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AIR RAID PRECAUTIONS

HANDBOOK No. 10

(*1st Edition*)

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LONDON
HIS MAJESTY'S STATIONERY OFFICE
1939
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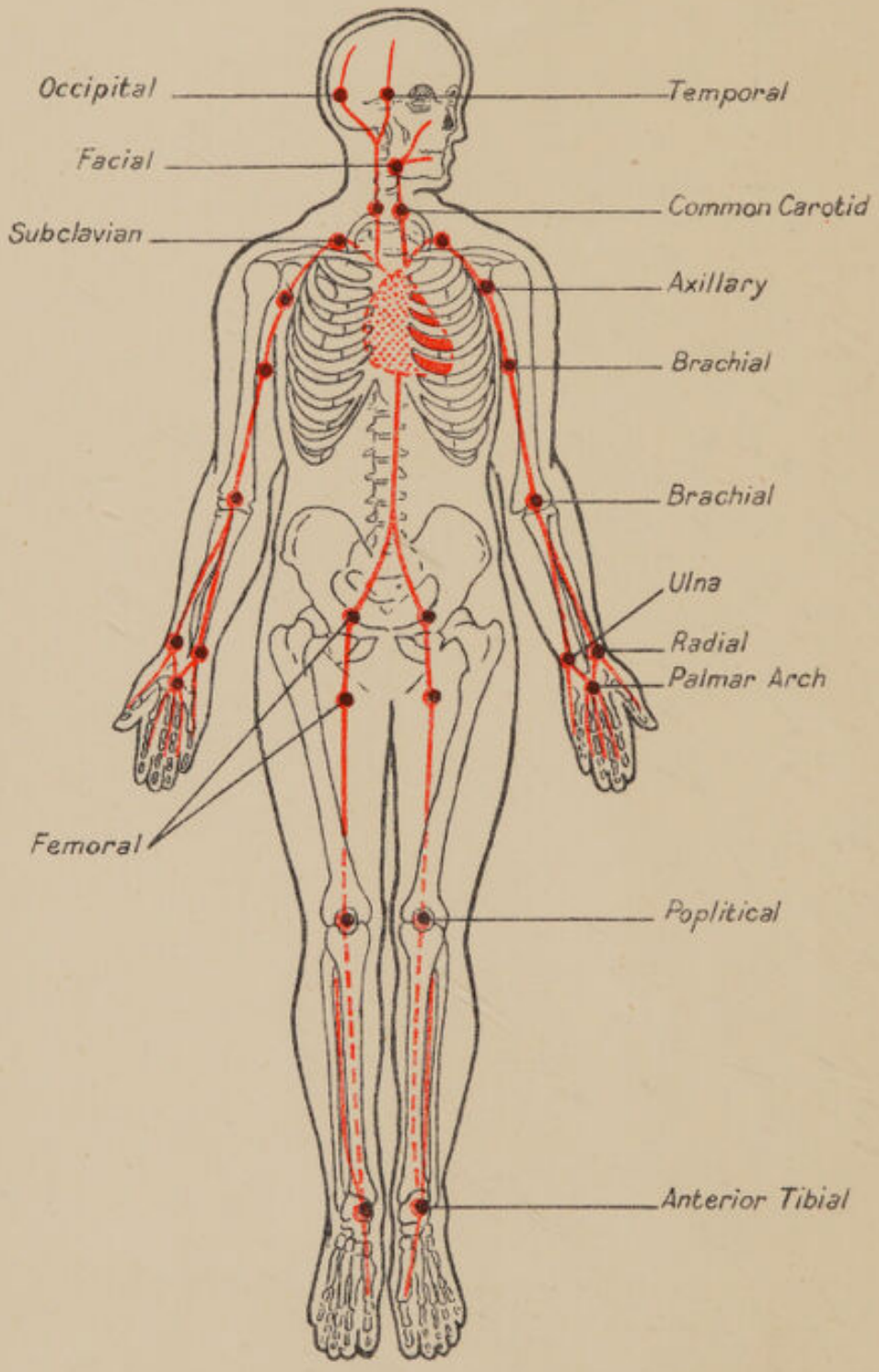

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Some portions of text and certain diagrams have been reproduced from R.A.M.C. Training, 1935, and the Manual of Instruction for Royal Naval Sick Berth Staff, 1930.

LIST OF ILLUSTRATIONS

A.R.P. HANDBOOK No. 10

GENERAL PREFACE

The series of Air Raid Precautions Handbooks (of which a list is given on last page of cover) is produced by the Air Raid Precautions Department of the Home Office, with the assistance of Government departments and other bodies concerned.

The measures for safeguarding the civil population against the effects of air attack which these handbooks describe have become a necessary part of the defence organisation of every country.

If war were ever to occur, it must be assumed that the scale of attack would greatly exceed anything which was experienced previously and might involve the use of gas as well as high explosive and incendiary bombs. Preparations to minimise the consequences of attack from the air cannot be improvised on the spur of the moment, but must be made, if they are to be effective, in time of peace.

The Handbooks are designed to describe a scheme of precautions which it is hoped would prove effective in preventing avoidable injury and loss of life, or widespread dislocation of national activities.

AIR RAID PRECAUTIONS

HANDBOOK No. 10

(*1st Edition*)

TRAINING AND WORK OF FIRST AID PARTIES

INTRODUCTION

Among the responsibilities placed upon scheme-making authorities by the Air Raid Precautions Act, 1937, and the Air Raid Precautions (General Schemes) Regulations, 1938, is that of setting up a casualty service to operate in time of war. It is unnecessary to stress the importance of such a service both from the humanitarian point of view, and from the point of view of the favourable effect on public morale of the knowledge that casualties will receive first aid attention and will be removed for surgical treatment and nursing without delay.

It is emphasised that the efforts of individuals, however great in number or skilled and devoted, will be less effective than those of a service trained for the tasks it will be called upon to perform and organised into disciplined units.

This publication is concerned with the organisation, training and work of First Aid Parties, whose duty it is to deal with casualties where they occur and to pass them on to establishments capable of providing appropriate treatment and care.

First Aid Parties will be stationed at depots situated at suitable points throughout the district (see Section 2). On receiving information that casualties have occurred, they will proceed to the scene of the incident with their transport to administer first aid and to arrange for the removal of cases to a first aid post or to hospital, as may be appropriate.

The principles governing the disposal of casualties are explained in Chapter III, Section 8.

First aid posts may be either fixed or mobile. In most centres of population buildings have been adapted and equipped, and in many less densely populated areas mobile first aid post units have been provided. These consist of personnel, equipment and stores conveyed in a suitable vehicle. They will proceed to the scene of the incident and deal with the casualties there.

Appropriate cases will be sent to the nearest hospital capable of receiving them from which, if it is in a dangerous area, they will be transferred as soon as possible to other hospitals situated in districts less liable to attack. In these latter hospitals they will be retained for more prolonged treatment and nursing.

CHAPTER I

Scheme-making authorities are responsible for the following matters connected with first aid parties:—

(*a*) The individual enrolment of suitable volunteers, including persons who may already be members of one or other of the existing first aid organisations (St. John Ambulance Brigade, the Detachments of the British Red Cross Society, or the St. Andrew's Ambulance Corps.)

(*b*) Instruction of these volunteers in first aid and in anti-gas measures prior to their allocation to a first aid party.

(*c*) Practical and collective training of first aid parties and combined training with other organised Air Raid Precautions services.

(*a*) *Initial Instruction and Certification in First Aid.*

A certificate in first aid must be held or obtained by volunteers for first aid party work. The certificates of the following bodies are recognised as a suitable qualification :—

The St. John Ambulance Association.

The St. Andrew's Ambulance Association.

The British Red Cross Society.

The National Fire Brigade Union.

The London County Council.

Classes should be arranged for volunteers not in possession of certificates. Particulars are to be found in A.R.P. Circular 703, 189/19 of 26th August, 1938.

(*b*) *Initial Instruction in Anti-Gas Measures.*

The prescribed course is described in Section 3 of the Appendix to A.R.P. Circular No. 26/1939.

(*c*) *Practical and Collective Training.*

The local authority may make its own arrangements directly or may arrange to make use of the normal peace-time organisation and training activities of local units of the first aid bodies. Responsibility and command, however, remain with the local authority.

In either case, the local authority will at this stage have a certain number of persons instructed in first aid and anti-gas measures, and individually selected and allocated as first aid party workers. Some of these will be members of the uniformed first aid organisations, the remainder will be volunteers from the general public without any such membership. From this personnel first aid parties should be formed, each consisting of four men with a driver. The members should be trained to work as a team under a selected leader and

then given practice in their wartime duties as part of the local A.R.P. system. This comprises work in collaboration with other Air Raid Precautions services (e.g. Rescue Parties, Ambulances, Aid Posts) under the local Control Centre, as part of the organisation for the collection, reception and treatment of air raid casualties.

It is emphasised that members of first aid parties should be among the best of the first aid men at the disposal of the local authority. They must be technically well-instructed, and well-trained in their duties; and they should be stout-hearted men of character. Not only can they do much by the exercise of their technical skill and general commonsense and presence of mind to mitigate suffering and even save life, but, by the proper exercise of their duty of decision as to the initial disposal of each case, they can help to maintain the smooth running of the casualty service machine. If they are less than first class, suffering may be inadequately relieved, and lives may be lost. If the decision as to initial disposal is faulty, the whole service will be handicapped.

CHAPTER II

2. General description of the work of First Aid Parties in war

Before proceeding to discuss the selection, allocation and practical training of the personnel of first aid parties, it is desirable to outline the work they would be called on to perform in war, and the wartime organisation of the system.

Stationing and despatch of First Aid Parties.

First aid parties each consisting of four men and a car driver will be raised, trained, and maintained on the scales notified to each local authority. Parties on duty will be stationed in "first aid party depots," which should so far as practicable be rendered splinter-, blast-, and gas-proof. First aid party depots should be distributed over the area so that any part of it can be reached by one or more parties with the minimum delay and should be in telephonic communication with the local Control Centre; but to provide against any breakdown it is desirable, if possible and if suitable from other points of view, to have them situated near to a police, fire, or first aid station at which reports of damage in the locality would be likely to be received.

The number of parties allotted to each depot will depend on local conditions but in urban areas should never be less than two. Normally sufficient transport will be available at the depots for moving the parties. Suitable reserves are necessary.

From these depots parties will go out, as required, on the receipt of a message from the local Control Centre, or exceptionally as the result of direct appeals from air raid wardens, police, etc. When a party goes out in response to a direct call the Control Centre should always be notified.

Arrangements are being made for the ambulance vehicles to proceed with, or closely follow, the first aid parties. Stretchers and blankets will normally be carried in the ambulance vehicles.

Procedure on arrival at a scene of casualty incidence. Each first aid party must have a recognised leader who should take charge of the situation and direct the activities of the party.

The sequence of action on arrival should be :—

(1) A rapid survey of the situation noting the casualties needing prior attention and those needing extrication.

(2) Such immediate first aid attention as is necessary.

(3) Removal, either direct to the Casualty Receiving Hospital or to a first aid post. There will also be certain cases who may be allowed to go home after attention.

R.A.M.C. Training, 1935, says that in the field 75 per cent. of casualties not only can, but will, make their own way, unassisted or helped by their comrades, to the nearest medical unit, without waiting for the arrival of collecting parties. Allowing for a higher proportion of severe injuries in the case of aerial bombardment and for the presence of women, children, and the aged, it may be reasonable to estimate some 25 per cent. of casualties as being "walking wounded," although any estimate must be quite provisional. This leaves 75 per cent. which may require transport, and the provision necessary in this respect must be dictated by experience. A proportion of the "walking wounded" may also need some first aid attention.

The first aid party may, then, have to deal with three main groups of casualties :—

(*a*) those urgently needing attention in order to prevent imminent death, e.g. cases of severe external haemorrhage or of true asphyxia.

(*b*) those severely injured and gravely shocked who must have first aid attention in order to make removal possible and to prevent avoidable secondary shock, which will adversely affect their recovery.

(*c*) those who after first aid attention can make their own way home or to a first aid post.

Time should not be spent in elaborate splinting or dressing, the simplest of the appropriate procedures being chosen (for example, in certain cases, "splinting" a fractured leg by securing it to the opposite one; securing a fractured arm to the trunk). Nothing in the way of first aid attention beyond the essential should be attempted. This maxim should not however be applied too rigidly, and the importance of careful handling and of keeping the patient warm must not be overlooked. The interests of the casualty are best served by his rapid comfortable removal to a place where he can obtain shelter and detailed care; the interests of the community are served by such methods as will clear an affected area in the shortest possible time, sending cases to their proper destination.

As regards initial disposal, categories (*a*) and (*b*), needing removal by wheeled transport, will fall into two groups, and a decision must be taken in each individual case. Cases whose immediate needs are likely to be served by the facilities offered by first aid posts should be sent there. Other cases, who urgently need surgical attention or whose condition makes it essential to reduce handling and movement to a minimum, should be sent direct to the hospital if it is not too far away.

If decision as to initial disposal is incorrect, and if hospital cases go to first aid posts or vice versa, handling and transportation of these cases will be doubled, and space will be occupied unnecessarily in ambulance vehicles, in first aid posts, or in the reception-units of hospitals. It is important that these principles should be understood and adopted not only from the point of view of advantage to the patient, but also because the layout, equipment and staffing in the first aid posts and in the reception units of hospitals must be based on the assumption that they will deal largely with the appropriate type of case. The basis of decision is further discussed in Section 8.

It must be understood that first aid parties are not merely and solely stretcher bearers. They are to be regarded as trained personnel charged with duties important both for the individual casualty and for the smooth running of the system.

It may happen that there will be more casualties requiring wheeled transport than the vehicles of the party or the ambulances available can accommodate at once. In this case the leader of the party will decide priority of removal, and give instructions to the vehicles to return for further loads. If necessary he will send a messenger or telephone for more ambulances. Vehicles will proceed either direct to the hospital or to a first aid post and will return to their first aid party or depot as ordered.

In the case of wounded or injured who are also grossly contaminated it is the duty of the first aid party to treat (e.g. with anti-gas ointment or with suitable solvents) any spots or splashes of liquid gas visible on the skin, and to remove the contaminated outer clothing. (Complete stripping and cleansing will in these cases, of course, be carried out on arrival at the first aid post or hospital.)

Uninjured persons who are simply contaminated should be directed by air raid wardens, police, etc. to take prompt steps to obtain cleansing for themselves at the nearest house or first aid post.

Small articles of personal property will accompany the patient. A distinguishing mark such as a label should be attached to certain casualties in the circumstances mentioned in Section 10.

First aid parties must work in close liaison with rescue parties—to help in the removal of injured persons from under débris and to ensure that further harm is not done to them in the process of extrication.

Police and air raid wardens, besides giving such help as they can prior to the arrival of first aid parties, can be of assistance by indicating to the party the number and position of casualties.

General Summary.

Members of first aid parties must bear in mind that :—

(*a*) their technical knowledge and training in first aid should be of a high standard.
(*b*) they have definite and important responsibilities as individuals.
(*c*) they are at the same time members of a team and that their team is part of an organised service.

They should remember that first aid should be as simple as possible ; that more urgent cases should be dealt with first ; that gentle initial handling and keeping the patient warm are important in preventing shock ; and that early removal to shelter and skilled attention, either in a first aid post or hospital, is desirable.

It is important that first aid parties should keep in touch with the local Control Centre. Parties with their vehicles must be organised and controlled locally to work in close collaboration with other Air Raid Precautions services.

3. Arrangements for practical training of persons selected and allocated for First Aid Party work

Officer in charge of First Aid Parties.

Although the medical officer of health is primarily responsible for all medical services, it may be desirable for the local authority to appoint an officer under him to be in charge of its first aid parties. It may also in some cases be convenient for this officer to enrol volunteers for the casualty services and arrange for their initial instruction in first aid and in anti-gas irrespective of whether they are subsequently to be allocated to first aid parties, to first aid posts, as ambulance attendants, or in other capacities.

Volunteers of suitable physique, intelligence and temperament might be earmarked for this branch on enrolment but they should

not be definitely allocated until they have completed their course of initial instruction.

Arrangements for training : A.R.P. First Aid Party companies.

Local authorities may either make direct arrangements for the training of their first aid parties or may utilise the existing machinery of the uniformed first aid organisations.

In urban areas it may be convenient to group the volunteers allocated to first aid party work into companies, and to base the companies on definite headquarters for training. If the existing machinery of local units of the St. John Ambulance Brigade, British Red Cross, or St. Andrew's Ambulance Corps is placed at the disposal of the local authority for training, the companies might be affiliated to units of these first aid organisations, which might in the first place supply the necessary instructors and officers.

Premises.

A first requirement will be the provision of suitable premises for meeting and training, for which facilities may exist in municipally-owned buildings, schools, public halls, etc. A fairly large hall is desirable, for practices and stretcher exercise, together with rooms which can be used for the storage of training and other equipment, for lectures and classes, as an office for the officer in charge, and for the rest and recreation of personnel before or after drills and meetings.

If the services of a local unit of the first aid organisations are being used the unit will in all probability already have premises which may be suitable.

Officers and Instructors.

Each first aid party company will need an officer in charge, possibly with subordinate officers to assist, and a certain number of persons to act as instructors.

The training of first aid parties is a specialised subject, and great care should be exercised in the choice of officers and instructors. It is hoped to institute courses to prepare officers and instructors for their duties : particulars will be published at a later date.

Whatever arrangements are made for the training of personnel direct responsibility for the service still rests with the local authority, who must appoint the senior officers.

Subordinate Officers and Instructors—these should be made by the medical officer of health in consultation with the officers in charge of companies. Appointments should be confined to persons of experience, but not necessarily to members of the existing uniformed organisations.

The officer in charge of the service will post his men to companies for training. Each company will be divided into parties

of 4 men, who should be of about the same height and specially selected and trained together for team work. A driver should also be appointed for each party.

As training progresses leaders should be chosen to take charge of each party.

GENERAL OUTLINE OF TRAINING SUGGESTED

The subjects dealt with should include :—

(*a*) Explanation, demonstration, and practice in dealing with casualties, with special reference to types of air raid injuries ; counter-shock measures ; arrest of haemorrhage ; methods of immobilising injured parts ; the principles of initial disposal ; methods of transportation, including carriage without stretchers, stretcher exercises, and the loading of ambulance vehicles.

(*b*) Knowledge, preparation and maintenance of material and equipment ; system of replacement of stretchers, blankets, tourniquets or splints passed on with casualties.

(*c*) Knowledge of general A.R.P. casualty service organisation. Specific details of the local scheme ; the location of the aid posts and hospitals, the depots of parties and ambulance and control centres.

(*d*) Combined working as mentioned below.

Indoor and outdoor practice should be held, first in daylight (or with artificial light) and then in the dark. Inter-party and inter-company tests and competitions should be arranged on the lines suggested in section 9.

When training has advanced sufficiently, parties should be practised in working in liaison with rescue parties and other A.R.P. services and with other units of the local casualty service scheme.

CHAPTER III

4. Practical training in the treatment and handling of cases.

General Principles

The training of first aid parties should be practical and approached in a commonsense and realistic way. Judgment and decision will be needed and must be developed during training, bearing in mind that the casualty services may be exposed to their greatest stress at an early stage in hostilities and that then there may be little time for training and adjustment. This is one reason why peace-time preparation must be thorough, practical, and bear some relation to the circumstances expected to obtain, so that these units can function as efficient and disciplined parts of an organised service.

A sound groundwork of first aid is necessary: this has been given in the instructional classes preceding allocation to a first aid party. Each case has to be treated on its merits in such a way that vitality is conserved to stand subsequent movement and operation.

In dealing with a casualty, the first thing to consider is: "Is there any immediate danger to life?" This would include:—

(*a*) Haemorrhage and shock.

(*b*) Interference with normal breathing (e.g. pressure on the chest by earth or débris as in a collapsed trench or building; or as a result of contact with a live wire; or through obstruction of the air passages).

(*c*) Proximity to a source of danger to life (e.g. fire; dangerous masonry; moving machinery; exposed wires; or escaping coal gas).

These must be dealt with at once. Bleeding must be controlled; interference with normal breathing must be removed; the source of danger must be removed from the casualty or the casualty from the source of danger.

The next thing is: "Is he to be moved at once?" It may be necessary to move him in order to prevent further injury, as for example if he is found lying on ground contaminated with persistent gas, to make it possible for his injuries to be reached, or to shift him out of heavy rain or keen wind. A casualty should not be moved unnecessarily, and it must be decided whether treatment is called for prior to moving.

To think of some very simple examples:—

A wounded man, found lying on ground saturated with mustard gas and bleeding severely from the main artery of the leg, needs to have the bleeding controlled before he is removed from the liquid gas.

A casualty with a fractured leg found unconscious in a closed room full of coal-gas from a broken gas-pipe is in immediate danger of his life unless he can be got out quickly, and this should be done irrespective of the general rule not to move a case of fracture until the fracture is attended to.

A wounded man, bleeding severely and with an apparently broken arm, found lying unconscious across a machine with still moving parts should be removed from the machinery before his haemorrhage and his fracture is attended to.

From the above examples, it will be clear that ordinary common sense is necessary in applying first aid; and that the sequence of

action in each case has to be considered according to the circumstances.

Certain general principles apply in all cases, and are here re-stated :—

(*a*) Severe bleeding must be attended to at the earliest possible moment, no matter what other injuries are present.

(*b*) The casualty must be removed at once from any source of danger.

(*c*) Ensure normal breathing; artificial respiration if needed must be started promptly and maintained without intermission.

(*d*) A greater or less degree of shock accompanies every injury. This condition, characterised by a disturbance of all vital functions, including effects on the circulation, is discussed in Section 6. It will be present in most air raid casualties. Clothes should not be removed unnecessarily.

(*e*) Death is not to be assumed because signs of life are absent. For example, in a case of true asphyxia it is better to persist in artificial respiration on a corpse than to let a man die for a lack of trying. Cases have recovered after breathing has stopped for long periods. To decide that a case is dead is always difficult.

(*f*) Where there is injury to the abdomen or chest wall, handling and movement should be extremely gentle and reduced to a minimum.

(*g*) In cases of severe laceration or of fractured bones, the affected parts should be immobilised by the use of splints or by the simple methods to be described before the patient is moved, subject always to the considerations mentioned above. The greatest care should be taken, especially when a broken bone protrudes.

(*h*) In all cases, the first consideration is by correct prompt action to save life; the second is to deal with shock; the third to prevent aggravation of the condition, by injudicious movement or careless handling; the fourth to arrange for the removal to shelter and skilled care.

These general principles apply to all first aid.

5. Types of injury to be expected

Wounds resulting from air raids may vary within wide limits and may often be of a mixed type. Multiple injuries are to be expected.

Lacerated wounds are likely to be common. They may be extremely severe and extensive, possibly with complete avulsion of limbs or with gross damage to the trunk and internal organs. They may be less destructive, but associated with gross crushing of muscular and other tissue or with multiple injury and irregular and extensive tearing and penetration.

Crush injuries may result from falling masonry and may frequently be associated with fracture, including fracture of the spine. These may be immediately fatal, or so severe that the casualty does not survive extrication. Severe mangling of limbs and compound fractures will be common. At the same time there may be simple fractures and less dangerous injuries such as gross contusions.

Casualties without obvious external injury may be encountered. First aid party personnel should be able to recognise the signs of *internal haemorrhage* and of concussion.

Burns are to be expected. The special danger of shock by burns involving extensive areas should be explained.

Injuries due to flying fragments of glass, often with portions retained, will occur, and many wounds of the back and buttocks will be found in people lying in the prone position.

Shock will be present in every case and will frequently be extreme. First aid parties should appreciate the importance of keeping the patient warm in reducing the liability to secondary shock after the patient has passed on to hospital or first aid post.

6. Wound Shock, Primary and Secondary

As described in first aid courses, shock is a condition of acute failure of vitality, always present to a greater or less degree in every injury. In air raid cases it is likely to be marked. Its rapid onset should be stressed, as should the importance of measures to combat it. Shock is to be described as *Primary* or *Secondary* as under :—

Primary Shock.

The symptoms come on immediately after injury and may vary from faintness to complete prostration. If grave and untreated it may lead to death. The signs are as follows : the face is pale, with cold clammy perspiration, especially on the forehead ; the breathing is slow and shallow ; the body is cold, especially at the extremities. The patient rapidly becomes dull and " lifeless," and may lapse into unconsciousness.

The causes of shock include pain, chill, loss of blood and of fluid from the body, and the absorption of poisonous products of tissue destruction, most marked when muscular masses are crushed or when large areas are burned. It is to be treated on general lines.

These are :—

(i) *Relief of pain*, e.g. by adjustment of the position by suitable support of injured parts or by the sealing of burned areas.

(ii) *Protection from chill.*—The temperature of the body falls rapidly in shock. Unnecessary removal of clothing should be avoided. The casualty should be wrapped in blankets (which are included in the equipment of each vehicle working with first aid parties) or coats. It should be pointed out that merely laying a blanket or blankets over the case is not sufficient. They must be carefully wrapped round him, and at least one layer should be between him and the ground. The preparation of a stretcher with blankets should be taught and practised. See Section 11, page 19.

(iii) *The arrest of haemorrhage.*

(iv) *The dressing of extensive burns.* Tannic acid dressings by their coagulating action relieve pain, prevent loss of fluid by oozing, and prevent the absorption of poisonous products of tissue destruction.

(v) *Immobilisation of fractures, joint wounds, and severely lacerated limbs before transport.*

(vi) *Gentle handling, lifting and removal.*

Secondary Shock.

This condition is unlike primary shock in that its onset is often preventible. The duty of first aid parties is to treat the primary shock, which is always present, and to adopt measures to prevent the onset of secondary shock.

Secondary shock may come on after recovery from primary shock. It means that handling has been clumsy, hurried or careless; that faulty organisation or poor discipline has led to inefficiency and delay, that incorrect decision as to initial disposal has caused double journeys and double handling, or that bleeding has restarted ; that the patient has been exposed to cold ; or that poisonous destruction-products have passed into the system.

On the other hand, primary shock may pass directly into the graver condition of secondary shock without an interval.

Tourniquets and dressings should be accurately adjusted, and if loosened watched during the journey. Note that bleeding may be relatively slight while the case is suffering from primary shock; but as the heart's action gets stronger it may increase. Hot sweet tea is an excellent stimulant if it should happen to be available. Nothing should be given by the mouth to unconscious cases or to cases with abdominal wounds.

If cases have to wait for ambulances, they must be given shelter if necessary, though in fine weather, even at night, they are as well in the open air as under cover as long as they are kept warm.

Casualties who survive the original injury and shock but who develop secondary shock will not be able to stand operation so well as those in whom the secondary condition has been prevented by proper handling.

7. Haemorrhage

Severe bleeding endangers life. Even the continued oozing of blood from a large area may lead to collapse and death if neglected. Loss of blood is one of the main causes of shock, both primary and secondary. First aid party personnel must be familiar with the rules for the treatment of bleeding, as set out in the textbooks. Direct pressure over the wound by the firm application of a large dressing will often be efficacious, but the arterial pressure points must be accurately known, and methods of indirect pressure (and for its maintenance) and the use of tourniquets and improvised tourniquets should be practised. All textbooks very properly devote much space to the application of tourniquets for under certain conditions their application is essential, but in practice such conditions are seldom found and tourniquets are seldom needed. Unless it is obvious that large arteries are affected tourniquets should not be put on until direct pressure has been tried.

It should be emphasised that the St. John type of tourniquet is intended for the maintenance of direct pressure at an arterial pressure point, and that absolute accuracy in placing the block of the tourniquet is essential. In tightening the tourniquet by the stick only enough force should be exerted to collapse the artery. Very little pressure is sufficient. The instruction sometimes heard "Twist the stick until the bleeding stops," can be most dangerous. If the block is not accurately on the pressure point, not only is no good being done but definite harm.

A tourniquet of the Samway or "rubber-tubing" type exerts uniform pressure all round the limb above the site of injury. It is suitable for a grossly crushed, lacerated or avulsed limb,

with severe bleeding. It should be applied over a thick pad, e.g. a narrow-folded triangular bandage. Again the tourniquet must not be too tight. Gangrene of the whole limb necessitating amputation has often followed the application of too tight a tourniquet.

Screw-pattern tourniquets should be avoided. (See previous page.)

Severe lacerated wounds accompanied by bleeding should be treated by firm bandaging whenever possible, without the use of a tourniquet.

The forehead of every case to whom a tourniquet has been applied must be clearly marked with a large "T" in indelible pencil and a marked label attached to the patient. This is for the information of those subsequently handling the case, in order that the dangers associated with leaving a tourniquet in position too long may be avoided, and the case recognised as requiring early attention.

Members of first aid parties should be able to recognise internal haemorrhage by its signs (rapidly increasing pallor; cold clammy skin; hurried and laboured breathing; thirst; restlessness; finally air-hunger).

8. Initial disposal

(1) *Walking cases.*

There will certainly be a number of slightly injured casualties who will be able to proceed to their own homes. They may attend for subsequent treatment at the outpatients departments of certain hospitals, which are arranging to provide this treatment, or alternatively may be treated by their own doctors.

There will also be many cases who, although able to walk, are not fit to go home direct. They should be directed to first aid posts.

(2) *Cases requiring transport.*

First aid post cases comprise those who require attention by a doctor but who nevertheless are not likely to require in-patient hospital treatment even though temporarily unable to walk far.

Hospital cases comprise those who are likely to require in-patient hospital treatment. They should be sent to hospital direct, straight from the streets. An exception must be made of persons who are too severely injured to stand the journey until they have had attention by a doctor at an aid post. This will depend very much on the distance to hospital.

A few examples of hospital cases are:—

All cases of internal haemorrhage; open pneumo-thorax; shattered limbs; grossly lacerated and crushed limbs; abdominal wounds; compound-complicated fractures; fractures of skull, spine, pelvis and thigh; injuries involving the eye; injuries

involving lower jaw and control of tongue ; acute pressure in skull injuries. Cases of severe haemorrhage and of multiple or extensive burns. Cases in which secondary shock is likely to supervene such as persons trapped for long periods under débris, or exposed to cold and wet.

9. Individual and Team Practice: team-tests and competitions; itemised marking sheets

First aid party training might include the following exercises which are indicated as suggestions and may be improved upon or added to in the light of experience.

A. Individual Practice (Indoor and Outdoor)

Training and practice in :—

(*a*) Diagnosis and need for priority of attention.

(*b*) Decision as to the treatment required and application.

(*c*) Decision as to initial disposal.

For this purpose, casualties should be either labelled or the instructor should give a verbal description of the appearance of the injury and of the general appearance of the casualty ; a diagnosis or definite statement of the type of injury should not be given. This is to be arrived at by the pupil.

Some examples might be :—

(*a*) To represent a case suffering from a fracture of the right thigh bone.

The person to represent the casualty might be discovered lying on his back with his right foot turned out and drawn up. A pad of cotton wool should be secured to his skin by sticking-plaster at the site of pretended fracture in order to simulate irregularity of the bone. A " tail " or " trail " of red flannel should be disposed on and under the affected leg to represent blood. The following information should be given by card or orally by the instructor :—

Patient answers when spoken to.
Face pale.
Skin cold and clammy.
Damp sweat on forehead.
Pulse weak and rapid.
Breathing shallow and weak.
Shortening of right leg.

(*b*) To represent a case suffering from a compound depressed fracture of the skull.

In this case co-operation from the patient is necessary. He might be discovered lying on his back or side and should pretend to be unconscious. Let the assumed fracture be about three fingers' breadth above one ear, say on the right side of the skull. The card

or the instructor should state that irregularity of the vault of the skull is felt at the site, accompanied by sticky dampness of the hair. The patient must let his arms and legs on the left side of the body (the opposite to the fracture) go limp to simulate flaccidity. The card or the instructor should give this information :—

Patient does not move or answer ; face slightly flushed ; breathing a little " snoring " ; skin not cold ; irregularity of vault at site, accompanied by sticky dampness of hair.

The injuries simulated having been discovered by the pupil, he should proceed to examine the whole body rapidly but thoroughly in order to eliminate the possibility of the presence of other serious injuries, taking care not to touch the wound, or to press on injured bones. He should then proceed to give the appropriate treatment, and to state what would be his decision as to immediate disposal, whether home, to first aid post, or to hospital.

The above are examples of what is meant, and others can readily be thought of and set out. An intelligent patient can help a lot by acting the part ; he should be taken into the confidence of the instructor and told how to behave. The card or the instructor should give other necessary information.

The instructor should not volunteer a full statement at the beginning of the examination, but should state appropriate details in reply to definite questions put by the pupil member. The pupil during his examination of the case will thus elicit the data he requires for his first aid diagnosis.

B. Training in team work within the unit (Indoor and Outdoor)

The training of parties of 4 men may proceed on the assumption that each party has been called out to deal with a group of say 10–15 casualties. The procedure should be as above but in addition the removal of casualties should be practised, using different methods of lifting and hand carriage, placing on stretchers, lifting stretchers over obstacles and loading vehicles.

As training progresses, the company might be divided into 3 groups, one to act as casualties, one to attend to them and the third to observe and criticise.

Inter-team or inter-company tests and competitions might be arranged.

Both in practice and in tests or competitions it will be helpful for the instructor to use marking sheets, which allot marks for each step. Simple examples of such marking sheets are given in Appendix A.

The medical officer of health or the local authority may be able to arrange for members of first aid parties to attend the Out-Patient and Accident Departments of hospitals or to be attached to existing public ambulance services.

CHAPTER IV

10. Marking of casualties

First aid parties are not expected to label all casualties or take particulars of names and addresses. An exception exists where for some special reason, such as the application of a tourniquet or the administration of morphia by a doctor, it is important to draw special attention to the case. A plain luggage label is being issued for the purpose but, failing this, a piece of paper attached to a button or pinned to the clothing will serve to distinguish the case. It should be marked with a T for tourniquet, M for morphia, H for haemorrhage, X for a wound of the chest or abdomen and C for gas contamination. These markings on the label are additional to markings of the appropriate capital letters on the casualty's forehead, in cases where this is possible.

11. Methods of Transportation

(a) *Stretchers.*

Most of the stretchers issued are of the rigid pattern but many types of folding stretcher exist throughout the country and will be used as required. The rigid stretcher of the same dimensions as the Army pattern canvas folding stretcher, namely :

Length—	
Bed	6 ft. 0 in.
Poles	7 ft. 9 in.
Width, total	1 ft. 11 in.
Height	6 in.
Distance between centres of runners—	
Ministry of Health pattern	4 ft. 10 in.
War Office pattern	6 ft. 0 in.

Owing to the difficulty experienced in getting full length stretchers into certain hospital lifts and small commercial vehicles, some of the latest metal stretchers are 7 ft. 4 in. in length, 2½ inches having been taken off the handles. The position of the runners, the U-shaped legs, on which the stretcher rests, remains the same and consequently there should be no difficulty in using either pattern in an improvised ambulance.

Training in the use of Stretchers.

The placing of casualties on stretchers, and their removal and loading into ambulances should be in accordance with methods which have been found by experience to be the most comfortable

to the patients. Hence, although it is not intended that first aid parties should receive training in the form of drill, practice in loading and handling stretchers is desirable.

Stretcher practice

Stand to Stretchers.

The four men of approximately the same height will be numbered 1, 2, 3 and 4. No. 1 is the leader and stands at the front right handle. All orders will be given by No. 1.

No. 2 places himself at the left of the stretcher opposite No. 1;. No. 3 is at the rear handle behind No. 1, and No. 4 behind No. 2.

Lift Stretcher.

All stoop, grasp the handles of the poles with the inner hand, rise together, holding the stretcher at the full extent of the arm.

Collect wounded.

The squad will advance and place the stretcher on the ground in line with the patient, either at the head or foot as may be convenient.

No. 1 attends to the casualty, assisted by 2 and 3 unless they are attending to other casualties. No. 4 prepares the blankets on the stretcher and helps as required. When the patient is ready for removal No. 1, 2 and 3 will kneel on one knee at one side and lift him from the ground, assisted by No. 4 from the opposite side. One man takes the weight at the shoulders, the two bearers on opposite sides, at the centre, lift the hips and in lifting they may find it easier to join hands beneath him, while the fourth raises the legs. The patient is rested on the knees of 1, 2 and 3, while No. 4 slips the stretcher under him and arranges the blankets as he is lowered on to it. Any convenient article may be used to steady the head or to serve as a pillow, though a pillow is not necessary for most cases.

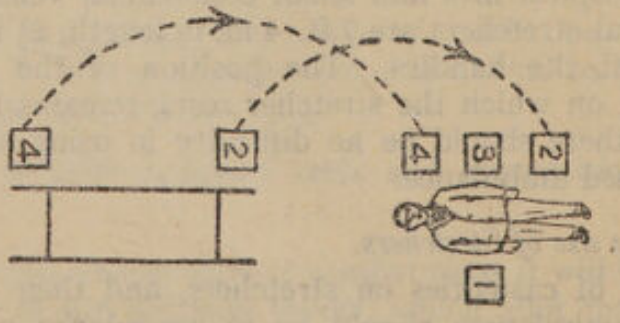

Fig. 1—Loading Stretchers

Advancing.

The bearers step off together with the inner foot, using short, shuffling steps. The party is therefore out of step, which is more comfortable for the patient. If only two men can be spared to carry the stretcher the front man should step off with the left foot and the rear man with the right, thus being out of step. It does not matter whether the patient is carried head first or feet first, but his head should be uphill unless there is some reason to the contrary.

Shoulder carry.

The party should halt, turn inwards, grasp the stretcher with both hands, and lift it gently on to the shoulders, turning to the right or left according to the direction they are going. When a stretcher is being carried on the shoulders both hands are required to support and steady it, and some padding on the shoulders is desirable.

Loading a Stretcher with only two men.

The stretcher is again placed in line with the patient, preferably at his head. After dressing the wounds 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 either pressing up from the ground or by helping to lift himself by taking 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 across the stretcher as they advance.

Loading an ambulance.

The method of loading will depend on the type of fitment in the vehicle. The stretcher should always be lowered to the ground in line with the vehicle, the patient's head to the front. After No. 1 has made certain that the tracks and steadying straps are clear and in proper position the four bearers turn inwards, lift the stretcher together and slide it into the tracks, assisted, when circumstances permit, by the ambulance attendant and, if need be, by No. 1. The most awkward berth to load—generally the upper berth—should be loaded first unless there are reasons to the contrary. Two men alone should never attempt to load or unload an ambulance. The ambulance orderly should see that the steadying straps are properly adjusted and that the patient is as comfortable as possible and well wrapped up before the ambulance moves off. Wherever it is possible, the attendant should travel inside the ambulance with his or her patients and not sitting in front, unless it is the type of vehicle without a solid partition at the back of the driver's seat where those in front can see and talk to the patients inside as easily as if they were actually inside.

General instruction regarding the use of Stretchers

(i) *Preparation of a Stretcher with blankets.*

Before an injured person is placed on a stretcher, it should be covered with a blanket folded lengthwise, or with his overcoat, so that he does not lie in direct contact with the canvas or metal

bed-portion. This adds to his comfort and keeps him warm, thus reducing shock. It is more important to place blankets under him than over him. With two layers of blanket underneath and one on the top a man is better off than with one layer underneath and two on the top.

When three blankets are available they should be folded and used as shown in the following diagrams :—

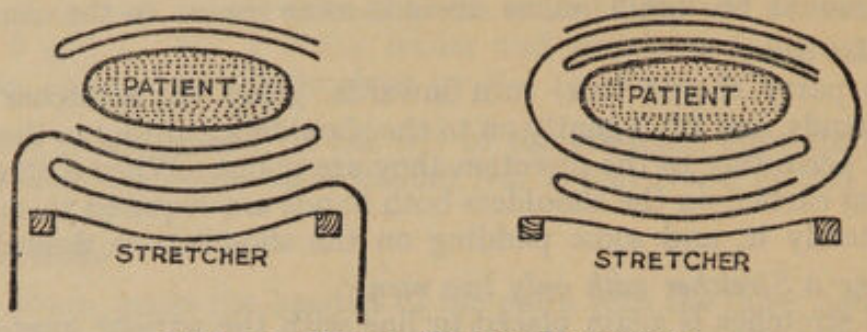

FIG. 2—USING THREE BLANKETS

If only two blankets are available instead of three, the upper folded blanket shown must be dispensed with.

Carrying Stretchers.

A stretcher always should be carried as nearly level as possible. On slopes, the injured extremity should be kept at a higher level, e.g. a casualty with head injuries should be carried head first up stairs ; one with a fracture or wound of the lower limbs head first down stairs.

If a stretcher has to be carried over a wall or fence the front handle of the stretcher should be rested on the wall or fence and the stretcher held level by the bearers in rear, while those in front cross the wall. All bearers then lift together, moving the stretcher forward until the rear handles can be rested on the wall and the stretcher kept level by the bearers in front. The rear bearers then cross the wall and the carriage of the stretcher is resumed.

If a wide ditch has to be crossed, the stretcher will be lowered as near the edge as possible. The two bearers at the front end descend into the ditch. All four bearers, lifting together, move the stretcher forward until the rear handles can be rested on the near edge of the ditch. The rear bearers now enter the ditch. Again all working together, the stretcher is lifted until the front handles are resting on the far side. By similar movements the stretcher is lifted out of the ditch on the far side, and the march is resumed.

Position of the casualty on the Stretcher.

The position of the casualty on the stretcher depends on the situation of the wound, but will usually be on the back. The following types of wound or injury require special positions :—

(*a*) In head injuries care must be taken that the injured part does not press against the stretcher. Casualties with severe

injuries to the mouth and lower part of the face may need to be carried face downwards with the head hanging over the end of the stretcher in order to prevent the tongue falling back and causing choking.

(*b*) For injuries to the lower limbs, the casualty should be laid on his back, inclining toward the injured side. This position is less liable than others to cause motion of the injured limb during transport. A casualty who is in splints should, however, be placed on his back and not inclined to the injured side.

(*c*) For injuries to the upper limbs, if the patient is unable to walk he should be placed on his back or on the uninjured side, as there is thus less liability of displacement of a broken bone.

(*d*) A casualty suffering from chest injuries should be placed with his chest well raised, his body being inclined towards the injured side. This tends to relieve any difficulty in breathing.

(*e*) Abdominal cases should be placed on the back, the abdominal wall relaxed by flexing the knees over a box, haversack or rolled coat and the head and shoulders raised. No attempt must be made to replace protruding organs (see Appendix F).

(*f*) If there is injury to the cervical region of the spinal column, the patient should be carried lying on his back with a stiff pillow or support under the head, neck and shoulders, to prevent flexion of the neck, and with pads at each side of the head to prevent it rolling about ; if the injury is in the dorsal or lumbar region he should be placed face downwards.

Action by bearers if exposed to gas.

On gas being encountered, the bearers halt and lower the stretcher to the ground as rapidly as possible. All the bearers, and the casualty if he is able, put on their respirators. If the casualty is unable to put on his respirator for himself it will be put on by whichever bearer has first adjusted his own. Care should be taken to ensure that before the head harness is drawn over the casualty's head the lower part of the facepiece is well under his chin.

Head bandages should be removed to ensure gas-tightness of the respirator, if it can be done with safety. Gas-tightness of the respirator can be obtained by ensuring contact between the fitting surface of the facepiece and the skin which lies over the bony structure of the forehead, cheeks and chin. Any dressings applied between the fitting surface and the skin will permit the entrance of gas. Hence no dressing should be placed over these parts if it can be avoided. Should it be absolutely necessary to place a dressing on a wound over these parts, the minimum thickness should be used. It may be necessary to remove some of the padding from ready-made pad dressings. It will be found that by adjusting the tension of the

head-harness, by loosening the elastics, applying the dressing, and then gradually tightening the harness, the mask itself will retain dressings in position.

When an unconscious casualty is wearing a respirator it should be inspected frequently to see that the person is getting enough air.

Full details of the methods of adjusting respirators, for all three types (Civilian, Civilian Duty and Service) on a casualty are to be found in A.R.P. Handbook No. 1 (2nd Edition) on pages 76, 89 and 97 respectively.

(b) *Handseat and other methods.*

Methods of carrying casualties by handseats and other methods, when stretchers cannot be used, and methods of improvising stretchers, are described in Appendix B. Personnel should be trained in these methods.

12. Stores and equipment for First Aid Parties

Appendix C gives the medical stores issued to first aid parties.

When coming on duty at his depot, the leader should inspect the party's haversack ; the articles to be carried in the vehicles ; and each man's water-bottle and pouch. Each man is responsible for coming on duty with his pouch filled and in proper condition, and with his water-bottle filled with fresh, clean water.

During action, bearers may draw from the vehicles or the party's haversack articles which they have expended or which are not included in the pouch.

After a period of activity each member will report to the leader his pouch deficiencies. The leader will be responsible for their restocking.

Casualties sent to first aid posts or hospitals will remain on the stretcher on which they were originally placed. Immediately the vehicle has unloaded, it will draw from dumps or stores at the post or hospital, stretchers, blankets, tourniquets and splints to the number passed in with casualties, and will return to the party with these articles. This is most important. It will be for the local authority to see that arrangements are made for this immediate exchange of non-expendible articles in such a way that no time is lost and no vehicle returns to its party short of any of these essential items.

It will be for the officer in charge of first aid parties generally to satisfy himself on these points, and to arrange for reserve stores to be held at first aid party depots for replenishing pouches and haversacks.

First aid party personnel should have the above details explained and should be instructed in the care of the articles. They should, of course, have emphasised to them the need for clean hands and nails, both when handling first aid material and when attending to the wounded.

CHAPTER V

13. Combined working of First Aid Parties

(*a*) *With other A.R.P. services.*

It may be necessary for first aid parties to work in close liaison with Rescue Parties or Fire Services. The collapse of a large building with trapped casualties will test the skill and common sense of first aid parties personnel to the utmost.

Many of these cases will not be able to be freed at once, and will need some attention while still unextricated. Shock will be extreme and must be treated as far as the situation of each case will allow.

The arrest of bleeding and protection from chill, wet, and further damage during the process of extrication, will require great care.

(*b*) *With other casualty service units.*

When individuals have been trained in their duties as a party, the next stage is the training of all the units of a local casualty service to work together as part of the general scheme.

Daylight training should precede night training or exercises in which all the A.R.P. Services are engaged.

Combined training with other casualty service units might take the following forms :—

> First aid parties. ambulances, first aid posts and casualty receiving hospitals, together with the local Control Centre and necessary inter-communications, should be manned. Groups of casualties should be placed simultaneously at different parts of the area, and messages should be sent to the local Control Centre. First aid parties and their transport should be despatched and cases handled as in war, being received and dealt with at first aid posts and at hospitals.

APPENDIX A

Examples of Marking Sheets

The following are examples of marking sheets for use in tests and competitions, as referred to in Section 9.

Example I.

(*a*) *Information*—given by means of a card, or orally by the instructor or judge :—

" This man has been carried out of a burning building. His hands are burnt : there are no obvious signs of bleeding or fracture. He is unconscious."

(*b*) *Note for Instructor.*
Man to be lying on his back.

(*c*) *Marking Sheet.*

At once place casualty upon his face	2
with arms extended above the head	2
and head turned to one side	2
so as to keep his nose and mouth away from the ground	1
Do not waste time by loosening clothing	2
To turn on to the face, stoop at his side, place his arms close to his body	2
cross his far leg over his near leg, and, protecting his face with one hand	2
with the other grasp his clothing at the hip on the opposite side of the body and pull him smartly over	2
see that there is no obstruction in the mouth	2
Induce expiration. Kneel across the casualty facing his head	1
Place your hands on the small of his back, their lower edges just clearing the top of his pelvis	1
the wrists nearly touching, the thumbs as near each other as possible without strain	1
and the fingers passing over the ribs on either side and pointing towards the ground, but not spread out	1
Bending your body from the knees swing slowly forward so that the weight of your body is conveyed to your hands directly downwards. No exertion needed ; the necessary pressure is given by the weight of your body	2
Swing your body slowly backwards to its first position thus removing the weight from your hands which are kept in position	2
Alternate these movements by rhythmic swaying forwards and backwards of your body	2
12 times a minute	2
The rhythm is : pressure 2 seconds and relaxation 3 seconds	2
When natural breathing begins regulate the movements of artificial respiration to correspond with it	2
Wrap casualty in blankets	2
Rapidly look for other injuries	2
Apply dressings to burns on hands	1
either strips of lint soaked in water	1
covered with pad of cotton wool	1
and secured by bandage	
or the same with tannic acid jelly on side to be applied to the flesh	2
If stretcher at once available, load casualty on to stretcher, obtaining assistance from other members of your first aid party	2
For loading with two, three or four bearers—correct procedure	4
Decision as to initial disposal (to first aid post by wheeled transport)	2
	50

Example II.

(*a*) *Information* (by card or orally) :—

" This casualty is found lying unconscious in the street. He appears to have been struck by falling masonry and to have been driven violently against handcart."

(*b*) *Note for Instructor.*

The casualty is lying on his right side with his right hip resting against an overturned handcart. He is unconscious, but comes round during the course of the test. Occipital haemorrhage ; fractured pelvis ; simple fracture right scapula.

(*c*) *Marking Sheet.*

Speak to the patient. He does not answer	1
Is breathing present (" Yes ")	1
Carefully remove barrow from casualty, and out of the way	1
Note possible injury to pelvis	2
Note haemorrhage back of head	2
Is blood scarlet ? (" Yes ")	1
Spurting ? (" Yes ")	1
Character of wound (" Incised ")	1
Decide treat as arterial haemorrhage	2
Apply indirect pressure on occipital artery pressure point	2
Is haemorrhage controlled ? (" Yes ") Examine the wound	1
Foreign bodies ? (" No ")	1
Local signs of fracture ? (" No ")	2
Apply clean dressing	1
Haemorrhage still controlled ? (" Yes ")	
Further examination. Colour face (" pale ")	1
Skin (" cold and clammy ")	1
breathing (" shallow ")	1
Any blood from nose, ears or mouth ? (" No ")	3
Undo tight clothing neck, chest and waist	1
Keep head low and turn on one side	2
Treat shock. Gently wrap in blankets	2
Examine for other injuries. Clavicles (normal)	2
scapulae, left (normal), right irregularity	2
and swelling	1
Any haemorrhage ? (" No ")	2
Left scapula normal. Shoulder joints both normal	2
Forearm and hands normal	2
Ribs normal	2
Treat simple fracture of right scapula	2
Apply broad bandage in armpit injured side, cross hands over uninjured side and tie under arm	2
St. John sling	3
(The Judge : Patient is now recovering consciousness)	
Enquire pain anywhere else. (Patient indicates right hip)	2
Can he move lower limbs ? (" Only with difficulty and pain ")	2
Suspect fractured pelvis	2
Confirm no injury to spine	2
Confirm no injury to lower limbs	2
Lay in position of greatest ease	2
Broad bandages round hips	2
tight enough to give support	2
bandage both hands and both ankles together	2
Blankets or coats over and under patient	2
Ascertain if haemorrhage still controlled (" Yes ")	2
If stretcher available, obtain services of other members of party for loading	2
Prepare and test stretcher (stretcher to be prepared with blankets)	4

Place in position for loading	 1
Load stretcher supporting injured parts	 6
Lift stretcher ; adjust slings ; advance	 6
(Ambulance vehicle now available)	
Approach ambulance and load into ambulance	 4
Decision as to immediate disposal (direct to hospital)	 5
	100

EXAMPLE III.

(*a*) *Information* (by card or orally) :—

" Two of you have been detached by the leader of your party to attend to the following group of six casualties :—

No. 1 casualty is obviously dead, since you can see that the whole of the right side of his head has been crushed in.

No. 2 casualty is standing leaning against a wall holding his head. Bright blood is running from his head over his fingers, hands and arms.

No. 3 casualty is lying on the ground apparently unconscious, with no obvious signs of injury.

No. 4 is lying quite still with blood spurting from a wound in the middle of his right thigh.

No. 5 is lying on his back shouting and throwing his arms about. There is some deformity of the right leg.

No. 6 is semi-reclining, holding the right side of his chest and is coughing up blood, apparently with pain at every breath."

(*b*) *Note for Instructor.*

No. 1 is dead.

No. 2 has a slight scalp wound at the top of his head.

No. 3 is suffering from internal haemorrhage from a penetrating wound of the abdomen, with small points of entry and exit.

No. 4 has an incised wound of right thigh with bleeding from right femoral artery.

No. 5 is hysterical and has compound fractures of his right tibia and fibula.

No 6 has compound fractures of the sixth and seventh ribs on the right side.

(*c*) *Marking Sheet.*

Priority.

No. 1 bearer goes at once to casualty No. 4	 3
and immediately makes indirect digital pressure on the pressure point	 3
finds incised wound, with no fracture or gross laceration	 2
raises limb and supports it raised	 2
No. 2 bearer proceeds to casualty No. 5 and warns him to keep still	
Then goes to help No. 1 bearer with No. 4 patient, adjusting St. John tourniquet accurately on the pressure point	 2
After wrapping No. 4 casualty in blanket and supporting limb in elevated position, on anything available (box, large stone, etc.) No. 1 bearer proceeds to casualty No. 6, No. 2 bearer to casualty No. 2	 2
Casualty No. 6. Bearer inclines him to right side, supporting him in that position and warns him to lie still	 2
The other bearer to casualty No. 2	
decides no dangerous arterial haemorrhage and no underlying fracture	 2
Applies dressing, pad and bandage	 1

No. 1 bearer to casualty No. 3. No obvious signs of injury.	
No signs external haemorrhage	2
Casualty pale, skin cold and clammy	
breathing, sighing	2
Decide internal haemorrhage. Wrap patient warmly	2
Both bearers to No. 5. Leg steadied until splints applied	2
Clean dressing to wound	1
Two splints	2
Firmly apply	1
Five bandages correct positions	3
Bandages passed correctly	3
One bearer to No. 4 patient. Notes haemorrhage still controlled	2
Elevation maintained	1
Other bearer to No. 6 patient. Right arm in large arm sling	2
Cover casualty No. 1.	
Decision as to initial disposal.	
No. 2 home as walking case with instructions to attend own doctor or first aid post.	
No. 3 and No. 4, direct to hospital	4
No. 6 and No. 5, direct to hospital	4
Priority of removal in this order :—	
(1) No. 3 and No. 4	
(2) No. 6 and No. 5	4
Load on to stretchers as available, obtaining assistance from rest of your first aid party	2
Loading on to stretchers :—	
Casualty No. 3	4
Casualty No. 4	4
Casualty No. 6	4
Casualty No. 5	4
When ambulance vehicle available	
Loading into ambulance vehicle	8
	80

APPENDIX B

Method of carrying injured persons where stretchers are not available or cannot be used

1. Injured persons can be carried in several ways if no stretcher is available or if it is impossible to use a stretcher.

A. If only one bearer is available.

(i) *"Pick-a-back."* Carry him in the ordinary pick-a-back position. This is the best way if he is conscious and able to hold on.

(ii) *"The Fireman's Lift."* A good way for carrying a helpless or unconscious patient and one which allows the bearer a free hand (*see Figs.* 3-5). It is easier for the bearer than pick-a-back, but not so comfortable for the patient. First roll him on to his face, keeping his arms to his sides. Stand at his head, put your hands under his shoulders and raise him to a kneeling position or get someone to help. Now put your hands under his armpits, and raise him up a little. Stoop, place your head under his right arm, put your own right arm between or round his legs, bring his weight well on to your shoulders, grasp his right wrist with your right hand and rise. Work the weight well up on to the back of the neck.

B. If two or more helpers are available.

(i) *Hand Seat: the Two-handed Seat* (for a patient who cannot assist the bearers).

Two bearers face one another on either side of the patient and stoop. Each bearer passes his arm nearest the patient's head under his back just below the shoulders and, if possible, grips his clothing. They raise the patient's back and slip their other arms under the middle of his thighs, clasping their hands with a hook grip (*see Figs.* 6-8).

The bearers rise together and step off with short paces.

The Four-handed Seat. Two bearers 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 patient puts one or both arms round the necks of the two bearers.

The Fore and Aft Method. The patient is placed on his back. One bearer raises the shoulders and passes his hands under the arms from behind, clasping them in front of the chest. The other bearer takes one leg under each arm and they carry him feet first. If a leg is broken, both legs should be tied together or put in splints and carried together under one arm.

FIG. 3—THE FIREMAN'S LIFT.
Stage I.

FIG. 4—THE FIREMAN'S LIFT.
Stage II.

FIG. 5—THE FIREMAN'S LIFT.
Stage III.

FIG. 6—TWO-HANDED SEAT. STAGE I.
The drawing shews the bearers' arms and hands a little too low down.

FIG. 7—TWO-HANDED SEAT. STAGE II.
Method of clasping hands (the "Hook-Grip").

FIG. 8—TWO-HANDED SEAT. STAGE III.
Bearers have risen together and are ready to move off by side paces.

APPENDIX C.

First aid parties: their first aid material

CONTENTS: THE POUCH*

(One pouch per man.)

Bandages, triangular		9
†" Dressings, First aid," large		6
medium		6
Canes (for tightening improvised tourniquets) (6 in. long)		3
Labels, Casualty Identity, books of 20 (with indelible pencil)		1
Ointment, bleach (and pieces of clean, washed rag), 2 oz. tins	tin	1
Safety pins, large, cards of 6	cards	3
Scissors, 7 in., with lanyard (one blade pointed)	prs.	1
Tannic Acid Jelly, ½ oz. tubes	tubes	2
Tourniquet		1

(Each member of a First Aid Party will carry a water bottle and an electric handlamp.)

CONTENTS: FIRST AID PARTIES' HAVERSACK.

(One Haversack per Party.)

Bandages, triangular		36
Canes for tightening improvised tourniquets (6 in. long)		8
Clasp-knife, large		1
Cotton wool, 1 oz. packets	pkts.	6
Dressings, first aid, large		18
medium		12
Lint, unmedicated, in squares about 8 in. × 12 in.	square	6
Ointment, Bleach, in 2 oz. tins (and clean, washed rags)	tins	4
Safety Pins, large, cards of 6	cards	8
Tourniquets, St. John type		2
Samway type		2
Splints, sectional, wooden	sets	2
Straps, webbing, with metal fasteners for securing splints (Length about 18 in., width about 2 in.)	straps	18
Tannic Acid Jelly, ½ oz. tubes	tubes	4
Torch or lamp, with stand and shield		1

TO BE CARRIED IN THE VEHICLE.

Blankets		8
Splints, thigh, wooden	sets	3

---

* Fitted with a sling so that it can be carried over the shoulders.

† " Dressings, first aid " are made up in pads. The sizes are:—

Large dressing	8 in. by 6 in.
Medium „	6 in. by 4 in.
(Small „	4 in. by 3 in.)

Straps, webbing with metal fasteners, for splints 21
Stretchers 4
Respirators, spare, for use of casualties whose own are lost or destroyed.

Each first aid party combine should go into action with double the above numbers, so that the party can receive from the vehicles immediate exchange for articles loaded in with casualties.

The following Appendixes (D, E, F, G, and H) are intended as general reminders on the practical application of certain first aid methods taught in the initial instructional courses in pure first aid and dealt with in the recognised first aid text books. It should be remembered that members of A.R.P. First Aid Parties must be kept efficient in pure first aid (e.g. by means of refresher talks and practices) in addition to their specific air raid training as described in this Handbook.

APPENDIX D

Principles of bandaging

THE TRIANGULAR BANDAGE

Triangular bandages are most useful articles of first aid equipment. They may be used to keep splints (or dressings) in position; to afford support to an injured part, as arm slings or to secure a fractured limb to its opposite fellow or to the trunk; to make pressure, as when used in the treatment of bleeding, or to reduce or prevent swelling (as in a sprained ankle).

There are also other types of bandage (roller bandages and special bandages) which will not normally be used by first aid parties.

The Triangular Bandage. Pieces of calico or linen, usually 40 in. square, are cut from corner to corner. Each half forms a Triangular Bandage. The longest edge is called the lower border, the two others the side borders. The upper corner opposite the lower border is called the point, the other two corners are called the ends.

To fold a Triangular Bandage for packing:—

Fold it vertically down the middle, placing the ends of its lowest edge together. Bring the point, and the two ends, to the middle of the lower border. This forms a square. Fold the square in half from right to left and again in half from above downwards twice.

Triangular Bandages can be used in the following ways:—

(i) *As a "whole-cloth,"* i.e. unfolded, the triangle being spread out to its full extent.

(ii) *As a "broad fold" bandage.* Carry the point (the angle opposite the longest edge) to the middle of the longest edge opposite, and then fold the bandage again in the same directions.

(iii) *As a "narrow fold" bandage.* Fold a broad fold once, long edge to long edge.

Bandages can be secured by tying (using a reef knot)—or in certain cases by pinning.

Triangular Bandages should be secured by reef knots. Granny knots slip and should be avoided.

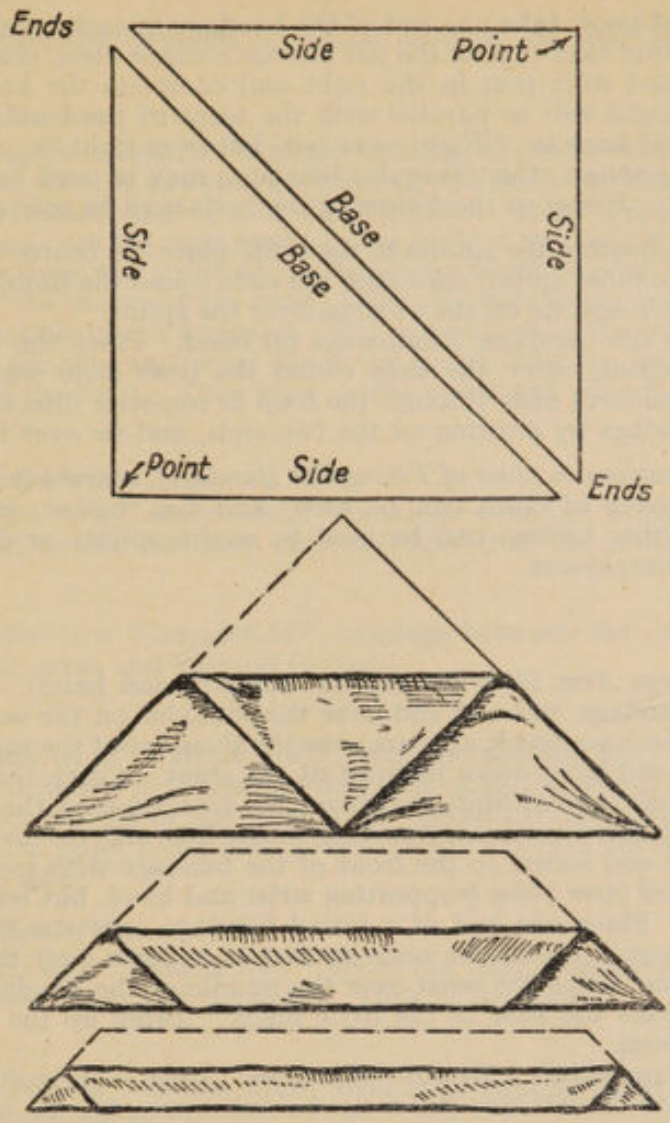

FIG. 9—THE TRIANGULAR BANDAGE.
Folding for " broad-fold " and " narrow-fold."

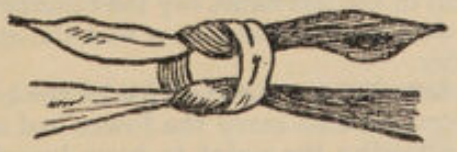

FIG. 10—REEF-KNOT, TO BE USED.
Contrast with granny-knot, to be avoided.

FIG. 11—GRANNY-KNOT.

To tie a reef knot: take one end of the bandage in each hand, pass the end in the right hand over that in the left and tie a single knot, then pass the end in the left hand over that in the right and complete the knot. The ends when pulled tight will be parallel with the turns of the bandage. The rule for tying a reef knot is: " Right over left, left over right."

For securing splints: the triangular bandages may be used broad or narrow as convenient. Either of the following methods may be used:—

(i) After adjusting the splints to the limb, place the centre of the bandage over the outer splint, then pass the ends round the limb, cross them on the inside and tie on the outside, over the splint.

(ii) Double the bandage, lengthways on itself. Place the loop upon the outer splint, carry the ends round the limb from without inwards, and pass both ends through the loop in opposite directions. Tighten the bandage by drawing on the two ends, and tie over the splint.

As improvisations in place of Triangular Bandages, scarves (e.g. Boy Scouts' scarves) or pieces of cloth can be used; and ties, braces, straps, belts or lengths of rubber tubing, can be used to secure splints or dressings or as improvised tourniquets.

Slings.

(*a*) *The Large Arm Sling* (to support forearm and hand). Spread out a Triangular Bandage, put one end over the shoulder on the sound side, pass it round the neck so that it appears over the shoulder of the injured side, and let the other end hang down in front of the chest. Carry the point behind the elbow of the injured limb, and place the forearm over the middle of the bandage; then carry the second end up to the first and tie them. Bring the point forward and secure to the front of the bandage with two pins.

(*b*) *The Small Arm Sling* (supporting wrist and hand, but leaving elbow to hang freely). Place one end of a broad bandage over the shoulder of the sound side, pass it round the neck so that it appears over the shoulder of the injured side: place the wrist over the middle of the bandage so that the front edge covers the base of the little finger. Bring up the second to the first and tie them.

(*c*) *The " Hand-raised " Sling or " St. John " Sling.* These directions apply for an injury on the left side (for a right-sided injury, for the word " right " in the directions substitute " left " and vice versa):—

(i) Place the patient's left forearm diagonally across his chest so that his fingers point towards the right shoulder and his palm rests on his breastbone.

(ii) Holding an unfolded Triangular Bandage with its point in the right hand and one end in the left hand, lay the bandage over the left forearm with the point well beyond the elbow and the end in the left hand on the right shoulder.

(iii) Supporting the left elbow, tuck the base of the bandage well under the left hand and forearm and carry the lower end across the back to the right shoulder, allowing the point to hang loosely outwards. Tie the ends in the hollow above the right collar bone.

(iv) With your left hand hold open the side of the bandage lying on the left forearm, and with your right hand tuck the point well in between the left forearm and the side of the bandage which you are holding open.

(v) Carry the resulting fold round over the back of the arm, and firmly pin it to a part of the bandage running up the back.

(*d*) *Improvised Slings.* Slings may be improvised by pinning the sleeve of the coat to the garment, by turning up the lower edge of the coat and pinning it, by passing the hand inside the coat or waistcoat and buttoning it, or by using scarves, ties, or belts.

To apply triangular bandages to special parts of the body (e.g. to secure dressings):—

(1) *The top of the head.*

Take an unfolded triangular bandage and lay its centre on the top of the head so that its point is towards the back of the head, and its lower border lies along the forehead just clear of the eyebrows. Make a short fold in the lower border and pass the ends round to the back of the head above the ears. Cross the ends over the point of the bandage, which should here be lying vertically over the crown of the head; bring the ends to the front again and tie off in the middle of the forehead. Put your hand on the top of the head to steady the dressing and draw down the point until the bandage is taut over the top of the head. Then turn up the point and pin off on the top of the head.

(2) *The side of the head.*

Put the centre of a " narrow-fold " bandage over the dressing, pass the ends horizontally round the head, cross and knot over the dressing.

(3) *Both eyes.*

Put the centre of a " broad-fold " bandage between the eyes, carry the ends backwards, cross and knot off in front.

(4) *One eye.*

Put the centre of a " narrow-fold " over the affected eye. Let one end pass obliquely upwards over the opposite side of the forehead, and the other downwards over the ear of the same side. Cross the ends below the bump at the back of the head, bring them forwards and knot-off above the eyebrow on the affected side.

(5) *Chin and side of face.*

Put the centre of a " narrow-fold " under the chin, pass the ends upwards, and knot-off over the top of the head. Tuck in the ends.

(6) *The neck.*

Put the centre of a " narrow-fold " over the dressing, cross the ends, and knot-off over the dressing.

(7) *The Chest.*

Apply the centre of a " broad-fold " over the dressing, pass the ends round and knot-off on the opposite side, leaving a long end. Now take a " narrow-fold," tie to the long end of the " broad-fold," bring it over the shoulder, and pin off to the " broad-fold " over the dressing.

(8) *The Abdomen.*

Put the centre of a " broad-fold " over the dressing and tie off on the side.

(9) *The Shoulder.*

Lay the centre of an unfolded Triangular Bandage on the top of the shoulder, point upwards, with the lower border across the middle of the arm. Fold in the lower border, carry the ends round the arm, cross them and knot-off on the outer side. Apply the small arm sling, draw the point of the first bandage under the arm sling, fold it back on itself and pin over the shoulder.

(10) *The Elbow.*

Place the centre of an unfolded Triangular Bandage over the back of the bent elbow, point upwards, turn in the lower border, pass the ends round the forearm, cross them in front, pass up round the arm, cross behind and knot-off in front. Tighten the bandage by gently drawing in the point, which is then to be brought down and pinned-off. Apply the large arm sling.

(11) *The Hand.*

Place the hand, palm down in the centre of an unfolded Triangular Bandage, with the fingers towards the point of the bandage. Bring the point over the back of the hand to the wrist, pass the ends round it, crossing them over the point. Then fold the point towards the fingers and cover it by another turn of the bandage round the wrist. Knot-off the ends in front of the wrist.

Alternatively, you can use a " narrow-fold " bandage in " figure of eight " fashion. Put the middle of the bandage over the dressing, bring the ends to the opposite side of the hand, cross and take two or three turns round the wrist and knot-off. Apply the large arm sling.

(12) *The Foot.*

Place the sole of the foot on the centre of an unfolded Triangular Bandage with the toes towards the point. Turn the point upwards over the instep: take *one of the ends in each hand* close up to the foot, bring them forward and cross them over the instep, covering the point.

Draw the point upwards to tighten the bandage and fold it towards the toes. Carry the ends back round the ankle and cross them behind, catching the lower border of the bandage. Bring the ends forward, cross them again over the instep covering the point, carry them *under the foot* and knot-off to the inner side.

(13) *The Hip.*

Pass a " narrow-fold " round the waist and knot-off in front. Then take an unfolded Triangular Bandage, put its centre over the hip, point upwards, with its lower border folded in and lying across the thigh. Pass the ends round the thigh and knot-off on the outer side. Draw the point upwards *under* the bandage round the waist, turn it down and pin-off.

(14) *The Knee.*

Keeping the leg straight, apply a " broad-fold " bandage, cross it behind and knot-off in front below the knee-cap.

(15) *Between the legs and lower part of the abdomen.*

Pass a " narrow-fold " bandage round the waist and tie-off. Pass the end of a second " narrow-fold " bandage under the first (waist) bandage at the middle at the back. Fold it over and secure it with a safety pin. Bring the other end forward between the thighs up to the waist-bandage in front: pass it under: turn over and secure with a safety pin.

Roller Bandages.

Roller bandages would not normally be used except in fixed units such as first aid posts or hospitals. Members of first aid parties should, however, have a general knowledge of the principle of roller bandaging. They consist of long strips of material, varying in length and width according to the part to which they are to be applied, e.g. for the head and upper limbs, 2 to 3 inches wide and 4 to 6 yards long: for fingers, 1 inch wide and 2 yards long; for the trunk and lower limbs, 3 inches or more wide and 6 yards long.

General rules for Roller Bandaging.

(i) First fix the bandage with two or three turns.
(ii) Bandage from below upwards, and from within outwards over the front of the limb.
(iii) Apply *uniform* pressure all through the process of bandaging.
(iv) Let each turn overlap about two-thirds of the preceding one.
(v) Keep margins parallel. Let any crossings or reversings be in one line, and rather towards the outer aspect of the limb.
(vi) Secure either by a safety pin or by dividing the free end into two strips by a scissor-cut parallel to its edge, knotting at end of cut and tying-off ends of the two strips.

(vii) To apply a roller bandage:—
Stand or sit opposite to your patient, support his limb in the position it is to be in when bandaged. Be careful that you do not put on the bandage so tightly that it causes pain or so interferes with circulation that it causes swelling of the limb below it. If when you squeeze the toes or fingers of a bandaged limb you notice that the colour returns more slowly than in the unbandaged limb, you know that your bandage is too tight.

(viii) Instruction for the roller bandaging of special parts of the body are beyond the scope of the elementary essential first aid dealt with in this book and can be read in the larger and more advanced manuals on First Aid and on Nursing.

Special Bandages are in the province of the hospital orderly or nurse and beyond the scope of the first aid worker. They include the " T " Bandage, the " many-tailed bandage " (for use after operation) and india rubber and elastic bandages.

APPENDIX E

Arrest of arterial haemorrhage: arterial pressure points

THE FIRST AID TREATMENT OF WOUNDS ACCOMPANIED BY ARTERIAL BLEEDING.

(i) Your first aim is to arrest urgent bleeding, your next to treat shock.

(ii) Put the casualty in a suitable position. The blood escapes with less force if he is sitting or, better, lying down.

(iii) *Except in the case of a broken bone or a lacerated or crushed limb*, elevate the bleeding part.

(iv) Expose the wound, removing clothing only as necessary.

(v) Press firmly with the soft part of the front of the tips of thumb and/or fingers (the " cushions ") directly on the bleeding spot, interposing a first aid dressing. This is called " direct digital pressure." Do not direct digital pressure over a fracture or an imbedded foreign body.

If direct digital pressure does not check the bleeding, if the wound is large, or if there is a fracture or foreign body, make firm pressure with thumb or fingers on the nearest *pressure point* at the heart side. Don't crook your thumb and fingers and just dig in; apply firm even pressure as above. (A pressure point is a known point at which an artery passes over a bone near to the surface so that it can be compressed against the bone. The chief pressure points of the body are set out on the frontispiece. Pressure on a pressure point above the actual wound is called " indirect digital pressure.")

Maintain this indirect pressure by a tourniquet or by flexion.

Carefully remove foreign bodies, such as pieces of glass or metal, or portion of cloth—if they can readily be seen and easily removed. Don't attempt to shift any that cannot be seen or which are at all embedded.

Cover the wound with a clean dressing and bandage it firmly. If there is a fracture, or a foreign body in the wound, bandage it lightly.

Support the affected part.

Ring Pads.

When, in cases of bleeding from the scalp, a fracture is suspected, do not make digital pressure but apply a ring pad around the site of injury. A ring pad is made in this way: pass one end of a " narrow-fold " bandage round your fingers: then pass the other end of the bandage *through* this ring thus made; continue to pass it through and through until the whole of the bandage is used and a ring is formed.

To improvise a tourniquet.

(*a*) Place a firm pad accurately on the pressure point.

(*b*) Put round the limb a narrow-folded triangular bandage (or scarf, tie, strap, narrow belt or braces), *with its centre over the pad.* Tie the ends in a half-knot on the opposite side of the limb.

(*c*) Take a short stout stick or piece of strong cane, the handle of an entrenching tool, a short metal bar, a strong ruler, or similar article (even a stout pencil will do, and failing anything else a walking stick will serve, though too long to be convenient), and lay its midpoint on the half knot. Tie a reef-knot over it.

(*d*) Twist the stick (etc.) so as to tighten the bandage, thus causing the pad to compress the artery against the underlying bone, stopping the flow of blood along it.

(*e*) Keep the stick fully twisted by tying it in position by the ends of the bandage already used, or by another bandage passed round the stick and limb, or by a piece of cord if you must.

The pad of the tourniquet *must be right on the pressure point*, otherwise the artery will not be compressed. If a suitable pad is not available, make a knot in the centre of the bandage, enclosing a stone or cork in it to give it bulk. See that the protruding and not the flat side of the knot is on the pressure point.

Elastic bandages are specially suitable *when part of a limb is grossly lacerated or is torn off.*

A tourniquet should not be left tightened for too long. After a reasonable period, never longer than fifteen minutes, first aid party personnel will relax the pressure of the tourniquet, while exerting direct pressure on the wound (over any dressing applied in the meanwhile), and will observe whether bleeding has ceased. If it has, the tourniquet is to be left in position, but relaxed, until the case is to be moved. It is then tightened, for the journey, and watched to see that it does not get displaced.

They will mark the case as described in Section 10 so that the staff at the post or hospital shall know that a tourniquet has been applied.

In all cases of wounds accompanied by haemorrhage, shock will be present and must receive attention as an important part of the first aider's duty.

Remember that firm pressure by bandaging will often arrest bleeding and that the tourniquet is not to be resorted to indiscriminately.

FIG. 12—AN IMPROVISED TOURNIQUET.

Common Types of Tourniquet.

(*a*) *The St. John Tourniquet.*—This consists of webbing, 2 in. wide, with a buckle, a pad, and a length of cane, with a string passing through it, fixed, as a twister, over the pad. The string is to secure the twister after tightening.

(*b*) *Samways Anchor Tourniquet.*—This is a piece of stout rubber tubing with an anchor-shaped metal catch attached to one end. It is applied by stretching the rubber tubing and winding it at least twice round the limb, and fixing it by passing the end round each prong of the anchor. (Especially useful for avulsed or shattered limbs.)

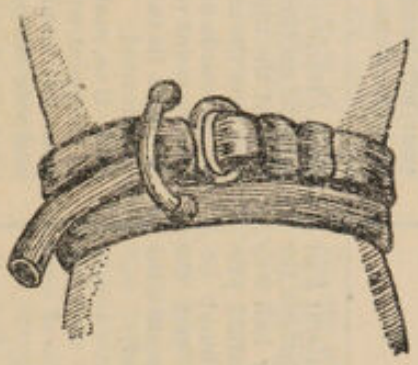

FIG. 13—SAMWAYS ANCHOR TOURNIQUET

The principal pressure points are described in the following table.

ARTERIAL PRESSURE POINTS.

Methods of applying indirect digital pressure, in certain cases to be maintained by mechanical means:—

(1) Apply as near the wound as possible except where the wound is extensive, and hence involves bleeding from more than one artery. In this case indirect pressure should be applied to the main artery above.

(2) Find the exact spot—feel for the artery's pulsation. Compress the artery *against bone*, not into and against soft tissues. You will know that you are on the right spot if the bleeding stops.

(3) Main pressure points are shown on the accompanying diagram, and the following table in this gives special details in connection with the compression of individual arteries.

(4) In the case of arteries of the limbs, pressure can be maintained on pressure points by mechanical means, e.g. by tourniquets or by forced flexion.

FIG. 14—COMPRESSION OF THE CAROTID ARTERY.

Part wounded	*Name of Artery*	*Line of Artery*	*Where and how compressed*	*Methods to be used*
Temple, front and top of head.	Temporal Artery	Runs upwards in front of ear to supply the side of the head; can be felt pulsating a finger's breadth in front of the ear in line with the angle of the eye.	Immediately in front of ear against the temporal bone.	*Digital Pressure.*—Place your palm behind where head joins neck with the forefinger pointing forward obliquely upward over the ear. Find the artery a finger's breadth in front of ear and compress it with the "cushion" of the thumbs. Use your left hand for a right-sided wound and vice versa.
Back of the head.	Occipital Artery.	Runs upwards behind the ear to supply the back of the scalp.	Against the skull, about four fingers' breadth behind the ear, immediately half-way between the mastoid process (the bony bump behind the ear) and the occipital protuberance(the crown of the head).	*Digital Pressure.*—Place your palm on the midline on the rounded back of the head so that the tips of your fingers extend to just over the crown: stretch the thumb in an outwards and slightly upwards direction to point to above the tip of the ear, and with its cushion pressing on the point as indicated. This point may be hard to find: if so, make pressure over the region of the point with a small, firm pad. (Use your left hand for a right-sided wound, and vice versa.)
Face below the eyes.	Facial Artery.	Runs upward from the neck across the lower jaw to supply the face below the eyes.	The artery crosses the lower edge of the lower jaw in a slight hollow or depression in the bone two fingers' breath in front of the angle of the jaw.	*Digital Pressure.*—Facing the patient, lightly grasp the chin, cupping the hand, and with the extended thumb seek and compress the artery where it crosses the lower jaw. In this case—use your right hand for a right-sided wound, your left hand for a left-sided wound.

Part wounded	*Name of Artery*	*Line of Artery*	*Where and how compressed*	*Methods to be used*
Neck.	Common Carotid Artery.	Passes up the side of the neck from where the collarbone meets the breast bone to a point midway between the angle of the jaw and the middle of the ear.	About an inch and a half above the collarbone, backwards and inwards against the spine in the neck. (Take care not to press on the wind-pipe.) It may also be necessary to press with the other thumb over the wound to arrest the flow of blood from the main vein of the neck (the Jugular) which runs alongside the Carotid Artery.	*Digital pressure*, placing the palm against the back of the neck and extending the thumb forward to the pressure point (see diagram). Digital pressure may have to be kept up by relays of helpers pending removal of the case to surgical care.
Shoulder and Armpit.	Subclavian Artery.	Runs outwards between the collarbone and the topmost rib, lying on the latter.	Behind the centre of the collarbone downwards and backwards against the top (first) rib.	Uncover the patient's neck and chest. Put his arm, on the affected side, against his body so as to depress the shoulder: make him lean his head over towards the affected side. Stand facing him, opposite the shoulder. Using the left hand for the right arteries (and vice versa) grip his neck low down, with your fingers behind his shoulder and your thumbs above and behind the collarbone in the hollow you will find. Press the thumbs deeply down against the top rib which lies beneath the collarbone at this spot. Pressure can also be exerted at this spot by using the padded handle of a door key (not a yale).

Part wounded	*Name of Artery*	*Line of Artery*	*Where and how compressed*	*Methods to be used*
Upper third of arm.	Axillary Artery.	Runs outwards from behind the collarbone to the other side of the armpit. It keeps close to the shoulder joint and can be felt pulsating when the fingers are pressed deeply into the soft tissues of the armpit.	In the armpit—at the junction of the middle with the outer third of the armpit.	*Digital pressure* is difficult. Use digital pressure at first, then place a large pad (the size of a billiard ball—made by knotting a bandage over a stone, etc.) in the armpit and bandage the arm tight to the side. Suggested steps in bandaging: Midpoint at a narrow fold bandage *on the pad:* cross bandage *in shoulder of same side* and tie under opposite armpit. This should hold the pad. Then bend the elbow of the affected side and bind the arm *tightly to the trunk* with a broad bandage, put on at the level of the elbow.
Lower two-thirds of arm.	Brachial Artery.	Runs down the inner side of the biceps muscle, from the armpit, gradually passing forward to the middle of the front of the elbow. (Its course is roughly mapped out by the inner seam of the coat-sleeve above the elbow.)	The middle of the inner side of arm, outwards and backwards against the upper armbone (Humerus). Bend of elbow under inner side of biceps muscle.	*Digital pressure followed by tourniquet:*—Digital pressure, then compress the axillary artery above, by pad and flexion. If this does not check the bleeding apply a tourniquet. In an urgent emergency and *if there is no* possibility of fracture, the brachial artery may be compressed, as a temporary measure, at the elbow by pad flexion or by flexion over a fold of the sleeve.
Hand and wrist.	Radial and Ulnar arteries.	Run down the front of the forearm on the thumb and little finger sides respectively.	About an inch above the wrist in line of the arteries.	1. *Digital pressure,* using a thumb for each. 2. *Pad and flexion* at the elbow joint.

Part wounded	*Name of Artery*	*Line of Artery*	*Where and how compressed*	*Methods to be used*
Palm of hand.				To control urgent bleeding from the palm of the hand *if no fracture is present or suspected:—* 1. Make the patient grasp firmly in the affected hand a firm pad. 2. Spread out a triangular bandage, turn up its base about 4 inches; lay back of patient's hand on centre of bandage; fold the point over knuckles and wrist; make the patient pull on the point of the bandage; cross the ends over fingers and thumb twice and tie them as firmly as possible. Elevate the forearm and support in " hand raised " sling.
Thigh.	Femoral artery.	Corresponds to the upper two-thirds of a line from the middle of the groin to the inner side of the knee. (To find the groin raise the limb to flex the thigh: the fold in the clothing at the top of the thigh indicates the groin). After following two-thirds of this line the Femoral Artery goes deep, passing behind the thigh bone, to become superficial in the back of the knee-joint as the Popliteal Artery.	(*a*) Against the pelvis in the middle of the fold of the groin. (*b*) Four fingers' breadth below the fold of the groin.	*Digital pressure:* using both thumbs, one over the other, with the fingers of both hands grasping the thigh. Then apply a tourniquet. This is not satisfactory at point (*a*) and relays of helpers may be needed to maintain digital pressure (each, when taking his place, slipping his thumbs under those of the helper he is relieving, to prevent spurts of blood escaping during the changeover.)
	Popliteal Artery.	Along the middle of the back of the knee (the ham).	At the centre of the ham, against the thigh bone.	*Digital pressure* or *forced flexion.*
Front of foot.	Anterior Tibial Artery.	Runs between tibia and fibula to middle of front of ankle.	Middle of front of ankle, with feet raised.	*Digital pressure* with pad and tight bandage round the ankle.
Side of foot.	Posterior Tibial Artery.	Runs down the base of the leg under the calf-muscles, then between the inner side of the ankle and the heel, to the side of the feet.	Behind the bony projection at the inner side of the ankle (the lower end of the inner side of the Tibia) with the foot raised.	As for Anterior Tibial above.

FIG. 15—COMPRESSION OF THE SUBCLAVIAN ARTERY.

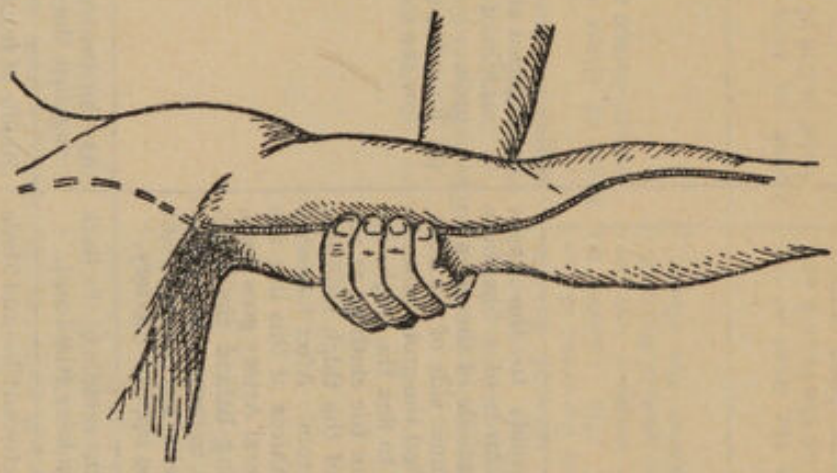

FIG. 16—COMPRESSION OF THE BRACHIAL ARTERY.

FIG. 17—FORCED FLEXION.

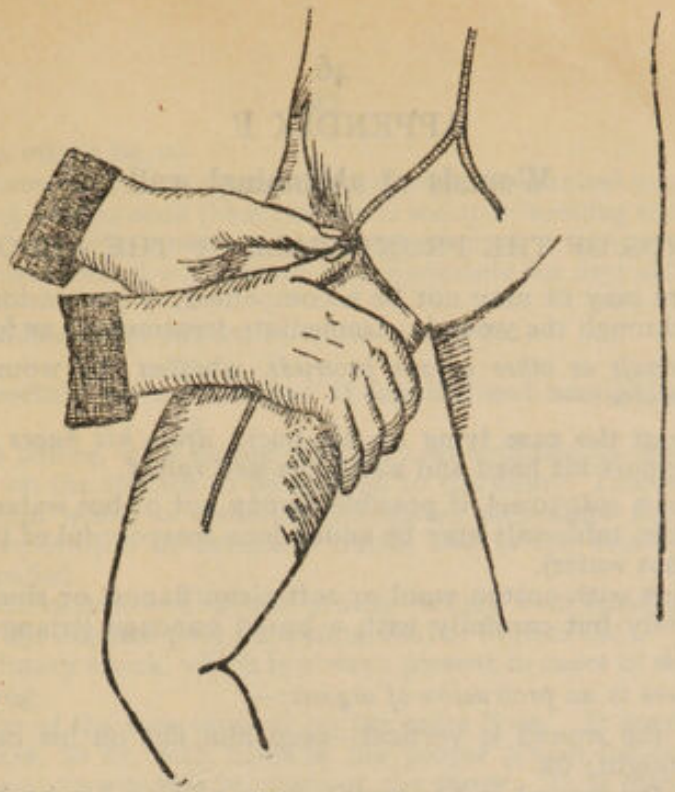

FIG. 18—COMPRESSION OF THE FEMORAL ARTERY AGAINST THE RIM OF THE PELVIS.

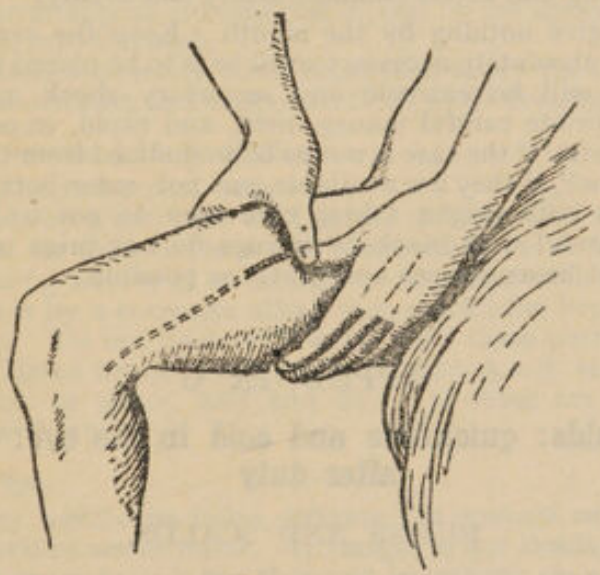

FIG. 19—COMPRESSION OF THE FEMORAL ARTERY AGAINST THE FEMUR.

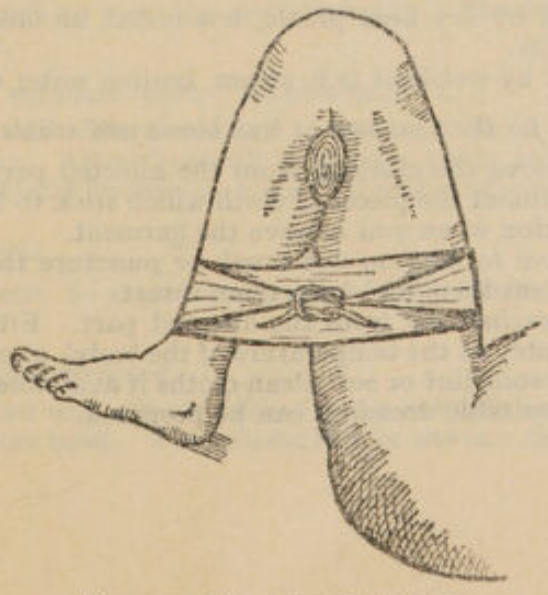

Fig. 20—FORCED FLEXION.

APPENDIX F

Wounds of abdominal wall

WOUNDS OF THE FRONT WALL OF THE ABDOMEN.

Wounds here may or may not be accompanied by protrusion of bowel or other organs through the wound. Immediate treatment is as follows:—

(*a*) *When bowels or other organs protrude,* whether the wound is vertical or transverse:—

(i) Keep the case lying on his back; *draw his knees well up,* and support his head and shoulders *well raised.*

Apply lint or a soft towel, if possible, wrung out of hot water, to which, if readily available, table salt may be added (one teaspoonful of table salt to a pint of clean hot water).

Cover the lint with cotton wool or soft clean flannel or similar material, securing it firmly but carefully with a broad bandage (triangular bandage " broad-fold ").

(*b*) *When there is no protrusion of organs:*—

(i) If the wound is vertical—keep him flat on his back with legs straight; OR

(ii) If the wound is horizontal, keep him on his back, with knees drawn up and his head and shoulders *well raised.*

Apply a dressing and broad bandage firmly and evenly.

In all cases—give nothing by the mouth. Keep the case warm. Don't move him unless absolutely necessary until he is to be placed in the ambulance vehicle. Shock will be extreme and secondary shock must be guarded against. Appropriate careful management, and rapid, smooth transport to hospital are essential if the case is not to be prejudiced from the outset.

In treating shock, if they are available, put hot-water bottles in the axillae and lying across both thighs, taking care they do not scald or burn him. (Cowell.) Be careful that blankets or rugs do not press on the abdomen. Let all movement be as smooth and gentle as possible.

APPENDIX G

Burns and scalds: quicklime and acid in the eye: eye irrigation after duty

BURNS AND SCALDS.

In addition to injuries due to missiles or to falling debris, burns or scalds may need attention.

A burn is caused by dry heat (flame, hot metal, an electric current, or a strong acid or alkali).

A scald is caused by wet heat (e.g. steam, boiling water or oil).

The general rules for the treatment of both burns and scalds are:—

(1) Carefully remove the clothing from the affected part, except where it sticks. Cut round the pieces of cloth which stick to the flesh and leave them in position when you remove the garment.

(2) If blisters have formed do not break or puncture them, but as far as possible, protect them and keep them intact.

(3) *Immediately exclude air* from the affected part. Either immerse it in water (preferably at the temperature of the body) or cover the part with clean cotton wool, lint or soft clean cloths if available, and bandage on. This is until suitable dressings can be prepared.

(4) Dressings might be:—
Lint or linen cut into strips about 2 in. wide and soaked in a lotion made by stirring baking soda (bicarbonate of soda) or washing soda (carbonate of soda) in sterile water, in the proportion of 2 teaspoonfuls to each pint. This method will seldom be appropriate for first aid party work;
or
similar strips soaked in warm strong tea;
or
special " burn dressings " if supplied and available;
or
strips, as before, with tannic acid jelly, as supplied to first aid parties, smeared on the surface to be applied to the flesh. This method forms a coagulum which is useful in preventing secondary shock, likely to be a complication of extensive burns, and is the first aid treatment recommended.

(5) Cover with cotton wool or soft cloths—secure with bandages.

(6) Support the affected part (in a sling, real or improvised).

(7) Treat primary shock, which is always present in cases of severe burning or scalding.

(8) For burns of the face proceed on the same lines. It may be useful to cut a *mask*, to fit, with holes in the proper places for eyes, nose and mouth, and to use this in place of the strips. It is often convenient to make the mask in two halves, the upper to cover the face down to the nose, the lower, with a hole at the mouth, to go over the lower part of the face, overlapping or being overlapped by the upper and extending over the chin into the neck.

(9) If a young child is severely burnt or scalded about the body, it may be placed in a warm bath and supported there while dressings are prepared.

Burns caused by corrosive acids or alkalis.

(i) Thoroughly flush the part with water.

(ii) If the burn is by a corrosive acid, bathe it freely with a weak alkaline lotion, such as that made from bicarbonate or carbonate of soda described in (4) above, or with milk in water, or with milk.

(iii) If the burn is by a corrosive alkali (e.g. quicklime) brush off any that still adheres. Do not flush with water until these particles have been removed. Bathe freely with a weak acid lotion, e.g. vinegar or lemon, or lime-juice, in water, half and half. If these are not available, flush well with water.

Quicklime in the eye.

Brush away any visible particles, irrigate the eyeball with one part of vinegar in four parts of warm water. If vinegar is not available, irrigate the eye freely with warm water. After thorough irrigation, close the lids, apply a soft pad, e.g. of cotton wool, or a folded handkerchief, and secure it with a bandage firm enough to keep the eyeball steady. The case should be seen by a medical officer.

Acid in the eye (e.g. sulphuric acid, " oil of vitriol ").

Irrigate the eye well with a solution of baking soda (2 teaspoonfuls to a pint of warm water). After thorough irrigation, apply pad and bandage as above. The case should be seen by a medical officer as soon as possible.

Irrigation of the eyes.

This would be done, as a routine measure, after tours of duty if gas has been present.

(1) *Using a douche-can irrigator.*

The irrigator, fitted with rubber tubing and a suitable nozzle, is suspended about a foot above the head. The patient lies, or sits in a chair, with the head

bent back. A kidney basin is held at the side of the head (and a towel and/or mackintosh may be placed round his neck). With the first and second fingers of the left hand gently, but firmly and thoroughly, separate the eyelids and with the right hand direct a stream of water or lotion, letting it flow into the *inner angle* of the eye. It will then flow over the eyeball and escape at the outer angle into the receiver.

To be successful the fingers opening the lids must be gentle but quite firm. A little (regulated) force may have to be applied. It is sometimes allowable

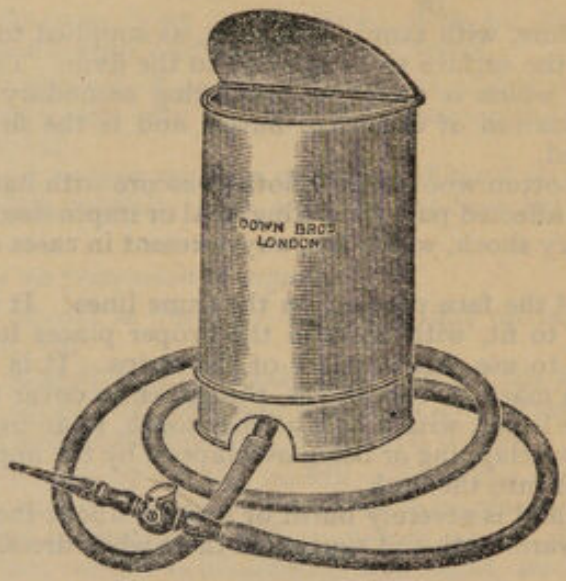

FIG. 21—DOUCHE-CAN IRRIGATOR.

A different nozzle can be used, for the eyes, and the flow of liquid controlled by a spring-clip on the tubing.

and helpful to direct the stream first into the eyelids and then when the man is accustomed to this to let it flow on to the eyeball as described, but not directly on to the pupil.

If a douche-can irrigator is not readily available one can be improvised from an ordinary teapot, the rubber tubing being attached to the spout (Stirling).

(2) *By an Undine.*

Use an Undine only if a douche-can irrigator or a suitable improvisation is not available, or when so ordered. (An Undine is a small glass flask made with a finely-drawn nozzle and a wide opening for filling.) The same procedure applies. If an Undine is used great care must be exercised to ensure that flushing of the whole of the conjunctival surface is very thorough.

FIG. 22—UNDINE.

APPENDIX H

Fractures: splints: certain special fractures

The initial first aid courses describe *the signs and symptoms* which may be present in cases of fracture:—

1. Pain at or near the place where the bone is broken.
2. Loss of power of movement of the affected limb.
3. Swelling around the part affected.
4. Deformity, the limb falling into an unnatural position and having an abnormal shape. It may be shortened by over-riding of the fragments of the broken bone.
5. Irregularity. If the bone is close to the surface the break in its continuity may be felt, and if the fracture is compound, the bone may be exposed and visible.

General Rules for the first aid treatment of fractures.

(*a*) The object of first aid treatment of a fracture is to prevent a bad job being made worse and especially to guard against the movements of the patient or careless handling by helpers converting a simple fracture into a compound, or an uncomplicated fracture into a complicated.

(*b*) Attend to the fracture on the spot *unless the surroundings or conditions are such that danger to life is threatened*, or there is danger of further injury. Protect the patient until the fracture has been attended to and the injured limb secured and, except for the reasons already mentioned, do not move him until this has been done. Care in handling and movement is important for all fractures and is especially so for fractures of the " spine," pelvis and ribs.

(*c*) If there is urgent, severe bleeding endangering life, it must be controlled first of all.

(*d*) Wrap blankets or coats *round* the patient using great care not to move him unduly. Warmth and air are indicated as part of your efforts to counter shock. Merely covering the patient is not enough to prevent him becoming chilled.

(*e*) With great care, and *without using force*, place the limb in as natural position as possible. In the case of compound fracture with a protruding fragment, it is forbidden to attempt to pull it back into place.

(*f*) Apply splints, bandages or slings when necessary over the clothing. If the factor of urgency is present as it frequently will be, or if there is no material for splinting immediately available, secure fractured limbs by careful bandaging to opposite limbs (in the case of fractures in the lower limb) or to the trunk (in the case of fractures in the upper limb).

(*g*) Splints (real or improvised) must be firm, and long enough to keep the joints immediately above and below the site of fracture at rest. The bandages must be firm but not so tight as to interfere with the circulation of the blood.

(*h*) In applying bandages near a fracture the upper one should be tied first. When the case is lying down, double the bandage over a splint or flat length of wood and pass it under the body or lower limb, taking advantage of the natural hollows of the body.

(*i*) In doubtful cases, treat as for fracture. In cases of fractured " spine," pelvis or thigh, never remove except lying down and with the greatest of care.

Severe lacerations or crushes of the limbs should be immobilised prior to initial removal, as if a fracture were known to be present.

Improvised Splints.

Serviceable splints may be improvised from such things as laths from a venetian blind, from rifles, walking sticks, folded coats, pieces of wood or of cardboard, from roiled up linoleum or newspaper, and from a number of other

articles, provided that the resulting improvisation gives you something firm enough to support the limb and long enough to prevent movement of the joints immediately above and below the fracture.

Special Fractures.

Common-sense application of the general rules for the first aid treatment of fractures will enable personnel to deal adequately with most fractures. There are, however, a few specific fractures which call for special care and for particular methods and should be specially discussed in first aid and party training. These are fractures of the " spine," pelvis, thigh, ribs and skull.

Fractures of the " spine."

(*a*) *Causes, signs and symptoms.* This may be caused by direct violence (e.g. a fall across a bar, or a severe blow on the back as from falling debris while prone) or by indirect violence (e.g. a fall from a height on to the head). Paralysis of both legs and of the lower part of the body may be an immediate result if the spinal cord is injured, and shock is always extreme. Diagnosis is by history and by loss of power in the legs, with loss of feeling as far up as the navel, and loss of control over the bladder and the bowels. A fracture of the spine in the region of the neck may, of course, be immediately fatal, or the case may survive with complete paralysis of arms, body and legs, and with breathing by means of movement of the diaphragm only (i.e. the normal movements of the chest wall in breathing are neither visible nor to be felt). The face will be pale, the lips pale or mauve, and the forehead possibly beaded with cold sweat. The skin, especially of the extremities, becomes cold and clammy. The pulse will be weak, irregular and rapid. Breathing may be either diaphragmatic or weak, rapid and shallow, later becoming laboured or sighing. The case may or may not be unconscious.

(*b*) *First aid attention.* Do not move the case unnecessarily. Warn him to be still. Tie a bandage like a figure 8 around his ankles and feet, tying the knot under his soles. Tie broad bandages round both knees and thighs. Carefully wrap him in blankets or coats.

Methods of removal. (Special attention is devoted to this point, since error may have grave consequences.)

The first step is to put him on a stretcher (which in this case should have its bed portion if of canvas made rigid by stiffening it with a series of short transverse boards) or on to a shutter, door or plank of suitable length and width, on which a smoothly folded rug or blanket should be placed. This transference to the stretcher or improvised stretcher must be done with the greatest of care, *taking particular trouble to see that the whole length of his back, his head and his legs are kept straight.* His spine Must Not be bent except in the case of evident injury to the spine in the cervical region when his head and shoulders should be supported by a pad or stiff pillow, with additional pads at the sides of the head to prevent it rolling about. The transference should be done in one of the following ways, according to the material and to the number of helpers available.

Method (i). Pass broad bandages under the patient's head, shoulder blades, buttocks, thighs and calves. Use the natural hollows of the body, and work the bandages into position smoothly, taking care not to move the patient. Tie the free ends of the bandages *on each side* to a long pole, metal bar, or similar article. Four bearers, two on each side of him, should stand facing inwards, and together, when the word is given, should grasp the poles with their hands wide apart, and then should *carefully and evenly* raise him while a fifth helper slides under him the stretcher on which he is to be laid. If there is no one to slide the stretcher under, the four bearers should move with short, smooth, side-paces until the patient is over the stretcher, when he is carefully lowered on to it. Obviously the stretcher should be placed in position in line with the patient and near his head, before the lifting operation is begun.

If only three persons are available, let one go each side to raise the poles, their hands having grasped them *wide apart and opposite to the patient's shoulders and hips*, while the third steadies and supports the legs.

Method (ii). If nothing is available for use as poles or as bandages, a blanket or rug might be carefully and slowly worked under the patient. Lay it open on the ground in line with his head. Let two helpers kneel, one by each shoulder, and work the edge of the blanket under the shoulders, then slowly pull it beneath the hips and legs. The body *must not* be lifted up to get the blanket under it. The patient is then lifted by the helpers gripping the sides of the blanket rolled close to him and parallel with him. If poles are available, but no bandages, use the blanket as above, but roll the sides of the blanket on to the poles, or even cut holes in the blanket through which the poles can be passed.

Method (iii). If neither poles, blankets nor bandages are available, open out the patient's coat and roll it firmly so that the roll is close up against his sides. One helper on each side grasps the rolled up coat, while others, one on each side, grasp the clothing round his thighs. A fifth, if available, supports the head and neck.

Method (iv). It has been suggested that all cases of fractured spine in the dorsal or lumbar region should be removed face down. A blanket or rug is to be opened out beside the patient, and he is gently rolled on to this, his arms being held to his side, and his legs kept straight. Then proceed as in method (ii) but *keep him face down.*

Fracture of the Pelvis.

If after severe injury in the region of the hip or loins a case shows no signs of damage to the legs but is unable to stand or even to move his legs without pain and difficulty, that is presumptive evidence that his pelvis is fractured, and you must treat him as such a case.

Put the patient into whatever position he finds most comfortable, raising or lowering his legs as he desires. Preferably, but by no means essentially, he should be flat on his back with his legs straight. Apply a broad bandage round his hips so that it is firm enough to give support but not so tight to press broken bones inwards. Bandage both ankles and both knees together. *Move him as described for cases of fractured spine.* He should not be allowed to pass water.

Fracture of the Thigh Bone (Femur).

This bone may be broken at any point, at its neck, in its shaft, or close to the knee.

In old people, relatively slight causes may lead to a fracture of the neck of the femur and it is often difficult to say whether or not fracture is present. If after injury an old person, when lying on his back, is unable to raise his heel from the ground, assume a fractured neck of the femur.

In cases of fractured femur, the general signs and symptoms of fracture are usually present. A specific sign is an abnormal turning outwards of the foot. Shortening of the affected limb will usually be present, and may be as much as three inches or as relatively little as half an inch.

First Aid Treatment. As in first aid text-books or:—Steady the limb by holding the foot and ankle: gently draw the foot down into line with the opposite number, and secure the feet with a figue of 8 bandage round ankles and feet. Pass seven bandages under both legs in this order:—

(i) At the chest, just below armpits.
(ii) At the pelvis, in line with hip joints.
(iii) Round both ankles and feet (*over* the initial figure of 8 bandage).
(iv) Round both thighs above fracture.
(v) Round both thighs below fracture.
(vi) Round both legs.
(vii) Round both knees (here use a broad bandage).

Now place a splint along the patient's injured side, from the armpit to *beyond* the foot, and secure it by tying the bandages as above *in the same order*. Tie them all *over* the splint except the one at the ankles, which is to be tied as a figure of 8 over the previous one. Load on to a stretcher, carefully supporting the whole length of the body and legs.

Fractured Ribs.

Ribs may be broken by direct violence, or less commonly by indirect violence forcing them outwards, in which case the broken ends of the bones may be forced inwards. In the former case injury to the lungs or other internal organs may occur, rendering the fracture " complicated."

Signs and symptoms are: A sharp cutting pain, especially on deep breathing: the breathing is short and shallow. If the lungs are injured, blood, mixed with froth, may be coughed up. If the liver or spleen are injured, *internal bleeding* will occur, and the patient will quickly become pale, cold and clammy, with thready pulse and weak shallow breathing. He will rapidly lose strength and become giddy and faint, especially on standing. Later the pulse may become so weak that it cannot be found at the wrist, and the breathing is hurried, laboured and accompanied by sighing and gasping, the patient becoming unconscious and passing into a state of collapse.

First Aid Treatment.

If there are no signs of injury to an internal organ, tie two broad bandages firmly round the chest, with the centre of the first immediately above, and the centre of the second immediately below, the site of fracture. The lower bandage should overlap the upper by half its width. Tie on the opposite side and slightly to the front. Support the arm of the injured side in a sling.

If an internal organ is injured Do Not apply any tight bandage to the chest. Lay the case down inclined, and supported towards the injured side. Loosen all clothing, keep wrapped in rugs or blankets, give ice to suck if by any chance it is available, and avoid moving the case more than is necessary.

In case of an open wound of the chest wall, with sucking of air and resulting difficult breathing, relief can be given by covering the opening with a suitable pad-dressing.

Fractures of the Skull.

(*a*) *Fractures of the base* of the skull may be caused by indirect violence as by a blow on the jaw or a fall on the feet from a height. The patient is usually unconscious, and blood-stained cerebro-spinal fluid may escape from nose or ears.

(*b*) *Fracture of the vault* of the skull may be caused by direct impact, and portions of the broken bone may press on the brain. When with a wound of the scalp a fracture of the vault is suspected, dressings, etc., should not press directly over the wound, but a ring pad should be used.

A case of head injury should not be moved unnecessarily. If the face is pale keep the head and shoulders low; if it is flushed, the head and shoulders are to be supported slightly raised. Tight clothing, especially about the neck and chest, should be loosened, and the case wrapped carefully in blankets or rugs. An unconscious person should, of course, not be given anything to be swallowed.

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