

CIVIL DEFENCE ORGANISATION

SOUTH AUSTRALIA

CASUALTY HANDLING

PART I.

OBJECT

To teach the following in Casualty Handling:-

- (a) Procedure involved with casualty handling.
- (b) Classification of casualties.
- (c) First Aid problems relevant to nuclear weapons.
- (d) Stretcher Handling.
- (e) The use of improvised stretcher equipment

GENERAL

Thorough knowledge of the procedures involved in the handling of casualties is essential for all Civil Defence workers. Correct casualty handling can save many lives and considerably shorten the recovery of many of the injured.

The techniques outlined in Part I and Part II cover every aspect of casualty handling. The application of a particular method to a problem is dependent on:-

- (a) The nature of the casualty's injuries - slight or serious, conscious or unconscious.
- (b) The position in which the casualty is found - ample space, narrow void, limited headroom.
- (c) Number of rescuers.

One important point that must always be remembered is that only when the casualty is in imminent danger by remaining where he is, does removal take priority over stoppage of bleeding.

CLASSIFICATION OF CASUALTIES

All casualties can be classified under three main headings:-

- (a) Walking wounded
- (b) Slightly injured casualties
- (c) Seriously injured casualties

Walking Wounded should, after necessary first aid treatment, be directed or sent to the nearest Forward Medical Aid Unit (F.M.A.U.) but occasions will arise when a decision as to whether they can be safely sent on foot or should go in a vehicle, may be difficult. The following are examples of some types of walking wounded casualties who should NOT be allowed to walk.

- (a) If there is a marked degree of shock, which may be out of all proportion to the injury received.
- (b) If there is the slightest doubt as to whether there is an internal injury or not; cases of multiple small injuries, although apparently superficial, may have caused some internal injury.



- (c) Casualties who have bled from an artery, even in a small wound.
- (d) Casualties with head wounds, even though they may appear slight.
- (e) All cases of poisoning by a nerve or lung irritant gas must on no account be allowed to walk but must be sent at once to a hospital as stretcher cases.

Slightly Injured Casualties are those whose injuries require that they must be evacuated for further treatment in cushion or base hospitals but the nature of the injuries does not necessitate the use of a stretcher and evacuation can be effected by sitting case car. A few examples of slightly injured casualties are:-

- (a) Cases of serious shock.
- (b) Casualties with an injury to a lower limb, unless it is only a very slight flesh wound.
- (c) Cases who appear to be suffering from gas poisoning or radiation sickness.

Seriously Injured Casualties are those who will require hospital treatment. They must be allowed to walk or be sent to the F.M.A.U. but should be taken from the ambulance loading point by ambulance to hospital. It might be necessary, where conditions permit, to take those too seriously injured to endure the long journey to the F.M.A.U. where the medical officer would prepare them for their journey. A few examples of cases requiring hospital treatment are:-

- (a) All cases of internal haemorrhage; open wounds of the chest (pneumothorax); shattered limbs, grossly lacerated and crushed limbs; stomach wounds; open complicated fractures; fractures of the skull, spine, pelvis and thigh; injuries involving the eye; injuries involving the lower jaw and control of the tongue.
- (b) Cases of severe external haemorrhage and of multiple or extensive burns.
- (c) Cases in which further shock is likely to supervene, as in persons trapped for long periods under debris, or exposed to cold and wet; in fact, all but those with trivial injuries or who are merely shaken, frightened or faint. It must not be forgotten that very small external wounds may be associated with damage beneath the surface.
- (d) All diabetic patients who may be injured or who are suddenly taken ill.

#### FIRST AID PROBLEMS RELEVANT TO NUCLEAR WEAPONS:

It is not the purpose of this precis to teach first aid, but some factors relevant to nuclear weapons are mentioned in this section.

- (a) Temporary Blindness Caused by Atomic Flash. Casualty section personnel must remember that persons standing in the open and facing the flash of the nuclear explosion may be temporarily blinded. This condition resolves itself without treatment in a matter of hours. The person requires reassurance that this loss is only temporary.



- (b) Flash Burns from Nuclear Weapons. Flash burns are produced by the intense heat released at the time of the explosion. The rays producing the flash burns have a low degree of penetration but have a severe action on the surface of any object struck by them. Solid objects in the path of these rays have a protective effect. Depending on the distance from Ground Zero ("GZ") normal clothing will afford some protection and light coloured clothing even more. Multiple layers of clothing are more protective than single layers. Flash burns have another interesting characteristic in that they only affect the surface of the body directly exposed to the ray.

The burns 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. The first aid treatment for flash burns is the same for ordinary burns.

- (c) Radiation Sickness. Radiation sickness is not a first aid problem in the immediate post disaster area. However, first aiders, etc., need to understand the symptoms which may develop and the principles recommended for treatment.

Victims of radiation, if otherwise not injured, may be capable of walking around immediately after the incident without apparent ill effects. In an hour or two, or even later, nausea and vomiting may develop, but it is important to remember that fear and anxiety may also produce these same effects.

Within days to weeks some radiation casualties may exhibit loss of appetite, tiredness and diarrhoea. Resistance is considerably lowered and various infections may develop after several days or even weeks.

Spots ranging in colour from red to purple (purpuric spots) and varying in size may appear on the skin and mucous membranes. Loss of hair occurs in certain cases after a week to several weeks, but the hair will grow again.

Radiation casualties should have rest and transportation to available medical facilities. They should be stretcher cases and every effort should be made to keep them as cheerful as possible. Even insignificant wounds should be carefully protected as the patient's resistance to infection will be very much lowered.

- (d) Emotional Disturbances. Individual emotional reactions will vary considerably after a nuclear attack or any major disaster. Broadly, the reactions will fall into three overlapping phases. First, a period of impact with the initial stresses followed by a period of recoil in which the individual becomes aware of what has happened, and finally, the period of adjustment, the post shock period.

During and immediately following a disaster some people will show periods of compulsive behaviour based on a desire to escape and rescue their families and belongings. They are liable to be confused and unable to concentrate. Most survivors are dependent upon other people and need, above all, guidance and leadership. This leadership will probably come initially from that 10-15% of the population who have the ability to remain calm in an emergency particularly if they have been trained for the job. About three-fourths of the survivors will react normally to the period of impact, being stunned, bewildered and easily led.

The remaining 10-15% will show more severe reactions, such as hysterical behaviour, confusion and paralysing anxiety. Those showing gross behaviour disturbances must be dealt with straight away to prevent the spreading of panic.



Some people will, as the result of this emotional disturbance, develop physical symptoms, such as nausea, vomiting, loss of appetite, sweating, trembling and palpitation of the heart. These are quite normal symptoms though if they have not gone after several hours, medical attention should be sought.

- (e) First Aid for the Emotionally Disturbed. Before anyone is capable of rendering efficient psychological first aid in a post disaster situation, it is essential that they be calm themselves. Some symbol of authority, such as a uniform or an armband, is necessary. When addressing a group speak loudly and distinctly, but be brief and to the point. Speak, if possible, from a vantage point.

Give such directions that will lead to activity, such as looking after each other's needs or acting as stretcher bearers. Singing is a good method of distraction from the serious side. Never move in an excited or rapid manner, encourage others to do likewise. Grossly disturbed individuals should be treated promptly. This can be done by a sympathetic and reassuring approach, if possible, use their name when speaking with them. Speak quietly but firmly and be brief. If the individual does not settle down, remove them from the group. Remember, panic can spread, especially from an emotionally disturbed person.

After the disaster, during the period of adjustment, disorders lose their group aspect and become predominantly individual. They consist of night-mares and insomnia, startle reaction, anxiety and fear, abnormal and emotional thinking. Some bodily symptoms will appear and initial symptoms may fail to improve.

Psychological first aid is designed to prevent emotional reactions from becoming more severe or permanent, and by reassurance, control and direction to prevent the spreading of panic, rumours, etc., and to divert the individuals concerned into useful activity thereby adding to morale and the civil defence effort. The normal routine of life should be re-established as soon as possible, that is meals, meal hours, hours of work, shelter, etc.

#### HANDLING A STRETCHER IN DIFFICULT SITUATIONS

- (a) A stretcher should, whenever possible, be carried in the horizontal position. There may be times when this is impossible as the casualty may have to be carried over debris and the bearers will have to climb up and down piles of rubble, etc. In such cases four or six bearers are an advantage.

If four bearers are available, one should be at the front end, one at the rear end, and one at each side of the stretcher. When they have to climb over a large heap of debris, the bearers at the sides turn inwards towards one another and take the full weight of the front end of the stretcher, while the front bearer climbs up on the debris; the front end of the stretcher is then lifted for him to grasp. The stretcher is then advanced and the bearers at the sides take the weight of the rear end of the stretcher while the rear bearer climbs on to the debris and grasps the rear end. A similar procedure is adopted when climbing down.

If only two bearers are available, it may be necessary to lay the stretcher down when they reach an obstruction so that they can ascertain the best method of getting over it. The bearer at the front end climbs on the debris, while the bearer at the rear end passes the front end of the stretcher up to him to grasp. The rear end bearer then resumes his position and lifts the stretcher to a horizontal position and the bearers cross the obstacle.



Care must be taken to see that the stretcher, if laid down, is resting on the "D's" with the bed of the stretcher clear of obstruction so that debris will not move under the weight of a human being and pieces of debris will not injure his body.

- (b) Using a Stretcher in a Confined Space. In confined spaces, if there is sufficient height and the casualty has been secured to the stretcher, it may be stood on end, and by grasping the sides can be moved round sharp corners.

Where the height is insufficient to permit this method being used, as in the case of shelters, a compromise between horizontal and vertical positions is necessary. The casualty should be carried feet first as far as the middle of the right-angled bend, when the front end of the stretcher is placed on the ground and the rear end lifted as high as the roof will permit. The stretcher can then be worked round the bend, one bearer easing the front end and the other the rear end.

It should not be turned on its side or height will be lost and difficulties increased. At the same time there will be a risk of the casualty banging against the inside of the bend.

- (c) Passing Over a Gap. When taking a casualty out of a damaged building it is often necessary to cross a gap in the floor. A ladder may be used as a bridge, providing that the precautions are followed.

Alternatively, two or more joists may be laid across the hole. They should be twice as long as the hole so that they rest on the sound joists of the damaged floor.

It is wise to use six bearers as a safety precaution when crossing a pile of debris which contains gaps. Two bearers go across the gap while the remaining bearers turn inwards and, lifting the stretcher, pass the front handles to them across the gap. The two rear bearers support the stretcher as it goes over and then relieve the frontbearers, who cross the gap and take up their position ready to take over the rear end of the stretcher. The remaining bearers then cross the gap and take up their positions at the sides of the stretcher.

#### THE USE OF IMPROVISED STRETCHERS

When there is a shortage of stretchers it is better to improvise rather than manhandle the casualty unnecessarily. Some examples of improvisation are:-

- (a) Doors used as stretchers. The door is placed with a brick at each corner and the casualty blanketed in the normal way. The usual lashing method is used except that instead of fastening the ends by clove hitches to the strings, bowlines are tied and looped over the corners.
- (b) Ladders used as stretchers. A half of a short extension ladder, such as carried by the rescue party will make an ideal improvised stretcher. Again, bricks are placed under each corner. Some pieces of board usually 6' x 1" are placed in the centre. The casualty is then blanketed in the normal manner. The lashing is altered slightly this time. It is begun with a round turn and two half hitches in the middle of a rung at the foot of the ladder. Three hitches are then taken about the ladder and the casualty at the shins, the wrists and the chest; the centre line of the hitches will be along the top of the casualty so that the end will come across the injured person's shoulder and will be fastened to the centre of the rung next above the shoulders by another round turn and two half hitches. No tightening hitches are required.



- (c) Mattresses can be used as emergency stretchers, especially if casualties are being removed from hospitals, etc.
- (d) There are many other methods, including the use of chairs, overcoats with sticks, blankets with sticks, galvanised iron sheets and bed frames. The list could go on indefinitely but these will give some idea of the degree of improvisation possible in the event of a nuclear disaster.

## CONCLUSION

Successful casualty handling has been described as the most important aim of Civil Defence. There is no doubt that efficient casualty handling in its many applications will do more to relieve suffering and expedite the recovery of stricken areas than any other aspect of Civil Defence. Part I of this Precis has been described the procedures involved in casualty handling, the classification of casualties, first aid problems relevant to nuclear weapons and the use of improvised stretchers and stretcher handling.

-----

## CASUALTY HANDLING

### PART II.

#### OBJECT

To teach the following in Casualty Handling:-

- (a) Emergency Methods for One Rescuer:
  - (i) Pick-a-back.
  - (ii) Human crutch.
  - (iii) Fireman's lift.
  - (iv) Fireman's crawl.
  - (v) Removal downstairs.
- (b) Emergency Methods for More than One Rescuer:
  - (i) Two-man human crutch.
  - (ii) Fore and Aft method.
  - (iii) Two handed seat.
  - (iv) Three handed seat.
  - (v) Four handed seat.
- (c) Removal of Casualties on to Stretchers:
  - (i) Webbing bands.
  - (ii) Blanket lift.
  - (iii) Clothing lift.
- (d) Handling of Bodies.
- (e) Casualty Labelling.



GENERAL

When casualties are in danger of receiving further injuries, by fire, coal gas, flooding or from dangerous structures such as leaning walls, etc., it is necessary to remove the cause of danger from the casualty or the casualty from the danger. If it is vital to remove the casualty to safety, he must be moved, regardless of his injuries. Only when the casualty is in imminent danger of death by remaining where he is does removal take priority over the stoppage of bleeding. There are several methods by which he can be moved, among them being by the use of webbing bands, the pick-a-back, human crutch, fireman's lift, fireman's crawl, fore and aft method, two handed and four handed seats.

VARIOUS TYPES OF HAND CARRIAGE - Methods suitable for one rescuer.

- (i) Pick-a-Back: Carry the casualty in the ordinary pick-a-back position. This is the best way if he is conscious and able to hold on.
- (ii) Human Crutch: Where the casualty can help himself, the rescuer stands at his injured side and places the casualty's arm around his shoulder, grasping the wrist with his hand. At the same time he passes his other hand around the casualty's waist, gripping his clothing at the hip and thus assists him by acting as a crutch. Each person should step off the outside foot - the rescuer using his nearest to the casualty as a prop - as in a three-legged race.
- (iii) Fireman's Lift: This is one way of carrying a helpless or unconscious person and allows the rescuer a free hand. It is easier for the rescuer than the pick-a-back method, but not so comfortable for the casualty.

This method should be used when it is known that gases heavier than air are present (e.g., petrol vapour, sulphuretted hydrogen, sulphur dioxide, nitrous fumes, etc.).

DRILL: Locate casualty. If in smoke, do not lose contact.

1st Movement: Place casualty in prone position (lying on face), straighten casualty - starting from the head, turn head to one side and clear mouth, place arms to sides, legs together. This movement is carried out by the rescuer walking astride the casualty. Step to the right of the casualty and retrace steps (backwards), maintaining left hand on casualty, returning to head.

2nd Movement: Raise casualty on to his own feet by gripping casualty firmly under armpits.

3rd Movement: Lift casualty on to his own feet by grasping strongly around chest, hold him firmly under armpits with your right arm, take firm grip of casualty's right wrist with your left hand, place your right knee between casualty's legs to help take the weight and to prevent the casualty from slipping to the floor.

4th Movement: Squat quickly, at the same time slipping right arm between the casualty's legs and pulling him across your own shoulders, using the grip on his right wrist to assist in drawing him across.

Correct the balance of weight before rising from the low squat position.



To carry the casualty down a ladder, it is most important that the casualty be perfectly balanced across the shoulders so that the rescuer's hands are free to grasp the rungs of the ladder.

- (iv) Fireman's Crawl: If a rescuer finds an unconscious casualty, or one who is unable to help himself, or who is too heavy for one of the above three methods to be applied, the Fireman's Crawl can be used as follows.

Turn the casualty on his back and tie his wrists together (use handkerchief, sashcord lashing, etc.). Kneel astride him facing his head and place your head through the loop thus formed by his arms. By crawling on your hands and knees you can then drag him with you, even though he may be heavier than you are.

- (v) Removal Downstairs: To move the casualty downstairs, lay him on his back, head towards the stairs and secure his wrists together. Place your hands under his armpits and grasp his wrists. Moving backwards, ease him gently downstairs.

VARIOUS TYPES OF HAND CARRIAGE (Cont.) - Methods suitable for more than one rescuer.

- (i) The Fore and Aft Method: In this method the wrists are tied and the trunk lifted in the same way as the removal downstairs method by the rescuer. The other rescuer takes one leg under each arm and they carry him feet first. If one leg is broken, both legs should be tied together or put in splints and both legs carried under one arm.
- (ii) Two Handed Seat: Two rescuers face one another on either side of the casualty and stoop. Each rescuer passes his arm nearest the casualty's head under his back just below the shoulders and, if possible, grips his clothing. They raise the casualty's back and slip their other arms under the middle of his thighs, clasping their hands with a hook grip. The rescuers rise together and step off with short paces.
- (iii) Four Handed Seat: (See attached diagram). The rescuers face each other and each grasp their own left wrist with their right hand. Their hands are then put together, the free left hand grasping the right wrist of the man opposite. The casualty puts one arm or both arms around the necks of the rescuers.

The three handed seat is a variation of this method.

REMOVAL OF CASUALTIES ON TO STRETCHERS

- (i) Webbing Bands: Sets of webbing bands are carried by the Rescue Parties and are used: (1) for lifting a casualty from the ground on to a stretcher; and (2) for lifting and carrying a casualty from a place where it is impossible to take a stretcher.

Each set consists of four bands made of stout canvas webbing  $4\frac{1}{2}$  inches wide and two different lengths, two being 2 feet long and two 3 feet long. The shorter bands are intended to go under the head or neck and the feet, and the longer ones under the chest and hips (or small of the back). At the ends of each band is a handle, a long and short, made of  $\frac{1}{4}$  inch drawn steel wire welded at the joint, the long handle being 12 inches long and the short 4 inches.



The long handles are used for pushing under the body of a casualty lying on the ground, after which the webbing band is pulled through so that there will be a handle at each side. When pushing a band under a casualty the long handle is grasped by a rescuer with his right hand at the point where the handle joins the canvas, he then slightly raises the casualty from the ground with his left hand and pushes the handle under his body; the rescuer on the other side then raises the casualty slightly with his left hand and pulls the handle and band through with his right hand. It is only necessary to raise the casualty a ¼ inch from the ground. When a casualty is lying close to a wall or other obstruction, it is not possible to pull the long handle through, so the short handle is bent over the long handle and pushed through by it; the short handle is then pulled through and the long handle withdrawn at the same time.

Several methods of carrying casualties by webbing bands have been adopted to meet different situations. Training and practice in the carrying of casualties by these bands is essential. It must be remembered that these webbing bands are not to be regarded as a substitute for a stretcher, but only as a means of taking a casualty to a stretcher from a place where it is impossible to use one.

- (ii) Blanket Lift: When a casualty is being removed from a void, space may not permit the use of a standard stretcher. In these cases a blanket lift may be used which will be more comfortable for the casualty and easier for the party to handle. It is made by doubling the blanket length-wise, and rolling the edges in fairly tightly to the side of the casualty, thus forming a handhold for the bearers.
- (iii) Clothing Lift: In this method of loading a stretcher, five personnel are required. Two on each side of the casualty and one at the head. The casualty is eased gently on to his side and two rescuers place their arms under the shoulders and lower buttocks and grasp the clothing on the opposite side of the casualty to them. The two rescuers on the other side then do likewise and the fifth man (the man in charge) supports the head. The casualty can then be transported (using side steps) and loaded on a stretcher.

#### HANDLING OF BODIES

Whenever possible, Civil Defence personnel handling remains should use the rubber gloves issued for the purpose. Where necessary, they should tie a pad or handkerchief dipped in some deodorising fluid over the nose and mouth. Where such fluid is not available, wearing of respirators will help overcome nausea caused by foul smells.

Where bodies are recovered they should be deposited in the nearest convenient building and some suitable covering placed over them, such as tarpaulins, pending removal to temporary mortuary. They should not be left in roads or other open spaces. The public and all persons not directly concerned should be kept away whilst bodies are being recovered.

The dead should be treated with due respect, but priority must always be given to the living.

Parts of bodies should be placed in metal bins, labelled and sent to the mortuary.

On no account should anything be removed from the dead or casualties, except that which be necessary to establish their identity.



Any article of value, however small, found or removed from damaged premises must be handed in. Greatest possible care must be exercised in this matter. To safeguard himself, the finder should immediately declare the objects found, handing them in at the first opportunity and obtaining a receipt for same.

In the absence of a doctor the 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 available, to avoid delay the casualty should be sent direct to a hospital and not to a first aid post.

#### CASUALTY LABELLING

Bodies must be labelled when they are recovered. The standard casualty label will be used and the front side completed. The following symbols are to be entered on the reverse side of the label, are also applicable.

- (i) If a body is contaminated or suspected of having been contaminated by persistent gas, the label should be clearly marked with a "C".
- (ii) For those suspected of having died from the effects of poisoning by nerve gas or non-persistent gases, the label should be clearly marked "XX".
- (iii) For those suspected of having died from radioactive effects, the label should be marked "R".

#### CONCLUSION

The purpose of this precis has been to outline the various methods of Casualty Handling for use by one or more rescuers.

Remember, all persons injured are to be called "Casualties" until seen by a doctor, then they are called "Patients".

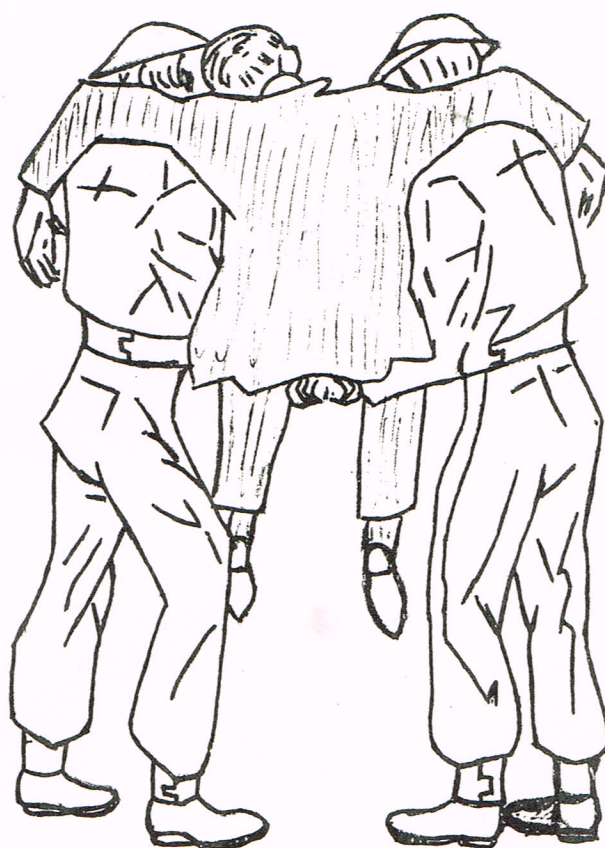
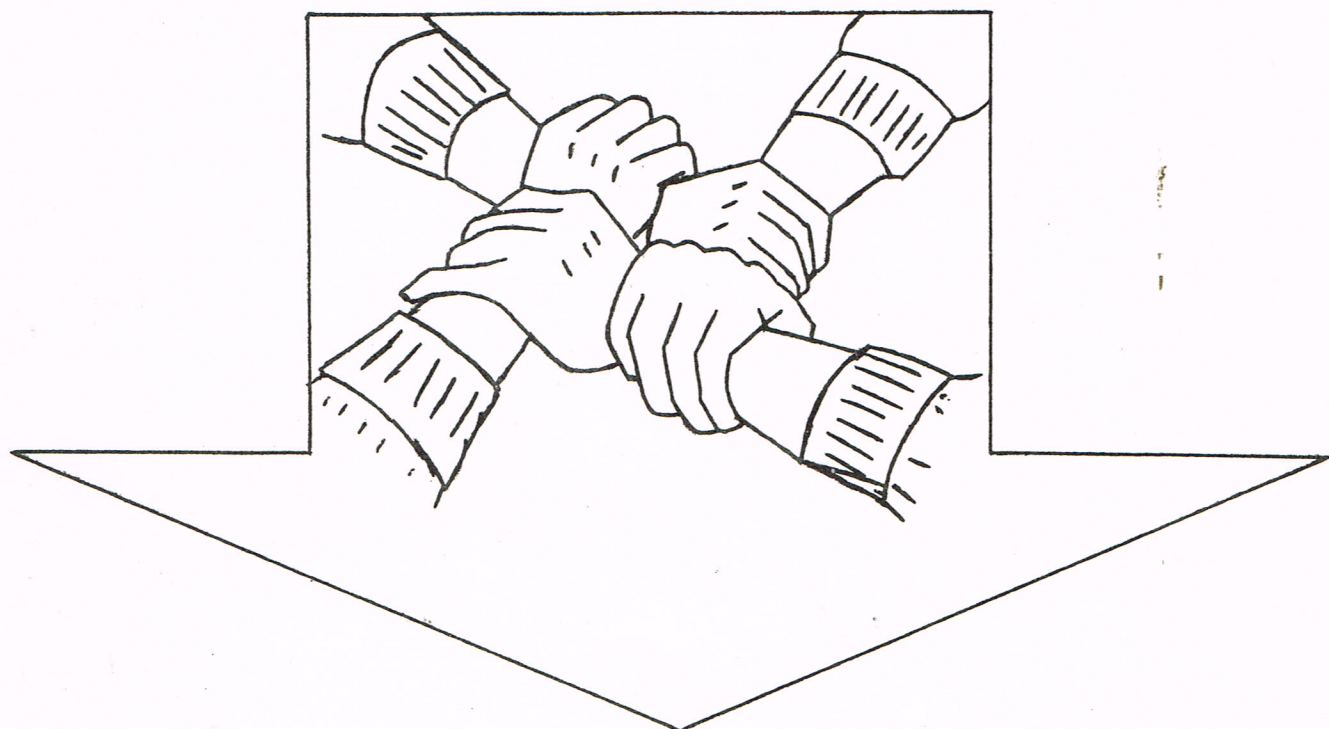
In conclusion, it must be stressed again that only when the casualty is in imminent danger of death by remaining where he is does removal take priority over stoppage of bleeding.

-----oOo-----



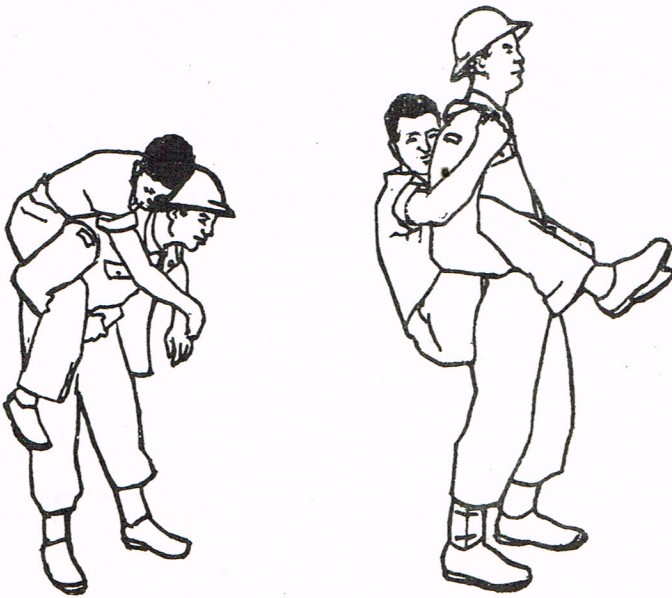
TRANSPORT OF CASUALTIES

FOUR HANDED SEAT



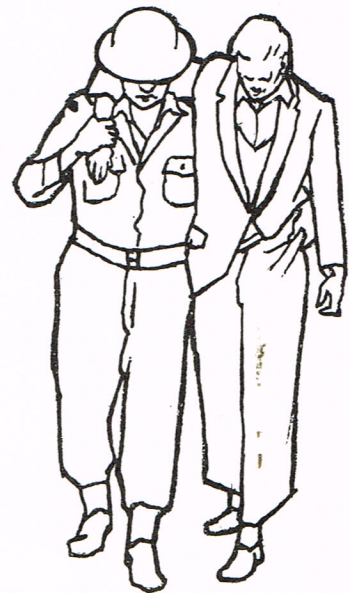
METHODS SUITABLE FOR MORE THAN ONE  
RESCUER





Pick-a-back  
(Right)

(Wrong)



One-man Human Crutch



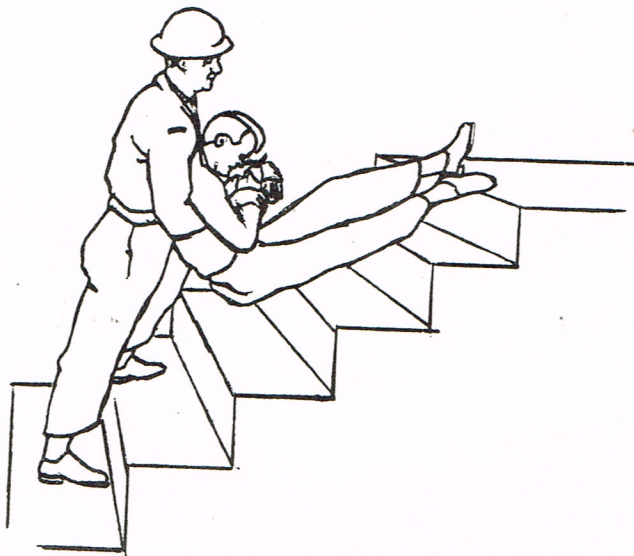
The Fireman's Lift



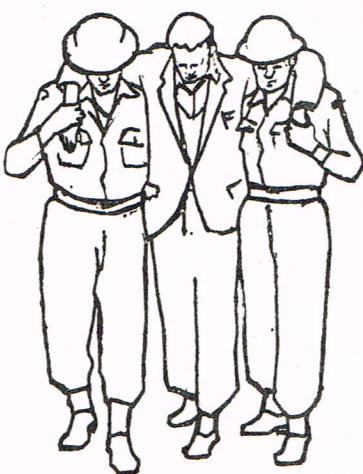


Method of Securing  
wrists in the  
Fireman's Crawl.

The Fireman's Crawl



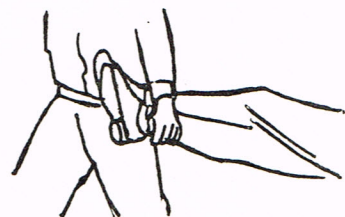
Removal Downstairs Method



Two-man Human Crutch



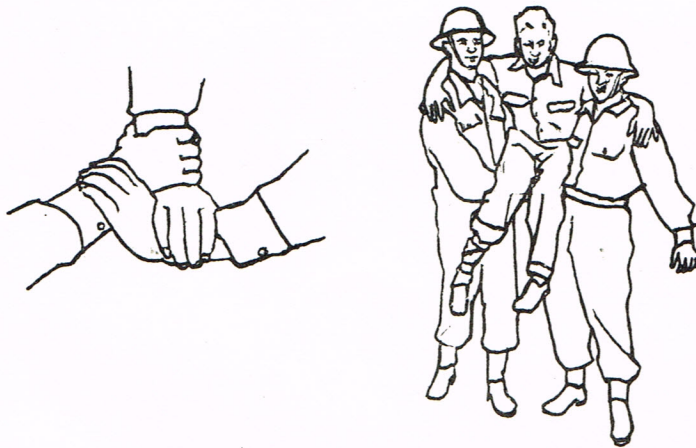
The Fore and Aft Method



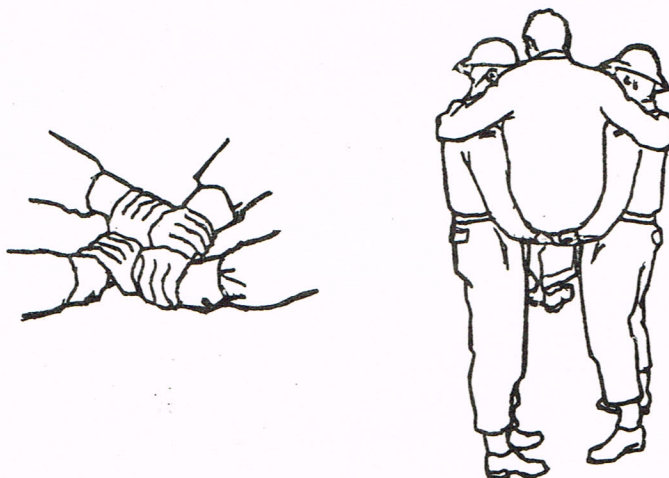




The Two-handed Seat

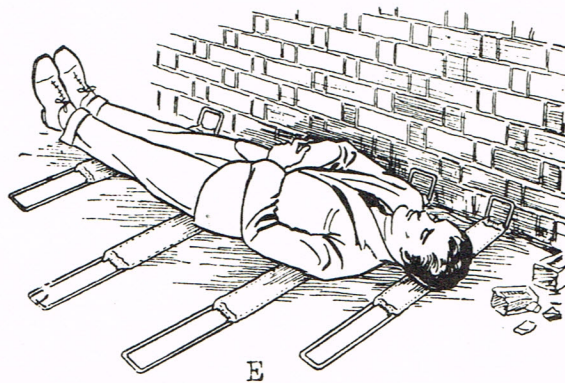
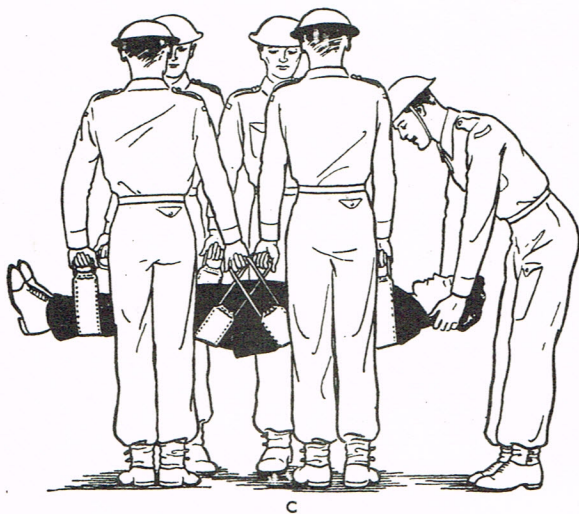
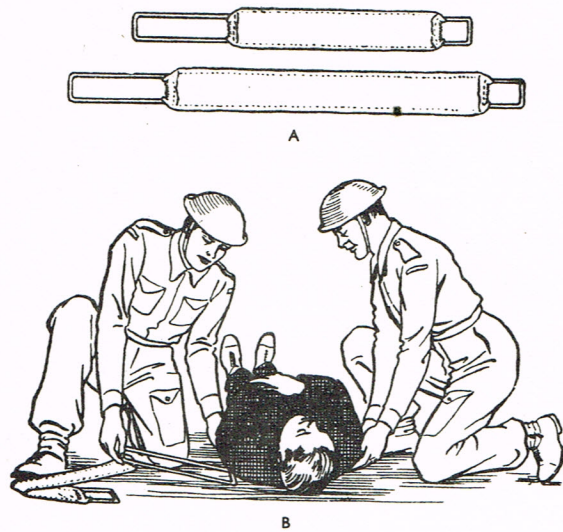


The Three-handed Seat



The Four-handed Seat





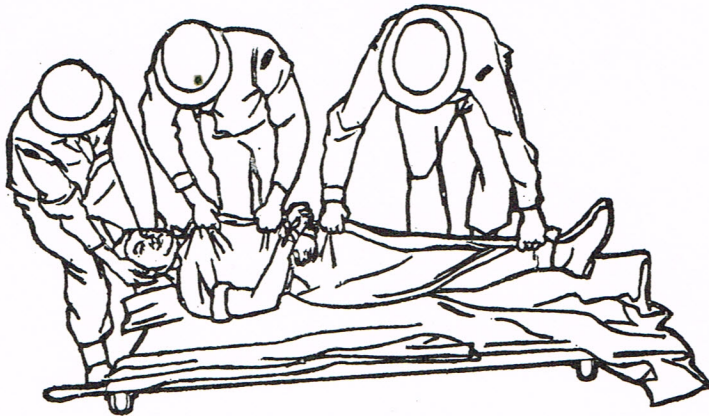
- A - Webbing Bands
- B - Placing under casualty
- C - Lifting Casualty
- D - Webbing bands as applied near wall.
- E - Bands correctly placed for lifting.

Use of Webbing Bands



The Blanket Lift





The Clothing Lift.