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HOME OFFICE
CIVIL DEFENCE

Manual of Basic Training

VOLUME II

BASIC
FIRST AID

PAMPHLET No. 3

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GENERAL PREFACE

The series of Civil Defence handbooks and pamphlets is produced under the authority of the Home Secretary by the Civil Defence Department of the Home Office with the assistance of and in co-operation with the Secretary of State for Scotland and other Ministers concerned.

Measures for safeguarding the civil population against the effects of war which these publications describe, have become an essential part of the defensive organisation of this country. The need for them is not related to any belief that war is imminent. It is just as necessary that preparations for Civil Defence should be made in time of peace as it is that preparations should be made for the Armed Forces.

The publications cover, as far as is possible, measures which can be taken to mitigate the effects of all modern forms of attack. Any scheme of Civil Defence, if it is to be efficient, must be up-to-date and must take account of all the various weapons which might become available. The scale of bombing experienced in Great Britain during the 1939-45 war might be considerably exceeded in any future war, and types of weapons and tactics which were not experienced in this country might conceivably be used against it in the future. It does not follow that any one of the weapons, e.g. the atomic bomb, will necessarily be used, and it is most important that a proper balance is held between what is likely and what is possible.

The use of poison gas in war was forbidden by the Geneva Gas Protocol of 1925, to which this country and all the other countries of the Western Union were parties. At the outbreak of a war, His Majesty's Government would try to secure an undertaking from the enemy not to use poison gas. Nevertheless the risk of poison gas being used remains a possibility and cannot be disregarded any more than can certain further developments in other scientific fields.

The publications are designed to describe not only precautionary schemes which experience in the last war proved to be extremely effective in preventing avoidable injury and loss of life, or widespread dislocation of national industries, but also the training, both technical and tactical, which will be required of the personnel of the Civil Defence Services if they are to be ready effectively to play their part if war should ever break out. The publications aim at giving the best available information on methods of defence against all the various weapons. Information is not complete in respect of some of these weapons and the best methods of countering them, but as results of experimental work and other investigations mature, they will be revised and added to from time to time so that the Civil Defence Services may be kept up-to-date and their training may be on the most modern and experienced lines.

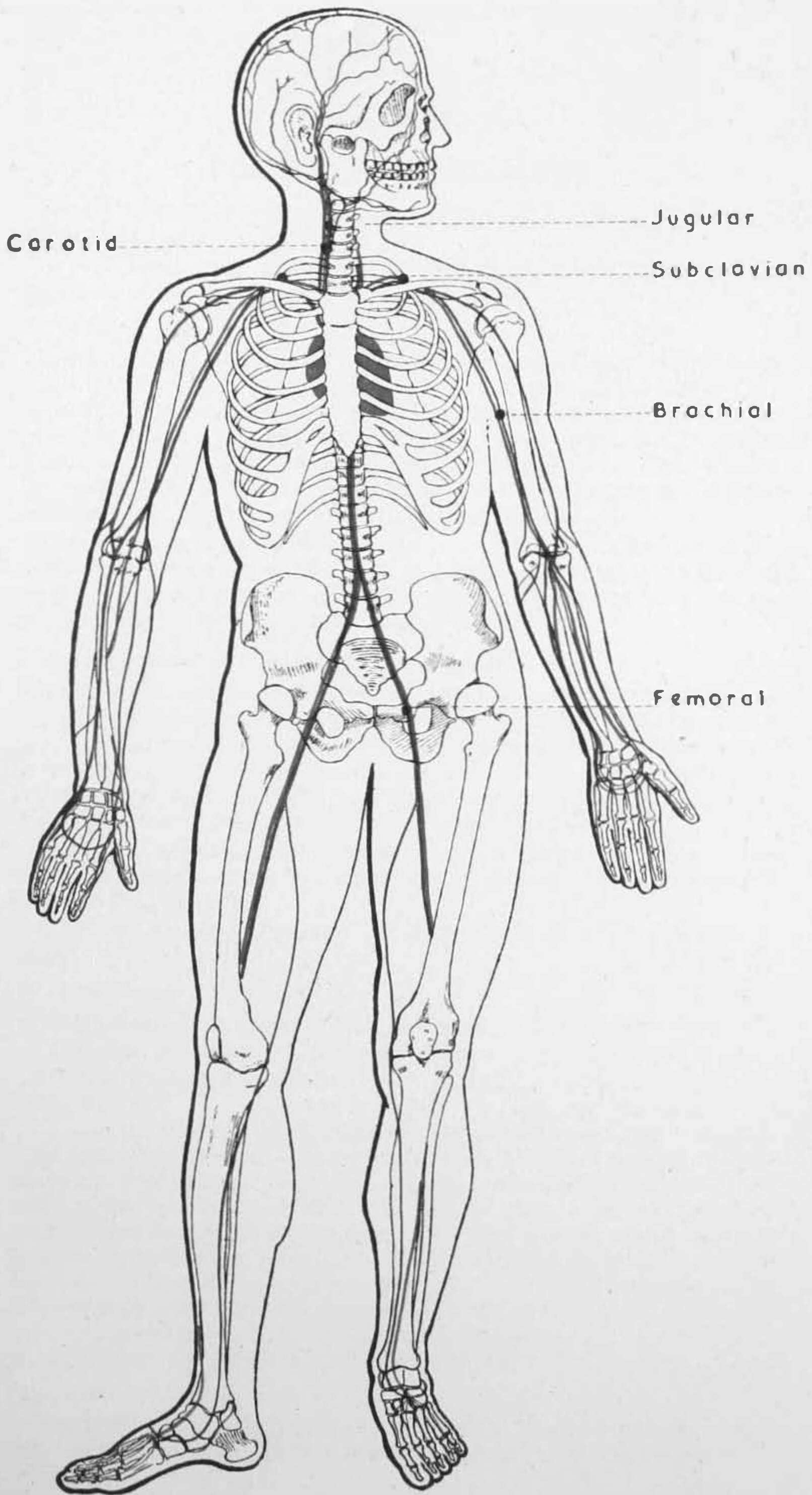
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Carotid

Jugular

Subclavian

Brachial

Femoral



CHAPTER I

POINTS TO REMEMBER

1. (a) **Symptoms**—are abnormal sensations felt by a patient and complained about.

(b) **Signs**—are abnormal conditions found in a patient on examination.

2. The Pulse

Every time the heart beats it pumps blood into elastic walled tubes called arteries which carry the blood to every part of the body. The blood travels along as a wave distending each portion of the tubes as it reaches it with a jerk or jolt which can be felt, or even seen, in certain arteries which lie upon bones and are near the surface. This is called the "pulse." As the normal heart beats 72 times every minute the pulse does the same. This is known as the "*Pulse rate.*"

The easiest method of feeling the pulse is to place the tips of the fingers on the front of the forearm of a person just above the bend of the wrist and on the thumb side. The number of beats of the pulse per minute is timed by the second hand of a watch.

3. Pressure points to stop bleeding from Arteries

Imagine the various blood tubes (arteries) to be like hosepipes. If you step upon a hosepipe when water is flowing through it and compress it against a hard substance like stone or brick you will stop the flow of water so long as you keep your foot upon the pipe. In the same way if you compress an artery with your fingers against a hard substance, in this case a bone, you will stop blood from flowing through it.

The places where you can compress arteries against bones are known as *Pressure points*. You must remember these places and know exactly where to find them.

A few of the most important as described below is all you need to know.

(i) *In the Neck*

Severe bleeding in the neck will be coming from an artery called the Carotid, and you must compress this artery to stop the bleeding.

TO DO THIS. Lay the patient down and kneel by his injured side facing his head. If the wound is on the left side grasp the nape of his neck with the fingers of your right hand at the back and your thumb in front below the wound about 1½ inches above where the collar bone meets the breast bone, on a line running between this point and the angle of the jaw, as shown in Fig. 1. When you feel the artery beating press it backwards against the spine with your thumb, taking care not to press upon the windpipe, and to *use only enough force to stop the bleeding.* There is a carotid artery on each side of the neck, but *on no account must you compress both arteries at the same time, otherwise you will kill your patient.* If the wound is on the right side of the neck you must of course use your left hand instead of your right.

(ii) *Injury to Jugular Vein*

The Jugular vein bringing blood back to the heart which runs alongside the Carotid artery is also usually wounded at the same time and



Fig. 1
Compression of Carotid Artery.

bleeds profusely. Pressure upon the artery alone will not stop this. To do so spread out the fingers and thumb of your free hand beneath the patient's chin, with the fingers behind the neck, and press your thumb *above the wound* (i.e., nearer to the head) on the same line and in the same way as you are doing for the artery with the other thumb.

(iii) *In the Upper Limb*

Severe bleeding from the shoulder or armpit can be stopped by compressing an artery (subclavian) which lies below the middle of the collar bone.

TO DO THIS. Lay the patient down and kneel at the side of the injured shoulder facing his head. Quickly but gently uncover the upper part of his chest. If the injury is on the left side draw the patient's head towards you with your left hand to relax the neck muscles. Place your right palm on his shoulder with the fingers behind and press downwards and backwards with your thumb upon the artery which lies in the hollow above the middle of the collar bone, *remembering not to use too much force*. If you are on the right spot the bleeding will stop. Both thumbs may be used, as this is less tiring, in which case, without moving the right hand place the palm and fingers of your left hand on the patient's chest and press the thumb on top of the other. Do not let your hands and arms obstruct the application of a dressing (*See Fig. 2*).

N.B.—With a wound on the right side your hands will of course be reversed.



Fig. 2
Compression of Subclavian Artery.

(iv) *In the Arm and Hand*

If blood is coming from a wound in the arm below the shoulder and cannot be stopped by ordinary means you must do this by compressing an artery (brachial) in the upper arm.

TO DO THIS. Make the patient sit or lie down and place yourself at the side of or behind him. If the left arm is bleeding, grasp his left wrist with your left hand and bend the elbow. Pass the fingers of your right hand round the under side of the middle of the upper arm so that the fingers are on the inside and the thumb on the outside. Feel for the artery beating in the groove below the biceps muscle (the line of the artery roughly corresponds to the inner seam of a coat sleeve above the elbow), and press it outwards, i.e. towards you, against the bone. *Gentle pressure is sufficient.*

N.B.—If the injury is on the right side reverse your hands. (See Fig. 3.)



Fig. 3

Compression of Brachial Artery.

(v) *In the Groin*

Bleeding from a large artery (femoral) in the thigh is *extremely dangerous* as blood spurts out with great force. Unless you can compress this artery within a short time of the injury the casualty will die from loss of blood.

TO DO THIS. Lay the patient down flat and kneel by his injured side facing either his feet or his head. Raise the thigh and bend the



Fig. 4

Compression of Femoral Artery.

knee so that the foot remains upon the ground. The crease in the clothing at the top of the thigh indicates the *line of the groin*.

Encircle the upper end of the thigh with the palms and fingers of your two hands so that the thumbs are on the front of the thigh and the fingers at the back. With one thumb feel for the beating of the artery in the centre of the line of the groin. When you feel it place the other thumb on top of the first and press the artery downwards with both thumbs against the hip bone upon which it lies, *using only just enough pressure to stop the bleeding (See Fig. 4)*.

4. Respiration

Respiration means breathing. The normal healthy person breathes 15 times every minute. To find out how many times a person is breathing lay him down and place your hand lightly upon his chest or belly. See how many times your hand rises and falls in one minute and time this with the second hand of your watch. Each time your hand rises and falls constitutes one breath. The number of times a person breathes per minute is called the "*Respiration rate.*"

CHAPTER II

FIRST AID AND THE HANDLING OF CASUALTIES

II. General Principles

At any time during or after enemy air raids you may be called upon to give first aid to an injured person, or one who is only frightened and suffering from shock, though uninjured. It is up to you to do what you can on the spot to deal with immediate danger to his life, and to prevent any injury or condition from becoming worse.

Do not try to do more than is absolutely necessary ; the longer you take over superfluous things the longer is the delay before your patient is safely in a hospital. At an incident you may find a number of casualties requiring your attention. Do not at once start to work on the first casualty you see, who may be only slightly injured, but make a rapid survey of the situation, find out all you can from onlookers as to how the incident happened ; enquire about the presence of other casualties whom you cannot see, and note any possible sources of danger, such as crumbling buildings, fires, broken gas and water mains and the like. Decide which of the casualties need your help most urgently and attend to them first, doing your work in a methodical manner which will give you self-confidence and inspire the others. A casualty may be bleeding profusely from a wound ; the bleeding must be stopped at once and the wound dressed. A bone or bones may be broken ; these must be attended to. Pain must be relieved. Shock must be minimised as far as possible. Burns must be treated. A man may be wholly or partly buried in debris and when extricated be found to have stopped breathing. Unless you can quickly remove the cause of his stoppage of breathing and give him artificial respiration he will die from suffocation. Unconscious casualties are frequently met with, and you can do a great deal for them if you apply your knowledge and use your common sense. Always remember that *common sense and initiative play a very important part in first aid.*

When your first aid treatment is completed you must decide what to do with the casualty. All cases which you consider serious, or seem in a bad way, must be sent on a stretcher in an ambulance to hospital ; the quicker they reach there after being made safe to travel the better chance they will have of ultimate recovery.

Do not rely entirely upon your own opinion if you have any doubt as to whether you are doing right or not, but consult a doctor, if one is easily available at an incident, or a fellow worker whose knowledge and experience are superior to yours, as soon as you can.

A condition known as shock is present to some extent in every casualty, even affecting the uninjured or only slightly injured. Its consideration is of the greatest importance in carrying out first aid measures, as these are designed to protect casualties from the effects of shock and to minimise it as far as possible.

Never forget that a casualty is a *human being* who has had a terrifying experience and suffered a great shock. It is your duty as a person

rendering first aid to do all in your power to gain the confidence of an injured person by firm but gentle handling, and to relieve his anxiety by sympathy and convincing reassurance.

To sum up

In dealing with casualties at an incident your chief aims must be :—

- (i) To preserve life by correct and prompt action.
- (ii) To protect from further shock.
- (iii) To prevent an injury from becoming worse by careful handling and by reassurance.
- (iv) To arrange for early removal to shelter and skilled care.
- (v) *Above all you must realise that speed can be combined with gentleness and care.*

CHAPTER III

SHOCK

14. Definition of Shock

S H O C K is the chief cause of death among air raid casualties when the victims are not killed outright.

In its simplest everyday form shock is seen when a person is suddenly startled by the receipt of bad news, seeing a horrible sight, by a sudden blow or fall however caused, and the like. The shock may be sufficient to cause him to faint even though there is no obvious injury, or indeed, any injury at all. People usually recover rapidly from this kind of shock with appropriate treatment, although cases do occur when it causes death by itself, especially in elderly people, young children, and people with weak hearts.

A far more serious type of shock is usually met with in air raid casualties and is a true "killer." It occurs with *every* injured person to a more or less extent, and the danger to his life depends largely upon the severity of his injury. Severe wounds causing loss of much blood; injuries, whether bones are broken or not, caused by crushing; severe burns, breaking of the bones of the thigh or back are examples of injuries which produce intense shock, and may prove fatal. It is therefore of extreme importance for you to study and remember the symptoms and signs of shock so that you will be able to recognise and treat it properly.

15. Symptoms and Signs of Shock

A person may feel giddy, cold and sick, and actually vomit. He may lose consciousness, wholly or partly, and fall down. His *skin* becomes pale, cold and clammy, and beads of perspiration may stand out on his forehead. If he becomes worse the colour of the skin changes to blueish grey, and later, in severe cases, to a leaden colour, most noticeable in the lips and lobes of the ears.

H I S P U L S E beats faster than normal, i.e. more than 72 times per minute, and is weaker and more difficult to feel. In severe cases of shock the *pulse* is the most important thing for a first aider to note. If it is beating say 100 times to the minute and does not get less but, on the contrary, tends to increase this is a danger sign. If it increases rapidly (up to say 150-180 times a minute) and becomes harder to feel the patient is in a bad way and is probably bleeding internally.

B R E A T H I N G is usually quiet, shallow and often hardly noticeable, generally quicker than normal, i.e. more than 15 times to the minute. In bad cases of shock in which there is internal bleeding a condition known as "air hunger" occurs. (This is described later under "bleeding.")

T H E E Y E S may have a glassy stare and the pupils are larger than normal; the larger the pupils the more serious the condition.

A S H O C K E D P E R S O N may be alert and apprehensive, even excitable if he is conscious, but as his condition gets worse he becomes

confused and may be unable to reply to even the simplest questions, gradually or quickly relapsing into complete unconsciousness.

All the above symptoms and signs will be more pronounced if bleeding is coming from a wound outside or inside the body, and also if at the time of his injury the casualty was tired, cold, hungry and afraid.

16. Treatment of Shock

Lay the patient down gently with his head low and turned to one side, unless he has an injury to his head or chest, in which case raise his head and shoulders and support them. *Loosen* clothing round his neck and waist. In most simple fainting attacks this and keeping the patient warm is all that is needed and he soon recovers. If he is conscious and only feels faint it is generally sufficient to sit him up and get him to bend forward with his head between his knees until he feels better. Support him if necessary and give him plenty of air.

Stop any bleeding from an External Wound

Relieve pain by placing the patient in the position most comfortable to him and support any injured part. *Keep him warm* by blankets or clothing and by covered hot water bottles at his feet and sides of chest. (*N.B.*—Hot water bottles must not be too warm, and must be protected so that they do not burn the patient.)

Always remember that a shocked casualty must never be overwarmed to the extent of sweating as this increases shock.

The foot of the stretcher upon which the casualty is lying may be raised about 9 inches off the ground and supported on such things as a roll of blanket, sandbags or bricks.

Give hot, sweet tea, coffee or cocoa if the patient is conscious and can swallow. A teaspoonful of sal volatile in the equivalent of a wine glassful of water is also useful. *On no account* give anything to drink if there is a wound in the abdomen or chest, or you suspect internal bleeding. *Do not give any alcohol.*

Remember what you have learnt about *handling, reassuring and cheering up* the casualty. Relieve his anxiety about the fate of relatives and friends who were with him at the time of his injury. Do not leave him alone while you are waiting for him to be taken to hospital, but get someone to stay with him and put him in a sheltered place if possible, even if it is only behind a piece of masonry. Do not let bystanders worry him.

Any bad case of shock, or one in which you have any doubt, must be sent to hospital on a stretcher in an ambulance as soon as possible after you have attended to him. If a doctor is available at an incident get him to see the patient but lose no time in doing so; *every second of delay in getting the patient to hospital is bad for him.*

CHAPTER IV

BANDAGES, SLINGS AND DRESSINGS

20. The Triangular Bandage and its uses

This bandage is made by taking a piece of calico or linen, usually 40 inches square and cutting it into two pieces from one corner to another, thus making two triangles, each of which is one bandage.

The longest edge is called "the lower border" or "base," the pointed end opposite to it "the point," and the two corners "the ends."

Triangular bandages are used in the following ways :—

(a) As a "whole-cloth," i.e. fully spread out.

(b) As a "broad-fold," by bringing the point to the middle of the lower border and then folding over again in the same way.

(c) As a "narrow-fold," by folding a broad-fold once, long edge to long edge (See Figs. 5, 6, 7 and 8).

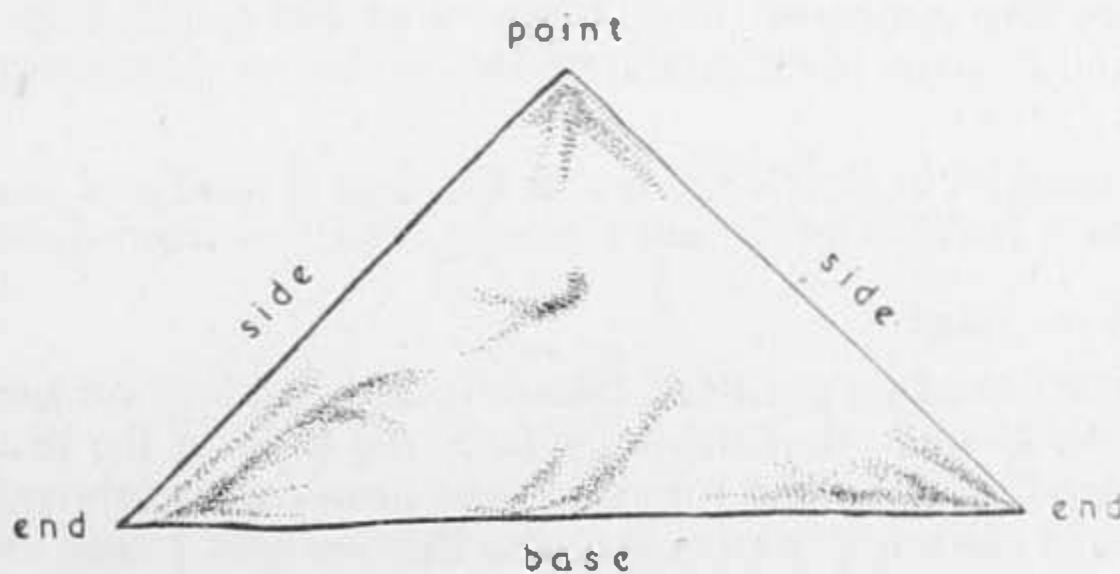


Fig. 5

Whole-Cloth Triangular Bandage.

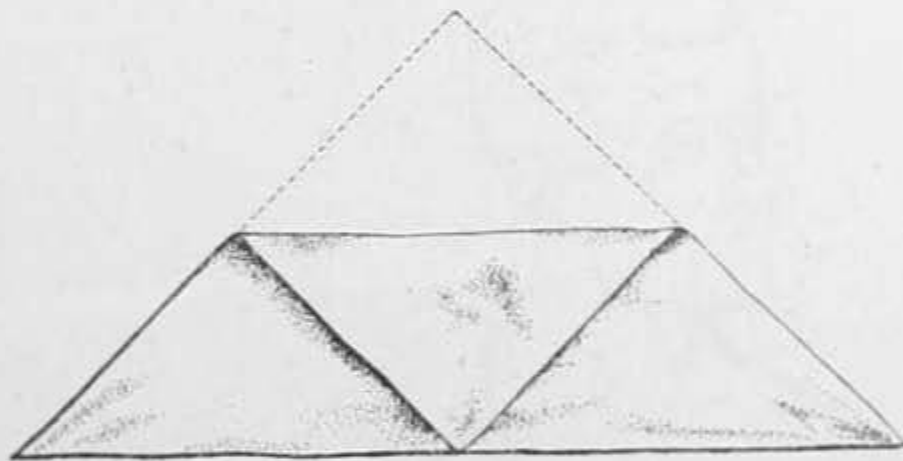


Fig. 6

Once Folded Bandage.

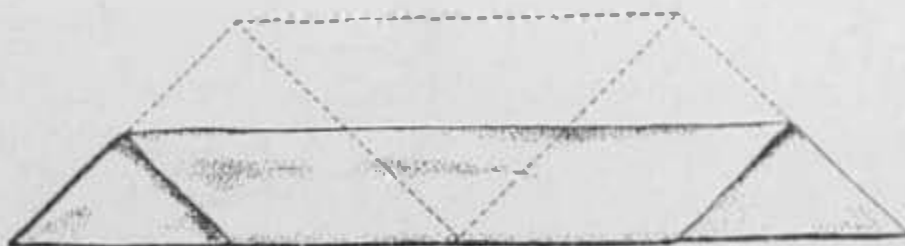


Fig. 7

Broad-Fold Bandage.

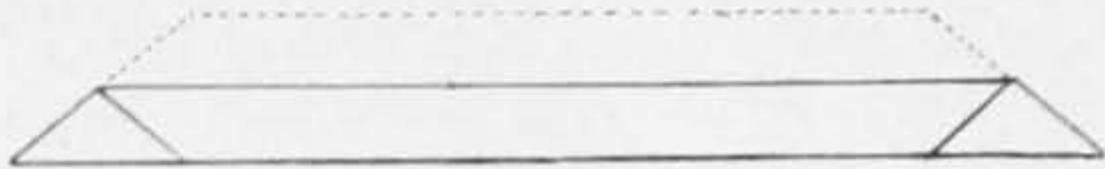


Fig. 8
Narrow-Fold Bandage.

TRIANGULAR BANDAGES are used to keep dressings or splints in position, to afford support to an injured part as a sling, to bind a broken lower limb to its fellow or a broken upper limb to the trunk. They are also used to make pressure to arrest bleeding, and are useful in preventing swelling from such injuries as a badly sprained ankle.

N.B.—When applying bandages and slings it is to be remembered that they must always be tied with a “reef-knot,” never with a “granny”.

To tie a reef-knot take one end of a bandage in each hand, pass the end in the right hand over that in the left and tie a single knot. Pass the end in the left hand over that in the right and complete the knot. The rule for tying a reef-knot is “right over left, left over right.”

To fasten a splint to a limb broad or narrow-fold is used. Place the centre of the bandage over the splint, pass the ends round the limb, cross them on the inside and tie off on the outside over the splint.

A few examples of how a triangular bandage is used as a bandage are given below. Further information can be obtained from the diagrams.

The top of the head

Lay the centre of an unfolded (whole-cloth) bandage on the dressing on top of the head so that the point faces the back of the head and its lower border lies along the forehead, just above the eyebrows. Make a short fold in the lower border and pass the two ends round the back of the head above the ears. Cross the ends over the point of the bandage.



Fig. 9
Application of Shoulder Bandage.

bring them to the front again and tie off in the middle of the forehead. Place a hand on the head to steady the dressing and pull the point down until the bandage is taut on top of the head. Bring the point up over the ends and pin on top of the head.

The Shoulder

Lay the centre of an unfolded bandage on the top of the shoulder over the dressing with the point upwards and the lower border across the middle of the upper arm. Fold in the lower border, carry the ends round the arm, cross them, bring them to the front again and tie off.

Support the arm in a small arm sling, draw the point of the bandage under the sling at the neck, fold it over and pin it to the bandage on the shoulder (See Fig. 9).

The Hip

Pass a narrow-fold bandage round the waist and tie it. Take an unfolded triangular bandage and place it with its centre over the dressing on a hip, point upwards, and its lower border lying across the thigh. Pass the ends round the thigh, cross them, bring them to the front and tie off on the outer side of the thigh.

Draw the point up under the bandage at the waist, turn it down pin it to the portion on the hip (See Fig. 10).

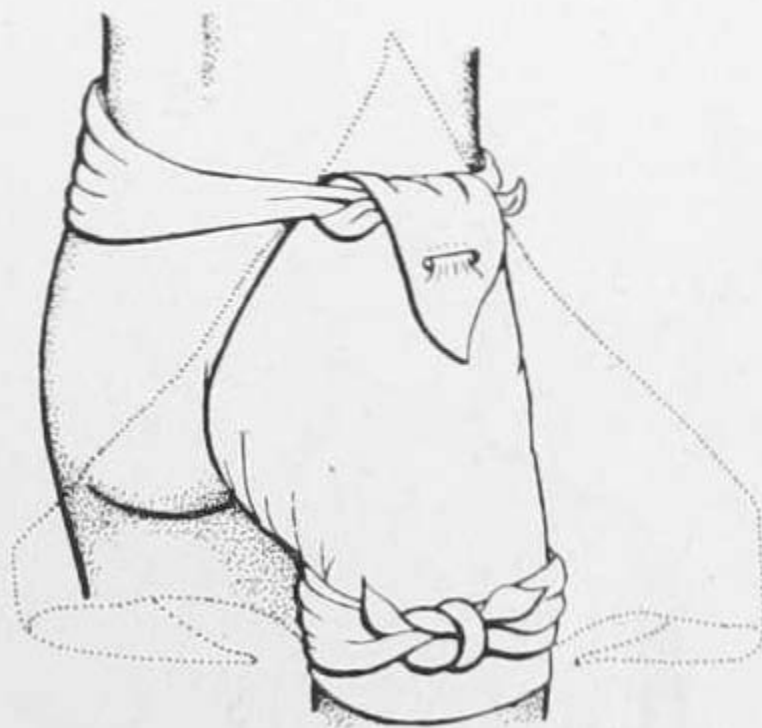


Fig. 10

Application of Bandage to Hip.

Triangular bandages used as slings

Examples of the application of slings are given below (See Figs. 11, 12, 13, 14 and 15). Two types most commonly used are described.

The Large Arm Sling

With the point of a whole-cloth bandage in one hand and one end in the other, face the patient and lay the bandage against his body with one end over the shoulder on the sound side and the point towards his injured side. Pass the upper end round behind his neck and allow the free end to hang over the collar bone on the injured side for about three inches. Gently bend the elbow of the injured arm and place the forearm

and hand on the centre of the bandage with the hand a little higher than the elbow. Support the arm with one hand while you gather up the free lower end and tie it to the end hanging over the collar bone. Bring the point round over the elbow and fix it to the front of the bandage with one or more safety pins.

The Collar and Cuff Sling

This is made by placing a " *clove hitch* " over the hand and round the wrist and fastening the free ends round the neck.

TO MAKE A CLOVE HITCH take a narrow-fold bandage and make one loop towards the centre with the free end in your right hand *in front*. Now make another similar loop with the free end in your left hand *behind* and place the two loops together with the second in front of the first. Slip the loop thus formed over the hand on to the wrist and pull the two free ends tight for tying. A clove hitch knot does not tighten when both ends are pulled, otherwise it might constrict blood vessels in the wrist.

Improvised Slings

Slings can be improvised by pinning the sleeve on the injured side to the coat ; by turning up the lower edge of the coat and pinning it ; by putting the hand inside the coat or waistcoat and buttoning it, or by using scarves, ties, strips of clothing or belts.



Fig. 11

Application of Large Arm Sling (First Stage).



Fig. 12
Application of Large Arm
Sling—Completed.



Fig. 13
Application of Small Arm Sling.

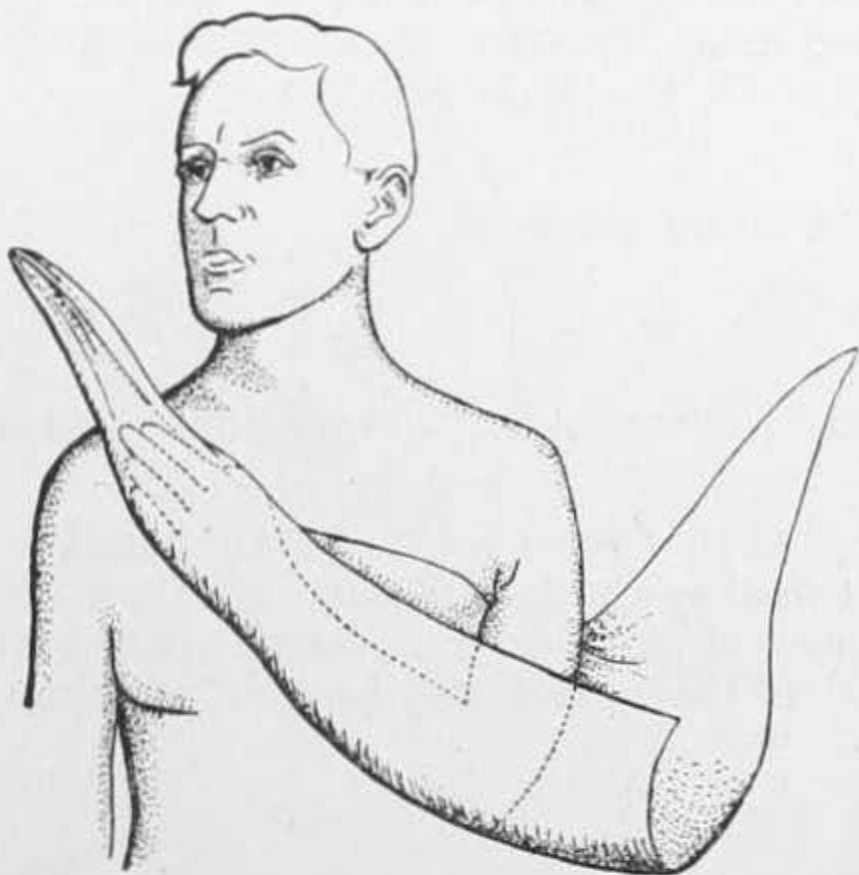


Fig. 14
Application of St. John Sling (First Stage).



Fig. 15
Application of St. John
Sling—Completed.

21. The Rubber Bandage

This consists of a length of elastic about four feet long and two and a half inches wide with two tapes sewn at one end for tying (*See Fig. 16*). This can be used to stop bleeding by winding it round a limb with even pressure immediately above the dressing (i.e. between the heart and the wound), and with each turn over the previous one. The tapes are tied securely round the limb over the bandage, taking care that this does not slip while the knots are being tied. A rubber bandage *must never be hidden by a dressing and it must be loosened at frequent intervals, of not more than fifteen minutes*, to see if the bleeding has stopped.

This is of *extreme importance* and failure to do it may result in the patient losing his limb from gangrene.

A rubber bandage must be applied *over* a dressing to cover the stump of a limb which has been torn off, in order to stop bleeding. It should be applied firmly as near to the edge of the stump as possible without a danger of its falling off. *When used for this purpose it must not be loosened at intervals, but left in position.*



Fig. 16
Rubber Bandage.

22. Dressings

A dressing usually consists of layers of lint or gauze, on top of which is a thick pad of cotton wool and a bandage which keeps the dressing in position.

Sterilised Pad Dressings.

Certain types of made up pad dressings consisting of the above, previously sterilised and wrapped ready for use in packets are used for casualties at incidents. (See Figs. 17, 18, 19, 20 and 21.)

They are :—

- (i) *Large and Medium first aid dressings.*
- (ii) *Mine dressings.*
- (iii) *Shell dressings.*

The first field dressing carried by every soldier is an example of this form of dressing.

If none of these are available a clean, freshly folded pocket handkerchief, a clean triangular bandage used as a pad (with their inner surfaces next to the wound), or a clean piece of paper or an envelope opened up with its inner clean surface next to the wound may be used as purely temporary substitutes.

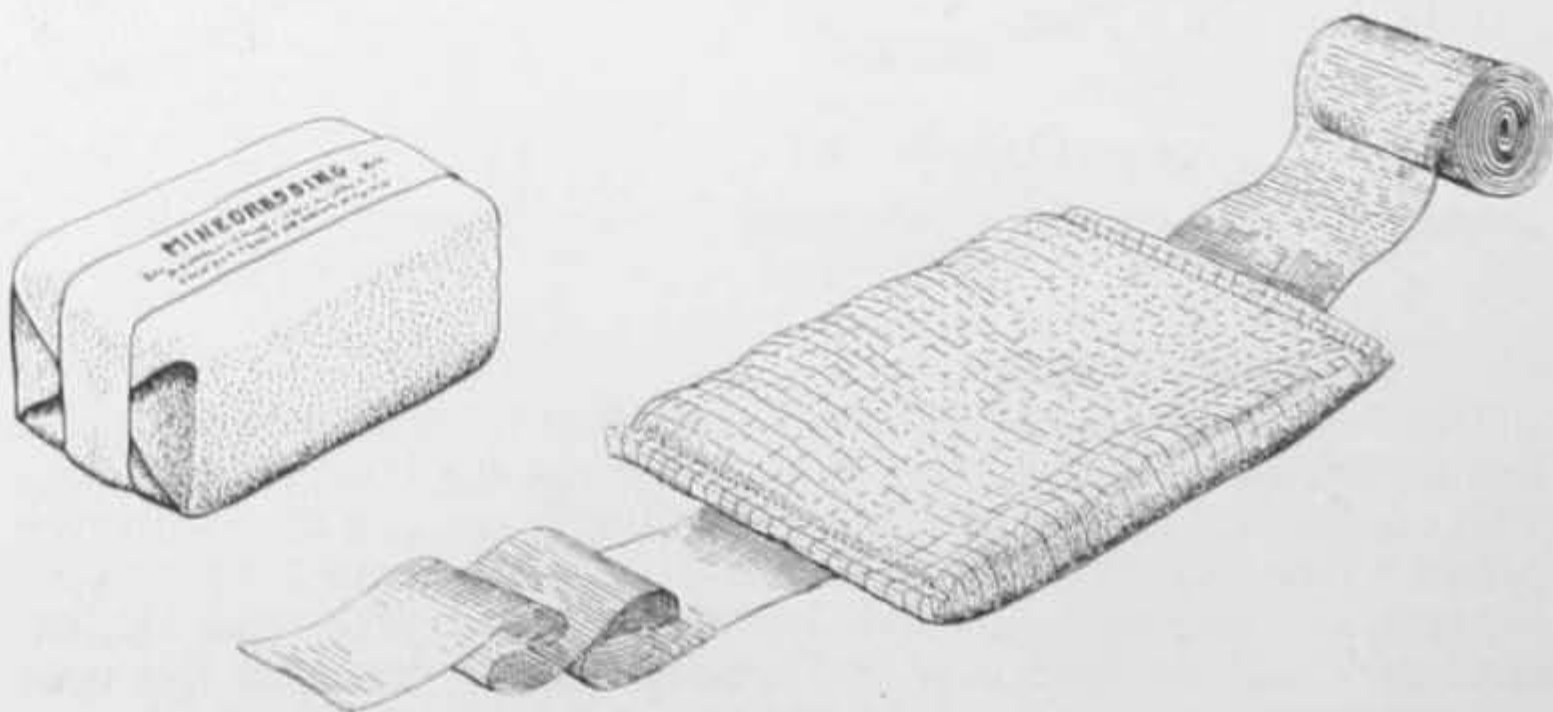


Fig. 17
Made up Pad Dressing—Mine Dressing.



Fig. 18
Application of Pad Dressing to Chest.



Fig. 19
Application of Pad Dressing to Chest—Completed.



Fig. 20
Application of Pad Dressing to Eye Injury.



Fig. 21
Application of Pad Dressing to Eye Injury—Completed.



CHAPTER V

BLEEDING (HAEMORRHAGE)

26. Two Types of Bleeding

(i) *External Bleeding*

Bleeding may be either slight or severe, and this you should be able to recognise at once if it is coming from a wound. When you see blood escaping this is *external bleeding*.

Blood may either spurt out or flow in a small or large stream. In any case your job is to stop it as soon as possible, and it stands to reason that if blood is spurting out or flowing in a large stream, the sooner you stop it the better, otherwise your casualty will die from loss of blood.

(ii) *Internal Bleeding*

There is another kind of bleeding, which is not coming from a wound which you can see, but which, for all that, can be equally or even more dangerous. This is when bleeding occurs inside the belly, the chest, or the skull and is called *internal bleeding*.

This form of bleeding can be classified under two headings :—

Visible (which you can see).

Concealed (which you cannot see).

Examples of *visible internal bleeding* are :—

(a) An injury to the belly which may cause blood to be passed in the motions or vomited.

(b) An injury to the chest which may cause a person to cough up blood.

(c) An injury to the skull which may cause bleeding from the nose or ears.

CONCEALED INTERNAL BLEEDING may occur in any of the above parts without any external wound or any signs of bleeding, and you will only be able to suspect that it is taking place from certain symptoms and signs which it produces in a person. Even though your attention may be taken up with bleeding from an external wound, you must never lose sight of the possibility of *concealed internal bleeding* occurring at the same time, especially if your patient seems worse than his external wound warrants, as this may be comparatively trivial.

Remember that of these two types *concealed internal bleeding* is the more dangerous, and many lives are lost through failure to recognise it in time.

27. Symptoms and Signs of Bleeding

All the symptoms and signs of shock may be present in a person suffering from loss of blood, and their severity largely depends upon the amount of blood lost.

Two or three symptoms and signs however are prominent when a great deal of blood has been lost. They are :—

AIR HUNGER. In this condition the patient feels that he cannot get enough air and is being suffocated. He becomes intensely distressed

and may struggle violently, tearing at his clothing and throat in the effort to obtain more air. Air hunger should always make you suspect bleeding—probably internal.

THIRST is often very marked and bitterly complained of.

BUZZING IN THE EARS and dimness of vision occur later and constitute a very grave sign, often heralding the approach of complete unconsciousness and death.

28. Treatment of External Bleeding

Lay the patient down flat unless his head or a limb are bleeding, in which case raise the part and prop it up. Blood will then not be able to flow so easily as it has to be pumped uphill from the heart. *Do not raise a limb with a broken bone.*

Your immediate object is to stop the bleeding as soon as possible by putting pressure on the bleeding spot. To do this :—

Expose the bleeding point by opening or cutting off clothing, but do not needlessly expose the patient or remove or destroy more clothing than is necessary.

Remove any pieces of glass, metal, stone or other debris lying near the wound, but *do not* attempt to touch any embedded in the wound.

If there are no such pieces and you are certain that no bone is broken, press with your fingers or thumb directly on the bleeding point and keep them there while a dressing is being made ready. If a clean handkerchief or a dressing is immediately available place this on the wound before you apply pressure, but speed in stopping the bleeding is the great necessity and no time should be wasted.

Take one of the first aid dressings in sealed packets called "mine dressings" or "shell dressings." Get someone to open up a packet, hold the bandage on each side of the pad, put the pad directly on the bleeding point in place of your fingers, and bandage it firmly so that the pad is pressed tightly on the wound. Press your fingers again on the dressing until the bleeding seems to have stopped. If blood comes through and soaks the dressing, do not take it off but put another on top and bandage even more firmly.

If there are substances sticking in the wound and it is in a limb, you cannot press your fingers upon it, but you can stop the bleeding by winding a *rubber bandage* round and round the limb above the wound (i.e. between the wound and the heart) and tying it firmly with the tapes (remembering what you have been told about loosening it at intervals). You must not put a pad dressing on to a wound which has pieces of glass or other substances sticking into it, as this will drive the pieces further into the wound, so take several sterilised pad dressings and build up a soft mound round the wound with them to take off the pressure, after which you can apply another sterilised pad dressing on the wound and bandage lightly with impunity. This is known as a *built up dressing* and can also be used in bleeding from other than a limb (*See Fig. 22*).

In severe cases where blood is spurting from a wound, or where blood is dripping through a dressing already applied, put on a second or even third dressing and bandage firmly. If bleeding continues use pressure with your fingers or thumb on the correct *pressure point* for that part.

Release your pressure gradually to see if the bleeding has stopped, *but take care to use only enough pressure to stop it.*

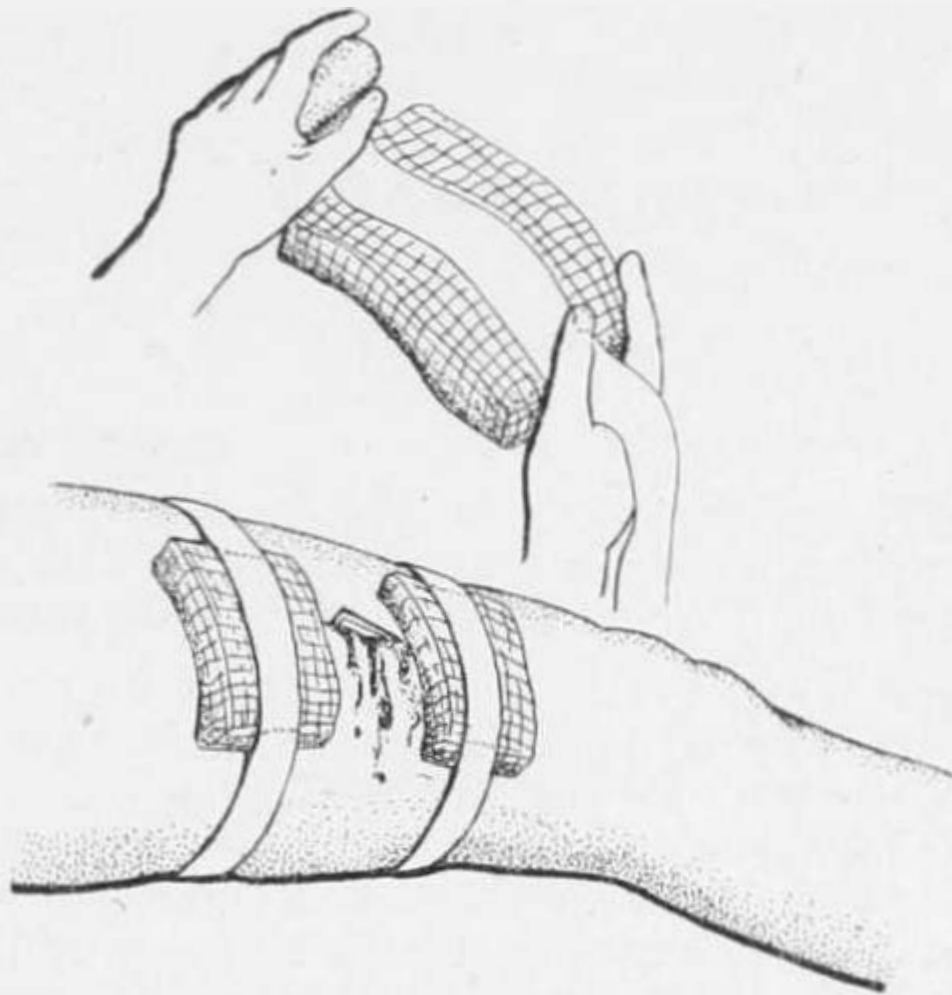


Fig. 22
Application of " Built-up " Dressing.

Get the patient to hospital as a stretcher case in an ambulance as soon as possible, and, if you suspect that he may still be bleeding or likely to, accompany him to keep up pressure on the pressure point until the hospital is reached. Write an H on a label or piece of paper and tie it to him.

29. Treatment of Internal Bleeding

As soon as you decide that a casualty is bleeding internally, you must take all measures to protect him from further shock and send him as a stretcher case in an ambulance to hospital as soon as possible. Do not put hot water bottles near any part from which you think blood may be coming, or give him anything to drink, even if he is very thirsty.

Use the utmost care in handling and moving him and write an X on a label or piece of paper which you should affix to him.

CHAPTER VI

WOUNDS

33. Types of Wounds

Many kinds of wounds are met with among air raid casualties, ranging from minor cuts and bruises to limbs torn off or large gaping wounds in other parts of the body. The following are examples :—

(i) **LACERATED** wounds are caused by pieces of jagged metal from bombs, by flying debris, or when a person is blown by blast against some unyielding sharp object. These wounds are usually large and may do serious damage to the trunk and internal organs ; limbs are frequently torn off. Owing to the intense shock which such wounds produce there may be little bleeding either external or internal at first, but it will come on as the casualty recovers from his shock.

(ii) **PUNCTURED** wounds are caused by small fragments of bombs which penetrate the skin and may damage internal organs. They may also be caused by pieces of glass, brick, stone, metal or wood. The wounds they make on the skin may appear trivial but internal bleeding often occurs with severe shock.

(iii) **PENETRATING AND PERFORATING.** Penetrating wounds are caused by massive bomb splinters and are more often found in persons near to the explosion of a bomb with no intervening structure as a protection. They may also be caused by broken glass, flying rubble or by machine gun or rifle bullets.

In a *penetrating* wound the missile is retained in the body ; in a *perforating* wound it passes right through the body, leaving an entrance and an exit wound.

(iv) **CONTUSED WOUNDS** are caused by blunt articles such as falling beams and may be associated with abrasions with little damage to the skin but extensive damage by crushing and bruising to the underlying muscles and internal organs. Such a wound is also caused when people are flung against a hard substance by blast.

(v) **WOUNDS OF THE EYE** are common and most frequently caused by flying fragments of broken glass or by pieces of debris, stones or bricks. Fire Service personnel are frequent sufferers from this form of injury.

(vi) **BURNS AND CRUSHING INJURY** which will be dealt with later.

(vii) **COMPLICATIONS.** A majority of wounds are accompanied by *bleeding* ; some are associated with *broken bones* ; all injuries in which the skin is broken are liable to poisoning by germs, and all casualties whatever their injury may be will suffer from some degree of *shock* which may be slight or severe.

Remembering these facts should provide you with a clue for the correct first aid treatment of wounds, and enable you to put into practice what you have learnt.

34. First Aid Treatment of Wounds

As in cases of bleeding get the casualty to lie or sit down.

Stop Bleeding.

Protect from further shock.

Treat broken bones if present.

Cover the wound as quickly as possible with a clean dry dressing.

Never attempt to cleanse a wound at an incident. In exceptional cases where there is extensive damage and severe shock a dressing may be applied through tears in the clothing to avoid further uncovering of the wound. This will help to keep germs out of the wound and will ease pain.

Be careful not to waste time in putting dressings on multiple unimportant wounds which are not a danger to life in themselves but the shock from them is—you will be delaying the removal of the patient to hospital by so doing.

DRESSINGS AND BANDAGES.

(a) First aid dressings, large and medium.

(b) Mine dressings.

(c) Shell dressings.

(d) Triangular bandages.

Apply one of these as described for the treatment of external bleeding. If a limb is injured support it with one of the triangular bandages used as a sling after applying the dressing. Do not stint the dressings. If you are dealing with a large wound apply a large dressing (e.g. shell dressing) or several of them. The casualty will be grateful for the protection and warmth and they will ease the pain.

35. Treatment of Special Wounds

A few hints are necessary for the first aid treatment of special wounds which may be encountered, such as :—

(i) Wound of the Belly (Abdomen)

The most common injury in air raids is a penetrating wound of the belly wall by pieces of metal, fragments of glass, stones or rubble which have entered it from the front. In cases where a person has been lying or crouching down when hit the missile may enter the belly through the buttock or back and first aiders may miss this wound if they suspect an internal injury to the belly and only look for a wound in front. If the belly wall is opened up the intestines will protrude and this greatly adds to the severe shock from which the casualty is suffering. Any wound of the belly must be regarded as extremely serious as it may prove fatal within a short time.

The chief dangers are :—

Internal bleeding.

Shock.

Blood poisoning caused at the time of the injury by germs which may cause death at a later date.

First Aid Treatment

Lay the patient down on his back on a folded blanket or articles of clothing with his knees drawn up and a rolled up blanket or coat beneath them. Support his head and shoulders on pillows, folded

blankets or greatcoats piled upon one another. This prevents more intestines from coming out if any have already done so. Put a protected hot water bottle (*N.B.*—not too hot) at his feet and between his thighs—*do not place one near the wound*. Wrap him in blankets leaving a space for the wound to be dressed.

Dress the external wound. If intestines are protruding *do not* attempt to touch them or push them in again but cover them at once with a large first aid dressing (preferably shell) and bandage firmly but not too tightly in position. A second dressing may be applied on top of the first and the two kept together by a broad-fold triangular bandage over both and the previous bandages. *Now* cover the abdomen with a blanket (*See Fig. 23*).



Fig. 23
Treatment of Wound of Belly.

If no intestines are protruding treat the patient as above whether the wound is horizontal or vertical.

Do not give anything by the mouth.

Get the patient to hospital lying on a stretcher in an ambulance as soon as you possibly can, but do not move him unnecessarily until he is ready to be placed in the ambulance. Move him with the utmost care and gentleness, as every movement increases his shock. *Call a doctor* to see the casualty if one is available. *Tie on a label and mark it with an X.*

(ii) Wounds of the Chest

Penetrating wounds of the chest by pieces of metal, glass, stones or rubble may prove rapidly fatal from severe injury to a vital organ, such as the heart or lungs, or from internal bleeding.

An example of a serious injury to the chest is when air enters it from without, through a wound, and causes the lung on that side to collapse. This may produce what is known as a "*sucking wound*" as when the

patient breathes in and out air is sucked into and blown out of the chest with a whistling sound. Breathing becomes increasingly difficult as the lung is pressed upon by the air and tends to collapse further, and the patient's life is in danger.

Ribs may be broken with or without any external wound, and their jagged sharp broken ends may do a great deal of damage to the contents of the chest especially the lungs, causing very profuse bleeding, either external or internal.

The chief dangers are :—

- (1) *Bleeding.*
- (2) *Shock.*

First Aid Treatment

Lay the patient down on his back on a folded blanket inclined towards the injured side, with his shoulders slightly raised, and place a second folded blanket lengthwise at his back as a support. Loosen any tight clothing round his neck and waist. Put a protected hot water bottle between his feet and thighs but not near his chest. Wrap him in blankets.

Place the arm on the injured side in a large arm sling or support it on a bundle of clothing.

Dress any external wound. If air is being sucked in and blown out of the chest put a large pad dressing over the wound and bandage it lightly round the chest.

Do not give anything to drink.

Get the patient to hospital on a stretcher in an ambulance as quickly as possible and tie a label on him with an X marked upon it.

HANDLE THE PATIENT WITH THE UTMOST CARE.

(iii) Wounds of the Eyes

These may be caused by particles of dust, stones or wood blown into the eyes, or more serious injuries may be due to fragments of metal from bombs or by splinters of glass which have penetrated the eyeball. The pain these injuries produce, whatever they are, is intense and shock is often very marked.

First Aid Treatment

Do not attempt to examine the eyes at an incident or to remove any particles which may have got into them. Your hands will be dirty and you will only do more harm than good by trying to open the eyes to see what the damage is.

Never attempt to wash out the eyes but cover one or both eyes if affected with a dressing and bandage lightly but securely in position. (N.B.—The only exception is in the case of contamination of the eyes by mustard gas when they should be washed out thoroughly with water as soon as possible.)

Protect the casualty from further shock and send him to hospital as a stretcher case as soon as you can. There he will receive expert treatment by an eye specialist.

CHAPTER VII

FRACTURES

SEE DIAGRAM OF SKELETON

41. Cause of Fractures

A fracture is a broken bone. Those fractures with which you are principally concerned are caused by :—

(i) DIRECT VIOLENCE

When a missile such as a bomb splinter, a piece of brick or falling debris strikes a bone and breaks it at the point where it is struck this is known as a “fracture by direct violence.”

(ii) INDIRECT VIOLENCE

A bone may be broken at some distance from the place where violence is actually applied. For example if a man falls heavily on an outstretched hand he may break the collar bone on that side without injuring the hand ; a person jumping from a height and landing on his feet with his legs held stiffly may break his back. This is known as a “fracture by indirect violence.”

42. Types of Fractures which you must be able to recognise are :—

(i) A CLOSED OR SIMPLE FRACTURE.

This results from an injury which breaks a bone without causing any external wound at the site of the break.

(ii) AN OPEN OR COMPOUND FRACTURE.

With this type there is a wound of the skin at the site of the fracture, and this allows communication between the outside air and the broken bone, hence the term “open.”

(iii) A COMPLICATED FRACTURE.

When the sharp jagged ends of a broken bone damage an internal organ such as the brain or lungs, or tear some important blood vessel or nerve, this is known as a “complicated fracture.”

A “closed” fracture may be made “complicated” or “open” by rough handling.

43. The Symptoms and Signs of a Fracture are :—

SHOCK—Always present in some degree with any fracture. May be severe.

PAIN AND TENDERNESS at the site of the fracture, quickly followed by bruising and swelling.

BLEEDING if there is an open fracture.

LOSS OF POWER in the affected part. Generally speaking if a limb is broken it cannot be moved, and never without pain.

IRREGULARITY on the surface of the bone e.g. on the collar-bone or the bone of an arm. In an open fracture the ends of the broken bone may be sticking out of the wound.

DEFORMITY AND UNNATURAL MOVEMENT. You may find a person's leg which has been broken crumpled up underneath him with the foot turned round the wrong way. The bones of the leg may be bent in a place where there is no joint e.g. between the knee and the foot if both bones of the leg are broken.

CREPITUS. This is a grating sensation which may sometimes be felt and even heard and is caused by the ends of the broken bone rubbing one against the other when moved. *On no account* must a first aider ever try to obtain this sensation by rubbing the ends of the bone together. By doing so he may make the break worse, and in any case will cause much pain and increase shock.

44. First Aid Treatment of Fractures

When all the above symptoms and signs are present in a person who has perhaps injured a limb you will find it fairly easy to spot the injury as a fracture. In many cases, however, the only information you will be able to obtain will be from the casualty himself (who may say he heard a bone snap), or from bystanders who witnessed the injury; symptoms and signs may be few. Severe pain and swelling with inability to move a limb following an injury should always make you suspicious of a fracture. If you are in any doubt as to whether there is a fracture or not you must treat it as if there is one.

Lay the patient down. This will lessen shock. If you suspect a fracture of the skull raise his head and shoulders a little and support them.

Stop bleeding if the fracture is open, and apply a dressing. In all open fractures there is some bleeding, but it can generally be stopped by putting on a dressing and bandaging lightly. If bleeding continues you will have to use indirect pressure, especially if the bleeding is from an artery.

Place the casualty in the position most comfortable to him and protect him from further shock, with the means at your disposal.

Immobilise the fracture. By this is meant to fix the damaged part so that any movement by the patient or by you cannot cause the broken bone to move, as this will increase the deformity, cause great pain, and make his shock worse. *Only when you have secured the fracture* should you consider moving the patient, and not before.

Remember that it is not your job to try to "set" a fracture, so if it is a limb which is broken try if possible to fix it in the position in which you found it, using the utmost care and gentleness and moving it as little as you can. If the limb is distorted call for a doctor or someone more experienced in first aid than you are. *Do not try to straighten the limb yourself* or to push back any pieces of bone sticking out of an open fracture.

45 How to Immobilise a Fracture

The instructions below relate entirely to fractures in the upper and lower limbs; fractures in other parts are described separately.

The two methods adopted for immobilisation are :—

By using unyielding substances such as wood, metal and the like as splints.

By using the trunk as a splint in the case of fractures of the upper limbs, and the opposite limb (if uninjured) in the case of fractures of the lower limbs. This method is known as "body splinting."

(i) **PREPARED SPLINTS** are made from pieces of wood or metal cut to the desired shape and length so that they can be bound to a broken limb to prevent it from moving. As they are hard substances *they must always be padded* with cotton wool, lint or anything soft such as articles of clothing before they are placed next to a limb. Each splint must be sufficiently long to keep not only a broken bone from moving *but also the joints above and below the fracture*. Thus, if a bone in the forearm is broken the splint must reach above the elbow and extend below the wrist. Splints are fastened to a broken limb by triangular bandages, straps with buckles, or, as improvisation, ties, pocket handkerchiefs and the like can be used. Splints can be applied next to a limb or over the clothing covering it. *The knots in bandages or buckles of straps must always be fastened on top of the splint never on a limb.*

(ii) **IMPROVISED SPLINTS.** As prepared splints may not be available when you need them you will have to improvise substitutes for them. Such things as walking sticks, folded umbrellas, pieces of wood from debris, tightly rolled up newspapers with a stick in the middle, maps and the like make excellent splints, provided they are firm enough and sufficiently long and wide to fulfil the purpose.

N.B.—Never forget to pad splints, and do not tie bandages too tightly so that they stop the circulation in a limb.

(iii) **BODY SPLINTING.** It is not only often extremely difficult to obtain any material for splints or to apply them under the conditions which exist during air raids especially by night, and moreover, searching for splints or their substitutes and applying them will only delay the despatch of a casualty to hospital and increase his shock by the handling which the application of the splints necessarily entails. If therefore you find a casualty with a broken collar bone, or broken bones in an arm or hand secure the affected limb to the body with triangular bandages, with a final one as a sling, thus using the body as a splint. Put padding between the limb and the body before securing.

In the case of the lower limbs if a thigh bone or the bones of one leg are broken put pieces of padding material between the knees and the ankles and first of all tie the feet together with a triangular bandage. Next fasten narrow fold triangular bandages over pieces of padding above and below the fracture, whether of a thigh bone or bones of the leg. Pass a broad-fold triangular bandage round both thighs and below both knees tying the knots over padding on the sound limb. If a long wooden prepared splint or substitute is readily available this may be used for a fractured thigh in addition, provided that its application does not increase the delay. It should reach up as far as the armpit and be secured to the chest by a broad-fold bandage passed round it over the splint and extended below the feet.

46. Special Fractures

There are some fractures which cannot be treated by splints, but require special recognition and treatment. Examples are given below.

(i) Fracture of the Skull

The skull is a rounded closed bony box which contains the brain. It consists of a domed top, flat curved bones with their convex surfaces outwards forming the forehead, sides and back of the head, and a flat bottom. This part of the skull is called the "*cranium*" to distinguish it from the face, its top portion is called the "*vault*" and its bottom the

"base." Upon this "base" the under part of the brain rests, the remainder filling up the bony cavity but not quite touching the bones. The brain itself which is roughly the same shape as the box, is whitish-grey in colour, weighs about three pounds in a normal adult and, on account of its shape and wrinkled surface is often likened to a gigantic walnut. It is made up of an enormous number of nerve cells, nerve fibres and blood vessels, so it can easily be imagined how serious any damage to it can be.

The parts of the skull most likely to be fractured are :—

- (a) The vault.
- (b) The base.

(a) FRACTURE OF THE VAULT

Due to *direct violence* e.g. a blow or fall upon the head, and may be "open" or "closed."

The skull cap may be crushed or splintered and pieces of the bone driven inwards on to the brain forming a "*depressed fracture*." *Bleeding* which accompanies the fracture may be unable to escape outwards so pours into the skull and presses upon the brain, causing what is known as "*compression of the brain*." With every fracture of the skull there is bound to be some bleeding but this does not always press upon the brain. In most cases of injury there is a shaking up or stunning of the brain, which produces "*concussion of the brain*." This varies in intensity, according to the severity of the injury, from a headache and dazed state which passes off, to complete unconsciousness.

(b) FRACTURE OF THE BASE OF THE SKULL

Generally due to *indirect violence* as for instance, by a blow upon the jaw, or when a person falls from a height and lands upon his feet or buttocks. In such cases the "base" or shelf within the skull, upon which the brain rests, is cracked or broken and, as in a fracture of the vault, bleeding occurs and may press upon the brain.

It will be seen from the above that the main dangers of a fractured skull are its effects upon the brain and nervous system. Of these effects *concussion* by itself is the least severe, and may pass off without serious consequences. If, however, blood is pressing upon the brain, and continues to do so, a casualty will become rapidly worse and his life will be in great danger from *compression*.

It is therefore of the utmost importance for you as a first aider to be able to know what to look for so that you can find out if a skull is broken, and if so, whether it is causing pressure upon the brain by pieces of bone or bleeding, or not.

In any case you must regard every fracture of the skull as serious and *bear in mind* that even if signs of compression of the brain do not come on at once they may do so later.

In consequence, get a doctor to see the casualty as soon as you can so that he can be removed to hospital with the least delay.

Symptoms and Signs

The following *symptoms* and *signs* presented by a casualty suffering from *concussion* or *compression* of the brain should help you to arrive at a decision.

(c) CONCUSSION OF THE BRAIN

Headache and giddiness, perhaps vomiting. May only last a few seconds or minutes then pass off or, if the blow is severe, unconsciousness may come on at once and last for several hours.

All signs of *shock* are present (e.g. face pale and cold, pulse feeble and quick, breathing quiet and shallow).

The *pupils of the eyes* are as a rule equal in size and become small when a light is shone into them regaining their normal size when it is removed. The same effect is produced in daylight by simply covering the eyes with a hand for a moment and then removing it.

You must remember, however, that it is often extremely difficult to examine the eyes of a casualty at an incident, and moreover you can do damage to them by opening them with dirty fingers and allowing dust and grit to get into them. Never attempt to do this yourself, especially in the case of an unconscious casualty. It is far better to carry out necessary first aid and send him to hospital as soon as possible whether you suspect him to be suffering from *concussion* or *compression*.

If you lift the arms or legs of the casualty off the ground you will not get any feeling of limpness in them as will occur if they are paralyzed; moreover, the casualty will not complain of numbness or loss of sensation in them. An unconscious casualty will frequently vomit when he regains consciousness. This is a fairly constant sign. A confused mental condition may persist for a time after he is quite conscious, and he may remember nothing of what has happened to him.

(d) COMPRESSION OF THE BRAIN

Signs of compression may follow directly upon those of concussion, or after an appreciable interval. Sometimes a casualty may seem to have recovered from concussion but later symptoms and signs of compression appear. This may be due to bleeding inside the skull, lessening or stopping on account of shock and then restarting as the patient recovers from this.

Severe headache and restlessness. Twitching of muscles of body or of one or other limb on one side only. As bleeding continues twitchings cease and limbs become limp and placid. Unconsciousness may soon develop.

Face is flushed and hot.

Breathing is slow and snoring. The cheeks are puffed in and out with every respiration.

Pulse is slow but forcible.

Both pupils of the eyes are larger than normal and one is *larger* than the other. They do not become smaller in the presence of light.

If one or other or both limbs on one side are raised they will feel *lifeless* and *limp* compared with those of the other side. If the patient is conscious he will say that they are numb and he cannot feel you touching them.

(e) SYMPTOMS OF FRACTURE OF THE BASE OF THE SKULL

Symptoms and signs are usually those of concussion or compression, often there are only signs of concussion with a bruise on the head to account for them.

Loss of consciousness does not always occur.

Bleeding from the nose and ears, sometimes the mouth, or into one eye making it blood-shot.

N.B.—If in addition to a head injury you find these signs you must always suspect a fracture of the base of the skull.

(J) FIRST AID TREATMENT OF FRACTURED SKULL

Lay the patient down with his head on a pillow, rolled up blanket or clothing. Apply a mine dressing over any wound and bandage lightly. If you suspect a depressed fracture put a *built-up sterilised pad dressing* round the wound before putting a dressing on top, and bandage lightly. If blood is coming from the ear, nose or mouth, put a light dressing over the *ear only* to prevent germs getting in. Turn the patient's head towards the side from which blood is escaping and *make no attempt to plug the ear or to stop the bleeding. Protect from further shock. Give nothing to drink, even if the patient recovers consciousness, in case he may vomit. Get a doctor as quickly as you can.*

The casualty must be sent to hospital on a stretcher in an ambulance at the earliest opportunity. If unconscious his head must be turned to one side and supported in that position by sandbags to prevent movement.

(ii) Fracture of the Lower Jaw

This may be caused by a blow on the jaw from a flying missile, such as a brick, and there may be little or no external wound, or a portion of the jaw may be carried away by a piece of H.E. bomb, leaving a gaping wound with profuse bleeding.

(a) FIRST AID TREATMENT

Warn the casualty not to try to speak and apply a clean dry dressing (e.g. shell) to any external wound.

With the patient leaning forward support the lower jaw with the palm of one hand, gently pressing the teeth of the lower jaw against those of the upper; then apply a bandage to maintain this position. The best form of bandage which is simple and easy to apply is the "*barrel bandage*." This should be used when there is a danger of the tongue slipping backwards into the throat and blocking the windpipe. To apply this bandage, without relaxing support of the jaw, place the centre of a narrow fold triangular bandage under the jaw and well back over the dressing. Carry the ends of the bandage upwards in front of the ears and loosely tie the first loop of a reef knot on top of the head. While an assistant supports the jaw, hold the loose ends in your hands and with your fingers open out the knot on the head to form two loops, one passing forwards and the other backwards. Guide the forward loop on to the forehead just above the eyebrows, and carry the backward loop to the back of the head just above the nape of the neck. Gather up the free ends of the bandage and adjust them so that each cross-over is just in front of an ear. Then tie them on top of the head. (*See Fig. 24.*)

(b) TRANSPORT

If the patient is fit to travel to hospital as a sitting case he should sit with his head held forward and downward with his open hand supporting the chin.

If he is a stretcher case he must be placed face downward with a small pad under his chest so that his head hangs forward and his tongue cannot fall backwards into his throat. A second small pad placed under his



Fig. 24
Application of Barrel Bandage.

forehead is useful as a support. A bowl is placed beneath his face to catch blood or vomit, and of course he must be watched by the ambulance attendant during the journey to hospital.

(iii) Fracture of Collar Bone

Generally a closed fracture but may be open as a result of being struck by a fragment of bomb or debris.

(a) SYMPTOMS AND SIGNS

Severe pain, swelling and tenderness at the site of injury, with irregularity along the surface of the bone, especially marked in a thin person.

Deformity of the shoulder, the rounded portion being flatter than the sound side.

Some loss of power in the limb. The patient cannot raise the arm above the shoulder and, as the pain is increased when the arm hangs down, supports the arm at the elbow with the opposite hand, and bends his head towards the injured side to ease the strain on the muscles of the neck. A characteristic attitude.

(b) FIRST AID TREATMENT

Dress any external wound after removing sufficient clothing to expose it. Place a pad about the size of a man's fist in the armpit ; put the arm close to the side with the forearm across the chest, the open hand pointing towards the opposite shoulder. Apply a sling and bandages as shown in Fig.25. *Feel the pulse* at the wrist on the injured side to make sure that the pad in the armpit is not stopping circulation.



Fig. 25

Treatment of Broken Collar Bone.

If both collar bones are broken

(1) Three triangular bandages are necessary. A narrow-fold bandage is passed over each collar bone and through the armpits over a pad placed in each and tied with a reef knot to form rings round the shoulders, leaving the ends of the bandages free. Tie these ends together over a large pad of dressing in the middle of the back so as to brace back the shoulders and correct any deformity of the broken bones.

(2) Cross the patient's arms on his chest and apply a broad-fold bandage over the arms and round the body to act as a double sling. Tie the knot of the bandage below the wrists. (See Fig. 26.)

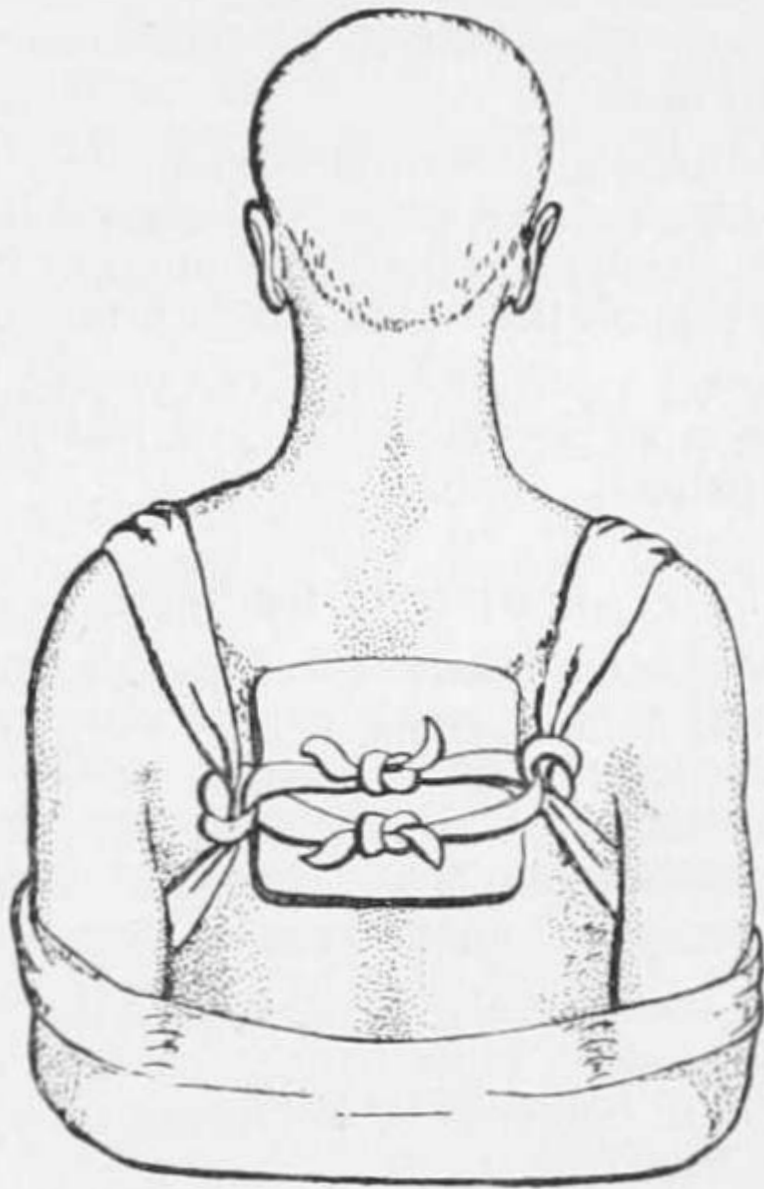


Fig. 26
Treatment of Both Collar Bones Broken.

(iv) Fractured Ribs

May be broken by *direct violence*, such as a blow on the chest from a bomb fragment, debris or a fall, or by *indirect violence* when pressure is applied to the back and front of the chest and the ribs bend outwards and break at a point away from the site of the pressure.

(a) SYMPTOMS AND SIGNS

These depend upon whether the broken ends of the ribs are driven into the lung by *direct violence* or not, as in the case of *indirect violence*.

The chief are :—

Severe pain in the chest at the site of fracture, made worse by breathing deeply or coughing. Tenderness is present at once, swelling and bruising may appear later.

If a lung is damaged bright red blood mixed with froth is coughed up and difficulty in breathing occurs.

An open wound over the fractured area which allows air to be sucked into and blown out of the lung with a whistling sound, is a *very serious condition*.

Shock is always present to some degree with broken ribs, but is very marked when a lung is damaged.

(b) FIRST AID TREATMENT

For a closed fracture with no lung injury, place the centre of a broad-fold bandage just below the site of the fracture and tie it on the opposite

side of the chest. As the patient breathes out the knot should be firmly tied. A second similar bandage is then placed with its centre just over the fracture, so as to overlap the first bandage by half its width.

Support the arm on the injured side in a large arm sling, place the patient with his body inclined towards the injured side, supported by a folded blanket at his back.

If a lung is injured dress any external wound. If air is going into and coming out of the lung through the wound place a large pad dressing over the wound and bandage lightly. Do not apply bandages as for a closed fracture, but support the arm in a large arm sling.

Protect from further shock and send the patient to hospital as a stretcher case as soon as possible. Call a doctor if available at the incident to see the patient.

(v) Fracture of the Spine

This fracture commonly known as a "broken back" is especially serious on account of damage which may be done to the spinal cord contained within the bony framework of the backbone. This is likely to happen if, in addition to a fracture, one or more bones of the spine are dislocated and press upon, or even sever the spinal cord.

This fracture is caused as in other fractures by :—

DIRECT VIOLENCE such as a blow on the spine from falling beams or debris, especially if a person is stooping at the time ; by the impact of a fragment of bomb, or by falling against a hard object such as a wall, railing or ladder, or by :—

INDIRECT VIOLENCE as when a person jumps from a height or from a moving vehicle and lands on his feet with the legs held rigid.

(a) SYMPTOMS AND SIGNS

Pain and tenderness at the site of injury aggravated by any movement.

Shock always present but very marked when the spinal cord is damaged.

A wound may be present, or swelling and bruising over the injured area.

A casualty may be either *conscious* or *unconscious*. Where the spinal cord is uninjured a casualty is generally conscious, and may even be able to walk. With severe damage to the spinal cord in most cases he will be unconscious.

Paralysis and loss of sensation in the limbs shows that the spinal cord is injured ; either the arms or the legs only or both may be affected.

All first aiders must remember that a broken back need not necessarily cause paralysis, only when the spinal cord is damaged does this occur. They must therefore not assume that a back is not broken because there is no paralysis.

(b) FIRST AID TREATMENT

If you suspect that a casualty has a fractured spine, call a doctor at once if one is available at the incident and, pending his arrival, warn the patient not to move and, without moving him, keep him warm with blankets or clothing and hot water bottles. (N.B.—As the patient may

have lost the feeling in his limbs special care must be taken to prevent the bottles from burning them.)

If no doctor is available summon expert assistance before you attempt to do anything further.

With this assistance put pads between the ankles, knees and thighs and tie a figure 8 narrow fold bandage around the ankles and feet, fastening the knot under the soles. Tie broad-fold bandages around both knees and thighs over the pads placed between them.

(c) REMOVAL FROM THE INCIDENT

Special attention must be devoted to this since any error may have grave consequences.

In moving or lifting the patient his spine *MUST NOT* be bent or twisted in any way. He must be carried lying *ON HIS BACK* wherever the injury to the spine may be. If he is found in some other position, he must be very carefully turned over *IN ONE PIECE* by two or more helpers, four if possible.

A stretcher with a blanket folded lengthwise upon it is brought close to the patient. A Civil Defence stretcher is the best type to use as its bed portion is rigid and flat. If a wood and canvas stretcher has to be used, it should if possible be made rigid and flat by placing transverse boards on its bed portion. If a stretcher is not available a door, shutter or plank of suitable length are excellent substitutes. (*N.B.*—See that neither the blanket nor the patient's clothes are wrinkled when he is laid upon the stretcher.)

The lifting and placing of the patient upon the stretcher should be done in one of the following ways according to the material and the number of helpers available—*taking particular care* to see that the whole length of the patient's head, back and legs are *kept straight* in one line.

By Blanket lift

(a) Five helpers are required, especially where the spine is dislocated, but if not available not less than four can just manage. A blanket is placed lengthwise on the ground in line with the patient and rolled up for half its width.

One helper supports and very gently pulls on the feet and legs while another does the same to the head, as the other helpers carefully turn the patient on to his side. The rolled up portion of the blanket is then placed close to the patient and he is gently replaced on his back upon the unrolled portion of the blanket. The rolled portion is then unrolled so that he lies in the centre of the blanket. The two edges of the blanket are then rolled up against the patient's body and grasped by a helper at each side, one hand under the buttocks and small of the back and the other under the shoulder blades. Without releasing the traction on the head and feet all four helpers lift the patient carefully and evenly while the fifth helper slides a stretcher beneath him. If no one is available for this the helpers should move with short smooth side paces until they reach the stretcher and gently lower the patient on to it, having previously placed upon the stretcher pads made of clothing rolled up, or folded triangular bandages, large enough but not too large to preserve the normal curves of the spine. These pads should be placed so as to be under the neck and small of the back when the casualty is laid upon the stretcher. (*See Fig. 27.*)

To prevent any movement of the casualty while being carried on the stretcher or loaded into the ambulance, triangular bandages should be passed over his chest, hips, below his knees, and tied to the stretcher poles on each side. Sandbags or rolls of clothing should be placed on each side of the head to keep it steady.

(b) If a blanket is not forthcoming, the patient's coat may be opened out and rolled firmly up against the sides of his body. The helpers on each side grasp the rolled up coat and the clothing round his thighs while other helpers support and maintain traction on his head and legs.

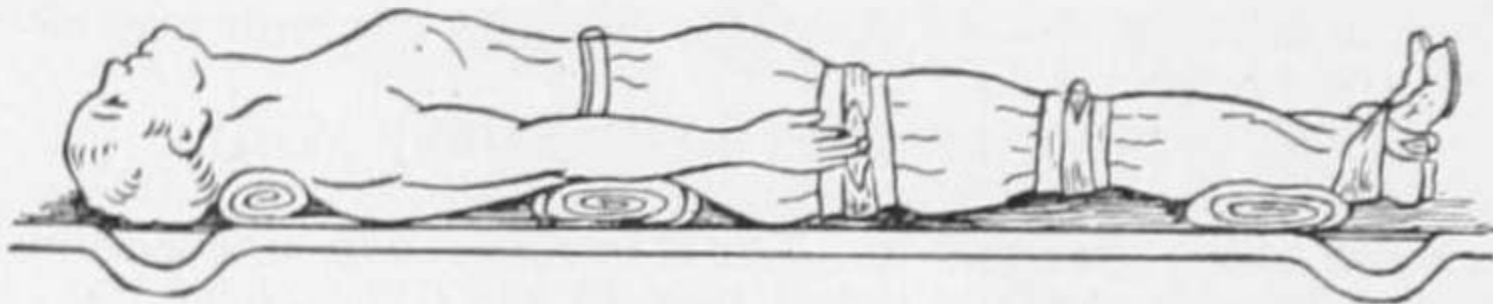


Fig. 27
Stretcher Pads for Spinal Injuries.

By Webbing Bands.

This method is particularly useful when casualties are found lying on uneven surfaces or in enclosed spaces where it is difficult for rescuers to work. A reference to Figures 28, 29, 30, 31 and 32 will show how these webbing bands are used for placing under a casualty and for lifting him.

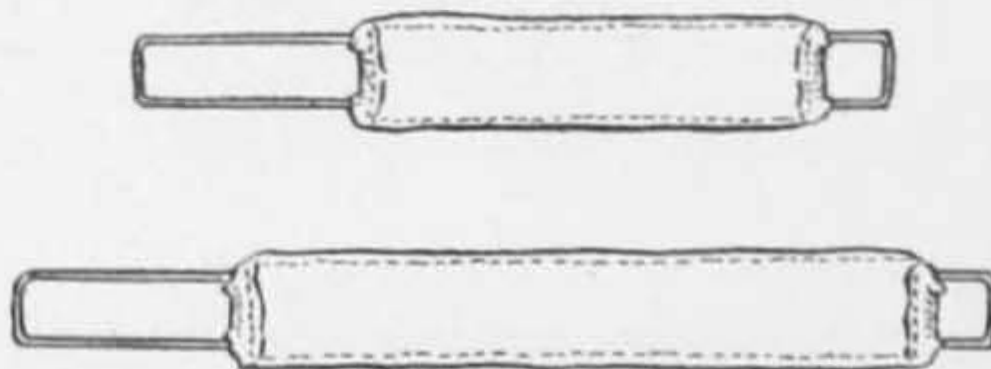


Fig. 28
Webbing Bands.



Fig. 29
Placing under Casualty.



Fig. 30
Lifting Casualty.



Fig. 31
Webbing Bands as applied near wall. Placing Band under Casualty.

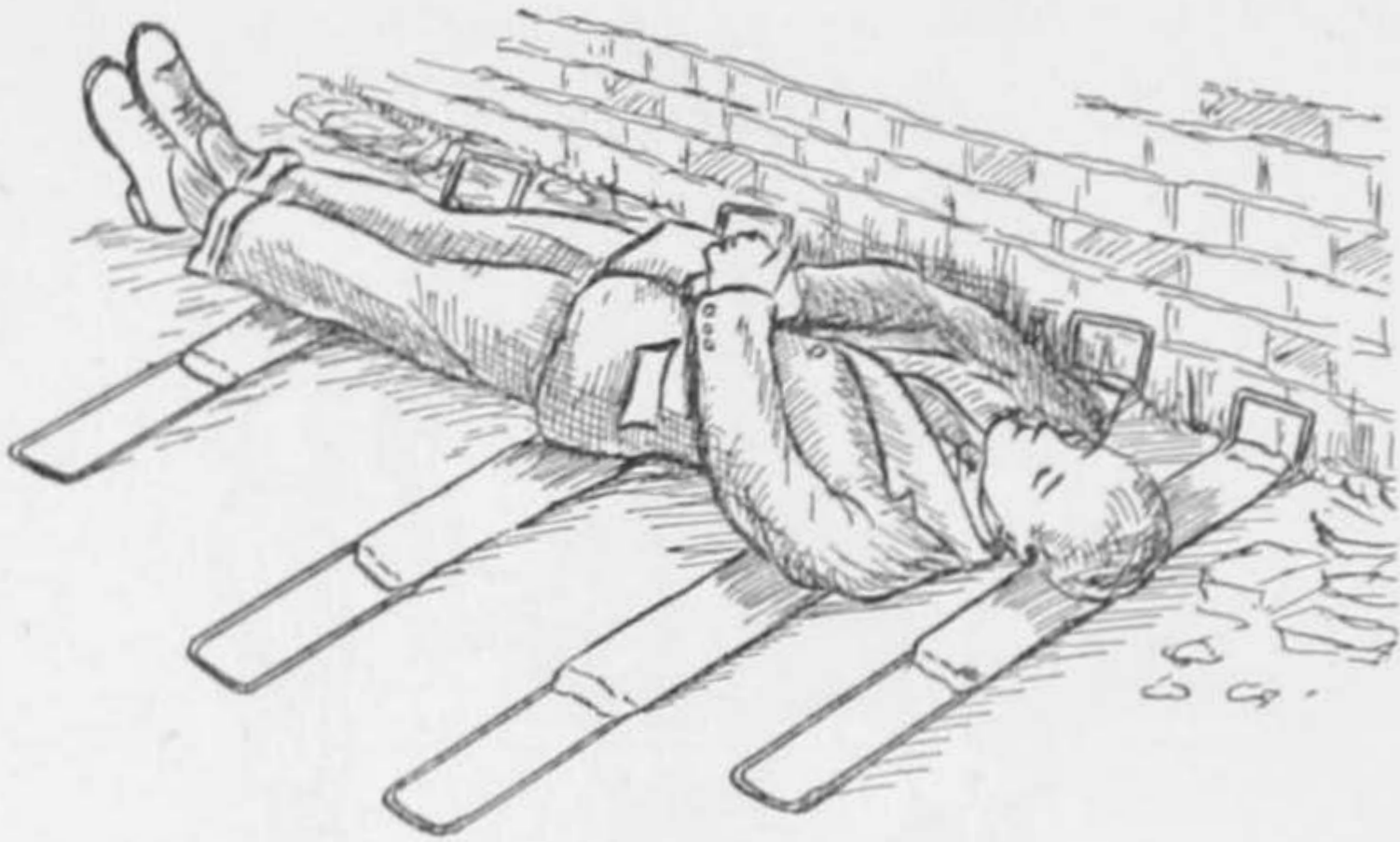


Fig. 32

Bands correctly placed for lifting.

CHAPTER VIII

SUFFOCATION (ASPHYXIA)

51. Definition and causes of Suffocation

Suffocation is a condition in which normal breathing is interfered with or stopped.

There are many causes of suffocation, and these are classified under separate headings with examples of the types which you are likely to meet among air raid casualties.

Inability to breathe because the air passages are obstructed.

By mechanical means.

Examples are blocking of the nose and mouth by dust and dirt (e.g. from damaged buildings) ; a dislodged dental plate stuck in the throat of an injured person, especially one who is unconscious ; inhaling blood into the lungs from a broken jaw, or food or liquid which has been vomited into the mouth and then sucked down into the lungs. Drowning is a classical example of this form of suffocation, but you are not likely to meet many cases of this.

By pressure on the air passages.

Examples are pressure on the chest by fallen masonry, and beams or when persons are buried under debris ; crushing of the chest when people are jammed tightly together in a crowd. An instance of this occurred during the last war when a large number of people died as the result of a panic at a London tube station used as a shelter.

Paralysis and spasm of the mechanism of breathing.

Cases of this are most likely to be met with in persons who are in contact with a "live" electric wire in a damaged building or on a road.

Spasm of the breathing muscles with stoppage of breathing occurs during an epileptic fit, or in young children with convulsions. You may meet cases of these conditions brought on by fear and excitement during air raids.

Breathing certain poisonous gases.

CARBON MONOXIDE, a very poisonous gas, is present in gas escaping from broken mains, damaged gas ovens and the like ; the fumes from a H.E. bomb in a closed space ; during tunnelling operations by Rescue personnel, and may cause serious interference with breathing and frequently death from suffocation.

Certain gases used in industrial concerns, two examples of which are ammonia and chlorine.

In chemical warfare phosgene and other lung irritant gases.

52. General symptoms and signs of Suffocation

These depend on whether the suffocation is partial or complete ; the former may pass on to the latter.

(i) PARTIAL SUFFOCATION

A person finds difficulty in breathing and becomes restless. Breathing becomes jerky and a struggle takes place to remove any obstruction and obtain air. A man tears at his throat and clothing.

Coughing and spluttering. Where the throat is partially blocked there is a whistling sound as the air passes through the narrowed opening.

The face becomes livid ; the veins in the neck stand out like cords and are filled with blood ; the lips and finger nails turn blue ; the eyes protrude and are staring and blood-shot.

Unconsciousness follows slowly or quickly and may pass on to :—

(ii) COMPLETE SUFFOCATION

The first stage of restlessness and fighting for breath may last up to five minutes, according to the degree of obstruction. Complete unconsciousness follows and breathing entirely stops. Within a short time the heart stops beating.

53. First Aid for Suffocation

THE FIRST STEP is to remove the casualty from the source of danger, for example :—

A gas or smoke filled room, a live electric wire, or the source of danger from the casualty, such as debris or pieces of furniture lying upon him.

You have already learnt how to get a person out of a burning room and how to protect yourself and him while doing it. Remember, you will not be protected if you put on your respirator when entering a room filled with coal gas, as the respirator gives no protection, and is in fact a danger because it masks the smell of the gas and its filter gets clogged up with smoke particles. If you do put on a respirator its filter must be covered by such things as a pocket handkerchief, towel, or an old sock. The Breathing Apparatus used by the Rescue and Fire Services is invaluable in gas-filled rooms or in tunnelling operations. In many cases it is sufficient for a rescuer to take a deep breath and hold it.

Contact with a live wire. Do not attempt to drag a person away from contact with a live wire without first protecting (insulating) yourself, otherwise you will receive a shock which may be fatal. If the current cannot immediately be switched off, you must first if possible try to find something which is a non-conductor of electricity to stand on. Rubber is ideal but is seldom available. Other things are a thick piece of wood or glass, bricks, a piece of linoleum, a mackintosh folded several times or a thick layer of straw. *Whatever is used it must be dry ; anything moist conducts electricity.* Try to pull the person off the wire with a dry wooden walking stick with a crooked handle covered with several pieces of dry newspaper, or another folded mackintosh. (*N.B.—Never use an umbrella as its metal ribs are conductors, and it may have a metal stick.*) Other things to protect your hands are rubber gloves, a rubber tobacco pouch, dry hot water bottle, a thick roll of dry newspapers or a dry coat. It may be possible for you to free the casualty by throwing a dry coat held by the sleeves over his head, or using a loop of dry thick rope.

THE SECOND STEP is rapidly to make certain that the nose and mouth are not obstructed in any way, and to clear them if they are.

THE THIRD STEP is to loosen all tight clothing and commence artificial respiration at once (this means the restoration of normal breathing by artificial means) if the casualty has stopped breathing. At the same time the body temperature and the circulation must be maintained by blankets and hot water bottles while artificial respiration is in progress. Try and get the casualty to a safe place if you can, and discourage onlookers who may impede you and prevent your patient from having all the air he needs.

54. How to carry out Artificial Respiration

(i) BY SCHAEFER'S METHOD

This can be done by one person only, using his hands. It is simple and easy to apply, consequently it should be used at an incident as it is of the utmost importance to "get cracking" at the earliest possible moment; every second's delay makes recovery less likely. (See Fig. 33.)

Instructions.

(a) Lay the patient down flat on his face *with his head turned to one side* and his arms laid forward above his head. This position helps the flow of anything from his mouth, and is particularly useful in cases of drowning; moreover, his tongue cannot fall back into his throat and block it up if he is unconscious, as it would otherwise do were he lying on his back.

(b) Kneel beside or astride the patient's thighs facing his head and place the palms of your hands on the small of the back on each side of the spine, the wrists nearly touching, the thumbs close to one another and the fingers fitting into the soft part on either side between the ribs and the hip bones.

(c) Keeping the arms straight bend your body slowly forward from the knees and hips until your shoulders are directly above your hands and your weight is pressing on the patient's back. This presses his belly against the ground and compresses the contents of the belly against the diaphragm and lungs driving air out of them. As you swing forwards count slowly—one—two or—twenty-one—twenty-two to obtain the correct timing in seconds. (N.B.—Do not press too hard. Remember that the muscles of an unconscious person cannot resist, so too heavy pressure may rupture the liver or break ribs.)

(d) Without moving your hands swing your body slowly backwards to its original position, thus relaxing pressure upon the back. The contents of the belly now fall back into their normal position the diaphragm descends and air is sucked into the lungs. While you are doing this count slowly—one—two—three or twenty-one—twenty-two—twenty-three.

Repeat this forward and backward movement twelve times a minute (two seconds for pressure, three seconds for relaxation). When natural breathing re-appears regulate your movements to correspond with it. Wrap the patient in blankets and apply hot water bottles. *Rubbing the legs and arms towards the heart restores the circulation but this should not be done until breathing recommences.*

CAUTION 1. This method must not be employed when there is an injury involving possibly a broken back or injury to abdomen. In such a case the following should be used, omitting Schaefer's method and putting the casualty straight on to a stretcher for rocking.

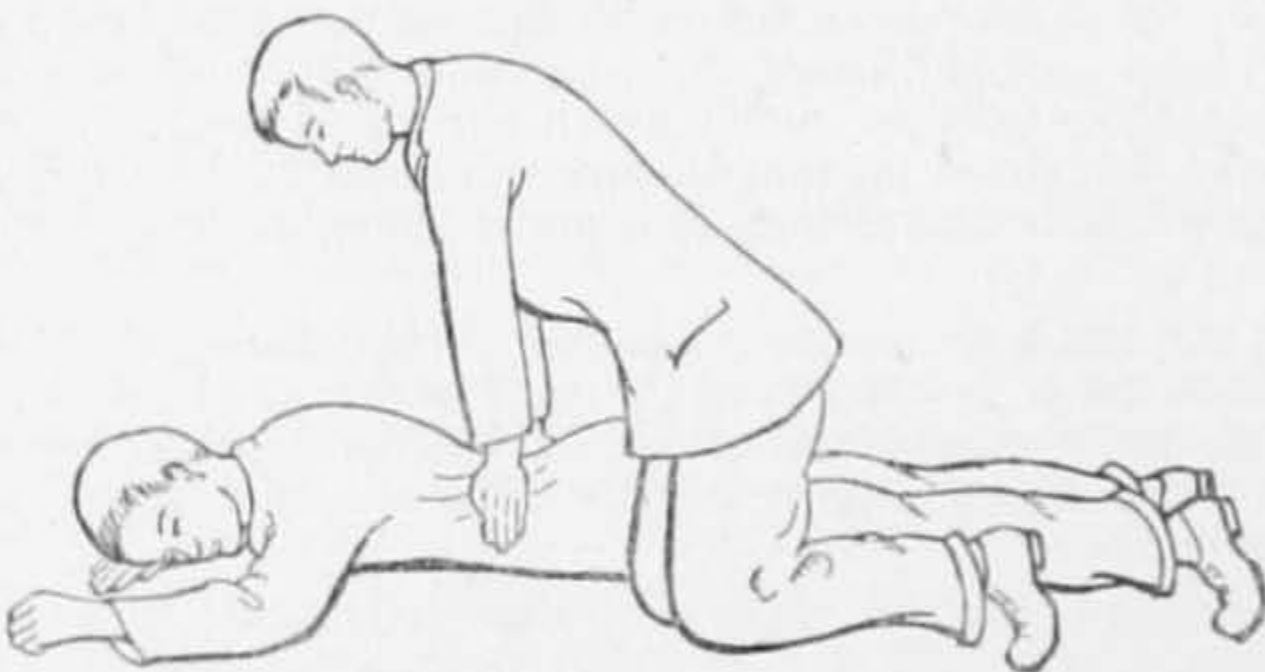


Fig. 33

Schaefer's Method of Artificial Respiration.

(ii) EVE'S ROCKING METHOD OF RESUSCITATION

This is an effective supplementary method which can be used after artificial respiration has been started by Schaefer's method. Its principle is that by rocking a person, with a "see-saw" motion, the weight of the belly contents moves the diaphragm up and down, alternately driving out and sucking in air as in Schaefer's method. One person can carry out the rocking, but two are required for the preliminary stages. (See Fig. 34.)

The materials required are a plane (stretcher, door or broad plank) to which the casualty can be fastened, a fulcrum on which the plane can be rocked, and nails, chocks or other means to prevent the centre of the plane from slipping on the fulcrum during rocking. No time must be lost in changing over from one method to another. The stretcher and fulcrum (a trestle is best) are brought alongside the casualty (already being treated by Schaefer's method) and he is rolled on to the stretcher face downwards, with his head turned to one side, and Schaefer's method is continued while wrists and ankles are bound to the stretcher.

The stretcher is then lifted on to the fulcrum and rocking through an angle of 45° (half a right angle) commenced at the timed rate of nine

rocks per minute (four seconds head down, three seconds feet down). *Warmth is essential* to restore the circulation while this is being done, and blankets and hot water bottles must be used for this purpose.

If a trestle (2' 8" high is best) cannot be obtained, a rope slung from a beam, a broken wall, a builder's two-wheel cart or two chairs back to back can be used as improvisations. A reference to the diagram will make the above clear.

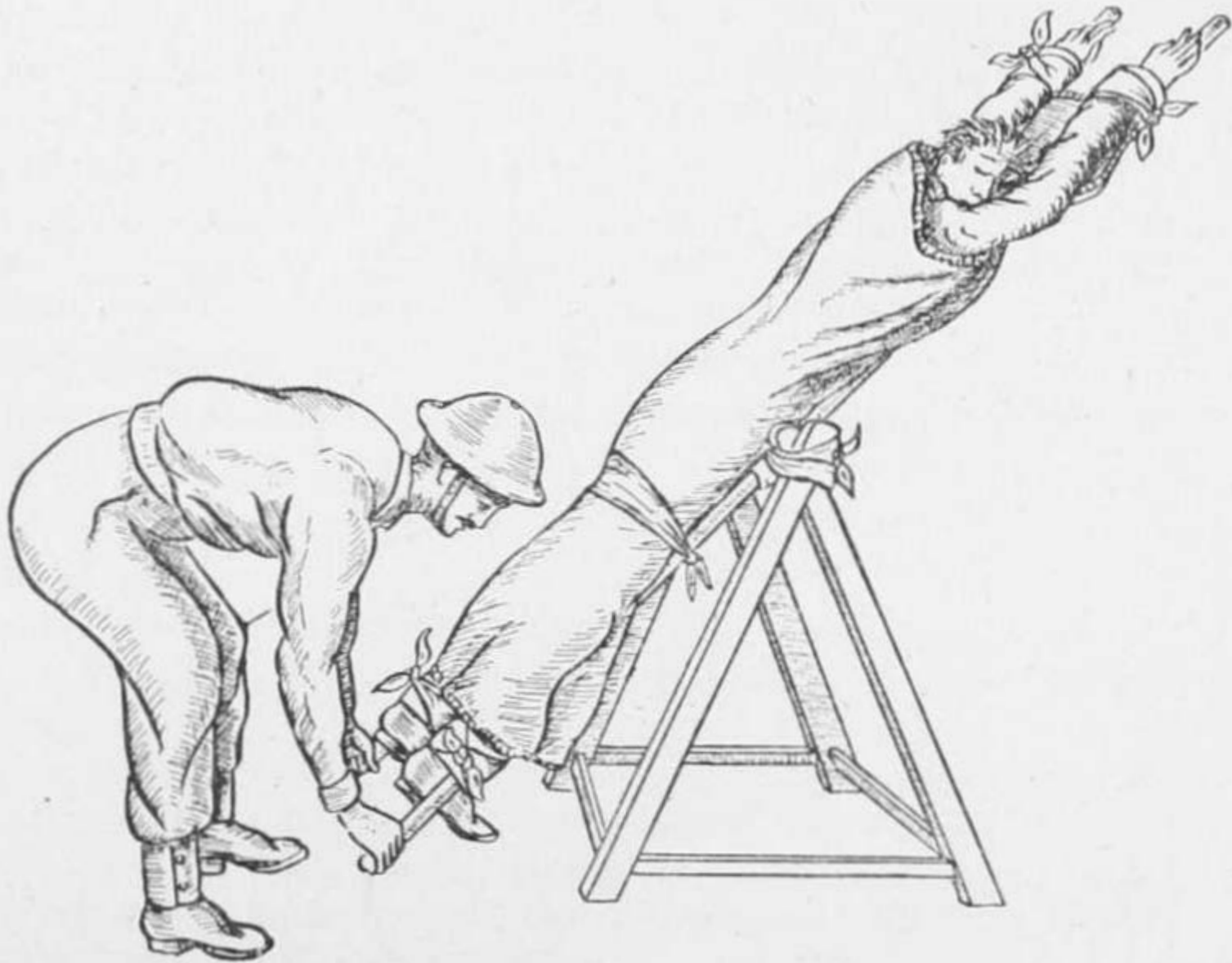


Fig. 34

Eve's "Rocking" Method of Resuscitation.

CAUTION 2.

Artificial respiration by any method *must never* be performed on persons poisoned by phosgene or other lung irritant gas, or on people injured by blast.

CHAPTER IX

BURNS AND SCALDS

59. Causes of Burns and Scalds

Both burns and scalds are caused by heat, the one by flame or dry heat, the other by hot fluids or steam ; the effects are very similar.

A BURN IS CAUSED BY :—

Dry heat, such as fire ; hot or molten metal ; the flash of a bursting bomb or ignited petrol. Unprotected hot water bottles are often a cause of burns, especially when used with unconscious patients.

A live electric wire ; a live rail ; by lightning.

Strong acids, such as sulphuric, and strong alkalis such as quick lime.

A SCALD IS CAUSED BY :—

Wet heat, such as boiling water and steam.

Hot oil or tar.

Boiling cooking fat and the like.

For the purposes of first aid, burns are classified as (i) superficial and (ii) deep.

(i) **SUPERFICIAL BURNS** may cause only a reddening of the skin, or patches of skin may be destroyed and blisters form.

(ii) **DEEP BURNS** destroy the skin and superficial tissues beneath it. In bad cases muscles, nerves, blood vessels and even bones may be destroyed, and whole areas charred.

60. Effects of Burns

The chief dangers from burns of any part of the body are :—

SHOCK. This comes first because it is the most important and one of the chief causes of death after burns especially among children and persons who are badly burned. There is far more shock with a superficial burn which covers a large area than a deep burn involving a smaller area, and a burn of the chest or abdomen is more dangerous than one which chars part of a limb.

BLOOD POISONING which comes on later as a result of germs getting into the wound. *Remember these two important factors when you are dealing with a burn.*

61. First Aid for Burned Casualties

It stands to reason that if you find a person suffering from burns in a burning building, lying beneath smouldering or burning debris, or in a room full of coal gas escaping from a damaged gas main, you must remove him as soon as possible from the source of danger, or the source of danger from him.

Before entering a burning room to get a casualty out you must protect yourself by covering your nose and mouth with a wet handkerchief or opened up triangular bandage, and take similar material to cover the casualty's face. When you enter the room crouch low to

reach the victim, and if his clothing is on fire pull him to the ground and smother the flames by wrapping him in a blanket, greatcoat or mackintosh, wet if possible. When the fire on the burning clothes is extinguished get him out to a place of safety as soon as you can and carry out first aid treatment as under :—

Do not remove more clothing than is absolutely necessary, in particular do not attempt to pull off clothing which is sticking to a burn ; pain and shock are thereby greatly increased and by exposing the burn to air.

Protect him from further shock by proper measures.

Blisters should on no account be pricked but left intact.

Do not attempt to cleanse the wound or apply any kind of oils or greasy substances.

Cover the burn with a large clean *dry* first aid or shell dressing, several if necessary, as soon as you can, and bandage firmly. Handle the part as little as possible.

Pain is relieved by immobilising the part. A sling may be sufficient for a slight burn of an upper limb, but in all cases of severe burns of upper or lower limbs, especially if delay may occur before the casualty can reach a hospital, the application of a splint over the dressing may be considered.

Give plenty of fluids to drink.

All cases of severe burns must be sent to hospital as stretcher cases at the earliest opportunity and treated as priority cases for despatch from an incident. Cases of burns usually travel well if they are sent to hospital without delay and without undue handling.

62. Flash and Radiation Burns from Atomic Bombs

When an atomic bomb bursts all kinds of radiations, as they are called, are discharged instantaneously and range from what we know as infra-red rays to those described as X-rays.

The radiations or rays which burn are emitted in a fraction of a second and affect the exposed skin of persons within a mile and a half of the bomb burst.

The period of the burning action is so short that almost anything in the way of clothes, or any other intervening substances however flimsy, affords protection ; white materials are more efficient than black of the same thickness.

Unless there is long enough warning for taking cover there is as yet no satisfactory means of preventing flash burns of exposed parts, e.g., face and hands.

People exposed within a few hundred yards of the bomb burst may have their skin dark brown or blackened, and whether or not otherwise injured, die very quickly. Those at a greater distance suffer burns which are " superficial " rather than " deep " and vary from something comparable to severe sunburn to severe blistering with loss of the surface cuticle. *They are extremely painful.*

First Aid Treatment

Burns caused by an atomic bomb in no way differ from those already well known and described above. The treatment is the same as for ordinary burns.

CHAPTER X

CRUSHING INJURY

67. The Cause of the Injury

At an air raid incident you may have to extricate a man who has been pinned down by a beam across his legs in a partially demolished house.

This man when freed may appear little the worse for his experience and complain only of numbness and stiffness in the leg which was under the beam. He will be taken to hospital and with rest and appropriate treatment may completely recover. Again, he may not and within a few hours develops "shock." With proper treatment he may also recover from this as most cases do. The odd one, however, after recovering from his shock is found to be gradually passing less and less urine, and unless this condition responds to treatment he will die within 6—8 days.

This very serious condition is the result of the cutting off of the blood supply to the muscles of a limb which is crushed, and in consequence the muscles die. Certain substances are produced in the dead muscles which poison the kidneys and prevent them from functioning properly. This damage to the kidneys occurs when the urine is acid, as it normally is. It is done soon after the limb has been freed, but does not become evident until after several hours, by which time the patient should be in hospital. It is easier to prevent damage to the kidney than to cure it; prevention is therefore of the utmost importance and no time should be lost in taking steps towards this end.

You must try to make the urine of the casualty *alkaline* and this is obviously done by giving him alkaline liquids to drink. This should be done for *all persons* who have been trapped by debris for an hour or more whether only a limb or other part is affected, as they may later develop this serious condition, however well they may appear at the time of their release.

68. First Aid Treatment

With the above in mind.

If there is a doctor at the incident notify him as soon as a trapped casualty is located. If no doctor is immediately available report the presence of the casualty to the Officer in Charge of the incident or to a responsible member of the Rescue Service.

Pending the arrival of a doctor, carry out the following treatment if *only a limb or limbs are involved*.

Give plenty of liquid, up to four pints, if there are no signs of injury to the belly. This should be given before the pressure on the limb is relieved, *but on no account should it delay extrication*. Try to obtain some baking soda (Bicarbonate of soda), *NOT WASHING SODA*, dissolve about two teaspoonsful to a pint of cold water and get the patient to drink as much of this as he can. Follow this with drinks of hot sweet tea or coffee. Other alkalis (magnesia powder, alkali

powder for indigestion and the like), or even plain water can be given if baking soda is not available.

If the casualty is conscious and in a position difficult to reach it may be necessary to use a rubber feeding tube and cup. Unless liquids can be given without harm to the casualty, as by sucking some into his lungs, you must await the arrival of the doctor who will direct this operation.

When the casualty is extricated protect him from further shock and send him to hospital on a stretcher in an ambulance as soon as possible.

N.B.—The limb which has been crushed must not have hot water bottles placed near it, and should remain uncovered.

CHAPTER XI

INSENSIBILITY

71. Insensible Or Unconscious Casualties

Unconscious casualties found during or after air raid incidents are often a big problem to those who have to deal with them as they cannot get any information from the victims as to what has happened to them or what they feel.

You have already read in the preceding pages of many injuries which can cause a person to become unconscious. What follows now is a summary of the chief causes of unconsciousness which you are likely to meet with, how to recognise the various causes, and how to render the most efficient first aid for an unconscious person.

It is comparatively easy for you to recognise the cause and know how to treat it if you find a person lying unconscious with an obvious serious injury, but the difficulty arises when you find an unconscious person with no visible injury to account for the unconsciousness. It is then that you will have to rely upon what you have learnt, and make a careful but rapid examination to discover from the signs which are present what is the matter with the casualty before you can hope to render the correct first aid.

Remember that a prolonged examination is *unnecessary* and indeed *inadvisable*, as if a person is injured seriously enough to make him unconscious the quicker he is sent off to hospital the better. You may however be able to do something to help him, and even save his life, by prompt and correct action on the spot.

Many air raids occur at night and you will find it extremely difficult on many occasions to make up your mind as to the reason why a casualty is unconscious as owing to the darkness, and the noise caused by exploding bombs, falling debris and the like, and from the fact that the casualty's face and clothing are probably covered by dust and dirt you may fail to recognise his presence, mistaking him at first for a heap of clothing or rubbish.

First of all you must realise that unconsciousness as found in air raid casualties is most frequently the result of some injury, but it may also be caused without any apparent injury, and by certain diseases which would perhaps not have come to light had it not been for air raids. Unconsciousness is therefore divided into two groups in the most convenient form for you to remember.

(i) Unconsciousness with Visible Injury

- (a) Open fractures of the skull or any part of the face, with concussion or compression of the brain.
- (b) Severe open wounds with bleeding in any part of the body.
- (c) Open fractures in any part of the body.

- (d) Multiple injuries caused by fragments of bombs which may or may not be associated with much bleeding.
- (e) Suffocation following an injury to the jaw which has allowed the tongue to block the air passages ; and from electric shock with burns.
- (f) Burns and scalds.
- (g) Severe contusions on any part of the body.

(ii) Unconsciousness without Visible Injury

- (a) Closed fractures of the skull with compression of the brain.
- (b) Internal bleeding in chest or abdomen.
- (c) Shock which may cause only a fainting attack or be very serious and sometimes fatal.
- (d) Suffocation from pressure on chest, swallowing dentures, blocking of nose and throat by dust or dirt, and by an electric shock without burns.
- (e) Certain conditions such as Apoplexy (caused by the bursting of a blood vessel in the brain and producing compression) and diabetic coma are sometimes precipitated during air raids in persons suffering from disease of the blood vessels in the brain and from diabetes. (Diabetic patients can often be identified as such by a special card they carry and a fibre disc worn round the neck or wrist, notifying that they are suffering from diabetes.) Epileptics sometimes have epileptic fits as a result of air raids.

N.B.—Shock is of course the predominant feature in all the foregoing.

The following points will be found useful to a first aider who finds an unconscious person.

72. Approach to Patient

On reaching the patient notice the following in regard to his appearance and surroundings.

- (i) In what position is he lying? Natural or unnatural.
- (ii) Is he breathing or not ? Does his breathing appear normal or abnormal ?
- (iii) Is his face pale, flushed, or blue ? If you cannot see the colour of the patient's face owing to darkness, or because it is covered with dirt, some idea of his condition may be obtained by placing your hand on his forehead. If his face is pale the skin may feel cold and clammy ; if it is flushed or blue the skin may feel hot.
- (iv) Is there a wound or any signs of blood about ?

In short, try to picture to yourself in what way he differs from a normal person whom you might find asleep. The information obtained from your own observations and from relatives or bystanders who may be able to tell you what happened before the patient became unconscious, how long he has been unconscious, whether the onset was sudden or gradual will be of value to you and also to the doctor when he arrives. Your immediate treatment may save the patient's life.

73. General First Aid Treatment

Send for a doctor at once.

Pending his arrival—when the patient's face is pale keep him lying flat with his head turned to one side. If his face is flushed or blue raise and support his head and shoulders.

Control any serious bleeding.

Loosen all tight clothing and let him have plenty of air.

Deal with any broken bones.

Keep him warm with blankets and protected hot water bottles.

Do not attempt to give anything by the mouth.

Get the casualty to hospital as soon as possible if no doctor is available.



CHAPTER XII

TRANSPORT OF CASUALTIES

79. Blanketing a Stretcher

Before a casualty is laid upon a stretcher you must cover it with a blanket folded lengthwise, or an overcoat, so that he does not lie directly upon the canvas or metal bed-portion. This adds to his comfort and reduces shock. *Remember* that it is more important to put blankets under him than over him. With two layers of blanket underneath and one on top a casualty is better off than with one layer underneath and two on top.

Two blankets only are required to blanket a stretcher properly. The way to do it is as shown in Figures 35, 36 and 37.

- (i) Lay one open blanket (A) lengthwise across a stretcher with one side close to the head end, and one end of the blanket having a slightly longer overlap of the stretcher than the other.
- (ii) Fold a second blanket (B) in three folds lengthwise and lay it on top of the first blanket (A) along the stretcher with its upper edge about 15 inches below the upper edge of the

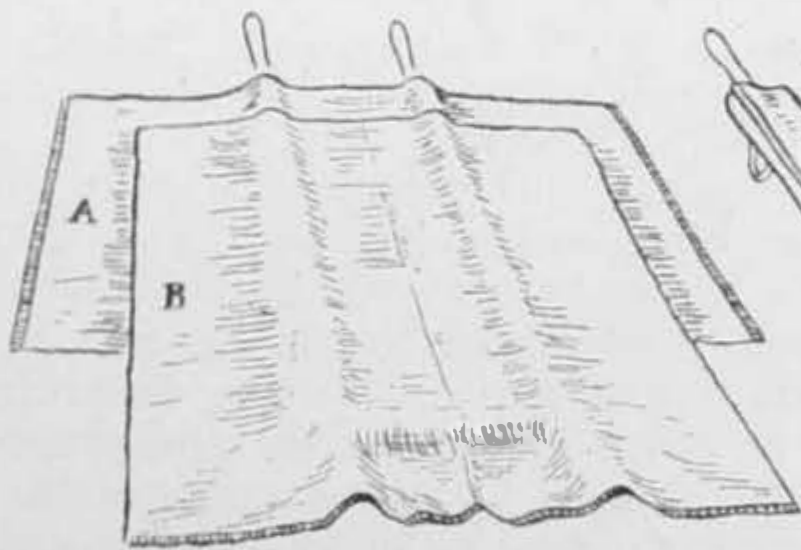


Fig. 35
Blanketing a Stretcher.

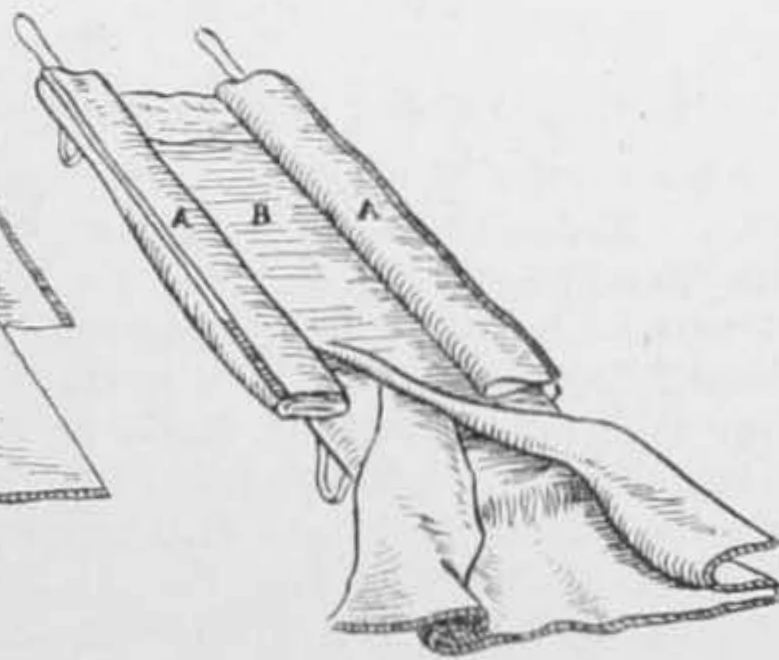


Fig. 36
Blanketing a Stretcher.

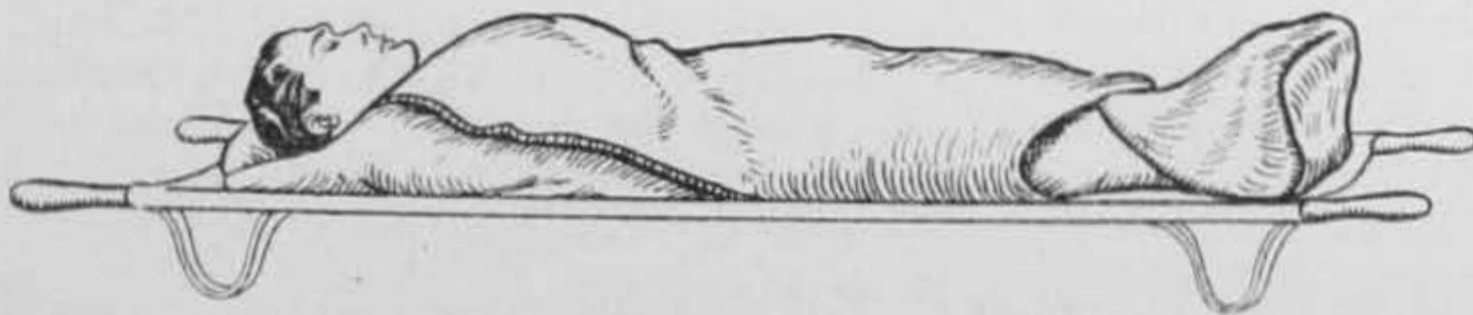


Fig. 37
Blanketing a Stretcher.

first blanket (A). There will be now four thicknesses of blanket upon which the casualty will lie.

- (iii) Open out the two ends at the foot of blanket (B) for about 2 feet to form two flaps.
- (iv) Roll up or pleat in concertina fashion the overhanging ends of blanket (A) and place them on the edges of the stretcher so that they will not drag on the ground when the stretcher is brought close to the patient.
- (v) When the patient is laid upon the stretcher wrap the two flaps of blanket (B) round his feet and tuck the ends between them.

Open out the rolled up folds of blanket (A) and wrap first the short then the long end round the patient tucking it well in at one side.

Your casualty will now be warmly blanketed.

TO SECURE BLANKETS AS A PACK ON A STRETCHER

- (1) Lay blankets (A) and (B) on the stretcher as described in (i) and (ii) above.
- (2) Fold in the two edges of blanket (A) taking the folds to the sides of the stretcher twice, then once again on to the stretcher.
- (3) Place the foot-end of blanket (B) on the stretcher, then fold it over and over with blanket (A) to form a flat pack, in the centre of which a hot-water bottle is placed. Secure the pack thus formed to the stretcher with a strap passed round it and the stretcher.

80. Lifting, Loading and Carrying a Stretcher

LOADING INTO AMBULANCE. The placing of an injured person upon a stretcher, carrying him from an incident and loading the stretcher into an ambulance is in accordance with methods which experience has shown to be the most comfortable for the patient. You should therefore know how to do this properly so that by disturbing him as little as possible you will lessen his discomfort and prevent further shock. Elaborate drill in carrying out the above is not necessary for you, as any form of drill must of necessity be modified to meet difficult situations. You should, however, be capable of efficiently performing the simple exercises depicted below which aim at providing and maintaining concerted action and good team work among those dealing with casualties.

(i) *Lifting a stretcher*

Four men of approximately the same height are allotted as bearers to carry each stretcher. For convenience they are numbered 1, 2, 3 and 4, each four men constituting a stretcher squad. The No. 1 bearer of each squad is the leader and gives all orders.

The position which these bearers take up in relation to a stretcher are :—

- (a) No. 1 on the right of the stretcher with his toes in line with the front end of the right pole.
- (b) No. 2 on the left of the stretcher in line with No. 1.

(c) No. 3 on the right of the stretcher behind No. 1 and his heels in line with the rear end of the right pole.

(d) No. 4 on the left of the stretcher in line with No. 3.

These positions are permanent.

On the command "LIFT STRETCHER—COLLECT WOUNDED" all four bearers stoop together and lift the stretcher from the ground with the hand nearest to the stretcher. They then double by the shortest route to the patient and halting three paces from and in line with his head; place the stretcher on the ground and stand up to await further orders.

(ii) *Loading a stretcher*

On the command "load stretcher" No. 1 bearer goes to the *right* of the patient at his hips, Nos. 2, 3 and 4 to the *left* of the patient at his knees, hips and shoulders respectively. All bearers now turn inwards together, kneel on one knee and pass their hands, palms upwards, beneath the body of the patient, No. 2 bearer supporting the legs, Nos. 1 and 3 by joining hands the thighs and hips and No. 4 the shoulders and head. At a given signal the patient is lifted gently off the ground on to the knees of 2, 3 and 4 bearers, No. 1 disengages and brings the stretcher which he places in front of the bearers ready for the patient to be lowered on to it. He then takes up his former position and again links hands with No. 3. On the command "lower" the patient is lowered gently on to the centre of the stretcher, the bearers disengage, rise and resume their permanent positions at the poles of the stretcher.

(iii) *Loading a stretcher with only two bearers*

The stretcher is again placed in line with the patient as before. After giving first aid the two bearers stand astride the patient facing the stretcher. The patient's arms are folded across his chest if he is unconscious but, if not, he may be able to help by grasping the leading bearer round the neck with one or both hands as he bends down, the bearers both bend together, lift the patient by the shoulders and thighs and shuffle forwards straddling the stretcher as they reach it.

(iv) *Lifting and carrying the loaded stretcher*

On the command "lift stretcher" all bearers stoop together, grasp the stretcher poles and lift the stretcher holding it at the full length of their arms.

At a given signal they step off together with the inner foot (i.e. that nearest the stretcher) so as to be out of step to prevent the stretcher from swinging.

As a rule it does not matter whether a casualty is carried head first or feet first, but when going uphill it is more comfortable for him to be carried head first, unless there is some reason to the contrary.

When an obstacle such as a wall, fence, or wreckage is encountered the front handles of the stretcher should be rested upon a firm part of the obstacle and the stretcher held level by the rear bearers while those in front cross to the other side and again grasp the front handles. All bearers then lift together moving the stretcher forward until the rear handles can be rested upon the obstacle and the stretcher kept level by the bearers in front. The rear bearers then cross the obstacle and the carriage of the stretcher is resumed.

(v) *Loading a stretcher into an ambulance*

- (1) The stretcher is brought to the ambulance by the four bearers and lowered to the ground one pace from and in line with the vehicle, the patient's head to the front.
- (2) No. 1 bearer gives the command "load."
- (3) All bearers turn inwards, lift the stretcher together and, taking a side pace to the ambulance, raise the stretcher gently to the level of the berth to be loaded, Nos. 1 and 2 bearers placing the front runners of the stretcher upon the tracks in the ambulance. The ambulance attendant enters the ambulance to guide the stretcher and secure it, while Nos. 1 and 2 bearers assist Nos. 3 and 4 to slide it into place.

81. Methods of Carrying casualties when stretchers cannot be used

Examples of various methods in which you can carry a patient when stretchers are not available or cannot be used are fully described in the Basic Rescue Pamphlet.

- (i) Two-handed and four-handed seats (By two persons).
- (ii) Fore and aft method (By two persons).
- (iii) The fireman's lift (By one person).

CHAPTER XIII

REMOVAL OF CASUALTIES AND DISPOSAL OF THE DEAD

87. Labelling of Casualties

It is not necessary for all casualties to be labelled, nor invariably for particulars of their names and addresses to be taken, but certain types of casualty, as mentioned below, as well as all unconscious casualties and all dead bodies should be labelled before being removed from the incident.

Tie-on casualty labels, with a symbol written on them, should be used ; failing this a piece of paper attached to a button or pinned to the clothing will serve. If possible, the forehead of the casualty should also be marked with indelible pencil with the same symbol.

The symbols used for marking casualties and their interpretation are as follows :—

88. Symbols Used.

*Symbol on label
and/or forehead.*

Interpretation.

X	Requires priority of removal from the incident and of examination when reaching hospital. This is used mainly, but not exclusively, for wounds of the chest and abdomen, for internal haemorrhage, and for <i>all</i> unconscious casualties.
T	A tourniquet has been applied. The time of application of the tourniquet and subsequent releases should also be indicated on the label.
H	Severe haemorrhage has occurred.
M	Morphine has been given. The time of administration and dose should be written on the label.
C	Contaminated or suspected of having been contaminated by PERSISTENT GAS.
XX	Poisoned by Nerve Gas or Non-Persistent Gases or suspected of having been so poisoned.
P	Burnt by Phosphorus.
R	Radioactivity.

*Standard Casualty Label
Front Side*

Strike out if $\left\{ \begin{array}{l} \text{UNCONSCIOUS CASUALTY} \\ \text{DEAD BODY} \end{array} \right.$ SYMBOL ON
not needed $\left\{ \begin{array}{l} \text{DEAD BODY} \\ \text{ADDRESS WHERE FOUND} \end{array} \right.$ OTHER SIDE

POSITION IN BUILDING.....
TIME AND DATE WHEN FOUND.....
APPARENT CAUSE OF DEATH OR INJURY.....

NAME AND ADDRESS, OR OTHER AID
TO IDENTIFICATION _____

SIGNED _____ Leader
or Deputy _____ Party,

Reverse Side

DATE _____ TIME _____

CRUSH INJURY

SYMBOL

If MORPHINE has been
given,
Time _____

LIMB COMPRESSED FOR _____
(period if known)

LIMB RELEASED at _____
(time)

Dose _____
IF TOURNIQUET has
been applied

BAKING SODA, etc., given _____ tea-
spoonfuls

Time Applied _____

TOTAL FLUID GIVEN

BEFORE RELEASE _____ pints

„ Released _____

SIGNED _____ Leader
or Deputy _____ Party.

Diagnosis of Death

In the absence of a doctor the Rescue Party Leader should take the responsibility of diagnosing death in clear cases, but where there exists any doubt as to whether life is extinct the advice of a doctor should be obtained on the spot.

If no doctor is immediately available, to avoid delay the casualty should be sent direct to a hospital and not to a First Aid Post.

Collection of Bodies

When dead bodies are recovered they should be deposited in the nearest convenient building and some suitable covering placed over them, pending removal; they should not be left on the highway or in an open space. The public and all persons not directly concerned should be kept away whilst bodies are being recovered.

Labelling of Bodies

In addition to the details on the casualty label the following information should be given where possible.

1. If the body is contaminated by Blister Gas, or is suspected of being contaminated, the label should be clearly marked with a " C ".
2. For those suspected to have died from the effects of poisoning by Nerve Gas or Non-Persistent Gases, the label should be clearly marked " XX ".
3. For those suspected to have died from Radioactive Effects the label should be clearly marked " R ".

Removal of Bodies

Recovered bodies should be removed to the mortuary as soon as possible, after labelling.



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