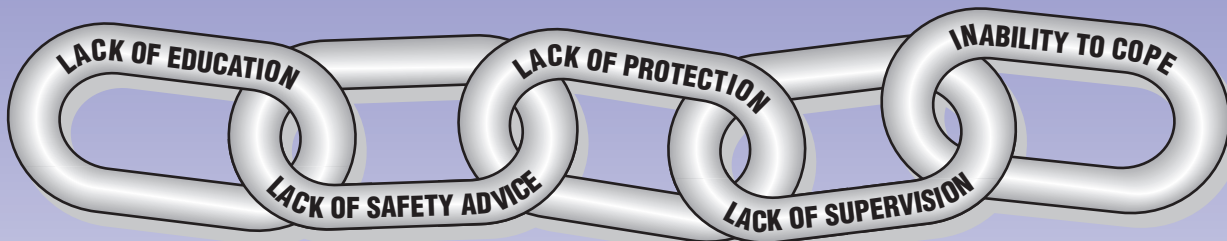
Near-drowning is when a casualty survives an immersion incident.

#### **THE DROWNING CHAIN**

Drownings and accidents in and around water follow a general pattern which can best be described as a chain of linked events. Each of the links can lead to direct injury or to the next link. The links are:

- Lack of education
- Lack of safety advice
- Lack of protection
- Lack of supervision
- Inability to cope

Drowning can occur in any depth of water, and may depend on the age, health and swimming ability of the individual, and the water and weather conditions prevailing at the time.



#### **Dry Drowning**

In about 10% of cases of drowning, water does not reach the lungs because of a muscle spasm in the region of the larynx. Water cannot enter the lungs, but neither can air, so suffocation occurs. In this case water will not enter the lungs unless the casualty loses consciousness, allowing the muscle spasm to relax.

#### **Wet Drowning**

This is where water enters the lungs, as either no spasm of the larynx has occurred, or the casualty has become unconscious in the water. Water cannot be removed from the lungs, and will be absorbed into the body.

#### **Secondary Drowning**

Water entering the lungs will cause irritation of the tissues and an outpouring of body fluid into the lungs. This may occur up to 72 hours after the initial incident and is known as secondary drowning.

Approximately 80% of deaths from drowning occur in open water locations, such as the sea, rivers, canals, lakes and reservoirs. The remaining 20% take place in swimming pools, garden ponds and domestic baths. 80% of those who drown are male, with 10% being between the ages of 11 and 24. In about 25% of fatal drowning incidents, some degree of alcohol intoxication has been shown to be a contributory factor (1998 statistics).

**Note:** *The information that follows should be used as a guide to basic techniques that may be used in an emergency. Reading and studying these notes should not replace training and assessment under the guidance of a qualified RLSS UK teacher or trainer assessor.*





## RECOGNISING THE CASUALTY

Before performing rescues, it is important to consider the different types of casualty, and the best way to help them. People in difficulty in the water do not always display the same characteristics. They may not shout, or wave for help. Casualties can be divided into four main categories.

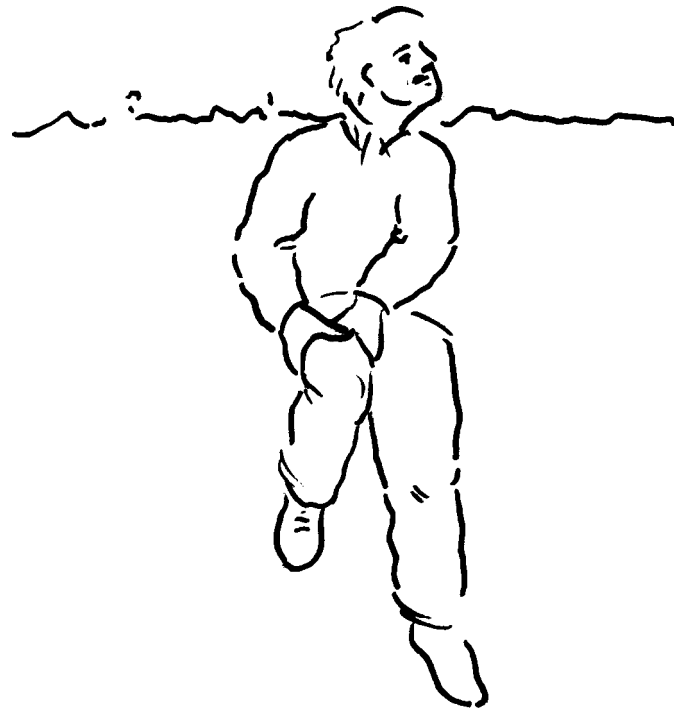
### **Non-Swimmer**

This casualty will probably be in an upright position in the water, and unable to use their arms or legs for support. The facial expression will be wide-eyed and panicking, with the main concern being to maintain breathing. The non-swimmer will submerge for increasing periods of time. There will seldom be a call or wave for help. The non-swimmer will not be able to respond to instructions, and is likely to grab hold of any would-be rescuer.



### **Injured Casualty**

This casualty may be able to swim but could be incapacitated by the injury, which will usually be supported, making the body's position in the water awkward. The casualty may be calling out with pain, which could limit his or her response to instructions.



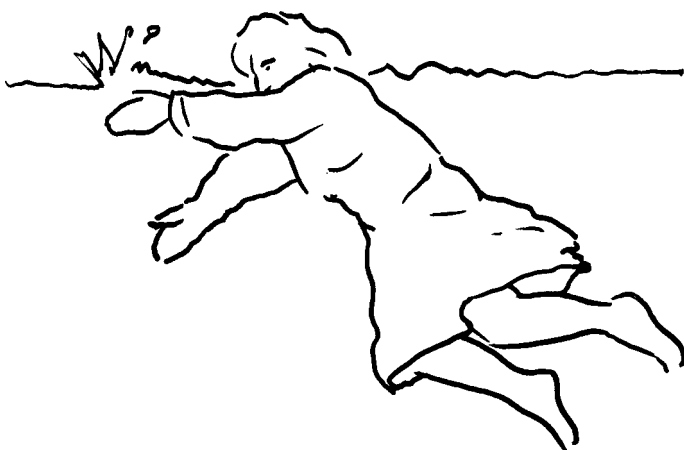
### **Unconscious Casualty**

This casualty will be partly or entirely submerged, face up or face down, and limp in the water. No attempts to attract attention will be made; the eyes will probably be closed. This casualty may be difficult to manoeuvre and heavy to rescue and land.



### **Weak Swimmer**

This casualty may be using the arms and legs to support the body in an inclined position facing help or safety; the head may submerge periodically, however, and water may be expelled from the mouth. Weak swimmers may be able to wave and shout to draw attention to themselves. As they can support themselves, weak swimmers will probably be able to respond to clear instructions, and may be able to propel themselves if a buoyant support is available.



### **Strong Swimmer**

A strong swimmer may also get into difficulties if suffering from illness, effects of alcohol or inclement weather/water conditions.







## ACTION IN AN EMERGENCY

There are a wide range of emergency situations involving immersion in water. The action to be taken by a rescuer depends on the precise circumstances of the incident. In an emergency, the rescuer must make an accurate assessment of the circumstances and quickly formulate a plan of action.

The main factors to be taken into account when forming a plan of action are as follows:

- SAFETY OF RESCUER
- Nature of area
- Number of casualties
- Priorities of rescue
- Available assistance
- Telephoning for help
- Rescue sequence
- Personal capabilities
- Leadership
- Selection of rescue aids
- Removal of clothing
- Flexibility of action plan
- Care of casualties

The accurate assessment of the situation and formulation of the appropriate action plan can only be achieved through training.

## PRINCIPLES OF RESCUE

A rescuer should enter the water to make a rescue only as a last resort and only if he or she is a trained lifesaver. Wherever possible, rescues should be undertaken from land. As a reminder, the following rescue sequence should be followed:

1. shout and signal
2. reach
3. throw
4. wade
5. row (if you know how)
6. swim with an aid
7. swim and tow.

### 1. *Shout and Signal*

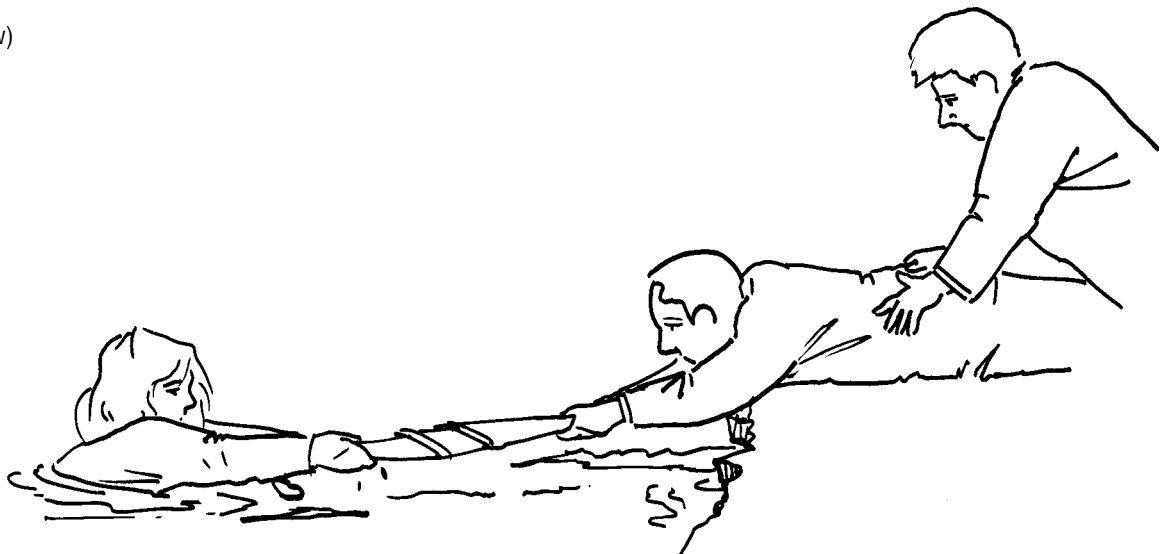
This is the safest form of rescue as it relies on use of the voice and hand signals, and avoids physical contact with the casualty in the water.

The casualty should be conscious, close to the side, and able to respond to instructions.

- a) Attract the attention of the casualty by shouting and signalling.
- b) Give clear instructions to the casualty: "Keep your head up." "Keep your hands in the water." "Kick your legs."
- c) Using hand signals and voice, instruct the casualty to the side.
- d) Instruct the casualty to a point of safety and on how to get out.
- e) Get the casualty away from the water's edge; calm and reassure them, keep them warm, treat for shock.

### 2. *Reach (with a rescue aid)*

- a) Select an available rescue aid.
- b) Attract the casualty's attention by shouting and signalling.
- c) Lie down on your front keeping the casualty under observation.
- d) Anchor yourself firmly, either using an assistant or by grasping a fixed object.
- e) Reach out with your rescue aid and instruct the casualty to take hold of it.
- f) Using a rigid aid: Hold it just to the side of the casualty. (If the aid is not grasped, hook it under the casualty's armpit to provide support.)
- g) Using a non-rigid aid: Keep hold of one end and throw the other end towards the casualty; where more distance is needed, two items of clothing can be tied together (wet clothing is better than dry).
- h) If the aid is not grasped, put it in direct contact with the casualty. If this is unsuccessful, alternative rescue methods will need to be considered.
- i) Steadily pull the casualty to safety.
- j) If you are in danger of being pulled in, let go and try again when you are more secure.
- k) Instruct the casualty to a position of safety.
- l) Move the casualty away from the water; calm and reassure them.





### **Reach (using a rope)**

This is an effective and safe form of rescue for use when the casualty is close to dry land, often as a result of falling into the water.

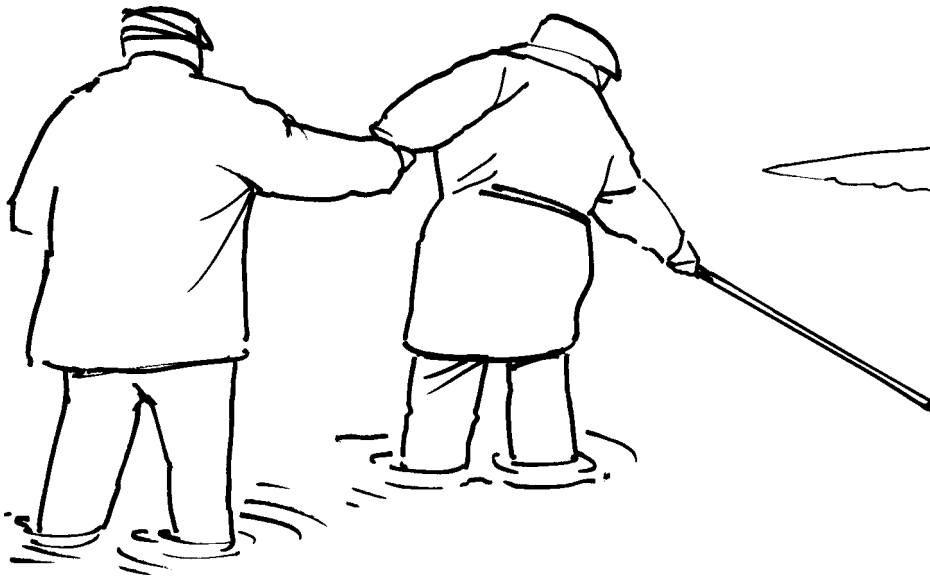
- a) Select a suitable length of rope.
- b) Attract the casualty's attention by shouting and signalling.
- c) Stand away from the edge and coil the rope. (There are several methods – practise regularly.)
- a) Before throwing, secure one end. (Tie to a secure object, tie a knot in the end to secure under one foot, or hold the end in one hand.)
- e) Throw to the casualty, allowing for wind, tide or current.
- f) If the rope lands out of reach, recoil and throw again.
- g) Instruct the casualty to grasp the rope with both hands and to face you.
- h) Haul in steadily hand over hand, observing the casualty.
- i) Let go if you are in danger of being pulled in.
- j) Instruct or assist the casualty out of the water.
- k) Move the casualty away from the water; calm and reassure them.

### **3. Throw**

- a) Select a rescue aid that is buoyant, e.g. football, plastic bottle or lifejacket.
- b) Attract the casualty's attention by shouting and signalling.
- c) Throw the buoyant aid to the casualty allowing for wind, tide or current.
- d) If it lands out of reach, throw another rescue aid.
- e) Instruct the casualty to grasp the buoyant aid with both hands and to kick with their legs to safety.
- f) Instruct or assist the casualty out of the water.
- g) Move the casualty away from the water; calm and reassure them.

### **4. Wade**

Where attempts to use reach and throw methods from the safety of the edge have proved unsuccessful and the water depth (shallow), flow and temperature permit a safe entry, the rescuer may wade into the water until a reaching or throwing rescue becomes possible. A wade rescue may also be appropriate where the casualty is unconscious.



- a) Attract the casualty's attention by shouting and signaling.
- b) Reassure them and explain what is going to happen.
- c) Select a suitable reaching or throwing aid.
- d) Enter shallow water safely; use the rescue aid to test depth.
- e) Wade by sliding your feet along the bottom, testing the depth.
- f) Ensure that the bottom is firm and free from obstructions before transferring weight onto the front foot.
- g) Reach or throw the aid to the casualty, giving clear instructions.
- h) When the aid has been grasped, encourage the casualty to return to safety; move slowly and carefully to the edge.
- i) Avoid direct contact with the casualty until you reach the side.
- j) Let go if you are in danger of being grabbed.
- k) Assist the casualty to land; provide aftercare.

### **5. Row (using a craft)**

A rescue carried out with the use of a craft should be attempted only if the rescuer is fully competent in handling that craft in a rescue situation. In this context 'row' is taken to include any method of propulsion for a small craft such as paddling, sailing, rowing or driving a powered craft.

When using a small craft the rescuer must adopt the following procedure:

- a) Attract the casualty's attention if possible by shouting and signaling.
- b) Decide on the best direction of approach to the casualty (usually, but not always, on the leeward [sheltered] side).
- c) Provide the casualty with a flotation aid or use a reaching aid to give the earliest possible assistance.
- d) Assist the casualty to board the rescue craft.

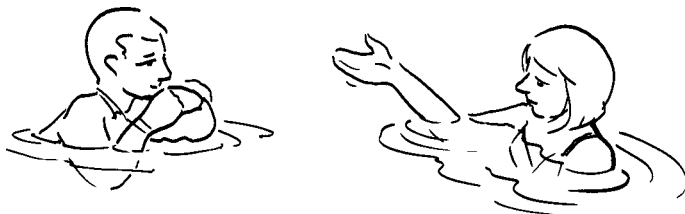
NOTE The appropriate point and technique of entry varies according to the type of craft.





## 6. Swim with an Aid (accompanied)

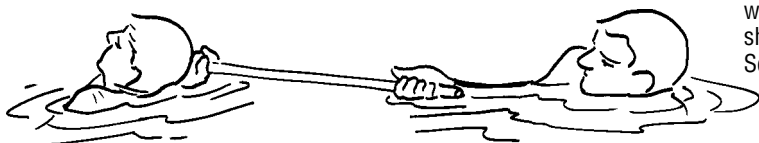
This method of rescue is useful for weak or injured swimmers who are too far from land for reach or throw rescues.



- Select a suitable buoyant aid.
- Enter the water safely.
- Approach and reassure the casualty.
- Keeping a safe distance from the casualty, explain what is going to happen.
- Float or throw the aid in front of the casualty.
- Instruct the casualty to hold the aid and kick.
- Accompany the casualty to safety; observe casualty and direction of travel.
- Assist the casualty to land and provide aftercare.

### Swim with an aid (non-contact tow)

A non-contact rescue should be used only when an accompanied rescue is not possible, and the casualty is weak, injured or a non-swimmer.



- Select a suitable aid for towing – more than one if possible.
- Enter the water safely taking the aid with you.
- Approach with caution, keeping the casualty in sight.
- Remain at a safe distance while instructing the casualty on what to do.
- Swim slowly and cautiously to a suitable position and pass the aid to the casualty, keeping out of their reach and keeping hold of one end of the aid.
- Tow the casualty, keeping your towing arm straight.
- Use sidestroke or lifesaving backstroke.
- Watch your casualty and where you are going.
- Give plenty of reassurance.
- Ask the casualty to kick to assist you.
- On reaching the side, assist to land; provide aftercare.

## 7 Swim and Tow (contact)

Rescues involving direct contact with the casualty are very dangerous for the rescuer, require specialist training, AND MUST NOT BE ATTEMPTED unless the rescuer has been trained in lifesaving. To train for these skills write to the Royal Life Saving Society UK to obtain details of your local branch/club, please enclose an SAE.

Contact tows should normally be used only where the casualty appears to be unconscious or co-operative, and must never be used when the casualty is struggling or in a state of panic. Even when a contact tow is being anticipated, the rescuer should take a buoyant aid to assist the rescue by providing additional support for the casualty or rescuer.

A variety of contact tows may be used; these are summarised as follows:

- Extended arm tow – with or without buoyant support.
- Clothing tow – use casualty's clothing grasped behind upper back.
- Wrist tow – grasp the back of the casualty's wrist; encourage them to kick.
- Cross chest tow – one arm over the shoulder and under the opposite armpit of the casualty, taking care not to obstruct the airway.
- Double shoulder tow – casualty held firmly under the armpits.
- Head tow – approach from behind, place your hands on each side of the casualty's head and swim on your back.

### Aftercare

The casualty needs to be moved away from the water, and reassured. To treat for shock, a conscious casualty should be laid on his/her back with his/her feet and legs raised if there is no injury. The casualty should be covered if it is cold. Nothing should be given to eat or drink. Send for the emergency services.





## PRINCIPLES OF LIFE SUPPORT

The importance of life support, in which resuscitation plays a major role, can not be over-emphasised.

In an emergency involving immersion in the water, the priority for the rescuer must be to maintain a casualty's breathing by the safest and most efficient manner possible. In ALL cases an ambulance should be summoned as soon as possible by dialling 999 or 112.

During rescue the casualty should remain as near horizontal as possible as this reduces the onset of shock. Immersion in cold water may also result in the casualty's suffering from hypothermia.

### The Unconscious Casualty

As soon as a position of safety is reached, land the casualty with assistance and apply the sequence of resuscitation.



### The Chain of Survival

For a casualty to have the best chance of surviving a near-drowning incident, it is essential that a rescuer activates the 'chain of survival'. Each link in the chain is a vital component in a series of lifesaving actions. The trained rescuer can undertake links 1 and 2 themselves and activate links 3 and 4.

**Link 1 Early access** – The rescuer should make sure the ambulance is on its way by dialling 999 or 112. The paramedics have specialist training and equipment, including a defibrillator.

**Link 2 Early cardiopulmonary resuscitation (CPR)** – By starting cardiopulmonary resuscitation immediately, a rescuer can "buy time" while the ambulance is on its way. See sequence of resuscitation.

**Link 3 Early defibrillation** – When the paramedics arrive they will administer an electric shock (defibrillation) to restart the casualty's heart, if it has stopped.

**Link 4 Early advanced life support** – The casualty is taken to hospital, where specialist cardiac medical care can be given. The paramedics will continue to attend to the casualty in the ambulance.

REMEMBER – THE CHAIN OF SURVIVAL IS CRUCIAL – IT SAVES LIVES!

## Sequence of Resuscitation (for an adult)

a) Check for **D**ANGER to the casualty or rescuer.

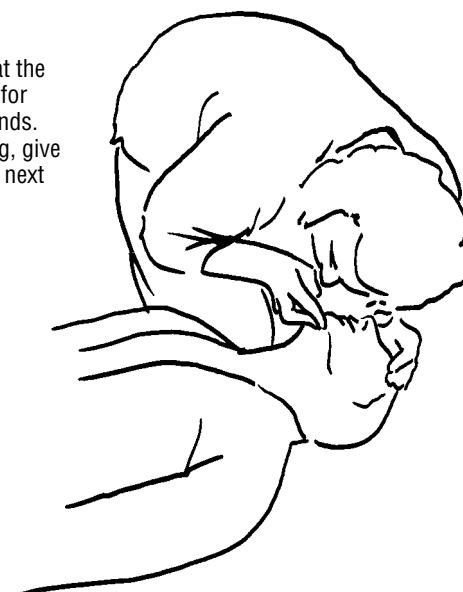
b) Check whether the casualty is responsive by shaking gently and asking, "Are you all right?" Leave them in the same position if they respond; if there is no response shout for help.



c) Check **A**IRWAY is clear of obstructions; use head tilt and jaw lift to open airway.

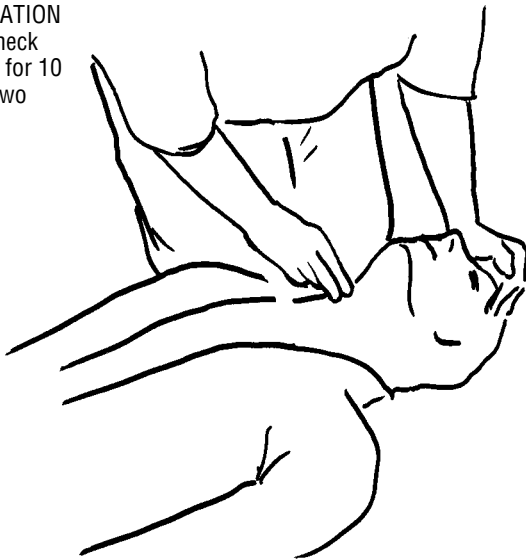


d) Check **B**REATHING. Simultaneously look at the chest, listen, and feel for breathing for 10 seconds. If there is no breathing, give 2 rescue breaths (see next page).

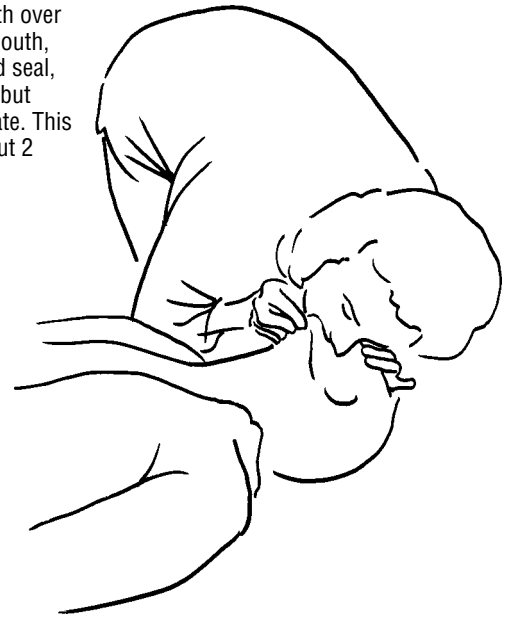




- e) Check **C**IRCULATION by feeling the neck (carotid) pulse for 10 seconds with two fingers.



- c) Place your mouth over the casualty's mouth, obtaining a good seal, and blow firmly but gently to ventilate. This should take about 2 seconds.



**Breathing and pulse present** - Place in the recovery position. Check breathing and circulation regularly. Send for the emergency medical services.

**Breathing absent, pulse present** - Give 10 rescue breaths (see Rescue Breathing below). Telephone for an ambulance. Continue to ventilate. Check pulse after 10 breaths.

**Breathing and pulse absent** - Dial 999 or 112 for emergency services. Begin cardiopulmonary resuscitation (see Cardiopulmonary Resuscitation below). Continue until medical services arrive.

- d) Lift your mouth away from the casualty, and check that the casualty's chest has risen with the ventilation. Take a fresh breath for yourself.

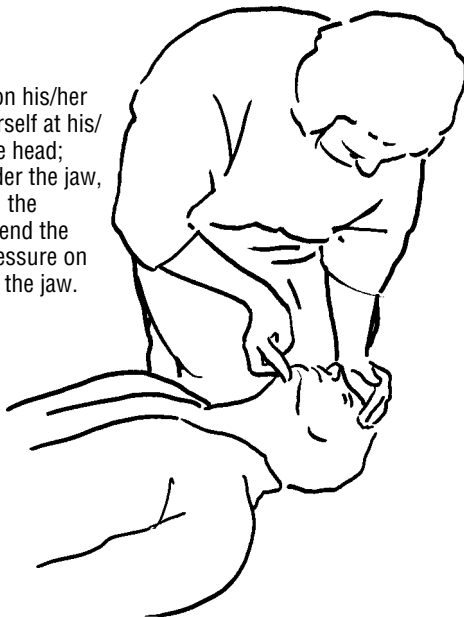
- e) Repeat the sequence 9 times giving 10 breaths in all, and check that the pulse is still present; feel for 10 seconds. If help has been summoned, and the pulse is present, continue rescue breathing until help arrives. If no help has arrived, leave now to get help.

#### **Cardiopulmonary Resuscitation (for an adult)**

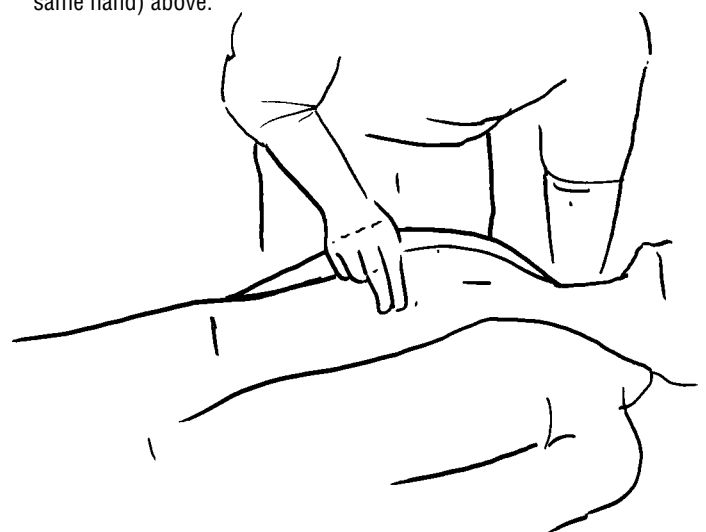
- Obtain head tilt and chin lift as before, but only ventilate twice.
- Establish there are no signs of a circulation (movement, colour, pulse).
- Begin chest compressions:
  - Trace the lower rib margins up to locate the bottom of the breastbone (sternum).
  - Place one finger on this point, with a second finger (on the same hand) above.

#### **Rescue Breathing (for an adult)**

- a) With the casualty on his/her back, position yourself at his/her side near to the head; place 2 fingers under the jaw, with other hand on the hairline. Gently extend the neck by putting pressure on the hairline and lift the jaw.



- b) Close the nose using the thumb and forefinger of the hand on the hairline, and maintain the jaw lift with the other hand.

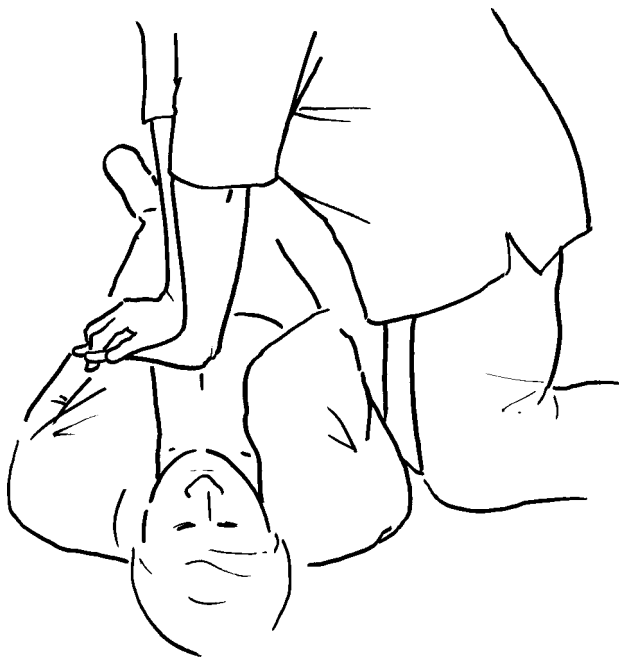




- Slide the heel of the other hand down the sternum until it touches the fingers (this locates the position for the chest compressions).



- Remove the 2 fingers from the lower sternum and place the heel of this hand on top of the hand already in position; interlock the fingers.
- Leaning over the casualty so that the arms are vertical and with straight arms, press down on the breastbone so that it depresses 4 to 5 cms (1.5 to 2 ins).
- Release the pressure.
- Repeat the process at the rate of about 100 times a minute.



- Pressure should be applied regularly, evenly and without jerking.
- Complete **15** compressions.
- Repeat head tilt and chin lift and ventilate twice.

Continue obtaining a clear airway and ventilating twice, followed by 15 compressions, until either medical assistance arrives, the casualty shows signs of recovery, or you are too exhausted to continue.

### **Two Rescuers**

Where two rescuers who have trained together as a team are present, they can work together on the casualty. Specialist training is required to ensure complete co-operation and understanding. For further information contact the RLSS UK.

### **Action on Children and Babies**

Because of anatomical and physiological differences, the resuscitation sequence on children and babies is different. It is recommended that those involved with teaching resuscitation techniques for young people or babies should receive further specialist training. For more information contact your local RLSS UK branch.

*When practising CPR, students **MUST NOT** place their hands, or press down on, their partner's chest. This must only be done on a resuscitation mannequin designed for that purpose. Students would not be required to blow into their partner's mouth. Simulated rescue breathing can be practised by tilting their partner's head back and blowing over their far cheek.*





## UNIT 6 ASA Awards Schemes

The Amateur Swimming Association offers various different schemes for all ages and abilities. These are designed to reflect a good educational base with a logical progression from earliest stages to specialist disciplines.

The following is an outline of the schemes:

### Parent and Child Awards

This scheme is designed primarily to introduce very young children and their parents to the environment and pleasure of the water.

### Rainbow Awards

There are 15 distance awards, recommended for pupils of 5 years and upwards, with tests from 5 metres to 5,000 metres.

### Water Skills

There are six progressive grades, the first three being of particular value to the early swimmer and those with a disability. Eventually the grades become more difficult, whetting the appetite for water polo, synchronised swimming and diving.

### National Curriculum Awards

These awards have been designed to meet the Key Stage 2 swimming requirements of the National Curriculum.

### Personal Survival

Designed to educate the swimmer in ways of delaying the onset of hypothermia, this scheme not only tests the physical ability of the performer, but also asks for knowledge about why given actions are performed.

### Swim Fit Awards

This scheme has several values. These are primarily adult awards, designed to motivate people to follow a swimming programme by setting themselves achievement targets. When used regularly, it can contribute to a health and fitness programme or be used by competitive swimmers to log their training. A record card, completed on an "honour" basis with no time limit, indicates the various distances completed.

### For People with Special Needs

In line with modern educational trends, the ASA has made several of its mainstream awards available to pupils with a special need, in particular the Puffin Badge, Rainbow Series, Early Water Skills and Swim Fit Schemes.

### The Spiral Bound Handbook

The schemes are all published in one book, which makes it easy for the teacher to choose and complete the skills on offer. Also pupils may see the colourful badge they are aiming for.

### The Awards Log Book

This enables pupils to see at a glance the award to aim for next, and motivates them to progress through the system.

### The Certificate of Merit

This is a special certificate presented to people who have been successful in gaining an award under adverse conditions.

*For further information contact:*

ASA Awards Centre  
Unit 1  
Kingfisher Enterprise Park  
50 Arthur Street  
Redditch  
B98 8LG



## ASA Youth Swimming Award

This award is a community service award involving individual target setting and designed to encourage young people aged 14 years and above to make an active and positive contribution within the community. The award also provides an ideal introduction to many vocational courses and qualifications and could be used as part of a course leading to GCSE.

### ASA Certificates

The Teaching and Coaching Certificates of the Amateur Swimming Association at the appropriate level are recognised by the City and Guilds of London Institutes for the award of National Vocational Qualifications. They are also widely recognised by educational authorities, schools, colleges, clubs and other employers as evidence of competence in the teaching and coaching of swimming and allied disciplines, and are in many cases a prerequisite for employment.

### ASA Magazine

The ASA produces a monthly magazine called *Swimming Times*. It is the largest swimming magazine published in Great Britain. For further information on how to obtain copies write to The Editor, *Swimming Times*, Harold Fern House, Derby Square, Loughborough, LE11 5AL.



## UNIT 7

### RLSS UK Awards and Qualifications

The awards and qualifications of the RLSS UK offer an unparalleled opportunity for people of all ages to undertake training and assessment in lifesaving, lifeguarding or life support. They combine fitness, knowledge, skill and judgement for dealing with simulated emergencies, particularly at aquatic locations. They require varying levels of proficiency and include:

#### Junior Lifesaving

The **ROOKIE Lifesaver** programme is a foundation programme combining the life skills of Water Safety, Self Rescue, Rescue and Emergency Response. Designed to teach these skills in a fun way to young people between 5 and 13, it is divided into four 'Star Grades' of competence. In addition, these young people can learn adapted specialist skills of lifeguarding including snorkelling and body boarding in the safe environment of a swimming pool. Awards in the junior range include *Junior Life Support* and *Rescue Breathing*.

#### Lifesaver Training

The **Lifesaver** (water rescue) programme is ideal for young people. Starting with Lifesaving 1, 2 and 3 awards which can be taken at any age, it includes the *Bronze Medallion*, the *Award of Merit* and *Distinction* awards taken from 14, 15 and 16 years respectively. For those accustomed to open water swimming, the *Bronze* and *Silver Cross* offer the ultimate challenge.

#### Life Support

This is another term for resuscitation (kiss of life) or CPR combined with those elements of first aid that may be needed to respond to a life threatening emergency such as choking, drowning and unconsciousness. The range of **Life Support Awards** includes *Community Life Support*, *Junior Life Support* and *Life Support 1, 2 and 3*.

#### Pool Lifeguarding

Recognised as the industry standard, the *National Pool Lifeguard Qualification (NPLQ)* can provide initial access to a career in the leisure industry as a pool lifeguard through a foundation module. Prospective candidates need to be 16 years of age.

#### Beach Lifeguarding

A range of awards and qualifications are available including the *National Beach Lifeguard Qualification*, the *Assistant Beach Lifeguard Award* and the *Rescue Boat Helm* and *Crew Award*.

#### Swimming Teachers and Coaches

Endorsed by the Amateur Swimming Association, the Institute of Swimming Teachers and Coaches, the Institute of Sports and Recreation Management and the Swimming Teachers Association, the *Rescue Test for Teachers and Coaches of Swimming* includes the practical lifesaving skills that may be needed by those supervising a 'programmed' activity in a swimming pool. *The Rescue Test for Supervisors of Swimmers with Disabilities* includes similar rescue techniques adapted for this specialist activity. A basic *Emergency Response Award (Swimming Pool)* is also available.

#### Outdoor Activities

Following the Lyme Bay tragedy in 1993 and the Activity Centres (Young Persons' Safety) Act 1995, the Society has introduced the *Aquatic Rescue Test for Outdoor Activity Supervisors* for those supervising outdoor activities in close proximity to open water. A basic *Emergency Response Award (Open Water)* is also available.

#### Training and Assessing

The Training and Assessing scheme includes the option to train as an RLSS UK lifesaving teacher and/or trainer assessor in a number of disciplines.

#### Qualifications and Awards Insignia and Validity

The insignia vary in design and price. All practical qualifications and awards have a validity period; the teacher and trainer assessor appointments do not.

*For further information contact:*

The Royal Life Saving Society UK  
River House  
High Street  
Broom  
Warwickshire  
B50 4HN  
Tel: 01789 773994  
Fax: 01789 773995  
E-mail: [lifesavers@rlss.org.uk](mailto:lifesavers@rlss.org.uk)







## Useful Publications

### Swimming Publications

For the latest price list for these publications contact Swimming Times Ltd, Publications Dept, Unit 1 Kingfisher Enterprise Park, 50 Arthur Street, Redditch, B98 8LG. Tel: 0800 220292

Title	Author	Publisher
<i>Teach Your Child to Swim</i>	S. Meredith/C. Hicks	Usborne
<i>Swimming</i>	J. Verrier	Crowood Press
<i>Swimming for Life</i>	R. Russell	Pelham Books
* <i>Swimming for All</i>	D. Sparkes	Pelham Books
<i>Improve Your Swimming &amp; Diving Skills</i>	E. Fischel	Usborne
<i>Water Activities for Adults &amp; Children</i>	A. MacKenzie-Farmer	Swimming Times
<i>Survival in Cold Water</i>	A. Donlan	Swimming Times
<i>ASA Handbook</i>	ASA	ASA
<i>ASA Laws of the Sport</i>	ASA	ASA
* <i>Introduction to Swimming Teaching and Coaching</i>	J. Lawton, F. Dalrymple-Smith, V. Way	Swimming Times
<i>Swimming Teaching and Coaching – Level 1</i>	L. Hogarth	Swimming Times
<i>Swimming Teaching and Coaching – Level 2</i>	R. Cross and Wilson	Swimming Times
* <i>National Curriculum Resource Pack</i>	ASA/RLSS UK	ASA/RLSS UK
* <i>Successful Swimming with the ASA</i>	A. Cregeen/A. Donlan	Swimming Times
<i>Teaching Synchronised Swimming</i>	J. Gray	EP/ASA
<i>Equivalent Performance Tables</i>	G. Sykes	ASA
<i>Water Polo Referee's Handbook</i>	D. Bathurst	ASA
* <i>Know The Game – Synchronised Swimming</i>	J. Gray	A. & C. Black
<i>Comparative Performance Tables</i>	Dr. G. Coen	GSF (DSV)
<i>Swimming Games and Activities</i>	A. Cregeen/J. Noble	A. & C. Black
<i>Swimming for Fitness</i>	G. Austin/J. Noble	A. & C. Black
<i>ASA Awards Scheme Booklet</i>	ASA	ASA
<i>Swimmers' Log Book</i>	ASA	ASA
<i>Aquafit Handbook</i>	J. Harrison	Sunderland Poly

### Lifesaving Publications

For the latest price list for these publications contact RLSS UK Enterprises Ltd, Lifesavers Direct, Trinity House, Lisburn, Northern Ireland BT28 2YY Tel: 02892 60696 Fax: 01846 606 968.

Title	Publisher
<i>Lifesaving</i>	RLSS UK
<i>Life Support</i>	RLSS UK
<i>Specially Safe</i>	RLSS UK
<i>Rookie Swim, Survive, Save</i>	Mosby Lifeline
<i>Rookie Trainer's Guide</i>	Mosby Lifeline
<i>Life Support Awards</i>	RLSS UK
<i>Life Saving Awards</i>	RLSS UK
<i>Lifesaving 1, 2, 3 – Teachers Guide</i>	RLSS UK
<i>Pool Lifeguard</i>	Mosby Lifeline
<i>Beach Lifeguarding</i>	Mosby Lifeline
<i>Safety at Inland Water Slides</i>	ROSPA + RLSS UK
<i>Safety on British Beaches</i>	ROSPA + RLSS UK
<i>Management of Health and Safety in Swimming Pools</i>	H+SE

For details of video films available, contact Swimming Times Limited.

#### Some useful addresses

##### Amateur Swimming Association

Harold Fern House  
Derby Square  
Loughborough, Leics, LE11 5AL

##### The British Sports Association for the Disabled

The Mary Glen Haig Suite  
34 Osnaburgh Street  
London, WC1 0QP

##### Institute of Swimming

Teachers and Coaches Limited  
41 Granby Street  
Loughborough, Leics, LE11 3DU

##### National Coaching Foundation

114 Cardigan Road  
Leeds, LS6 3BJ

##### The Royal Life Saving Society UK

River House  
High Street  
Broom  
Warwickshire  
B50 4HN

##### Sports Aid Trust

16 Upper Woburn Place  
London, WC1 0QN

##### The Sports Council

16 Upper Woburn Place  
London, WC1 0QP

##### Swimming Times Limited (Magazine)

31 Granby Street  
Loughborough, Leics, LE11 3DU

\* Indicates publication suitable for GCSE.

