

FIRST AID



ROYAL CANADIAN NAVY

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FIRST AID

IN THE
ROYAL CANADIAN NAVY

1942

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THIS Handbook on "First Aid", prepared by Surgeon Lieutenant R. L. Denton, B.Sc., M.D., R.C.N.V.R., is for the exclusive use of the personnel of His Majesty's Canadian Naval Forces, and is not for sale.

The information and instructions which it contains are meant to be of value to those who, in times of emergency, wonder what they should do.

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INTRODUCTION

In the Naval Service, especially during hostilities, everyone should be able to apply the simple procedures of First Aid to the injured. This knowledge must be acquired before the emergency arises, and can be achieved only by practice and study.

Every ship is supplied with First Aid chests, and in addition compact kits are placed in gun-turrets and at other strategic points. Each man should know the contents of these kits, and how to use them.

The purpose of this handbook is to show the simplest way in which first aid principles may be applied. An attempt has been made to avoid a confusion of facts on Anatomy, Physiology and Surgery, and to give the salient points of each first aid problem without unnecessary detail. It should not be felt that first aid is impossible without a large stock of medical supplies, so alternate and make-shift methods are frequently included to be used in case of such deficiency.

“Efficient First Aid may be a life-saving knowledge.”

CHAPTER I

PRINCIPLES OF FIRST AID

There are certain basic requirements in First Aid which should be practised until they become natural actions when the occasion arises:

1. The absence of signs of life does not mean death is present. It is better to carry out the procedures required than to waste time trying to decide this difficult question and perhaps allow the patient to die.

2. Remove the cause of the injury, or the patient from the cause.

3. Haemorrhage requires attention before all other things.

4. Allow the patient plenty of air.

5. Keep the person warm with blankets, hot-water bottles, etc.

6. Wounds of the skin must be kept covered with a clean dressing.

7. In case of a fracture, or suspected fracture, no movement of the patient is warranted until a splint is applied, unless he is in danger.

8. Efficient transportation should be carried out without unnecessary disturbance of the patient.

9. In case of poisoning the appropriate treatment must be given without delay.

10. Remove only as much clothing as is necessary to carry out treatment.

11. Stimulants are to be given only when the patient is conscious and able to swallow. Stimulants to be used are milk, tea, coffee or meat extracts. Alcoholic drinks, or drugs are not to be given under any conditions until ordered by the Surgeon.

12. Remember the limitations of First Aid—do not attempt to be the Surgeon. Send for the Doctor, or take the patient to hospital. Medical care is to be procured in every case.

13. Remember that shock can be a cause of death—study the description of shock, and the measures to prevent and treat it.

CHAPTER II

DRESSINGS AND BANDAGES

A Dressing is a covering applied to an injury. There are two types of dressing:

(a) *Wet*.—This may be used either cold or hot. It is called a compress. It helps to diminish pain.

A cold compress is made by several folds of cotton, gauze or other cloth wrung out with cold water. Ice water in a hot water bag may be used. Cold compresses become warmed by body heat and must be changed frequently.

A hot compress is made by folding cotton or flannel cloth wrung out with hot water, covered with oiled silk or other water-proof. It also must be changed frequently. If relief does not follow a hot compress, a cold one should be tried.

(b) *Dry*.—New, fresh wounds heal best when kept dry. Dry dressings, therefore, are to be used on wounds.

A piece of clean (sterilized if available) gauze, such as supplied in first aid kits is the best dry dressing. If this is not available, clean white cloth or laundered handkerchief may be used. The latter should be replaced by sterile gauze when it arrives. Absorbent cotton should not be applied as it becomes matted in the wound.

The dressing should be covered with absorbent cotton, and maintained in place by a bandage.

Bandages—are used to keep dressings or splints in place, to make slings, or apply pressure. The ends of a bandage must always be tied with a reef knot, never a granny knot.

Bandages may be improvised from strips of cloth, belts, neck-silks, lanyards, or handkerchiefs. The cotton

roller bandage of various widths is supplied with First Aid Kits, and is easy to use. It is the best bandage for keeping a dressing in place.

For holding splints in position, or for making a sling, the Triangular Bandage (Fig. 1) is useful. It is obtained by cutting a forty-inch square of cotton, or other cloth, diagonally. It can then be folded into the desired width to make a Broad or Narrow Bandage.

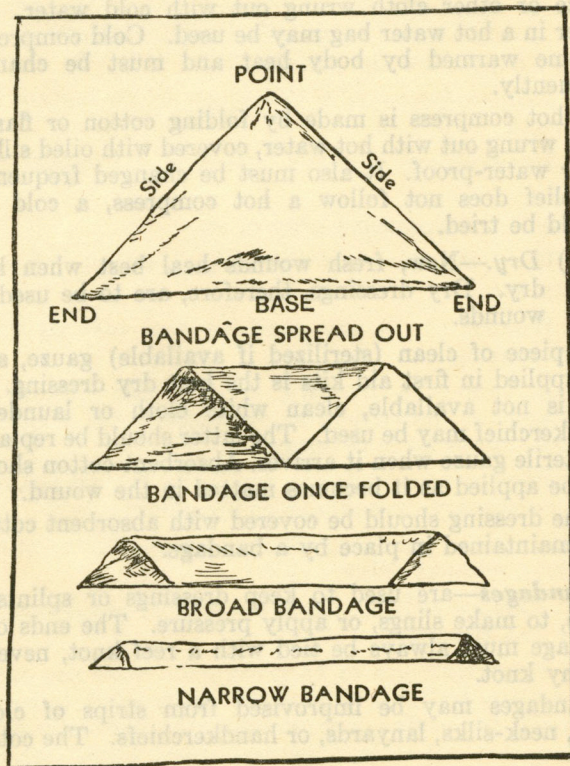
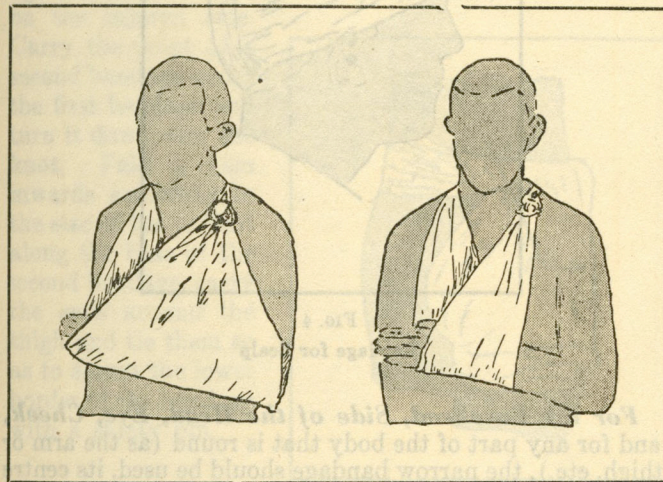


Fig. 1

Slings.—The triangular bandage is the best sling to use, but in the absence of this, a lanyard or belt may be used or by pinning the sleeve to the jacket.

The Large Arm Sling (Fig. 2) is used to support the forearm from elbow to tips of the fingers. One end is placed over the front of the shoulder of the uninjured side, carried under the injured arm, with the point of the sling at the elbow, and the other end brought outside the injured arm, over the shoulder of that side and tied behind the neck. The free apex at the elbow is folded to the front and pinned. The whole elbow and forearm are thus supported.

The Small Arm Sling (Fig. 3) affords support to the lower part of the forearm. It is made by folding the triangular bandage into a Broad Bandage, and is applied in a similar way to the Large Sling, leaving the elbow free. Support must be given at the wrist.

Fig. 2
Large Arm SlingFig. 3
Small Arm Sling

Application of Bandages

For the Scalp (Fig. 4). Fold a hem inwards about 1½ inches deep along the base of a Triangular Bandage; place the bandage on the head so that the hem lies on the forehead *close down to the eyebrows*, and the point hangs down at the back; carry the two ends round the head *above* the ears over the loose point behind and tie them on the forehead so as to secure the lower border of the bandage. Steady the head with one hand and with the other draw the point of the bandage downwards; then turn it up and pin to the bandage on the top of the head.

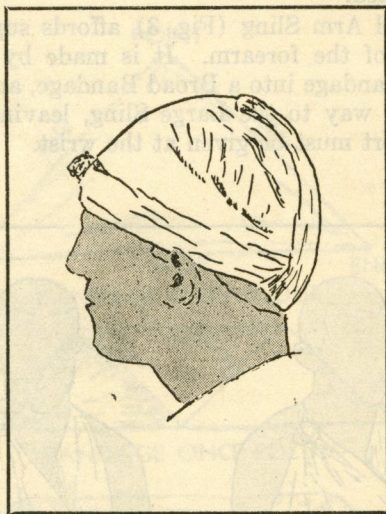


FIG. 4
Bandage for Scalp

For the Forehead, Side of the Head, Eye, Cheek, and for any part of the body that is round (as the arm or thigh, etc.), the narrow bandage should be used, its centre being placed over the dressing, and the ends carried round the head or limb, as the case may be and tied.

For the Shoulder

(Fig. 5). Place the centre of a triangular bandage on the shoulder, with the point running up the side of the neck; fold a hem inwards along the base of the bandage; carry the ends round the middle of the arm and tie them so as to secure the lower border of the bandage. Apply a small arm sling. Turn down the point of the first bandage over the knot of the sling, draw it tight and pin it

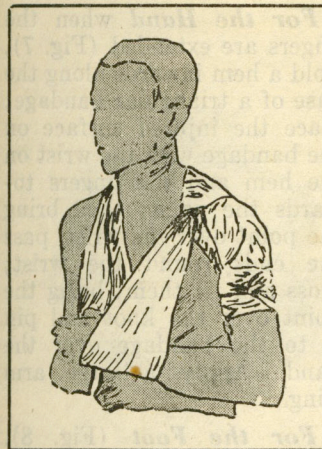


FIG. 5
Bandage for Shoulder

For the Hip (Fig. 6). Tie a narrow triangular bandage round the body above the hip bones, with the knot on the injured side. Carry the point of a second bandage under the first bandage and turn it down over the knot. Fold a hem inwards according to the size of the patient along the base of the second bandage, carry the ends around the thigh and tie them so as to secure the lower border of the bandage with a safety pin.

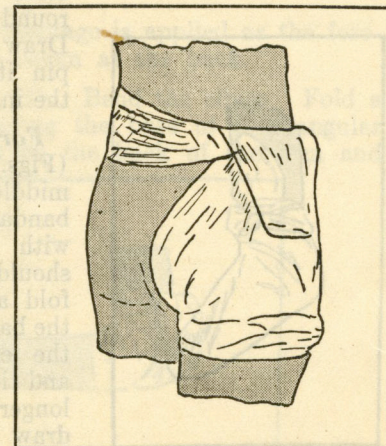


FIG. 6
Bandage for Hip

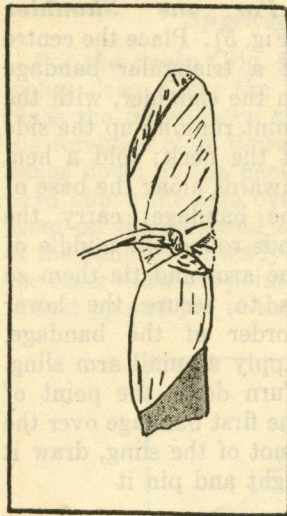


FIG. 7
Bandage for Hand

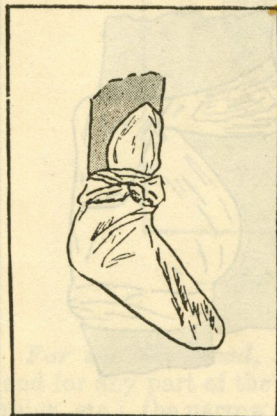
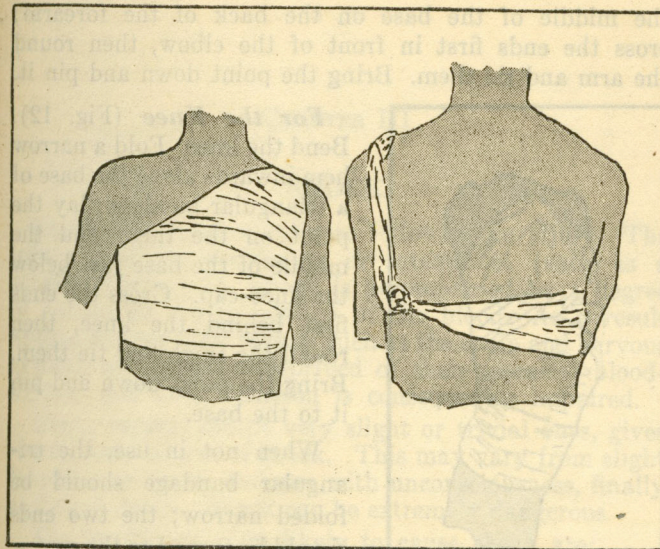


FIG. 8
Bandage for Foot

For the Hand when the fingers are extended (Fig. 7). Fold a hem inwards along the base of a triangular bandage; place the injured surface on the bandage with the wrist on the hem and the fingers towards the point; then bring the point over the wrist, pass the ends round the wrist; cross and tie them; bring the point over the knot and pin it to the bandage over the hand. Apply a large arm sling.

For the Foot (Fig. 8). Place the foot on the centre of the bandage with the toes towards the point; draw up the point over the instep, bring the ends forward and cross them; pass the ends round the ankle and tie them. Draw the point forward and pin it to the bandage over the instep.

For the Front of the Chest (Figs. 9 and 10). Place the middle of the triangular bandage over the dressing with the point over the shoulder on the same side; fold a three-inch hem along the base of the bandage, carry the ends around the body and tie them, leaving one end longer than the other. Then draw the point over the shoulder, and tie it to the longest end.



FIGS. 9 and 10
Bandage for Chest (front and back views)

For the Back. The bandage is applied as the foregoing, except that it is begun at the back.

For the Elbow (Fig. 11). Bend the elbow. Fold a narrow hem inwards, along the base of a triangular bandage; lay the point on the back of the arm and

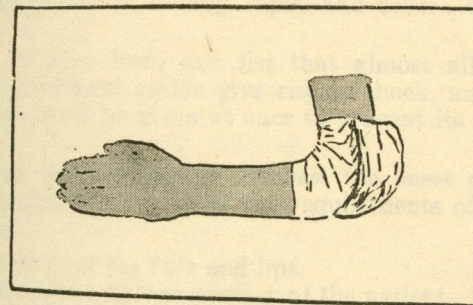


FIG. 11
Bandage for Elbow

the middle of the base on the back of the forearm; cross the ends first in front of the elbow, then round the arm and tie them. Bring the point down and pin it.

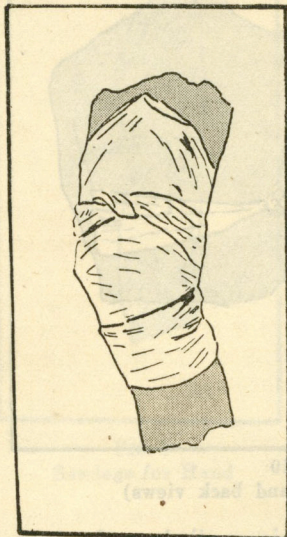


FIG. 12
Bandage for Knee

For the Knee (Fig. 12). Bend the knee. Fold a narrow hem inwards along the base of a triangular bandage; lay the point on the thigh and the middle of the base just below the knee-cap. Cross the ends first behind the knee, then round the thigh and tie them. Bring the point down and pin it to the base.

When not in use, the triangular bandage should be folded narrow; the two ends should be turned to the centre, and the bandage then folded into four, reducing it to a packet about $6\frac{1}{2}$ inches by $3\frac{1}{2}$ inches.



Bandage for Elbow

CHAPTER III

SHOCK

Shock is a state of collapse following an injury. The injury may be accidental, or intentional (such as a surgical operation). Shock is accompanied by a degree of failure of the circulation of the blood. As a result of this, certain vital organs, such as the brain and nervous system, are partially deprived of their essential blood-supply, and their function is consequently impaired.

Every injury, except very slight or trivial ones, gives rise to some degree of shock. This may vary from slight faintness to severe collapse with unconsciousness, finally ending in death. Shock can be extremely dangerous.

The conditions most likely to cause shock are:

1. Wounds, fractures, wounds of the abdomen and its contents, and "crushing injuries."
2. Loss of blood.
3. Burns.
4. Severe pain.
5. Long exposure to cold or wet.

Of these causes, abdominal wounds, crush injuries, and burns give rise to a very rapid and severe degree of shock.

It is evident from this list that almost all injuries received in Naval action give rise to shock, and proper treatment must be given at once to prevent its aggravation.

Certain warning signals forecast the onset of shock. Their recognition is one of the requirements of efficient First Aid:

1. Pallor of the face and lips.
2. Restlessness and anxiety of the patient.
3. Fall in body temperature, leaving the skin cold and clammy, with beads of perspiration.

4. Breathing becomes rapid and shallow.
5. Pulse is weak and fast.
6. Thirst is marked and vomiting may occur.
7. These warnings lead to listlessness, and finally to unconsciousness which may go on to death.

It is important to know that a man suffering from severe shock usually does not complain of pain.

The treatment of shock is twofold:

A. Prevention.—Every severely wounded man must be treated for shock, even though its presence is not apparent.

1. Treat the injury quickly and efficiently, yet as gently as possible.
2. Lay the man down with his head turned to one side. Keep him warm.
3. Give hot drinks of sweetened tea or coffee except in injuries of the abdominal organs. GIVE NO ALCOHOL.
4. Raise the feet.
5. Loosen tight clothing.

B. Treatment when shock is present. In addition to the above.

1. Morphine is essential. Notify the Officer in charge of this drug *at once*.
2. Place hot water bottles around the body, being careful not to burn the man.
3. Speak encouragingly to him. Do not discuss his injuries.
4. Get him to a Surgeon as soon as possible, as transfusion may be necessary.

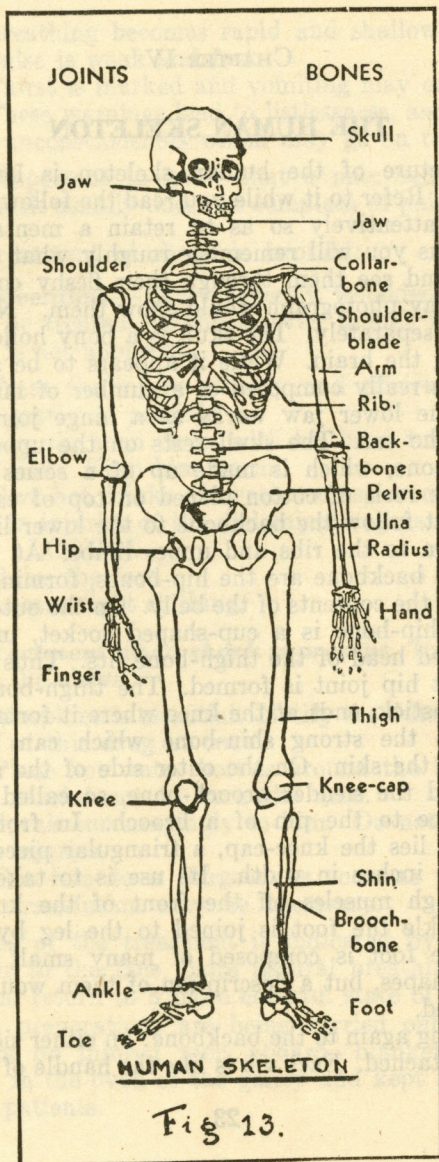
Success of the treatment is indicated by the return of colour to the face, more natural breathing, stronger pulse and return to a more cheerful state of mind.

When preparations are being carried out to receive survivors or injured men aboard, blankets must be warmed in the oven of the galley and kept in readiness for the patients.

THE HUMAN SKELETON

The picture of the human skeleton is here shown (Fig. 13). Refer to it while you read the following pages. Study it attentively so as to retain a mental picture of it. Thus you will remember roughly what the bones are like and see them through their fleshy covering or as an X-ray photograph would show them. Next study the bones separately. The skull is a bony hollow sphere containing the brain. While it appears to be all in one piece, it is really composed of a number of interlocking bones. The lower jaw works as a hinge joint just in front of the ear. The skull rests on the upper end of the backbone, which is made up of a series of small bones, like reels of cotton placed on top of each other. Let us first follow the backbone to the lower limbs, and then return to the ribs and upper limbs. At the lower end of the backbone are the hip-bones, forming a basin to support the contents of the belly. On the outer surface of either hip-bone is a cup-shaped socket, into which the rounded head of the thigh-bone fits. Thus the ball-and-socket hip joint is formed. The thigh-bone, like a huge drumstick, ends at the knee where it forms a hinge joint with the strong shin-bone which can be easily felt under the skin. On the outer side of the shin-bone is attached the slender brooch-bone, so called from its resemblance to the pin of a brooch. In front of the knee joint lies the knee-cap, a triangular piece of bone about two inches in width. Its use is to take the rub of the thigh muscles off the front of the knee joint. At the ankle the foot is joined to the leg by a hinge joint. The foot is composed of many small bones of peculiar shapes, but a description of them would be too complicated.

Returning again to the backbone: on either side twelve ribs are attached. Each rib is like the handle of a bucket



and curves round the chest from the backbone behind to the breast-bone in front. Look at the illustration. The breast-bone, flat and dagger shaped, lies under the skin, where its shape can be practically seen and felt in the live subject. On either side its upper end is attached to the collar-bone, which goes out horizontally to the point of the shoulder. This acts like an outrigger in keeping the shoulder out. It is like the old English letter f and lies so closely under the skin that it can be seen and felt quite easily. The outer end of the collar-bone joins with the outer end of the shoulder-blade to make the shoulder girdle. The shoulder-blade is a triangular bone lying on the back of the chest and is clearly visible in thin people. At the outer corner of the shoulder-blade is a shallow socket, in which works the ball-shaped upper end of the arm bone. This bone at its lower end forms the hinge-shaped elbow joint with the two forearm bones, and these join with the hand at the wrist. The hand, like the foot, is made up of many small bones too complicated for description.

Notice that there is a general similarity of arrangement between the upper and lower limbs. Both are joined to the body by a ball-and-socket joint, then a single drum-stick-shaped bone, and then a hinge-joint with two more or less parallel bones, which are joined by a hinge-joint to the hand or foot, these latter structures being composed of a collection of small bones.

FRACTURES

A fractured bone is a broken bone. There are several types, as illustrated in Fig. 14.

1. **A Simple fracture** is one in which the bone is broken, but with little damage to the soft tissues such as muscles, nerves, or blood-vessels.
2. **A Compound fracture** is one in which the ends of the broken bone protrude through the skin, or the damage to the skin and underlying structures is great enough to permit the entrance of air and dirt to the site of the fractured bone.

This damage may vary from the large laceration caused by jagged shrapnel to the fine puncture wound of a small calibre bullet which has penetrated with sufficient force to break a bone.

3. **A Comminuted fracture** is one in which there is shattering of the bone into three or more fragments. It may be a simple-comminuted or a compound-comminuted fracture.

In treating simple fractures, the prevailing danger is that by rough handling or other improper First Aid treatment the broken ends of the bone may tear through the skin, turning a simple fracture into a compound one. The shin-bone is especially liable to this complication.

Compound fractures give rise to more dangerous complications since infection may reach the broken bone through the damaged tissue, resulting in blood infection which endangers life or severe local infections which might result in the loss of a limb. Great care must be taken to prevent this complication by avoiding unnecessary movement of the broken limb and the prompt application of a clean dressing to the wound.

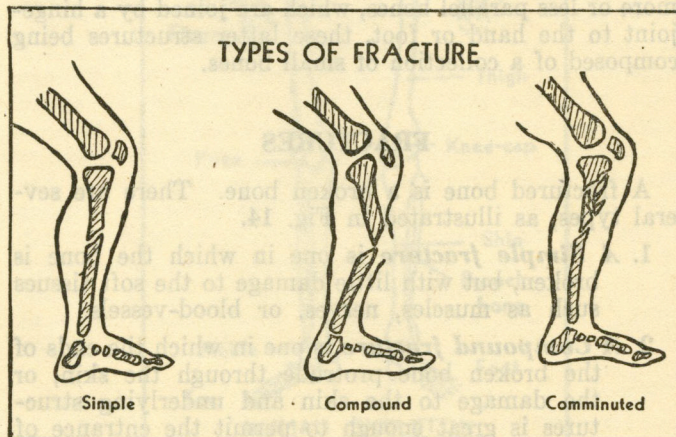


FIG. 14

There are several signs and symptoms of fracture by which the diagnosis may be made. They are described below. Not all of these must be present before a fracture can be considered certain, but diagnosis should not depend on one alone. In all cases of doubt, treat the injury as a fracture.

General Signs and Symptoms of Fracture

1. **Loss of Power.**—This must obviously happen when a bone is broken and its rigidity lost. The pain which occurs if the bone is moved will stop the patient from moving it. The tearing and bruising of the muscles and nerves and the internal bleeding will temporarily paralyze the part, and so contribute to the loss of power.

2. **Pain** is usually present, though shock may minimize it.

3. **Deformity.**—The limb can be seen or felt to be of a different shape from its fellow. It may be bent or twisted, or both. It is important to inquire if the two limbs were alike before the accident, for the limb may have been previously deformed.

4. **Shortening.**—This is a very important sign of fracture, but not always easy to notice. Most careful measurements from very definite bony points are required. The cause of the shortening may seem clear to you if the bone be compared to a bow and the muscles to a bow-string. If the bow be broken, the tense string would at once pull the two pieces together so that they overlapped.

5. **Swelling.**—With every fracture there is bleeding in the torn flesh round the broken ends of the bone. This, and the thickening which necessarily occurs with shortening, are chiefly responsible for the swelling.

6. **Irregularity.**—If a bone lies so closely under the skin that it can be easily felt, as is the case with the shinbone, then if that bone be broken and the fragments displaced, an irregularity will be easily felt on

sliding the finger up and down the bone. Especially will this be noticed if the fellow limb be examined at the same time.

7. Unnatural Movement.—Explains itself. Movement, such as bending or twisting, can only take place at the joints. If it takes place where there should be rigid bone, then the bone must be broken.

8. Bony Grating.—This is the gentle click which is felt, perhaps even heard, when the broken ends of the bone are rubbed against one another. This causes much pain to the patient, so should not be repeated when once discovered.

Finally, bear in mind that there may be several fractures. Therefore have a good general look before you start treatment, as otherwise you may be doing harm to one fracture while treating another.

Object of Treatment

THE OBJECT OF FIRST AID TREATMENT OF FRACTURES IS TO GUARD AGAINST FURTHER INJURY OR AGGRAVATION. NEVER ALLOW A SIMPLE FRACTURE TO BECOME COMPOUND.

General Rules for Treatment of Fracture

1. Attend to the Fracture on the Spot.—No matter how crowded the space, or how short the distance to a more convenient or comfortable place, no attempt must be made to move the patient until the limb has been rendered as immovable as practicable by splints or other means of restraint, unless life is in danger from some other cause.

2. When haemorrhage accompanies a fracture it must be attended to first, and the wound covered by a clean dressing.

3. Steady and support the injured limb so that its further movement by the patient or the bystanders is prevented.

4. With great care and without using force place the limb in as natural a position as possible, and, if shortening is observed in the case of fracture of a bone of the lower limb, place one hand behind the heel and the other on the instep and pull evenly upon the foot (extension) until the limb regains a more normal length. When the limb is straightened, on no account let go until it is secured in position by splints, otherwise there is great danger of the fracture becoming compound or complicated by injury to nerves or arteries. **DO NOT ATTEMPT EXTENSION IN THE CASE OF A COMPOUND FRACTURE WHEN THE BONE PROTRUDES.**

5. Apply splints, bandages and slings when necessary as follows:

(a) How to apply a splint.

Splints are strips of more or less rigid material and may be improvised from strips of wood, a walking stick, bayonet, rifle, broom-handle, or rolled paper. Anything that is strong enough, long enough, and wide enough may be used.

Surgeons themselves follow certain very important rules when applying splints. Such rules cannot be observed in First Aid splinting because the latter work must necessarily be of a temporary nature and is carried out frequently under difficult circumstances. In a few hours the temporary splints will be changed by the Surgeon, the broken bones will be set in their proper position, and the limb will be carefully placed in fresh splints. On the other hand, if ample time and suitable materials be available, there is no reason for not making a first-rate job of it from the very beginning. The pictures show actual cases. (Figs. 15 and 16.)

Injured limbs frequently continue to swell long after the accident, so due allowance should be made for this while bandaging. The splint should be well padded. If a hard substance be pressed against the skin for a long time a bare place or "splint sore" will appear. These sores take a long time to heal under the best of con-

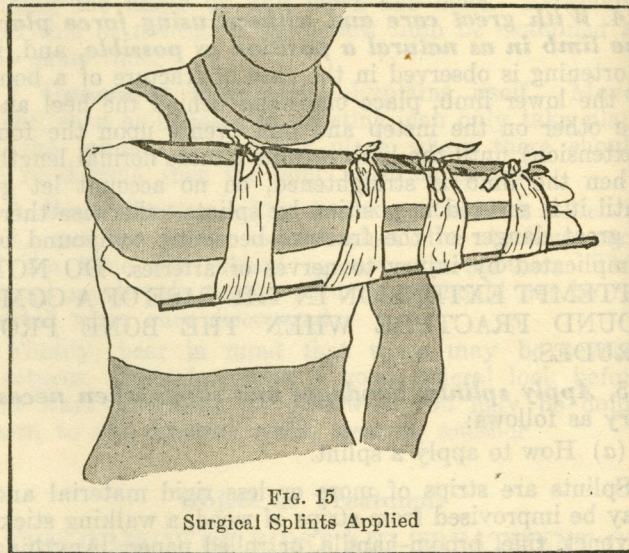


FIG. 15
Surgical Splints Applied

ditions. Tow or cotton wool is generally used for padding a splint, but some clothes or a handful of straw wrapped round the splint could be used instead.

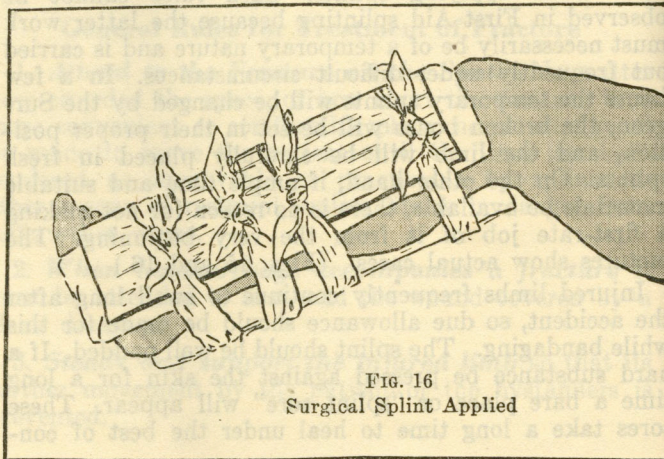


FIG. 16
Surgical Splint Applied

See that the splint is too long rather than too short, because a long splint gives better purchase for fixing the broken bone. Choose a splint too broad rather than too narrow, as a narrow splint may cause stoppage of the circulation from too tight bandaging. Then an angle on either side is left where the bandage cannot press on the limb. In the choice of splints prefer length and breadth.

- (b) The bandages must be applied firmly, but not so tightly as to constrict the circulation of blood in the limb, thereby producing congestion in the extremity. When the patient is in the recumbent position, double the bandage over the end of a splint to pass it under the trunk or lower limb, using the natural hollows of the body (the neck, loins, knees and just above the heels). Avoid jarring the patient while working them into their correct position. As a general rule:

For the trunk the broad bandage should be used. Pass it once round the trunk and fasten it by tying the ends (or with two or three safety pins) on the side opposite to the fracture, but if to secure a splint for a broken thigh, tie or fasten the ends over the splint.

For the limbs the narrow bandage should be used. Pass it twice round the limb, and tie the ends over the outer splint. If sufficient bandages are not available, the splints may be secured by lanyards, belts, etc.

When applying bandages near a fracture the upper one should be secured first. When securing an improvised round splint, an extra turn of the bandage should be made round the splint to hold it in position.

- (c) Slings, when necessary, should be applied as described.

IN ALL DOUBTFUL CASES TREAT AS A
FRACTURE

Special Fractures

Fracture of the Skull.—A fracture of the upper part is usually caused by direct violence, for example, a blow on the head. A fracture of the base is caused by indirect violence, through a fall on the head, a fall on the feet or lower part of the spine, or a severe blow on the lower jaw. If the upper part is fractured, the signs are swelling, irregularity, and frequently unconsciousness, either immediate or coming on gradually. If the base is fractured, insensibility may come on immediately, blood or fluid may issue from the ear channel, escape from the nose, or it may pass down to the stomach, whence it may be vomited. The fracture may involve the orbit, causing a blood-shot eye. Injury to the brain is the great danger attending a fracture of the skull.

Treatment

See "Concussion and Compression of the Brain," Chap. IX.

Fracture of the Lower Jaw.—The break usually occurs midway between the point of the chin and the angle of the jaw, as result of a blow on the side of the face.

First aid treatment consists of tying the mouth shut. The simplest way to do this is to take a four-foot strip of cotton, 4 inches wide, split each end to within two inches of the middle, cut a small hole in the centre for the chin, and apply tightly as shown in the accompanying illustration (Fig. 17).

Fracture of the Spine.—The vertebral column may be broken as result of a fall on the head, a fall across a bar, or by a heavy weight striking upon the back. It may even be caused by a fall from a height upon the feet. The actual break occurs in one or more of the spool-like vertebrae, and is often accompanied by a dislocation, or displacement of this bone. The dangerous part of a fractured spine is the crushing of the vital spinal cord which lies enclosed in the spinal column.

The signs and symptoms of fracture are usually present. It is important to remember that any person unconscious from a fall may have a fractured spine and should be treated as such.

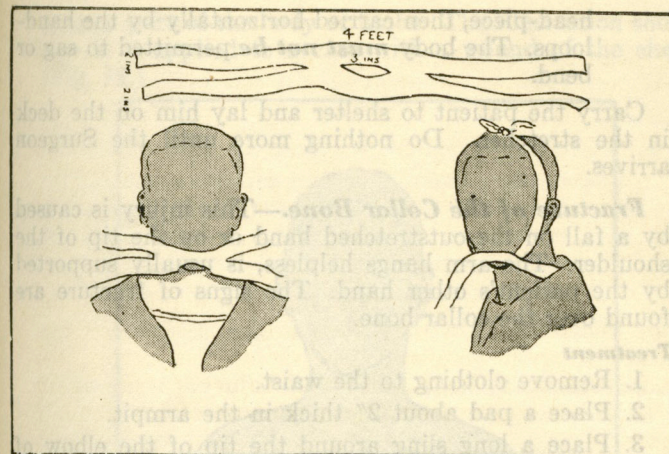


FIG. 17

Four-tailed Bandage for Broken Lower Jaw

Surgeons do not all agree upon the best method of transport of a case of fractured spine. The question is whether to lay the patient on his face or back; since it is very difficult to know which part of the curving spine is broken, a rigid rule cannot be laid down.

In the Navy, the primary need for transportation is to remove the patient from danger to a comparatively sheltered spot. Thus it is necessary to learn a simple, practical, yet safe method, which can be carried out quickly with the minimum of equipment.

- A. If a Neil-Robertson stretcher is **not** available, the patient is to be gently rolled on his face, with the head supported (do not allow the head to fall forward), on a tarpaulin or coat. The head is steadied in the face-down position by an assistant, the patient's legs are gently lifted, and he is dragged out feet first to shelter.
- B. If a Neil-Robertson stretcher is available (See Figs. 37 to 40), the patient is gently placed in it, the head supported by a bandage around the

head-piece, then carried horizontally by the hand-loops. The body **must not be** permitted to sag or bend.

Carry the patient to shelter and lay him on the deck in the stretcher. Do nothing more until the Surgeon arrives.

Fracture of the Collar Bone.—This injury is caused by a fall on the outstretched hand or on the tip of the shoulder. The arm hangs helpless, is usually supported by the patient's other hand. The signs of fracture are found over the collar bone.

Treatment

1. Remove clothing to the waist.
2. Place a pad about 2" thick in the armpit.
3. Place a long sling around the tip of the elbow of the injured side, carry it over the uninjured shoulder, tie it behind the back.
4. Bind the arm to the body from elbow to shoulder, to lever out and draw back the shoulder.

Fractured Ribs.—This is one of the accidents in which there is often much uncertainty as to whether there is a fracture or not. Fractured ribs are often overlooked. When a patient has had an injury to the chest followed by a severe stabbing pain on taking a deep breath, treat him as if his ribs were broken. The best treatment in these cases is to tie a broad binder tightly round the body where the pain is, so that the patient cannot breathe deeply. This usually relieves him at once. A good pattern of binder is the "many-tailed bandage." (Fig. 18.)

The Many-Tailed Bandage may be described simply as a square or oblong piece of cotton of suitable size torn at the sides into tails about one inch broad. It is applied to the body or limbs so that the untorn part nearly envelops the damaged area and then the tails are tied or pinned together, beginning with the lowest one. It is exceedingly simple and very efficient, besides being easily made and applied. It can be used

for any part of the body or limbs. The illustration shows how it is applied to a case with a wound of the chest. (Fig. 18.)

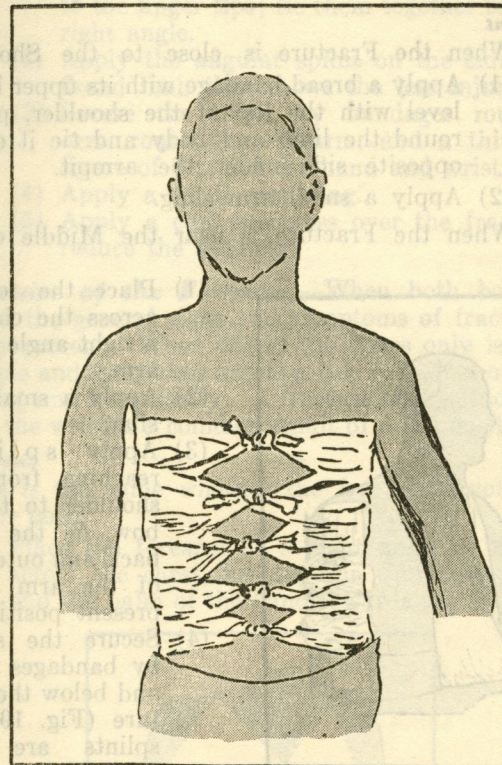


FIG. 18
The Many-tailed Bandage

Fracture of the Shoulder-Blade is very rare.

Treatment

Apply the centre of a broad bandage in the armpit of the injured side, cross the ends over the uninjured shoulder and tie them in front of the shoulder. Support the injured limb in a broad sling.

Fracture of the Arm.—The bone may be broken: (a) close to the shoulder; (b) near the middle of the shaft; (c) close to or involving the elbow-joint.

Treatment

- (a) When the Fracture is close to the Shoulder:
- (1) Apply a broad bandage with its upper border level with the top of the shoulder, pass it round the limb and body and tie it on the opposite side under the armpit.
 - (2) Apply a small arm sling.
- (b) When the Fracture is near the Middle of the Shaft:

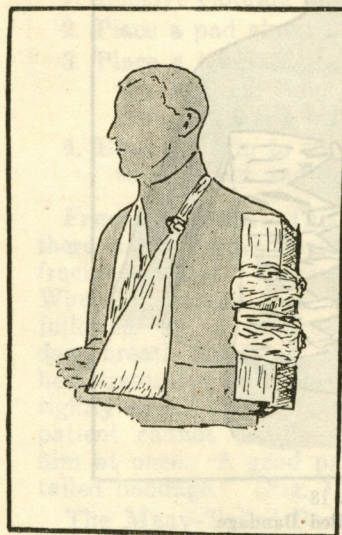


FIG. 19

Treatment of Fracture of Arm

- (1) Place the forearm across the chest at a right angle to the arm.
- (2) Apply a small arm sling.
- (3) Apply splints, reaching from the shoulder to the elbow, on the front, back and outer side of the arm in its present position.
- (4) Secure the splints by bandages above and below the fracture (Fig. 19). If splints are not available, secure the arm to the side by two broad bandages around the body.

- (c) When the fracture, whether of the arm or forearm, involves the elbow-joint:

This fracture is attended with much swelling, and it is difficult to ascertain the exact nature of the injury.

- (1) Take two splints, one long enough to reach from the armpit to below the elbow, the other long enough to reach from beyond the elbow to the finger tips; tie them together to form a right angle.
- (2) Apply the angular splint on the side of the flexed limb that shows the less injury.
- (3) Secure the splint by bandages round the arm, round the forearm, and a third as a figure of 8 round the hand and wrist.
- (4) Apply a small arm sling.
- (5) Apply a cold compress over the fracture to reduce the swelling.

Fracture of the Forearm.—When both bones are broken, the general signs and symptoms of fracture are usually present. When one of the bones only is broken the signs and symptoms are as a rule pain, loss of power, swelling, and irregularity. A fracture of the Radius just above the wrist is a common result of a fall on the hand.

Treatment

This is the same whether the fracture involves one bone or both.

- (1) Place the forearm at a right angle to the arm, across the chest, keeping the thumb uppermost, and the palm of the hand towards the body.

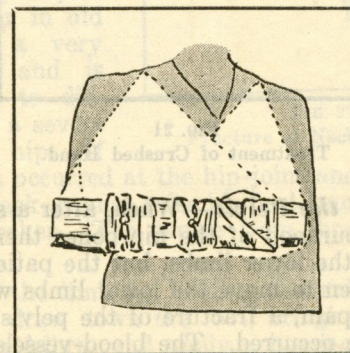


FIG. 20

Treatment of Fracture of Forearm

- (2) Apply splints on the front and back of the forearm from the elbow to the fingers.
- (3) Apply 2 bandages, embracing both splints; one is placed above the fracture, and the other round the wrist first and completed as a figure of 8 round the hand and wrist (Fig. 20).
- (4) Apply a large arm sling.

Fracture of the Bones of the Hand or Fingers.—Crushed Hand.

Treatment

- (1) Apply a carefully padded splint to the front of the hand, reaching from the middle of the forearm to beyond the tips of the fingers.
- (2) To secure the splint apply a bandage, crossed in the manner of the figure 8, to the hand and wrist and a second bandage round the forearm (Fig. 21).
- (3) Apply a large arm sling.



FIG. 21
Treatment of Crushed Hand.

Fracture of the Pelvis.—When, after a severe injury in the neighbourhood of the hip-bones there is no sign of damage to the lower limbs, but the patient is unable to stand or even to move the lower limbs without great difficulty and pain, a fracture of the pelvis may be assumed to have occurred. The blood-vessels and organs within the pelvis, especially the bladder, are in danger of being injured.

Treatment

- (1) Lay the patient in whatever position is found to give the greatest ease, and flex or straighten the lower limbs as the patient desires.
- (2) Apply a broad bandage round the pelvis, in line with the hip joints, tight enough to support the parts, but not so tight as to press the broken bone further inwards.
- (3) Apply a bandage as a figure of 8 round ankles and feet and a broad bandage round both knees.
- (4) Transport patient in a Neil-Robertson stretcher.

Fracture of the Thigh-Bone.—The thigh-bone may be broken at its neck, anywhere in the shaft or close to the knee. All the general signs and symptoms of fracture are usually present, and a prominent sign is the position of the foot, which lies on its outer side. Shortening may vary from one-half to three inches. A fracture at the neck (Fig. 23) is likely to occur in old people from a very slight cause, and is often difficult to distinguish from a severe bruise of the hip. If the injury has occurred at the hip-joint and the patient, lying on his back, cannot raise his heel from the ground, the bone is broken. The danger from shock is great.

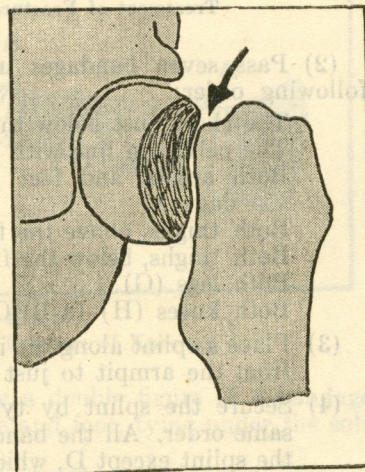


FIG. 22
Fracture of Neck of Femur

Treatment

- (1) Steady the limb by holding the ankle and foot. Gently draw down the foot, bringing it into line with its fellow, and apply a bandage as a figure of 8 round the ankles and feet. (Bandage A.) (Fig. 23.)

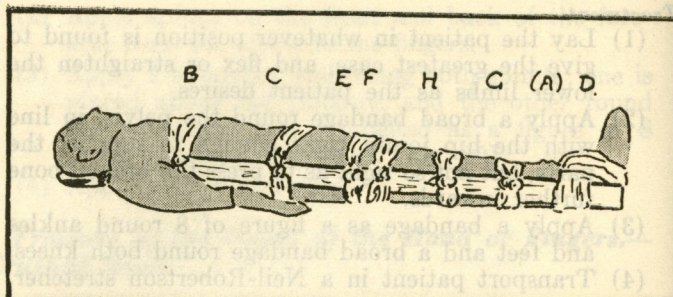


FIG. 23

Treatment of Fracture of Thigh-bone

(2) Pass seven bandages under the patient in the following order:

- The chest, just below the armpits (B).
- The pelvis, in line with the hip-joints (C).
- Both ankles and feet (D). This covers bandage A.
- Both thighs, above the fracture (E).
- Both thighs, below the fracture (F).
- Both legs (G).
- Both knees (H) (a BROAD bandage).

(3) Place a splint along the injured side of the patient from the armpit to just beyond the foot.

(4) Secure the splint by tying the bandages in the same order. All the bandages should be tied over the splint except D, which should be applied as a figure of 8 and tied under the soles of the feet (Fig. 23).

Fracture of the Knee-Cap.—The knee-cap may be broken by direct violence, but more frequently it is broken by muscular action, as follows: When the foot slips, in the attempt to prevent a fall the muscles in the front of the thigh act with such force as to snap the knee-cap in two.

Pain, loss of power (the limb will be quite helpless), irregularity (a gap may be felt between the broken fragments of bone) and swelling accompany this injury.

Treatment

- (1) Lay the patient on his back, support the head and shoulders, straighten and raise the limb.
- (2) Apply a splint along the back of the limb, reaching from the buttock to beyond the heel. The splint must be well padded behind the knee and ankle so as to raise the heel from the splint.
- (3) Secure the splint by bandages round the thigh (A), and leg (B) (Fig. 24).

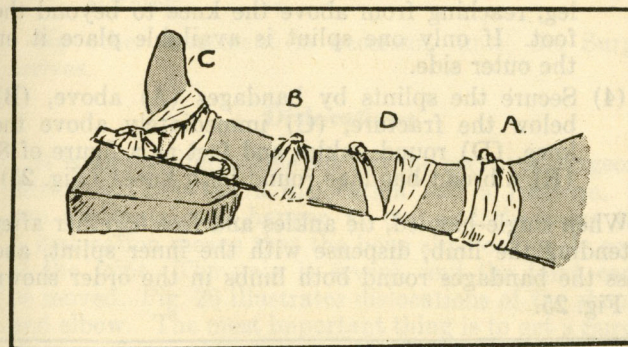


FIG. 24

Treatment of Fracture of Knee-cap

- (4) Secure the foot by a double figure of 8 bandage round splint, ankle and foot, tying under the sole of the foot.
- (5) Support the foot well off the deck by a pillow, roll of clothing or rugs.
- (6) Apply a narrow bandage with its centre immediately above the knee-cap, cross the ends in figure of eight, pass them again to the front of and tie just below the knee-cap (D).
- (7) Apply a cold compress over the fracture to lessen swelling of the joint.

Fracture of the Leg.—One or both of the bones may be broken. When both bones are broken all the general signs of fracture are usually present, but when only one

bone is broken deformity is not always noticeable. A fracture of the small bone, three or four inches above its lower end is frequently mistaken for a sprain, and sometimes for a dislocation of the ankle.

Treatment

- (1) Steady the limb by holding the ankle and foot.
- (2) Draw the foot into its natural position, and do not let go until the splints have been fixed.
- (3) Apply splints on the outer and inner sides of the leg, reaching from above the knee to beyond the foot. If only one splint is available place it on the outer side.
- (4) Secure the splints by bandages (A) above, (B) below the fracture, (C) immediately above the knee, (D) round ankles and feet as a figure of 8, (E) a broad bandage round both knees (Fig. 25).

When single-handed, tie ankles and feet together after extending the limb, dispense with the inner splint, and pass the bandages round both limbs in the order shown in Fig. 25.

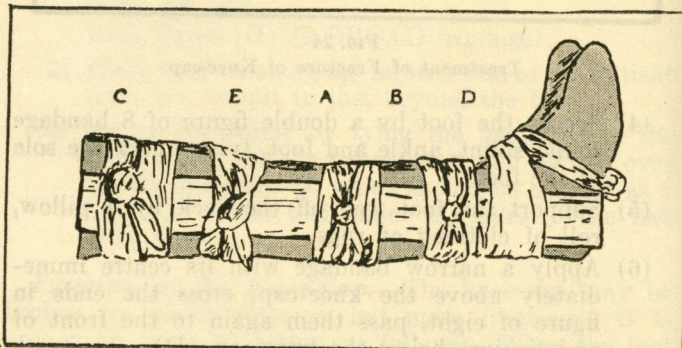


FIG. 25

Treatment of Fracture of Leg

When no splint is available the feet, ankles, knees and thighs should be tied together.

Fracture of the Bones of the Foot or Toes—Crushed Foot.—This is usually caused by dropping a heavy object, such as a shell casing on the foot. Pain, swelling, and inability to bear weight are present.

Treatment

- (1) Remove boot and stocking gently. If necessary cut them off.
- (2) Carry the man to a bunk; elevate the foot slightly, and support it well with pillows or rolls of clothing.

No other treatment is necessary until the Surgeon arrives.

Dislocations

It is almost impossible for anyone except a Surgeon to distinguish between a dislocation and a fracture. The two accidents may happen at one and the same time. A dislocation means that the bone slips out of its socket at the joint. The pain is severe, and the joint cannot be moved. Fig. 26 illustrates dislocations of the shoulder and elbow. The most important thing is to get a Surgeon as soon as possible, because the longer the bone is out the more difficult it is to get it in again. While waiting, treat the injured part as for fracture, choosing the position which is most comfortable to the patient. On no account make any attempt to replace the bones in position as great damage may be caused. Only a Surgeon can reduce a dislocation safely.

Bruises

A bruise or contusion is due to an injury causing bleeding underneath the unbroken skin. The discolouration is caused by the blood being forced out of the blood vessels. First Aid consists in stopping this hidden bleeding by raising the part and keeping it at rest, a splint often being necessary for this purpose. An ice-bag, if available, should also be applied; or a cold compress laid on the part and left uncovered so that evaporation can

take place. Soreness of the skin is prevented by application of a little clean olive oil or vaseline. Some slight bruises, such as a black eye, are best left entirely alone. Severe bruises, as when blood appears in the urine after a blow in the kidney region, should be attended by a Surgeon.

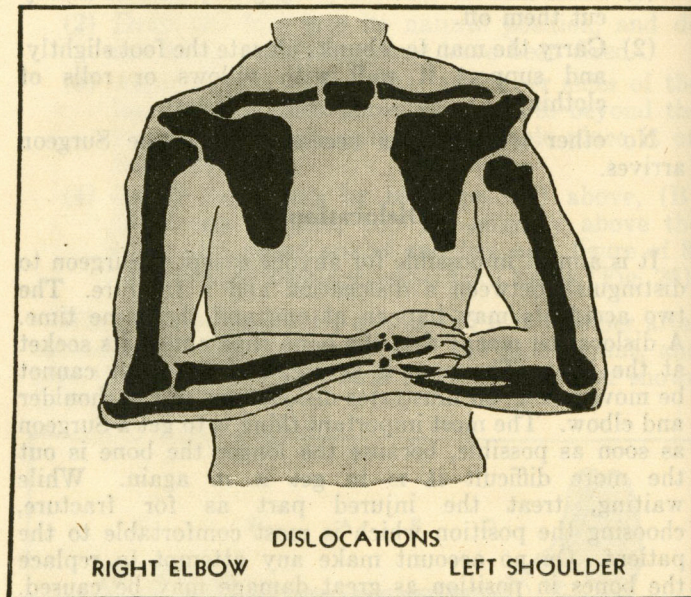


FIG. 26

Sprains and Strains

A Sprain is a tearing of the ligaments and tendons around a joint. A Strain is a stretching of them without a tear.

These common accidents are due to tearing of the muscles, joints, etc., and may be very complicated, and are generally caused by a sudden twist or severe wrench. They are accompanied by bleeding into the deeper parts (See Bruises) and are often followed by much disability.

In fact, it is truly said that a bad sprain takes longer to get well than a broken bone. The First Aid treatment is much the same as that laid down for bruises—namely, rest of the part, a splint usually being necessary. It is of the utmost importance that the patient shall not attempt to move the part or bear his weight on it. It is not uncommon to find a person trying to “walk off” a sprained ankle.

A special form of strain is “Rupture” or “Hernia”.

In the region called the groin, there is the weakest spot in the belly wall. Lifting a heavy weight, a jump from a height, or a blow in the groin may cause a tearing of the structures here, allowing a loop of bowel to be forced through the opening. This is accompanied by sudden pain, and a lump can be seen and felt in the painful area. It should be reported to the doctor at once as it may be very serious; besides, a Hurt Certificate can only be granted if the accident is reported immediately after it has happened. First Aid for rupture consists in laying the man down on his back, bending the knee on the affected side, and then gently but steadily pressing the whole swelling upwards. When the piece of bowel is felt to slip back with a gurgle, a pad should be applied to the part to prevent recurrence. If this attempt be unsuccessful no force should be used, but the man should be placed in a hot bath and then gentle pressure again tried. If a Surgeon can be obtained within a few hours no First Aid treatment should be attempted as this condition can be rather dangerous in unskilled hands.

In conclusion, the following hints are useful in the treatment of sprains and bruises:

- (a) When an injury is recent, the parts should be rested and wrapped in a thick layer of cotton wool and bandaged. All bandaging should be done from below up, i.e., from the foot towards the groin, and from the hand towards the shoulder; and it should not be tight.

- (b) When the injury is old and the parts are stiff, gentle rubbing should be employed. The rubbing of a limb should always be upwards, i.e., towards the body. The rubbing should be gentle and should be continued for five or ten minutes, rather than be rough and of short duration.
- (c) "Every kind of pain is best borne lying down."

CHAPTER V

THE CIRCULATION OF THE BLOOD

The organs concerned in the circulation of the blood are the HEART, the ARTERIES, the CAPILLARIES and the VEINS.

The HEART is a muscular organ which acts like a pump. It is situated in the chest behind the breast-bone and rib cartilages, between the two lungs and immediately above the diaphragm; it lies obliquely with a quarter of its bulk to the right, and the remaining three-quarters to the left of the middle line of the body. Its beat may be felt just below and to the inner side of the left nipple. The heart has four cavities, two on either side of a central partition. The two upper cavities are named the right and left auricles, the two lower the right and left ventricles.

The heart contracts and expands in adults at an average rate of seventy-two times a minute, but the rate increases as the position is changed from the lying to the sitting, and, still more, to the standing position; hence the importance of considering the patient's position in cases of bleeding. At every contraction of the left ventricle blood is forced into the arteries, which have a large amount of elastic tissue in their walls, and causes them to dilate, producing the regular expansion known as the pulse, which, corresponding with each beat of the heart, may be felt wherever the finger can be placed on an artery as it comes toward the surface under the skin. This is best demonstrated at the wrist and in front of the ear.

In the general circulation the purified bright red blood in the left ventricle of the heart is driven into the main artery of the body (Aorta). The blood is propelled forward by the force of the contractions of the heart, and by the recoil of the elastic walls of the arteries, which have been dilated by the blood at each beat of the heart.

From the aorta, branch-arteries are given off to all parts of the body. These arteries divide and sub-divide, becoming smaller and smaller, and end in very thin-walled vessels called capillaries. Through the thin walls of these capillaries, an interchange of gases and fluids takes place. The blood gives off oxygen gas and nourishment to the tissues and organs of the body. The nourishment is obtained from food which is digested in the intestine, then absorbed through the bowel into the blood. Oxygen is added to the blood in the lungs; this process turns the dark, impure blood to bright red, purified blood. The blood also takes up carbon dioxide gas and waste matters from the tissues; the presence of these impurities changes the colour of the blood from bright to dark red. The capillaries unite to form small veins, and these join with other veins, becoming larger and larger until they have all united to form two large veins (Venae Cavae), which enter the right auricle of the heart. These veins carry the carbon dioxide to the lungs where it is breathed off. The blood is helped onwards in the veins by the suction action of the heart, which dilates after being emptied at each contraction. The veins are provided at frequent intervals with valves, which permit the blood to flow forward but close to prevent any backward flow. When these valves fail, Varicose Veins develop.

From the right auricle of the heart the blood passes into the right ventricle; and the contraction of the ventricle forces it into the Pulmonary Artery, which carries it to the lungs. This artery also divides into capillaries in the lungs so that an interchange of gases takes place between the air and the blood. Here it gives off its carbon dioxide gas and impurities and takes up oxygen, thus becoming purified and bright red in colour. The capillaries unite to form the pulmonary veins which convey the blood to the left auricle of the heart, whence it passes to the left ventricle, and so completes the round of the circulation.

The course of the blood through the heart is shown diagrammatically in Fig. 27.

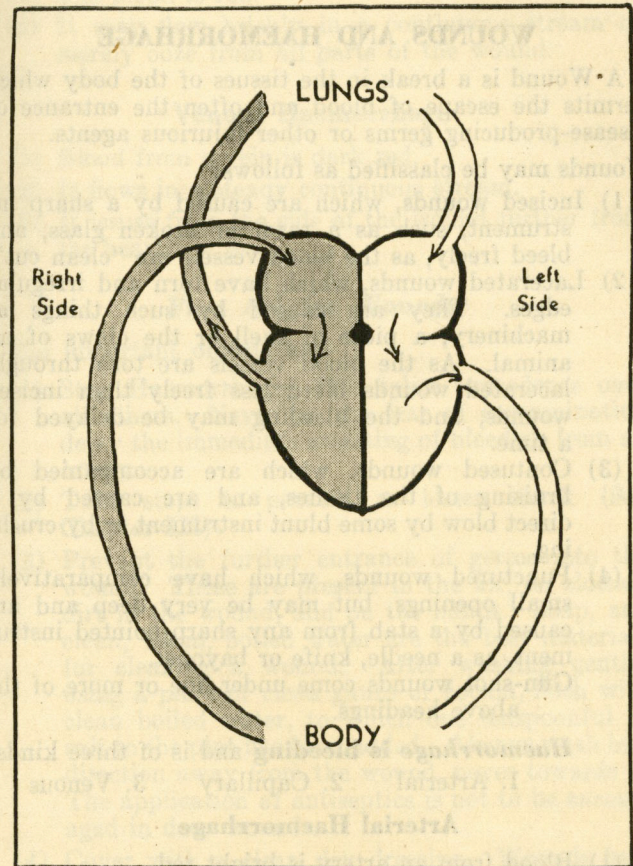


FIG. 27

WOUNDS AND HAEMORRHAGE

A Wound is a break in the tissues of the body which permits the escape of blood and often the entrance of disease-producing germs or other injurious agents.

Wounds may be classified as follows:

- (1) Incised wounds, which are caused by a sharp instrument, such as a razor or broken glass, and bleed freely, as the blood vessels are "clean cut".
 - (2) Lacerated wounds, which have torn and irregular edges. They are caused by such things as machinery, a piece of shell or the claws of an animal. As the blood vessels are torn through, lacerated wounds bleed less freely than incised wounds, and the bleeding may be delayed for a time.
 - (3) Contused wounds, which are accompanied by bruising of the tissues, and are caused by a direct blow by some blunt instrument or by crushing.
 - (4) Punctured wounds, which have comparatively small openings, but may be very deep and are caused by a stab from any sharp-pointed instrument, as a needle, knife or bayonet.
- Gun-shot wounds come under one or more of the above headings.

Haemorrhage is bleeding and is of three kinds:

1. Arterial 2. Capillary 3. Venous

Arterial Haemorrhage

- (1) Blood from an artery is bright red.
- (2) If the wounded artery is near the skin the blood spurts out in jets corresponding with the pulsation of the heart.
- (3) Blood issues from the side of the wound nearer to the heart.

Capillary Haemorrhage

- (1) The blood is red.
- (2) It may flow briskly in a continuous stream or merely ooze from all parts of the wound.

Venous Haemorrhage

- (1) Blood from a vein is dark red.
- (2) It flows in a steady continuous stream.
- (3) It issues from the side of the wound further from the heart.

First Aid for Wounds

The important objects are:

- (1) Stop Haemorrhage—This takes precedence over all others. Never let the fear of contamination delay the immediate arresting of bleeding from an artery.
- (2) Take steps to prevent or lessen shock (See Chapter III).
- (3) Prevent the further entrance of germs into the wound. These are present in the air, on clothes, dirt in the wound, and on the hands. Soap, and clean, warm, boiled water are the best materials for cleaning a wound. After washing gently, using a piece of clean gauze or cotton, flush with clean boiled water, to which one teaspoonful of salt to the pint has been added. Always wash in a direction away from the wound, never towards it. The application of antiseptics is not to be encouraged in deep wounds.
- (4) Cover with a clean dry dressing. Wounds heal best when kept dry. If sterilized dressings are available, use them; if not, a piece of clean *gauze* may be applied. Absorbent cotton should not be placed in a wound.
- (5) Keep the dressing in place with bandage or adhesive.

General Rules for Treatment of a Wound Accompanied by Arterial Haemorrhage

- (1) Place the patient in a suitable position, bearing in mind that the blood escapes with less force when the patient sits, and still less when he lies down.
- (2) Elevate the bleeding part, except in the case of a fractured limb.
- (3) Expose the wound, removing such clothing as necessary.
- (4) Immediately apply pressure with the thumb or fingers (digital pressure), either—
 - (a) directly on the bleeding spot (direct digital pressure). Direct pressure must not be made over a fracture or foreign body; or
 - (b) if the wound is large, or if a foreign body or a fracture is suspected, apply the pressure on a point on the heart side of the wound where the artery can be pressed against the underlying bone (indirect digital pressure). When making indirect digital pressure, avoid crooking the thumb or fingers and digging the tips into the part. The points at which the arteries may be compressed are described later.
- (5) As soon as practicable substitute for digital pressure a pad and bandage or if necessary a tourniquet on the pressure point while the wound is being examined and treated.
- (6) Remove any foreign bodies, such as broken glass, bits of clothing, hair, which can be seen lying loose in the wound; do not search for foreign bodies which cannot be seen.
- (7) If the wound is obviously dirty, and medical aid cannot be procured, wash away as much of the dirt as possible by gently pouring sterilized water over it freely, notwithstanding the fact that wounds heal best if kept dry. Never wash the surrounding parts towards a wound.

- (8) Cover with a dry dressing such as gauze or a clean handkerchief (not absorbent cotton).
- (9) Cover the dressing with absorbent cotton or other soft material.
- (10) Apply a bandage over the dressing firmly; but if the presence of a foreign body or fracture is suspected apply it lightly.
- (11) Relax the tourniquet and note whether bleeding has ceased. If it has, leave the relaxed pad and bandage or tourniquet in position; if it has not, re-apply pressure. As prolonged maintenance of tourniquet pressure may cause dangerous congestion in the limb, prompt steps to obtain medical aid are extremely necessary. If it is not obtainable within twenty minutes, at the end of that time again relax indirect pressure and note whether bleeding recurs. If necessary, re-apply indirect pressure and repeat these steps at intervals of twenty minutes until medical aid is obtained.
- (12) Support the injured part.

The Use of a Tourniquet to Arrest Arterial Haemorrhage

It has become unfortunately the custom to think of the tourniquet as being a ready-made apparatus of standard type, without which constant pressure cannot be placed on an artery. It should be emphasized that a tourniquet can and should be improvised very easily if a ready-made one is not at hand.

This instrument consists simply of a bandage (belt, strip of cloth, lanyard, etc.) about the limb, at the level at which the pressure is to be applied. A pad (roll of gauze, cork, closed seamanship knife) is placed over the artery, under the bandage, and the whole tightened by means of a twisting stick on the opposite side. When pressure has been applied the stick may be secured by means of a another bandage around the limb. If the pressure pad is applied properly the bleeding will cease almost at once.

Certain rules are to be observed in the use of a tourniquet:

- (a) The pressure must be released at the end of 20 minutes—this does not mean taking off the tourniquet, simply loosen it and watch the wound to see if the bleeding has stopped. If it has not, tighten the tourniquet for another 20 minutes. Repeat this until medical help has arrived, or bleeding has stopped.
- (b) Stay with the patient.
- (c) If the bleeding does not stop when pressure is applied, the tourniquet has not been properly applied, and must be readjusted.

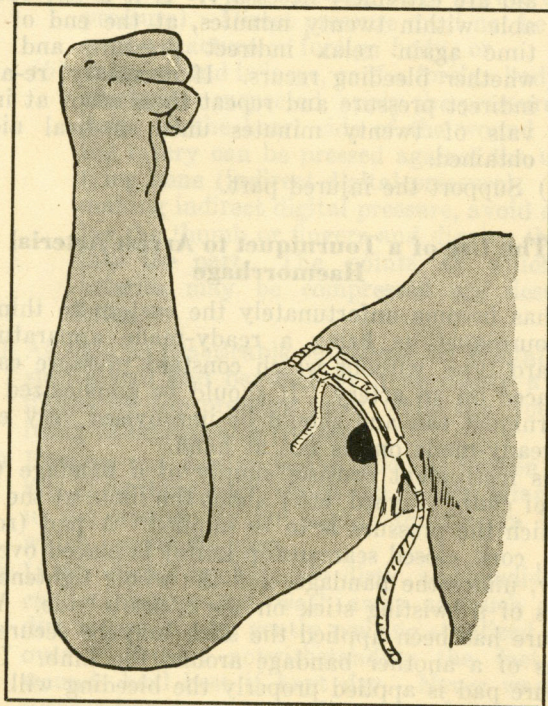


FIG. 28

St. John Tourniquet on Upper Limb

- (d) When a tourniquet has been properly applied, the *pulse* in the limb beyond it cannot be felt.

The first aid boxes supplied in ships of the R.C.N. contain a St. John Tourniquet. Study this, and practise its application (as demonstrated in the accompanying Figs. 28 and 29).

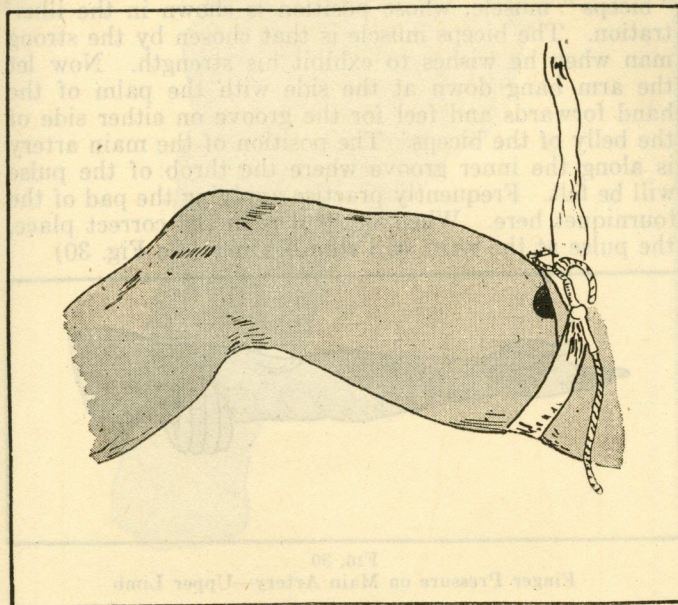


FIG. 29

St. John Tourniquet on Lower Limb

Methods of Arresting Arterial Haemorrhage From Common Sites of Wounds

There are certain recognized spots where it is easiest to apply a pad to three of the main arteries—namely, the main artery of the upper limb, the main artery of the lower limb, and the artery of the temple. In applying pressure to an artery, whether with fingers or pad, it is important to press the artery against the underlying bone. It is possible to stop all the circulation

by a tight bandage around the whole limb, but it is much more efficient and safe to compress only the bleeding vessel.

Bleeding From Upper Limb

In bleeding from the upper limb apply the pad as follows: Strip the limb and look for the belly of the "biceps" muscle, whose position is shown in the illustration. The biceps muscle is that chosen by the strong man when he wishes to exhibit his strength. Now let the arm hang down at the side with the palm of the hand forwards and feel for the groove on either side of the belly of the biceps. The position of the main artery is along the inner groove where the throb of the pulse will be felt. Frequently practise applying the pad of the tourniquet here. When the pad is in the correct place, the pulse at the wrist will stop beating (see Fig. 30).

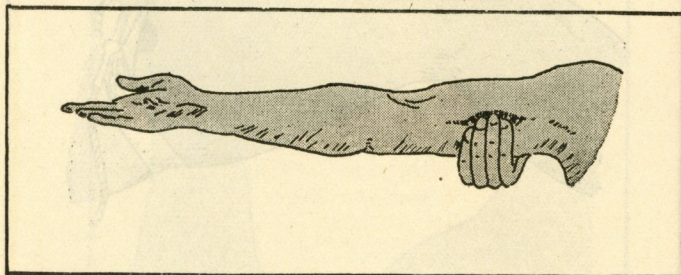


FIG. 30

Finger Pressure on Main Artery—Upper Limb

Bleeding From the Lower Limb

In the lower limb it is more difficult to find the main artery than is the case in the upper limb. Lay the patient down on his back and slightly bend both the knee and hip joints; turn the leg on its outer side as shown in Fig. 31. Then press the finger tips into a point half an inch to the inner side of the middle of the groin. Here the artery will be felt throbbing. In a big muscular man it is difficult to press your fingers in deeply enough to feel the artery. Then apply the pad of the tourniquet and the bleeding will cease immediately it is in the correct position.

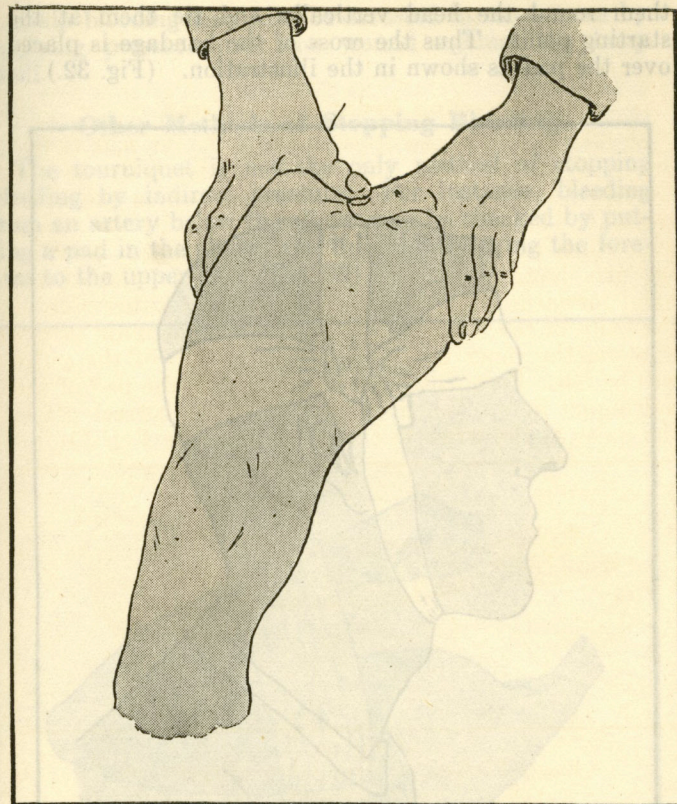


FIG. 31

Thumbs Pressing on Main Artery—Lower Limb

Bleeding From the Scalp

The artery of the temple can be felt, and often seen, running up the side of the head, just in front of the ear. It spreads out in branches on the scalp, where it can be easily compressed as it lies on the bony skull. Apply a pad on the trunk of the artery, and take a triangular bandage folded into a narrow band. Put the centre of it on the opposite temple, and bring it round the head horizontally. Cross the ends over the pad, then take

them round the head vertically and tie them at the starting point. Thus the cross of the bandage is placed over the pad as shown in the illustration. (Fig. 32.)

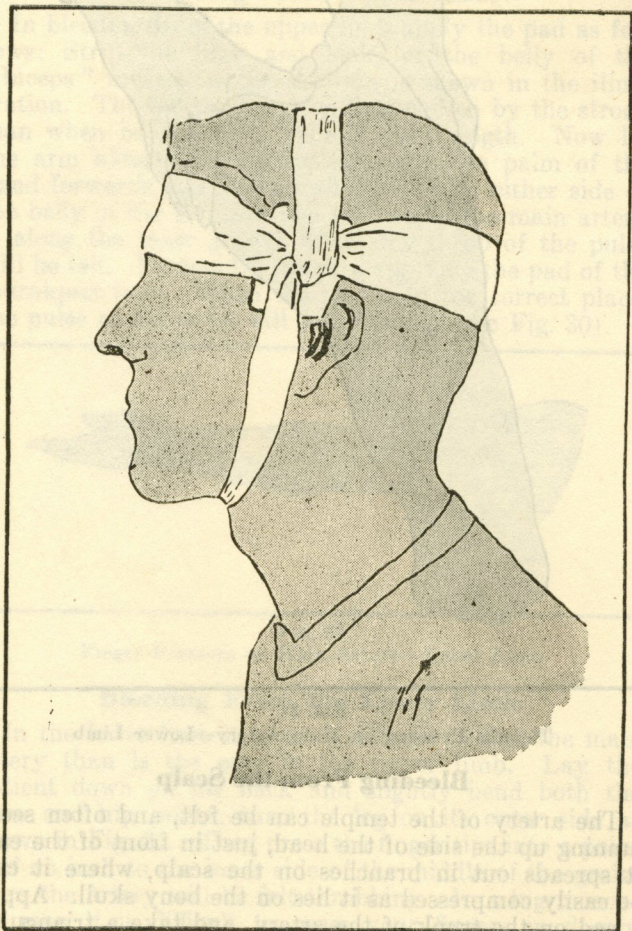


FIG. 32
Pad on Artery of Temple

Scalp bleeding may also be arrested in most cases by applying pressure over the wound against the bony skull.

Other Methods of Stopping Bleeding

The tourniquet is not the only method of stopping bleeding by indirect pressure. For instance, bleeding from an artery below the elbow may be checked by putting a pad in the elbow, and then tightly tying the forearm to the upper arm (Fig. 33).

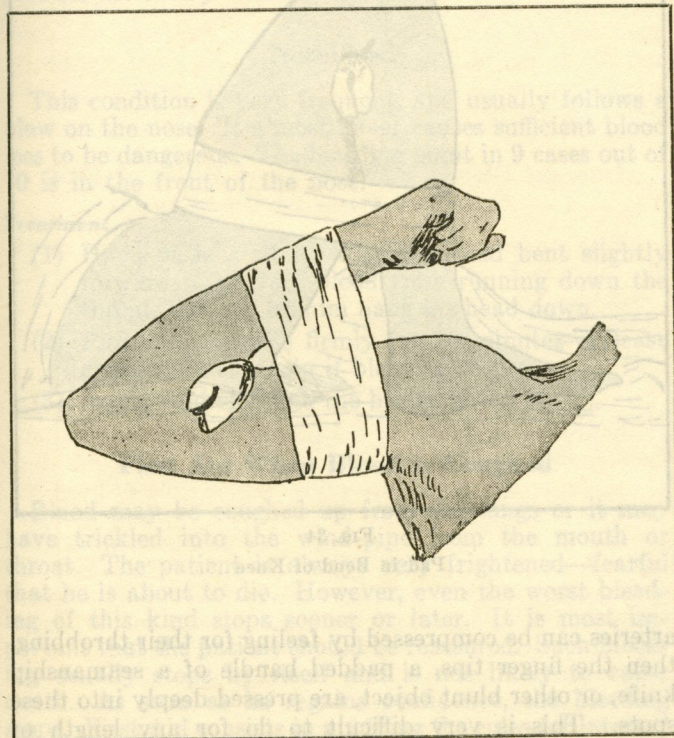


FIG. 33
Pad in Bend of Elbow

Bleeding below the knee is controlled by similar means, which are shown in the illustration very clearly (Fig. 34).

In some places, such as the large artery on either side of the neck or the one beneath the collar bone, it is obvious that a tourniquet cannot be applied. These

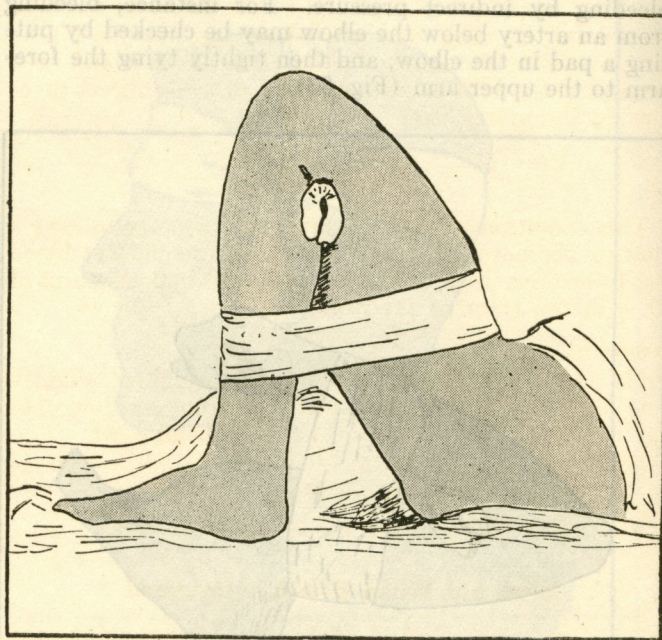


FIG. 34
Pad in Bend of Knee

arteries can be compressed by feeling for their throbbing, then the finger tips, a padded handle of a seamanship knife, or other blunt object, are pressed deeply into these spots. This is very difficult to do for any length of time, and a Surgeon should be found as quickly as possible.

Bleeding From Palm of Hand

In the palm of the hand lies quite a large artery which is sometimes cut by glass, or by a penetrating wound with a knife. The bleeding is severe and often difficult to stop. A tourniquet applied to the main artery of the upper limb is a good method of treating this injury (Fig. 28); or a pad may be placed in the bend of the elbow as has just been described (Fig. 33); or a clean pad may be placed in the palm of the hand, the fist closed over it and then bound tightly with a bandage so as to cause direct pressure on the artery itself.

Nosebleed

This condition is very frequent, and usually follows a blow on the nose. It almost never causes sufficient blood loss to be dangerous. The bleeding point in 9 cases out of 10 is in the front of the nose.

Treatment

- (1) Have patient sit up with the head bent slightly forward to prevent blood from running down the throat. Do not let him hang his head down.
- (2) Pinch the nostrils firmly for 10 minutes—release gently. Pinch again if bleeding recurs.
- (3) Apply cold cloths to the bridge of the nose.

First Aid When Blood is Coughed

Blood may be coughed up from the lungs or it may have trickled into the wind-pipe from the mouth or throat. The patient is always very frightened—fearful that he is about to die. However, even the worst bleeding of this kind stops sooner or later. It is most important that the patient should be reassured. Such bleeding usually stops by itself and is not likely to cause death. As soon as he regains confidence, the bleeding stops. First Aid consists in applying the rules for internal bleeding, such as putting the patient to bed in a cool, dark, perfectly quiet room, with plenty of fresh air, and

giving him ice to suck. All excitement and flurry must be avoided; the patient must not be allowed to speak, and, above all, give no alcohol.

Keep all the blood that is coughed up as its appearance may give the Surgeon valuable information whence it came.

First Aid in Vomiting Blood

Blood which is vomited has generally become altered in appearance and looks like coffee grounds. Occasionally, however, it may be bright red. The First Aid treatment for this is the same as that for coughing up blood and all forms of internal bleeding. No food should be given, but small lumps of ice may be swallowed. All vomit should be kept for the Surgeon's inspection.

Internal Bleeding and General Rules of First Aid in all Cases of Bleeding

When anyone has lost much blood from any cause, he falls in a faint, and his heart beats feebly and rapidly.

Imitate this method of nature by laying the patient down and keeping him very quiet. Do this in all forms of bleeding in addition to any other treatment. Do not try to revive him by splashing cold water over him or using any other remedies. Above all, do not give alcohol. Probably the majority of the public have a profound and deep-rooted conviction that, in all sorts and conditions of accidents, the great cure-all is "a nice drop of brandy." An excellent general rule in First Aid is never to give alcohol in any form whatever. Alcohol used internally may do more harm than good. In the present instance it is evident that if the heart be stimulated by alcohol, blood will be pumped all the more rapidly to the bleeding spot, making the patient's condition worse.

If a patient becomes very pale and faints, he is probably suffering from some form of bleeding internally, the cause of which may be unknown. In this case the treatment is similar to that for bleeding from a wound—namely, lay the patient down and avoid exciting the heart.

GENERAL RULES FOR TREATMENT OF A WOUND ACCOMPANIED BY CAPILLARY HAEMORRHAGE

1. Expose the wound, removing whatever clothing may be necessary.
2. Remove any foreign bodies, such as broken glass, bits of clothing, hair, which can be seen lying loose in the wound; do not search for foreign bodies which cannot be seen.
3. If the wound is obviously dirty, and medical aid cannot be procured, wash away as much of the dirt as possible with soap and water and by pouring sterilized water over it freely. Never wash the surrounding parts towards a wound.
4. Apply a mild antiseptic all over the wound and the surrounding skin, and cover with a dry dressing.
5. Cover the dressing with cotton wool, lint or other soft material.
6. Apply a bandage over the dressing firmly; but if the presence of a foreign body or fracture is suspected, apply it lightly.

GENERAL RULES FOR TREATMENT OF A WOUND ACCOMPANIED BY VENOUS HAEMORRHAGE

1. Place the patient in a suitable position, bearing in mind that blood escapes with less force when the patient sits, and still less when he lies down.
2. Elevate the bleeding part, except in the case of a fractured limb.
3. Expose the wound, removing whatever clothing may be necessary.
4. Apply direct digital pressure, except over a fracture or foreign body.
5. Remove any constrictions, such as collar or garters, from the heart side of the wound.
6. Apply a firm bandage round the limb near the wound on the side away from the heart.
7. Remove any foreign bodies, such as broken glass, bits of clothing, hair, which can be seen lying loose in the wound; do not search for foreign bodies which cannot be seen.

8. If the wound is obviously dirty, and medical aid cannot be procured, wash away as much of the dirt as possible by gently washing with soap and water and flushing with boiled water. Never wash the surrounding parts towards a wound.
9. Cover with a dry dressing of gauze—not absorbent cotton.
10. Cover the dressing with cotton wool or other soft material.
11. Apply a bandage over the dressing firmly; but if the presence of a foreign body or fracture is suspected apply it lightly.
12. Support the injured part.

WOUND OF THE ABDOMINAL WALL

Treatment

A. When there is no protrusion of organs:—

- 1 (a) If the wound is vertical, keep the patient flat on his back with the lower limbs straight.
- (b) If the wound is transverse, keep the patient on his back, draw the knees well up and raise the head and shoulders.
2. Apply a clean dry dressing to the wound.
3. Fix the dressing in position with a broad bandage tied tightly.
4. Keep the patient warm.
5. Give nothing by the mouth.

B. When internal organs such as the intestines protrude through the wound, whether vertical or transverse:—

1. Keep the patient on his back, draw the knees well up and raise the head and shoulders.
2. Make no attempt to replace organs, but cover them with lint or soft towel wrung out of sterilized hot water (at the temperature of the body 98.4°) to which may be added, if readily available, salt in the proportion of one teaspoonful to a pint of water. Change the application every fifteen minutes.

3. Cover the application with cotton wool or soft clean flannel.
4. Apply hot water bottles to both sides of the body; and keep the patient warm, avoiding undue pressure on the abdomen.
5. Give nothing by the mouth.
6. Remove the patient to hospital as speedily as possible.

CHAPTER VII

BURNS AND FROST-BITE

One of the most common injuries in Naval Service is a burn. Burns may result from many sources, from steam to electric current, and may cause damage of any degree from reddening of the surface to charring of deep structures.

Burns are divided into three groups:

1st degree—redness of surface only, e.g. sunburn.

2nd degree—blistering of surface, e.g. scald from steam or oil.

3rd degree—the surface has been burned through to the underlying tissues.

There are two dangerous complications of burns—**SHOCK** and **INFECTION**. The first aid treatment is primarily aimed at the prevention of these dangers.

The immediate measures to be taken are:

1. Remove the cause, or the patient from the cause if more practicable. Do not take useless risks—one patient is enough. If due to electric current, turn it off, or insulate your hands before touching him. This can be done with a mackintosh, dry newspaper, or rubber gloves.
2. Treat for shock (See Chapter 2).
3. Prevent infection by keeping your hands out of the wound. Do not apply oils or greases under any circumstances.
4. Remove patient to hospital as soon as possible.

Treatment of Various Types of Burns

A. First Degree—Apply nothing to the burn but a clean dry dressing.

B. Second and Third Degree—

1. Do not break blisters. This invites infection.
2. Remove clothing or dirt adhering to wound. If clothing is tightly stuck cut it around the burn with scissors.
3. Place the injured part in clean warm water (body heat) while preparing dressings.
4. Dress the wound. The treatment of burns has varied considerably in the past twenty years. Carron oil, once considered best, has been rejected completely; Picric Acid has also been discarded. There are now two reliable methods for first aid treatment:
 - (a) Tannic Acid—This is supplied in the form of a jelly (Tannafax, Tangel, etc.) which is applied thickly to strips of gauze and placed directly on the burn. Strong warm tea contains tannic acid, and can be used if better materials are not available. Apply clean gauze to cover the burned area, then pour on the solution of strong tea. Tannic acid in any form must *not* be used on burns of the hands or face, as severe deforming scars are likely to follow. For these sites, moist dressings of baking soda (one teaspoonful to a pint of boiled water) should be used.
 - (b) Triple-Dye Jelly is the best first aid treatment for burns. It is supplied in collapsible tubes. The jelly is spread directly on the wound, and strips of gauze are then laid on top of the thick layer of jelly. Absorbent cotton is placed over the gauze to prevent the jelly from soaking through. A retaining bandage is then applied.
5. Give fluids freely, and keep patient warm.
6. Send patient to hospital at once, as he probably will need a transfusion.

Special Types of Burns

1. Corrosive acids—such as the sulphuric acid from a fire-extinguisher.
 - (a) Neutralize the acid with an alkali, such as baking soda, or washing soda, applied directly to the burn. If these are not available, flood the area with warm water.
 - (b) Treat as a burn.
2. Corrosive alkali—e.g. quick-lime, caustic soda.
 - (a) Neutralize with vinegar or lemon juice, or if not available, flood with warm water.
 - (b) Treat as a burn.

Frost-Bite

Frost-bite is similar to a burn in many ways. The affected part, usually an extremity such as nose, ears, fingers, becomes waxy white, and insensible. If freezing is allowed to persist, the circulation may be lost and death of the tissues result.

Treatment consists of gentle DRY rubbing of the affected part OUTDOORS. When the circulation has been restored, the patient may be taken into the warmth.

Immersion Foot

This is a serious condition of the feet and legs sometimes seen in survivors who have been adrift in lifeboats or floats. It is a result of long exposure to cold and wet, and resembles frostbite or Trench-foot. Pain is often severe, the feet and legs are swollen, sometimes devoid of feeling and movement when the man is removed from the water.

Proper first aid is very important because the vitality of the legs is lost and the tissues are very easily damaged. A too rapid return of the circulation causes further damage and pain.

First Aid Treatment:

1. Lift the survivor inboard.
2. Carry him to a dry, fairly warm place.
3. Strip him of all clothing at once. **HANDLE FEET AND LEGS GENTLY.**
4. Wrap blankets around his body.
5. Dust any cuts or sores on legs with Sulfanilimide powder daily, if available.
6. Wrap the legs and feet in clean soft material, i.e. strips of sheet, gauze; lay them on pillows.
7. Warm the body, but **NOT THE LEGS.**
8. Give Morphine, if available, for pain.
9. Call a Surgeon as soon as possible.

Do Not:

1. Let him stand or walk.
2. Handle or rub the feet or legs roughly—no massage.
3. Place him near a fire, or in a hot place.—No hot water bottles.
4. Wash or soak the legs.
5. Apply any antiseptics or ointments, etc., except Sulfanilimide Powder.

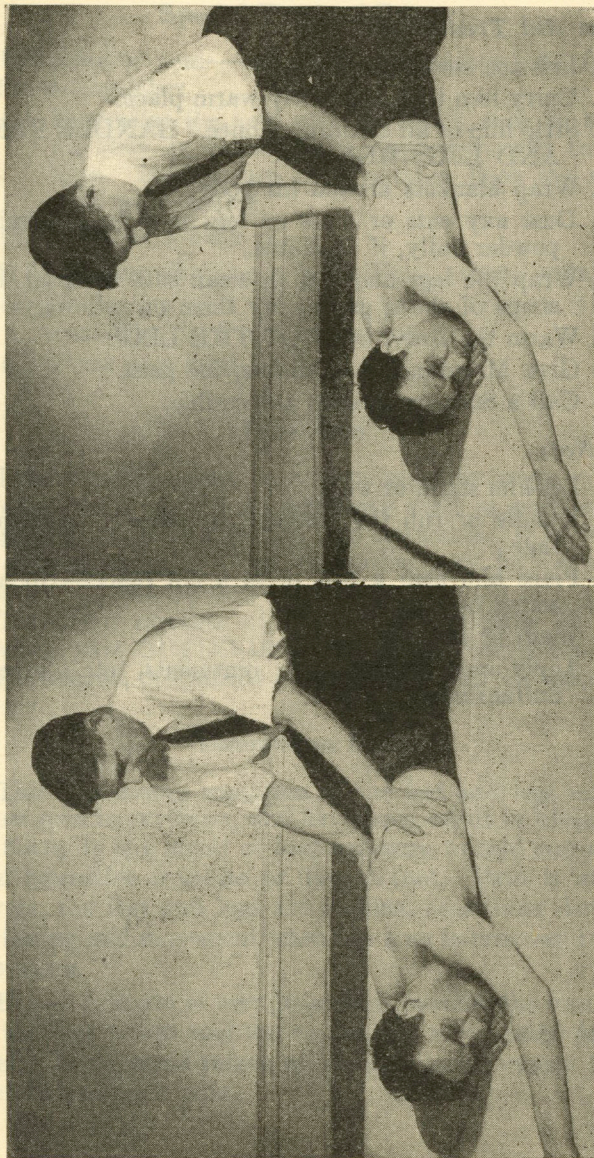


Fig. 35.—Artificial Respiration I

Fig. 36.—Artificial Respiration II

—R.C.N. Photo

CHAPTER VIII

ARTIFICIAL RESPIRATION

As the name indicates, this is a method of artificially carrying on the breathing action of a person who, due to some injury, has ceased to breathe.

Professor Schafer introduced the best method for treating those apparently drowned. It is often known as the "Prone-Pressure" method, and is carried out thus:—

Lay the man face downwards, with one arm outstretched. Place the other hand under his head.

Turn his head to one side.

Do not lose time by removing or loosening clothes.

Begin artificial respiration at once.

Tell one of the bystanders to prepare some sort of pad like a folded coat and slip it under the patient's body just above his waist. Probably several movements of respiration will be done before the pad is ready and thus invaluable time has been gained in "getting busy."

Kneel across his thighs facing his head.

Spread your hands out flat on his back over his lowest ribs.

Press gradually and slowly for about three seconds by leaning forward on your hands. Use no force.

Relax the pressure by falling back into your original upright kneeling position for two seconds.

The process of artificial respiration consists in repeating this swaying action backwards and forwards about twelve to fifteen times a minute. Study Figs. 35 and 36, and compare the slope of the operator's thighs in the two positions.

When natural breathing begins, regulate the movements of artificial respiration to correspond with it, and promote circulation by rubbing the limbs vigorously towards the heart and by applying warmth.

Watch the patient carefully for some time to see that the breathing does not fail; if it does, artificial respiration is to be resumed immediately.

Artificial respiration must be continued until respiration is restored, or until a Surgeon pronounces the patient dead.

CHAPTER IX

INSENSIBILITY

Insensibility is unconsciousness; it may be partial (Stupor) or complete (Coma).

The important first aid measures carried out will depend on one single important fact, to be determined before anything else is done—

"IS THE PATIENT BREATHING?"

A. *Insensibility When Breathing is Absent.*—This condition is known as Asphyxia. Some of the causes are:—

1. Obstruction of the air passages—drowning, strangulation, foreign body (food, etc.).
2. Poison gases—smoke, gasoline fumes.
3. Poisons swallowed.
4. Electric shock.

Treatment

1. Remove the cause, or the person from the cause if that is possible. Insert the index finger in the mouth to remove foreign material.
2. Apply artificial respiration.
3. Give fresh air. Loosen tight clothing.
4. Do not leave the patient.
5. Do not give anything by mouth.
6. When breathing is well established, remove patient to place of shelter.

B. *Insensibility When Breathing is Present*

As the treatment for the various forms of this type of unconsciousness will depend on the cause, an attempt should be made to discover this cause.

- (a) Injury to the head—Concussion or stunning is caused by a blow on the head or spine; unconsciousness may last for a few seconds, or for a

long time. It is important to remember that a head injury may not be followed by loss of consciousness until several hours later. This is called Compression of the Brain, and is caused by increasing pressure from a fracture of the skull, or blood clot on the brain. All unnecessary movement of the head is to be avoided.

1. Lay the patient flat on his back, in a darkened place if possible.
2. Apply cold compresses to the head.
3. Keep the remainder of the body warm.
4. Give *no* stimulants, *no* sedatives.
5. Call for a Surgeon at once.

(b) Drunkenness—Remember that this is a form of poisoning.

1. Lay the person on his side, and let him sleep it off.
2. Keep him warm—a drunken man is very susceptible to pneumonia.

(c) Fainting and Shock.

1. Lay the person down flat, elevate the feet.
2. Arrest haemorrhage if present.
3. Loosen clothing—keep warm.

(d) Apoplexy or “stroke” is caused by the breaking of a diseased blood vessel in the brain. This usually occurs in men over the age of forty-five. Unconsciousness occurs suddenly, the face is flushed, the breathing laboured—one side of the body is often limp.

Treat as for head injury.

(e) Sunstroke or heat-stroke is caused by exposure to the sun, or high temperature such as in the stoke-hold, for long hours. The skin is hot and dry, the temperature is high, the face flushed, the pulse fast.

1. Remove to a cool place.
2. Sponge the body with cold water.
3. Apply ice to the head.

See Chapter on Heat Exhaustion.

(f) Epilepsy.—This condition if manifested by the well-known “fit” caused by contraction of all the muscles. It is caused by a brain disease. The attack occurs suddenly, the patient falls, usually with a cry, the face is flushed, and the jaws are clenched.

Treatment

1. Remove the patient from danger.
2. Insert a piece of wood, or rubber between the teeth to protect the tongue from being bitten.
3. Loosen tight clothing.
4. Do not restrain the patient except to save him from falling from a bunk, injury by machinery, etc. He will not injure himself, except by biting his tongue.

CHAPTER X

METHODS OF TRANSPORT OF THE WOUNDED

The transport of a wounded man aboard ship offers many obstacles not encountered ashore. The more confined space of cabins, mess-decks, engine-room, and companionways does not permit the easy use of the standard type of stretcher. To facilitate the moving of a wounded man, the Navy has adopted a special type

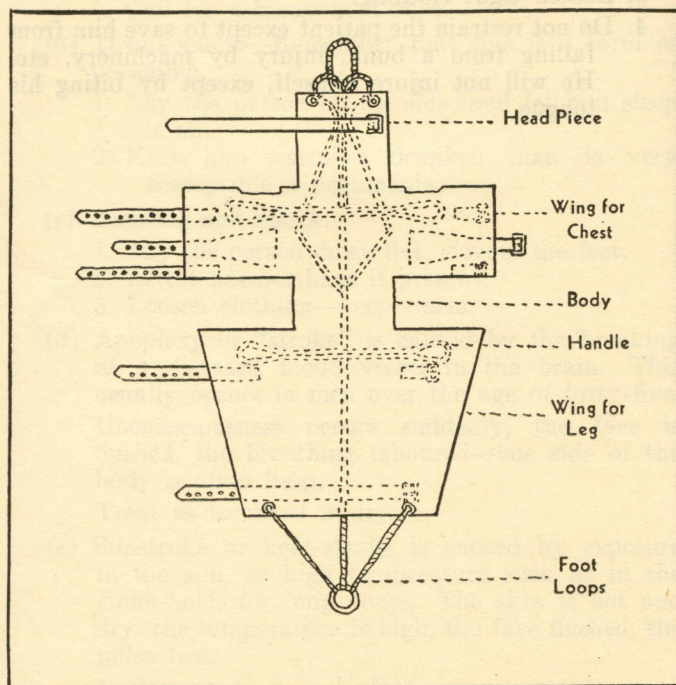
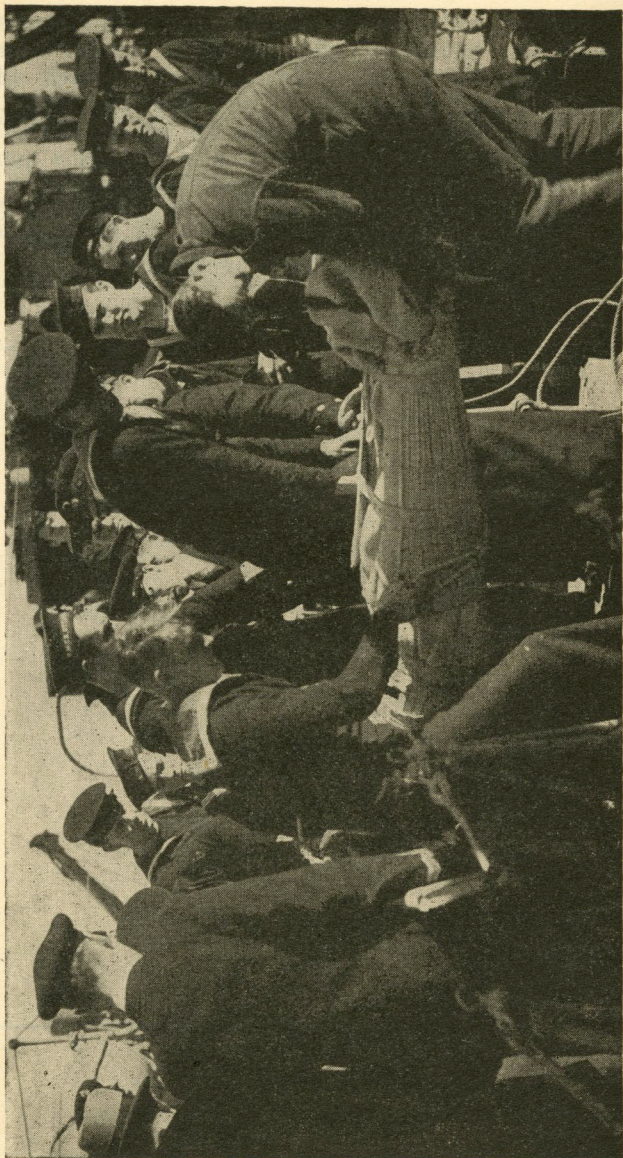


FIG. 37
Neil Robertson Stretcher

of stretcher, called the *Neil-Robertson*. This consists of a narrow "backbone", wide enough to support a man on his back; there are two flexible wings on each side, which fold over the patient's chest and legs, and are secured by straps. In this casing the patient is like a mummy, and can be hoisted vertically through a man-hole, slung oversides, or carried horizontally. If conscious, the arms may be left free. A diagram of the stretcher is here shown (Fig. 37), with photographs to demonstrate its use (Figs. 38-40 inclusive).



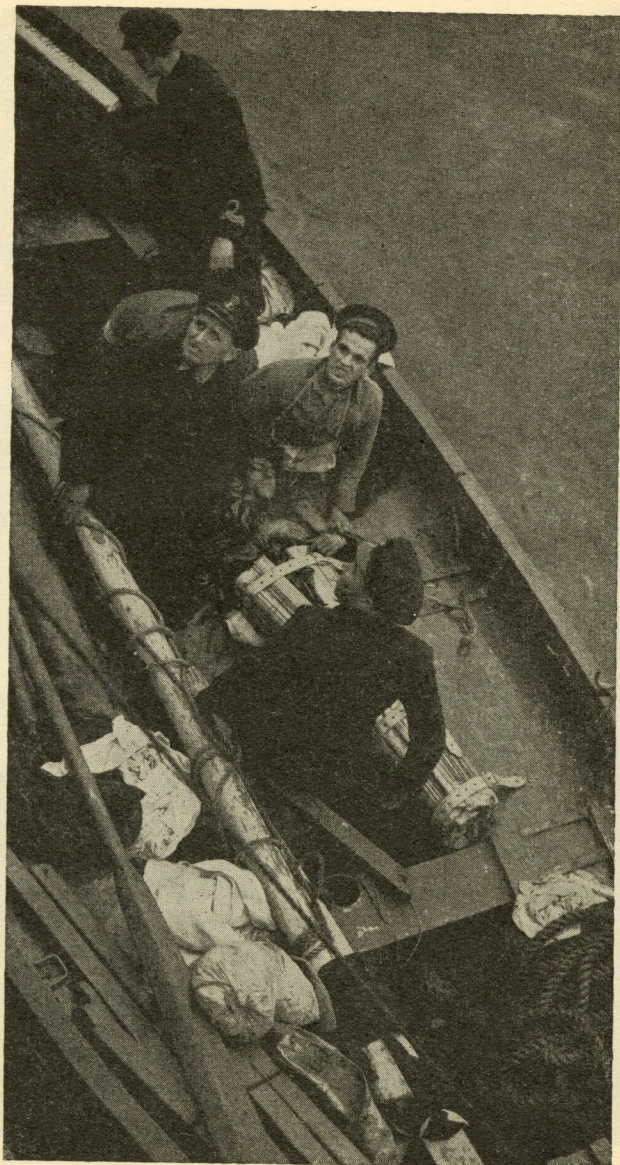
—R.C.N. Photo

FIG. 38.—Neil Robertson Stretcher in Use.



—R.C.N. Photo

FIG. 39.—Neil Robertson Stretcher in Use.



—R.C.N. Photo
FIG 40.—Neil Robertson Stretcher in Use.

The other practical method of moving a patient aboard ship is by actually carrying him; this is known as MAN-HANDLING. There are two efficient forms:

1. The fireman's lift. This is to be used when removal of the patient is immediately necessary, and help is not at hand.

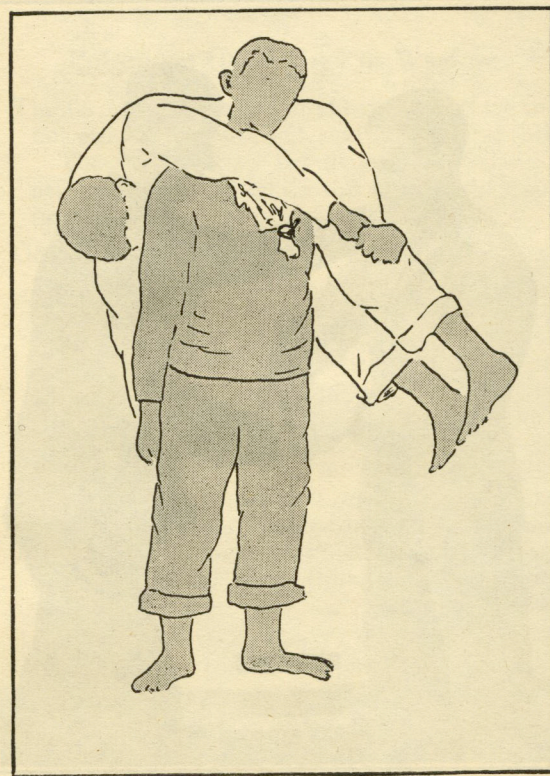


FIG. 41
Fireman's Lift

This method is best demonstrated by the illustration given (Fig. 41). By this means one hand of the carrier is left free to grasp the handrails.

2. When two bearers are available, the three-handed seat method may be used. This leaves one hand free to support the patient's shoulders. A study of the illustration (Fig. 42) will best demonstrate this method.

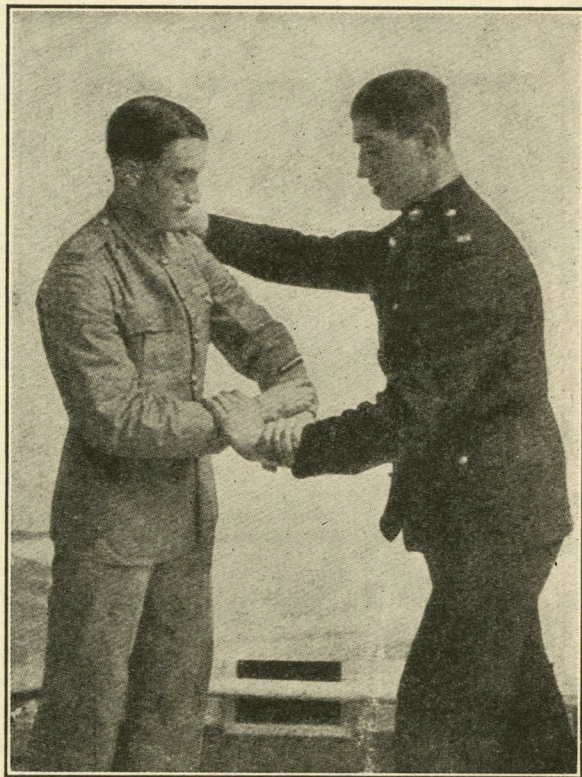


FIG. 42.—Three-handed Seat.

CHAPTER XI

WAR GASES

Poisonous Gases Used in Warfare

1. The term "poison gas" in chemical warfare includes not only true gases, but also liquids and solids.

The liquids may be dispersed by shell, bomb or aircraft spray, while the solids, when suitably heated, give off poisonous clouds.

2. Gases are commonly known by the effects that they produce on the human body; thus "tear" gases chiefly affect the eyes, causing watering, smarting and difficulty in keeping them open, while the "nose" gases, after a brief period of delay, produce intense irritation of the nose and throat, and give rise to sneezing, coughing and pain in the chest.

Neither the tear gases nor the nose gases cause any permanent harm to the individual; but, whereas all discomfort to the eyes, after exposure to the tear gases, disappears when the respirator is adjusted, the effects produced by the nose gases may persist for some time after the adjustment of the respirator.

First Aid treatment.—None required. Even when severe, the pain and discomfort produced by the nose gases disappear after a few hours.

3. Another class of gases—the "choking" or asphyxiating gases, can produce very severe injury to the chest, and even death, through "water-logging" of the lungs. Gases like Chlorine (which smells of bleaching powder) and Phosgene (which has a smell like that of musty hay) belong to this group, while the nitrous fumes which are

given off when Cordite or other explosives burn without detonation (as in magazine fire) also belong to this class.

When inhaled, chlorine is extremely irritating and produces a feeling of suffocation or choking. Phosgene is much less irritating, and the nitrous fumes are still less so.

Particularly with cordite fumes, the degree of irritation which these gases produce when breathed is no indication of the harmful effects on the lungs which may follow.

This delay period, following gassing by phosgene or nitrous fumes, is usually of some hours' duration. A man breathes the gas, and some twelve hours later begins to feel breathless and ill; this illness is made worse, and comes on more quickly, if he takes exercise after he has been gassed.

First Aid treatment.—Men who have breathed "choking" gases in sufficient strength to produce severe coughing should not be allowed to walk, and should be kept under medical observation for 24 hours. It is very important that they be kept warm and at rest.

4. The last and most important class of chemicals is that known by the name of "blistering" gases; these are oily liquids, of which Mustard Gas is the best known.

Mustard gas is almost colourless in the pure state, but dark brown or almost black when impure. In wartime it may be used in shell, bomb, or as a spray from aircraft. Owing to the slow evaporation of liquid mustard gas, it may persist for a long time, and will be dangerous until it has all evaporated and the vapour has been dispersed.

Both the liquid and the vapour given off by it penetrate all ordinary clothing and most materials, such as canvas, paint, rope gear, woodwork,

leather and rubber. They also penetrate the skin very rapidly without producing any pain or smarting at the time.

After penetrating the skin, both the vapour and the liquid will produce blisters; while contact of the skin with any part of the ship or gear which has been splashed or "contaminated" with the liquid will also result in burns.

Liquid mustard gas in the eye represents the gravest danger of aircraft spray, but the vapour given off by the liquid may also seriously injure the eyes and the lungs.

The only sure method of detecting the presence of mustard gas is by recognizing its smell, which resembles that of onions.

First Aid treatment.—To be of any use, first aid treatment against Mustard Gas must be prompt and thorough.

- (a) When it is known that the eyes have been exposed to vapour, they should be carefully washed with a solution of salt solution (one teaspoonful of salt to a pint of water), or if this is not available, with plain water.

In the case of liquid drops of mustard gas in the eyes this washing should be done at once. After the washing, a drop or two of liquid medicinal paraffin or castor oil should be placed between the eyelids to prevent them sticking. Great care should be taken not to rub the surface of the eye, or to apply a bandage. An eye-shade is permissible.

- (b) For skin contaminated by liquid mustard gas, protective ointment or **bleach paste** is the treatment of choice if it can be applied at once. The ointment (which will be a personal issue to each man in wartime) should be well rubbed in for one minute, and then wiped off with a rag, which must be destroyed after use; the paste (which is made by mixing equal parts of fresh bleaching powder and

water to make a cream) should similarly be well rubbed in for one minute, and then washed off with plain water. If, however, no treatment can be applied within ten minutes, thorough washing with soap and water, with frequent changes of the water, should be undertaken.

- (c) For skin which has been exposed to the vapour of mustard gas, as from drops of the liquid on the outer garments, washing treatment is preferable to bleach treatment, and should be applied to the whole body, preferably in the form of a shower.

NOTE.—It is most important to remember that, in all cases of contamination, all clothing must be removed as soon as possible; moreover, it must be regarded as dangerous to handle, or to retain in a closed space owing to the vapour of mustard gas which it gives off. It must not be reissued until it has been “decontaminated” or rid of all traces of the gas.

Protection against chemical warfare agents.—The respirator gives complete protection against all tear, nose and choking gases if a man is trained to adjust it properly and rapidly. In the case of mustard gas, complete protection to the eyes and lungs can similarly be obtained, but the rest of the body is exposed to the action of the gas, both in the liquid and in the vapour form, unless special clothing is worn.

As a special protection for the eyes against surprise attack by mustard spray from aircraft, “goggles” or eye-shields may be worn in wartime; they will safeguard the eyes without lessening a man’s efficiency, but they should be discarded in favour of the respirator if a spray attack is anticipated, or immediately after such an attack.

The naval oilskin suit, with sou’wester, rubber boots and oilskin gloves, gives protection to the body against liquid contamination for some hours. This outfit also provides protection against the vapour, but as the latter is sucked into the suit by the “bellows” action

produced by body movements, it is necessary to leave the dangerous atmosphere and to open up and ventilate the suit about every 15 minutes.

After contamination with liquid mustard gas, all protective clothing, including the respirator, must be “decontaminated” before reissue.

CHAPTER XII

POISONING

Elaborate details are useless because they would be forgotten at the critical moment. Simply learn the following general rules laid down by the St. John Ambulance Association:

1. When a person has swallowed a poison and threatens to go to sleep, keep him awake.
2. When there are no stains about the mouth, give an emetic (mustard and water), also milk, eggs, oils (except in phosphorus poisoning), and end up with strong tea.
3. When there are stains about the mouth, give milk, eggs and oils, but no emetic.

If a person, after taking poison, is drowsy and wants to sleep, that poison was probably opium or its most important constituent, morphine. The danger of letting the patient sleep is that he will probably never wake up again. For this reason make him walk about, give him black coffee to drink, and do not allow him to lie down.

If there are stains around the mouth of the poisoned person the poison was probably some burning fluid like carbolic acid or "caustic". Should this person vomit, the fluid, as it is vomited, would burn all the way up, making still worse the burns which it caused when going down. Besides, the burned stomach walls might give way in the straining which accompanies vomiting. It is better then, to make the patient swallow some antidote which will stop the burning action and prevent any more harm being done.

If the poison is "acid", such as carbolic acid, give him large quantities of water to which lime or washing soda has been added. Plaster, torn from the wall of a house and mixed with water, has proved very effective in such an emergency.

On the other hand, if the poison is alkali, such as caustic soda or lye, give the patient large quantities of equal parts of vinegar and water.

CHAPTER XIII

HEAT EXHAUSTION

This condition is often called Stoker's Cramp and is met with chiefly in hot climates, among the engineroom staff. It is caused by washing out of salt from the body by excessive perspiration, and by the drinking of large quantities of fresh water. It can be avoided by taking tablets or capsules of salt with the drinking water. The attack begins with nausea, vomiting, dizziness, and cramping of the muscles. The skin is pale, cold, wet, and the breathing is weak.

The treatment is:

1. Remove to a cooler place, keep patient lying down.
2. Give hot drinks of weak salt solution, or salt capsules with drinks of hot water.

Remember that this condition can be prevented by the regular taking of salt capsules while in tropical weather.

INABILITY TO PASS URINE

This is a serious condition, and requires urgent relief.

Sit the patient in a hot bath—as hot as he can bear. Cover him with a blanket, and tell him to pass his water in the bath.

Send for a Surgeon.

CHAPTER XIV

PREPARATION FOR ACTION

Just as the striking power of a ship is kept in readiness for emergency, so must there be preparation for the treatment of casualties beforehand.

There are five important points:

1. Supplies should be distributed to Forward and After First Aid posts. This will avoid total loss of valuable materials should one part of the ship be wrecked.
2. A Main Treatment Centre should be available, depending on the type of ship. The Officers' wardroom offers the best facilities for this.
3. First Aid haversacks are to be maintained in gun-turrets, engine-room, and on the bridge. These should contain bandages, dressings, and splints. They are to be checked at regular intervals to assure readiness at all times.
4. Certain members of the company, Cooks, Stewards, Victualling Assistants, Writers, must be trained to administer the necessary emergency measures, and to transport the wounded to the First Aid Post, or to the Main Centre, as soon as the action permits.
5. One of the Officers must be trained in the administration and use of Morphine. This cannot be learned after an engagement begins.

Treatment of Casualties

This must not be allowed to interfere with the firing power of the ship. Only the minimum of first aid can be carried out during the actual fighting.

Transportation and further care can be considered in three stages:

First—During a lull in action.

1. Give morphine as needed—this must be done by an Officer. Care must be taken to mark the forehead of the patient with a large "M" in ink, and to attach a tag to his clothing stating when and how much of the drug was given.
2. Remove casualties to the Fore or Aft First Aid posts.
3. Apply dressings, tourniquets, splints, etc. as far as possible in the limited time permitted. Haemorrhage must be treated first.
4. Apply dressing to burns.

Second—Immediately after action

1. Patients severely wounded are taken to the Main Treatment Centre, and appropriate treatment given as outlined in the previous chapters.
2. Hot drinks, blankets, and other shock preventives should be at hand.
3. Wounds and burns can be properly dressed.

Third—Arrangements for transfer of casualties to Shore Base or Hospital Ship.

The preparation for transportation should be carried out in advance, to avoid any delay when landing is made.