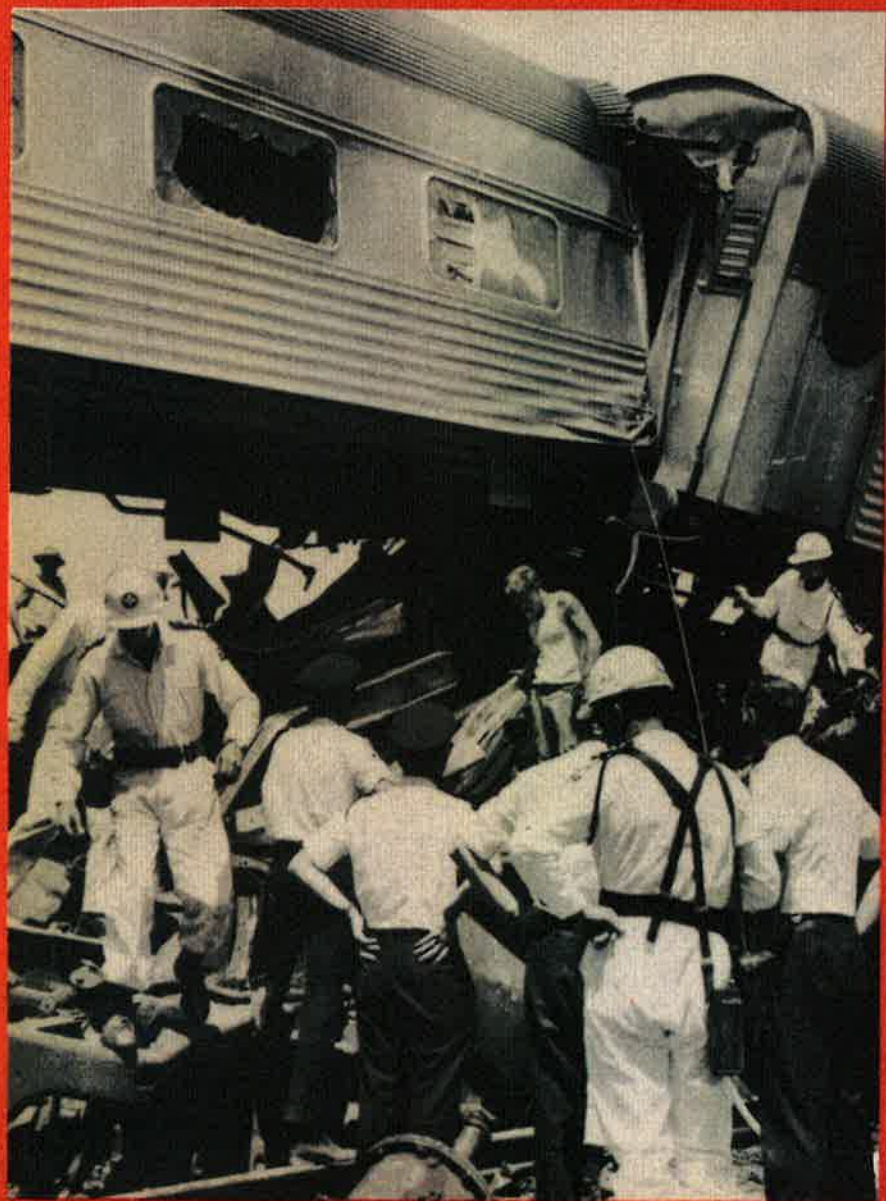


RESCUE NURSING





RESCUE NURSING

*A Training Manual
for Mobile Nursing and
Rescue Squads*



ST. JOHN AMBULANCE BRIGADE
VICTORIA DISTRICT

First Published in 1969

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T. Peter Bush
M. Davenport

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To our families without whose patience and forbearing the production of this book would have been impossible.

To all who have helped whether knowingly or not in the production of these notes.

To the many persons whose work has provided information on which we have unashamedly drawn.

To the members of Mobile Nursing and Rescue Squads who we hope will benefit from our work and maintain their interest in the service of their fellow men in disaster.

PRO FIDE
PRO UTILITATE HOMINUM

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FOREWORD

This manual is timely, and I sincerely congratulate the authors.

Some form of disaster without warning is always with us, but there is often a feeling, "It could not happen to us." Last year in Australia many more lives were lost through "accidents" than (with the exception of the 8th Division) Australian soldiers were killed or died during World War II, and many more were disabled or disfigured. Whether these tragedies will increase this year does not depend solely on the doctors, the nurses, the hospitals or the police, but also on the man, the woman, girl and boy in the street, in the home, or on the beach who KNOWS what to do AT ONCE.

Your first aid manual teaches you what to do on your own; this manual teaches you also how to serve with a team, not only of your St. John comrades, but with members of the Red Cross, the Police, the Country Fire Authority and the civilian ambulance.

Here you will find principles in the care of casualties. Master these before you study the details. Only if you are efficient in this service will you truly uphold our motto, "For the Service of Mankind".

F. KINGSLEY NORRIS,
K.B.E., C.B., D.S.O., K.ST.J., E.D.
Chief Commissioner

PREFACE

The establishment of Mobile Nursing Squads has greatly added to the service which members of the St. John Ambulance Brigade are qualified to give in treating casualties following disasters. The main functions of the Mobile Nursing teams will be to set up Advanced First Aid Posts where resuscitation can be given, emergency first aid already carried out by Rescue Squads at the disaster scene can be reviewed and if necessary complemented, and the condition of casualties reassessed before onward transfer to an emergency or Base Hospital.

No training manual is in existence designed specifically for this purpose. It is therefore to assist and guide the training of Mobile Nursing that these notes have been prepared. They are not intended to supercede the existing training manuals "First Aid" and "Nursing"— they are not intended to be a First Aid text-book — but are complementary to these, and should be considered in conjunction with these existing books.

A complete knowledge and understanding of the principles and information in these books is a *sine qua non* for membership of Mobile Nursing, and in the production of these notes such a knowledge has been assumed.

Because these notes have been prepared primarily to assist in the training of Mobile Nursing personnel in preparation for disaster work, some subjects usually dealt with in first aid manuals, e.g. poisoning, have been omitted. No reference has been made at this stage to conditions which might apply during conventional or nuclear warfare, but many of the principles behind the training outlined here would equally apply to these conditions.

In the preparation of these notes many sources of information, and many individuals, experts in their own fields, have been consulted. It is not possible to give an exhaustive list of all these

PREFACE

sources of information but the authors wish to place on record their sincere appreciation of the encouragement given by the Commissioner of the St. John Ambulance Brigade in Victoria, Lt.-Col. Sir Geoffrey Newman-Morris; the Deputy Commissioner, Dr. A. W. Burton; the District Superintendent, M. D. Phelan, and the helpful advice given so willingly by the following and many others:

Mr. Peter S. London, Mr. Leo Rozner, Mr. Peter Kudelka, Dr. Noel Mackey, Dr. A. Sinclair.

HIDDEN INJURIES

We acknowledge with grateful thanks the authors of *Manual of Ambulance Transport Nursing* for permission to reproduce this chapter in its entirety from their manual.

For further study by members of Mobile Nursing the following books are recommended:

Principles for First Aid for the Injured.

H. Proctor & P. S. London. Butterworths.

Manual of Ambulance Transport Nursing.

H. G. Berry *et al.* St John Ambulance Brigade, South Australia.

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Mobile Nursing Uniform, Indoor.



Mobile Nursing Uniform, Outdoor.



Mobile Nursing Uniform, Winter.

BELOW

Mobile Nursing Officer, blue parka, assisted by two Mobile Nursing members, attend a road accident victim.



INITIAL TREATMENT

The initial treatment given to victims of disasters at the scene of the incident is of prime importance. When diagnosis has been made and emergency treatment carried out, the transport of the patient for further treatment at a First Aid Post, Clearing Station, Field or Base Hospital is required. Such an Aid Post catering for primarily a transitional stage in the care of casualties may yet be an area where resuscitative measures can be initiated which will make the difference between life and death for the patient. It is imperative, therefore, that such facilities as are available at the forward First Aid Post be as highly organized and as efficient as conditions allow.

The circumstances of the disaster will determine the exact nature of the facilities which are available for the reception of the casualties. It is unlikely that premises suitable in all respects will always be available at or sufficiently close to the scene of the disaster. Under these circumstances the Officer in Charge will be required to use imagination and ingenuity to improvise from the most suitable accommodation available.

Whenever possible, permanent buildings are preferable; schools, church halls, factories, etc., but if not readily available and conveniently situated, temporary accommodation may have to be provided in tents or even in the open air.

CO-OPERATION AND LIAISON

Liaison with other Organizations:

RED CROSS

POLICE

CIVIL DEFENCE

COUNTRY FIRE AUTHORITY

METROPOLITAN FIRE BRIGADE

CIVIL AMBULANCE

Relief work in disaster situations necessarily involves a large number of individuals and different organizations. It is important

to remember the over-riding principle that care for the injured is the prime objective of all relief. To this end the interests of individuals and organizations must be subservient.

Contact between individuals of organizations may occur, and it is important that these should be harmonious. It is unthinkable that petty jealousies and rivalries should be allowed to interfere with the smooth running of an organization set up to render assistance to the victims of a disaster. Membership of any of the branches of the St John Ambulance Brigade is incompatible with such conduct, and in a situation where the Officers in Charge require the complete loyalty and obedience of all the members under their charge, it is important that personality problems be reduced to the absolute minimum.

In most instances, liaison and communication between organizations will take place at the level of the Officer in Charge. It is essential for the smooth running of any disaster organization that close co-operation and rapport be established.

DISCIPLINE

Discipline, being essentially the automatic ability to execute commands and directions from higher authority, without question or loss of time, and to contain oneself under conditions of duress, is the most essential requirement of a member of a Mobile Unit. To obtain such a degree of discipline, technical efficiency, competence and rigid self control are basic requirements, necessitating the highest standard of training to the degree that most actions are automatic and compulsive.

Discipline is the spirit . . . the actuating spirit that makes men and women freely surrender individual wills to the will of the leader, that binds them into a splendid fellowship, aspiring, sacrificing, training together for a common cause.

In Mobile Nursing, this is particularly vital, as under disaster conditions members will be expected to take considerable responsibility and at times, use their own initiative, hence the Rules of Mobile Nursing as contained in Appendix II.

SELF DISCIPLINE

Discipline within the Mobile Unit and self discipline are equally important. In a disaster, considerable stress will be placed on each

individual member and the immediate execution of instructions from persons of authority may mean the difference between life and death for the casualty. Every member of Mobile Nursing must be absolutely reliable and fully aware of her own limitations. If instructed to perform a particular function which she considers is not within her competence, or is not confident in her own ability to execute, she must, without hesitation, state that she is unable to carry out this particular function, and so not lead the Medical Officer or Nursing Officer to believe that their instructions are being carried out.

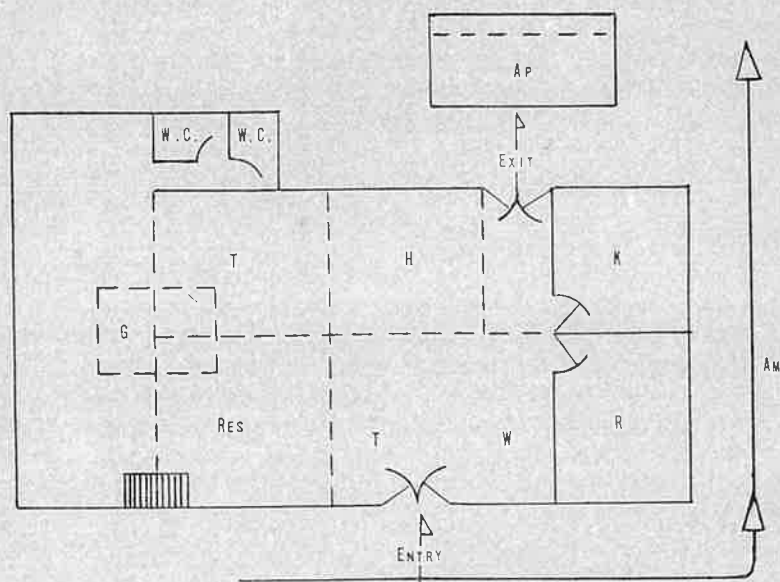
REST

Rest periods will be essential during prolonged periods of duty, and false heroics by continuing to work beyond the limits of personal endurance have no place in the membership of Mobile Nursing. It will be the responsibility of the Officer in Charge to ensure adequate relief and rest periods for members.

SELECTING SUITABLE PREMISES

The following factors should be taken into consideration:

1. Ready and easy access for foot parties and ambulance transport.
2. Standing and parking areas for motor transport.
3. Separate entrance and exit to working areas to facilitate free flow of casualties.
4. Administrative control area readily accessible to all treatment areas.
5. Adequate space for the number of casualties anticipated.
6. Main services, e.g. Water, Electricity, Gas.



A TYPICAL HALL ADAPTED FOR EMERGENCY USE

- | | |
|--|---|
| A : Ambulances. | K : Kitchen, for use as Staff Rooms. |
| Am : Movement. | R : Radio control, also police. |
| Ap : Parking. | T : Treatment areas. |
| C : Control Centre for Medical Officer and Officer Nursing. Table on stage for overall supervision, and clear area on floor. | Res : Resuscitation area. |
| H : Holding area. | W : Walking wounded and uninjured if no other accommodation available in separate building. |
| | W.C. : Toilets. |

When time permits, the premises should be prepared as follows:

1. Clear and clean the premises quickly.
2. Remove unnecessary furniture, retaining such that may have emergency use, e.g. school desks for placing stretchers on.
3. Place available furniture, e.g. school desks as above, or clear rooms to provide floor space for stretchers. When available, prepare mattresses and pillows, make up beds ready for the reception of casualties.
4. Place in position signs to mark entrance and exit, hospital, ambulances, etc.

EQUIPMENT REQUIRED

- Beds
- Bedding, Blankets, Pillows
- Bed Blocks
- Bed Cradles
- Stands for Infusion Bottles
- Bed Pans
- Urinary Bottles
- Buckets, Brooms, Floor Cloths, Scrubbing Brush, Dusters
- Soap, Nail Brush, Hand and Tea Towels
- Disinfectant

AREAS TO BE SEPARATED

1. (a) Immediate resuscitation area.
- (b) Holding area for casualties awaiting onward transport to base hospital.
- (c) Treatment area.
- (d) Area for minor casualties.
2. Provision for the reception of the uninjured, homeless or shocked patients not requiring immediate medical attention.
3. Mortuary accommodation.
4. Toilet accommodation, if necessary improvised.
5. Staff room.
6. Control centre, with radio contact for communication with rescue squads in the field, also with base hospital.

EMERGENCY OPERATING THEATRE

Under certain conditions arrangements for the establishment of an improvised emergency operating theatre may be required. In these circumstances particular attention must be paid to the cleansing and disinfection of the area, fly and dust-proofing where possible; and facilities for the sterilization of instruments, etc. will have to be provided.

Whenever possible a separate but adjacent area or areas should be set out as an anaesthetic and/or recovery room.

Emergency lighting and power may have to be supplied from a portable generator such as is carried by the St John Ambulance Brigade Rescue Squads.

THE RECEPTION OF CASUALTIES AND TRANSFER TO HOSPITAL

The initial sorting, assessment and reception of casualties at the First Aid Post is probably the most demanding and responsible task of any within Mobile Nursing. For this reason, it is essential that the person entrusted with this responsibility, in the absence of an experienced Medical Officer, the Mobile Nursing Triage Officer, should be an experienced First Aider, and should have the ability to make decisions quickly, at times under extreme pressure.

TRIAGE

The First Aid Post, or Advanced Dressing Station, is the unit in which Triage is first undertaken. Triage means that the casualty is assessed, his particulars recorded and the diagnosis made or confirmed, the casualty labelled if this has not already been done, such immediate treatment as may be essential is given, and the sorting into one of three groups is effected preparatory to evacuation.

Group 1: Requiring urgent resuscitation immediately.

Group 2: Severe wounds and cases requiring urgent or early surgery.

Group 3: All others, including urgent surgical cases not in Group 2:

Non-urgent
Lying Sitting
Walking wounded

Note that the apparently moribund form another category. These should be segregated and not evacuated, nor should the dead.

Triage is an important function, and should be in the hands of an experienced and capable officer. Considerable discrimination will be required in the proper grouping of urgent surgical cases.

Most casualties should arrive by ambulance or carried by foot parties already diagnosed and labelled, and emergency first aid

carried out. The Triage Officer will, in most instances, have to accept the diagnosis already made, and assess the severity of the injuries and condition of the patient on this diagnosis. However, this does not preclude the reclassification of the injuries, in respect to severity as well as actual diagnosis, at the reception stage.

A rapid inspection of the label or other identification marking, quick assessment of the general condition of the patient, breathing, pulse rate and volume, colour and skin temperature will help the sorting of these casualties into categories. If available, clerical assistance should be provided at the admission point for the Triage Officer; alternatively a record must be kept by the Triage Officer herself.

The treatment provided at the scene of the accident will necessarily be restricted to first aid, the scope of which will vary with the experience of the attendant and the equipment at his disposal. The main need is for assorted sizes of ready made dressings that are easy to apply in difficult conditions. When there are only one or two casualties, the main object is to prepare them to be taken in as much comfort and safety as possible to the place that will provide the definitive treatment they need.

At present this may call for a decision whether to send them to the nearest hospital, which may be small and scantily provided with staff and equipment, or to a larger one further away. The decision can be a difficult one but broadly speaking a seriously injured patient needing special care is likely to be better served in the long run if he goes straight to the hospital that can meet his needs without delay. If, however, he is judged not to be fit for such a journey the best plan may be to move him as little as possible and call for a resuscitation team. This is not to insist on resuscitation at the scene of the accident, where conditions can defeat even the most skilful attempts at venepuncture and thus cause a delay without benefit. The fact that flying squads have proved successful in obstetrical emergencies is a good enough argument for making them available to the injured, but they are likely to be more useful for supplementing the services of a small hospital than at the site of the injury.

When there are many casualties similar conditions apply. General practitioners, particularly in country areas, are likely to be much more useful on the spot than surgeons, who are better employed receiving patients in hospital and assessing them for treatment for further transport.

Broken limbs must be carefully splinted before the patient is moved. Thomas splint is still the best definitive appliance for the lower limb and provided that it steadies the limb and maintains

gentle traction, it does not matter in the short run if it is several sizes too large. If there are wounds as well as fractures, it may be most convenient to apply a light dressing first, then the splint and then complete the dressing with plenty of wool and a firm bandage round it and the splint. If a Thomas splint is not available, one or more pillows bound round the limb provide support that is both comfortable and effectual.

SMALL HOSPITALS

These can usually provide radiography, beds, surgeon, anaesthetist, and operating theatre but they cannot usually provide blood in large quantities and without delay; their role is to sort the seriously injured into three groups.

1. Those that can be treated on the spot, with or without assistance from another hospital.
2. Those that require special treatment and are fit to travel.
3. Those that require special treatment and are not fit to travel.

The first group is usually straightforward. The distinction of the second and third groups will vary according to distance, weather and travelling conditions generally. Transport by air has many advantages but they are not always realized in practice.

Head injuries usually travel well but it may be necessary for the patient to be accompanied by someone who can recognize and treat an obstructed airway with simple efficiency.

The prime tasks are to remove the living from danger, relieve their distress and pain (not necessarily by drugs), do what is necessary to save life:

- Ensure airway
- Stop accessible bleeding
- Ensure adequate ventilation of lungs
- Replenish circulation
- Control severe internal bleeding
- Relieve cardiac tamponade
- Relieve rapidly increasing cerebral compression

dress their wounds, support their fractures, prevent chilling and send them on their way. The dead can be dealt with later.

OUTLINE OF PRELIMINARY MANAGEMENT OF SEVERE INJURIES

A <i>Save life</i>	B <i>Review</i>	C <i>Restore function</i>	
		<i>Prevent infection</i>	<i>Repair injury</i>
1 Ensure airway Stop accessible bleeding	Complete examination	1 Cover wounds Give antibiotics A.T.T., etc.	Restore circulation Apply splints
2 Ensure adequate ventilation of lungs Replenish circulation	Make diagnosis Plan treatment	2 Explore and decompress wounds Remove foreign matter, dead and devitalized tissue Stop bleeding	
3 Control severe internal bleeding Relieve cardiac tamponade Relieve rapidly increasing cerebral compression	Execute plan	3 Dress	
		4 Repair Close without tension	
		5 Secondary surgery, physiotherapy, resettlement, etc.	

MOVEMENT

On admission after assessment, the casualties will be moved to one of the following areas:

1. *Resuscitation*: Casualties in the state of severe shock, requiring immediate resuscitation, transfusion, etc.
Casualties with respiratory embarrassment.
2. *Holding Area*: Casualties not severely shocked, with injuries, e.g. fractures which will require further treatment in hospital. These casualties will not include any with life threatening conditions.

3. *Treatment Area:* Patients requiring further treatment, e.g. redressing of wounds, burns, etc.
4. *Minor Injuries:* Casualties with minor injuries; walking wounded whose condition may require further treatment but not immediately.
5. *Mortuary:* Casualties obviously dead and certified as such. Dismembered limbs or portions of bodies will be required to be kept for identification.
(See chapter on care of the dead and medico-legal aspects of disasters.)

FIELD HOSPITAL

In the event of the establishment of a Field Hospital, it is advisable when conditions permit for separate wards to be designated in categories as above. If facilities exist, separate areas or wards for particular types of injuries, e.g. burns, fractures, etc., may facilitate treatment.

RESUSCITATION

Many a casualty after a major disaster admitted to the Mobile First Aid Post suffering from severe injuries will arrive in a serious state of collapse and be in urgent need of resuscitation.

GENERAL PRINCIPLES WILL APPLY

Attention must be given immediately to the following:

Breathing: Present or Absent and Character?

Airway: Clear?

Bleeding: External — Controlled?
Internal.

Immediate and rapid examination will include:

Skin colour and temperature

Pulse rate, Volume and Rhythm

Blood Pressure

These observations must be recorded at the time of observation.

BREATHING

If respiration ceases, immediate attempts must be made to restore it. Mouth-to-Mouth or Mouth-to-Nose artificial respiration must be instituted without delay and continued until spontaneous respiration is re-established or the patient is certified as dead. If available,

specialized equipment for artificial respiration, positive pressure apparatus, etc., should be used, but no time must be lost in waiting for the arrival of such apparatus before artificial respiration is commenced. Intravenous therapy, when available, will be initiated without delay for all patients suffering from shock.

In the absence of the necessary equipment, conscious patients can be given fluids by mouth and additional quantities can be given by rectal or gastric tube.

POSITION

In the absence of contra-indications, a shocked patient should be nursed with the head low, e.g. with the foot of the bed or stretcher raised.

PAIN RELIEF

For severe pain in association with severe injuries there is no substitute for morphia. This should be given, except in very exceptional circumstances, only under medical supervision.

In the absence of a doctor and for moderate pain, a conscious casualty may be given Panadol tablets 1-3, or aspirin, preferably in soluble form. Codeine may also be given if available.

Other drugs may be used by Medical Officers when indicated.

No attempts should be made to give any pain relieving drugs by mouth to an unconscious casualty.

Great care must be taken before administering any pain relieving drugs to patients suffering from head or abdominal injuries, lest the relief of the pain and discomfort mask the onset of symptoms and signs indicating a change or deterioration in the patient's condition.

Reassurance and sympathy to the severely injured casualties will considerably add to the chances of survival, by allaying fear and anxieties. Attention to the patients' worries and anxiety, e.g. concern for other members of their families, will help their condition.

TRANSFUSIONS

Major injuries, haemorrhage, burns, fractures, internal injuries and certain other medical and surgical emergencies are associated with the loss of fluid from the circulating blood volume. The fluid loss may be in the form of whole blood or plasma. The only treatment of value in such cases is the replacement of the lost fluid, and this is normally achieved by direct transfusion into a vein. Severe blood,

or plasma loss produces a condition of shock. Shock is not a static condition but a complicated process of re-adjustment in several systems of the body. One of the effects of shock is a vaso-constriction of the peripheral blood system, a collapse of the vessels in the periphery. This creates additional difficulties to the medical attendant for it makes the task of inserting a needle through the skin into a vein more difficult. Consequently, in severe collapse, it may be necessary for the doctor to introduce a cannula directly into a vein through an incision made in the skin — cut-down technique.

BLOOD TRANSFUSION

Before a blood transfusion is given the blood group of the patient is determined and a compatibility or cross-matching test between the red cells of the donor and the serum of the patient is performed. Only in grave emergencies, when immediate blood transfusion is essential for saving life are these tests omitted. Under disaster conditions, it is unlikely that supplies of blood or facilities for such cross-matching will be available. Therefore, it is probable that plasma, or some plasma substitute, e.g. S.P.P.S. (Stable Plasma Protein Solution), will be the fluid readily available for use in resuscitation in the First Aid Post.

S.P.P.S. (HUMAN) (*Stable Plasma Protein Solution*)

This product is prepared by the Commonwealth Serum Laboratories from blood obtained from voluntary donors to the Australian Red Cross Society.

S.P.P.S. is a fraction of pooled human plasma, prepared by Cohn's ethanol process, in which unstable proteins have been removed.

Albumin exerts a greater osmotic effect than the other plasma proteins, and whilst the albumin content of S.P.P.S. is slightly lower than that of 5 per cent albumin in Hartmann's Solution, the additional proteins in S.P.P.S. add to the osmotic effect.

Caution — No Antiseptic is Added

This product normally shows slight opalescence but, if it appears to be turbid by transmitted light, it must not be used and the bottle should be returned unopened to the Commonwealth Serum Laboratories. This product contains no antiseptic and should be used immediately after opening the bottle. Any unused solution remaining in the bottle should be discarded.

Indications and Mode of Use

S.P.P.S. is used principally for the resuscitation of shocked patients. The use of this product does not entail the risk of homologous serum hepatitis.

Instructions for Use

S.P.P.S. may be administered through the standard Red Cross blood transfusion giving set.

Proceed as follows:

1. Remove the central detachable portion of the metal seal of the bottle, but do not disturb the outer portion of it.
2. Apply tincture of iodine or 70 per cent alcohol to the rubber stopper and allow to dry.
3. Stand the bottle upright and insert the air vent needle through the larger of the two circles on the rubber stopper ensuring that the needle is within the lumen of the airway.
4. Invert the bottle and attach it to a support approximately 3 feet above the patient by a tape sling or other suitable means of suspension.
5. Clamp the tubing of the giving set and insert the perforator through the centre of the cross on the rubber stopper of the bottle. If the perforator is made of plastic, it will be necessary to puncture a hole with a needle prior to its insertion through the rubber stopper.
6. Allow the tubing to fill with solution by adjusting the clamp. Insert the needle at the lower end of the giving set into a vein and adjust the rate of flow.

BLOOD GROUPS

There are several systems of blood groups, the most important of which are the ABO and Rhesus (Rh) Systems. In the ABO system, there are four groups known as AB, A, B and O and a patient should always receive blood of the same group as his own, except in an emergency when Group O blood may be given while the patient's blood group is determined and cross-matched blood of the appropriate group obtained.

The transfusion of incompatible blood will be followed by clumping and ultimately destruction of the transfused red cells in the patient's circulation and renal damage which may prove fatal.

In the Rh system the red cells, irrespective of their ABO group, are either Rh positive or Rh negative depending on whether the red cells possess or lack a substance called the Rh factor. Approximately 83 per cent of the population in Great Britain and Australia are Rh positive and 17 per cent are Rh negative.

If an Rh negative person were to be given Rh positive blood, he or she might be sensitized to the Rh factor. Subsequent transfusions of Rh positive blood might then be accompanied by possibly serious or even fatal reactions.

THE GIVING OF BLOOD

This is a highly skilled treatment carried out by the doctor, but the auxiliary nurse may be called upon to assist by preparing the apparatus and by looking after the patient during and after the transfusion.

Donor blood is matched against the patient's blood in advance, and the name of the patient for whom it is intended is recorded on a label on the bottle. *The greatest care must be exercised in checking this label before the transfusion is begun.*

REQUIREMENTS FOR BLOOD TRANSFUSION

Prepare a basic trolley and add:

Sterile "giving set" in sealed container. Check expiry date.

Bottle of blood. Check expiry date.

Sterile hypodermic syringe and needles.

Local anaesthetic solution: e.g. 1 per cent procaine, xylocaine.

Sterile swabs and towels.

Skin cleaning lotions: e.g. surgical spirit.

Rubber tubing or sphygmomanometer to act as tourniquet.

Suitable padded splint.

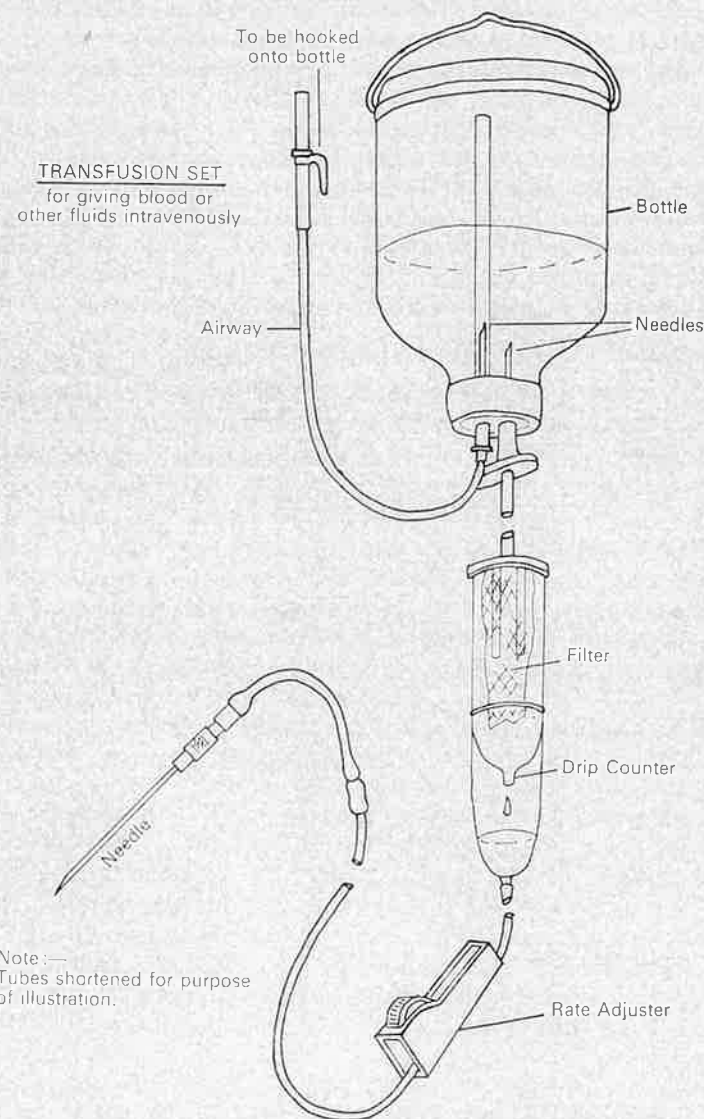
Small sterile dressing, strapping, bandage.

In some cases, it may be impossible to insert the needle of the giving set into the vein through the skin, in which case the doctor will have to cut down to expose the vessel and then tie an intravenous cannula in position. A cannula is a blunt-ended hollow tube, usually of stainless steel or plastic, about the diameter of an intravenous needle.

The standard disposable plastic giving sets are supplied with the blood or plasma. Although the sets may vary in detail they are all based on the same principle.

The transfusion is usually given into a suitable vein in the arm. In a severely shocked patient in whom no limb vein is easily seen, direct insertion of a cannula into the subclavian vein can be performed by someone experienced in this technique.

If the patient is restless, or transport to hospital is contemplated, and particularly if the journey is likely to be prolonged or over rough ground the limb is lightly secured to a splint to ensure immobility. The piercing needle of the giving set is inserted into the neck of the bottle. A long needle is inserted into the bottle to permit the entry of air as the fluid flows from the bottle. A tourniquet is placed in position around the upper arm. The filter chamber of the giving set is filled with blood (or other fluid being transfused) according to the instructions on the set. The drip stand is placed in

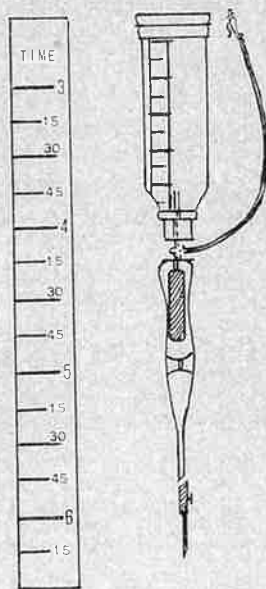
Intravenous Therapy

One type of Intravenous set.

position with the bottle clip and bottle in place. The operator washes and dries his hands and lifts the giving set out of the container which is held by an assistant. The set is then connected to the bottle of fluid and the flow is commenced and regulated. The tube is then clipped with a pair of artery forceps. When the set is thus fully prepared the tourniquet is tightened, the skin over the vein is cleaned and the needle inserted through the skin directly into a vein. Blood from the vein will be seen to flow from the tube when the needle is correctly inserted. The tube from the bottle is connected to the tube on the needle. The tourniquet is released. The artery forceps is released and the flow regulated to the desired rate which will be ordered by the doctor. This is usually 60 drops per minute but may be quicker if the patient is in urgent need.

THE ASSISTANT'S DUTIES DURING TRANSFUSION

1. To keep a constant check of the rate of the drip to see that it does not alter. A convenient simple flow meter can be improvised by attaching a length of Zinc Oxide strapping suitably



marked to the side of the bottle. This strip should be marked with graduations. The time required for the transfusion of the whole bottle, e.g. 1 litre, is decided by the Medical Officer and the rate of flow compared with this plan.

2. To see that the patient is comfortable and to reach anything she wants without disturbing the limb into which the transfusion is running.
3. To see that the needle or cannula remains in position.
4. To report before the bottle becomes empty so that a fresh bottle may be put up without delay either by the doctor or by a trained nurse. This operation must be carried out carefully and quickly to avoid the introduction of air or infection.

Never touch any of the apparatus or move the patient without permission.

COMPLICATIONS

If any complications or abnormal reactions occur, these must be reported immediately—the main complications which may be observed are as follows:

1. Rigor.
2. Pain in the back.
3. Pain in the chest with dyspnoea.
4. Fever, over 100°F.
5. Collapse, with nausea and vomiting—rarely.

These complications are most likely to occur if whole blood is being used for transfusions. The use of plasma, and particularly S.P.P.S., dextran, saline or glucose-saline as the transfusion fluid considerably reduces the likelihood of untoward reactions. If any complications should occur, they must be reported to the Medical Officer in Charge or the Nursing Officer immediately.

Immediate action should be taken by closing the clamp on the giving set to shut off the transfusion. The giving set, "blood flow line" can be removed from the needle and replaced by a new set with saline flowing. This maintains an open direct access to the circulatory system of the collapsed patient whilst removing the dangers of introduction of further blood likely to increase the incompatibility reaction.

When the transfusion is completed or discontinued permanently for any reason, the needle is withdrawn from the vein and the skin, and the skin wound is covered with a small dry dressing.

Under emergency conditions as will exist in the First Aid Post at a disaster, considerable difficulty may be experienced in finding a suitable vein into which a needle can be inserted. When a transfusion is set up and the fluid flowing freely, it is imperative that the flow should not be interrupted. Undue movement of the patient's limb may easily dislodge the needle from the vein interfering with the flow of the life-saving fluid into the collapsed patient's circula-

tion. This not only increases the risk to the patient, but adds to the strain and burden on the Medical Officer in charge.

If the needle is dislodged from the vein, the fluid may temporarily continue to flow into the limb. This can be recognized by swelling of the limb around the transfusion site, and probably a feeling of pain or discomfort in the limb. The transfusion should be discontinued by closing the clamp on the giving set, and the Medical Officer notified immediately.

A record of the amount of fluid transfused and the times the transfusion was commenced and was completed must be kept.

CIRCULATORY OVERLOAD

Overloading the circulation by the transfusion of too much fluid is a serious danger, and although it is more likely to occur in an anaemic patient who has not suffered severe blood loss and is being transfused for medical reasons, constant watch must be kept on a shocked patient who is being transfused. Serious and potentially fatal complications of this type of treatment can occur; cardiac and pulmonary embarrassment manifested by signs of difficulty in breathing; cough, possibly with blood-stained sputum; distension of the jugular veins in the neck; and cyanosis (blueness of the skin) are signs which herald the onset of a condition which if not immediately recognized and corrected can prove fatal.

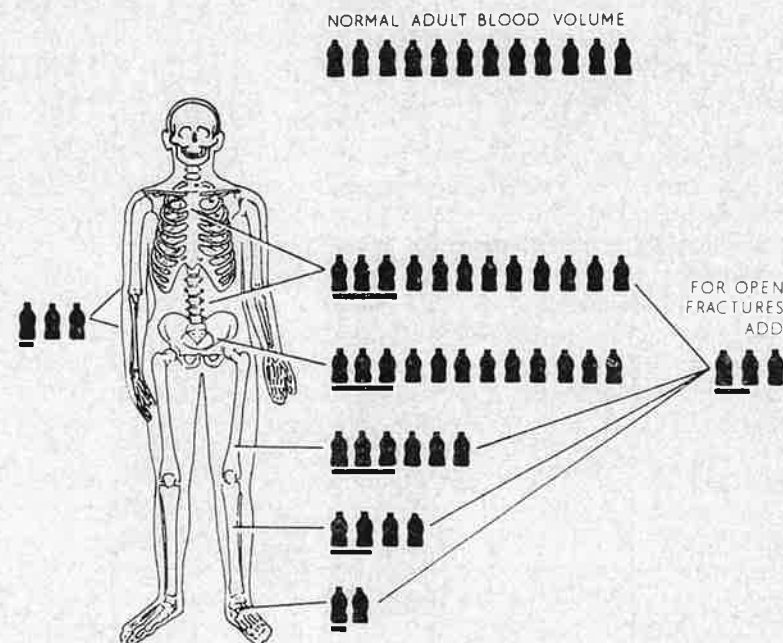
It is imperative, therefore, that a constant watch be kept for these symptoms and signs, and if they arise the transfusion must be stopped, and the Medical Officer informed immediately. This condition may be treated by the administration of Morphine 15 mgm., and atropine 1 mgm. subcutaneously, venesection and the administration of oxygen.

It is important that a careful record be kept of the volume of fluid transfused. For this purpose a fluid balance chart is required. This records the amounts of fluids administered by any route, oral, gastric, rectal or intravenous, and also the quantities of fluid lost from the body due to haemorrhage, vomit, urine, etc. For long-term observation approximately 30 ozs. (900 ml.) of fluid loss must be added per day due to insensible loss from non-obvious perspiration and in the breath. If severe sweating occurs, this figure will be greater.

HAEMORRHAGE

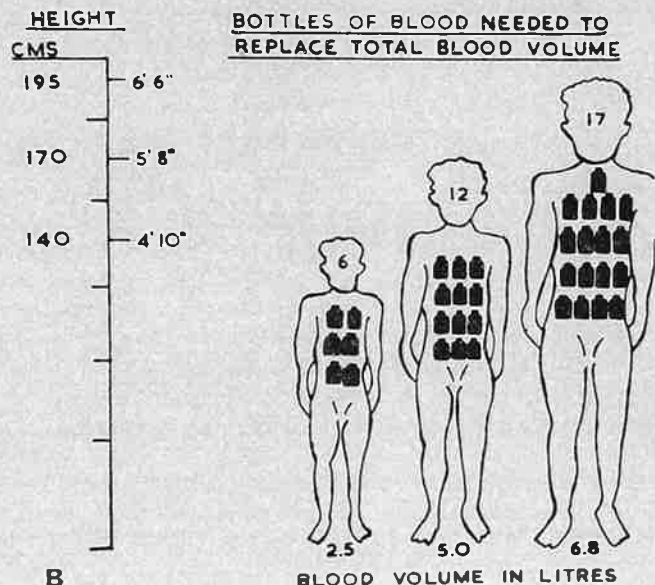
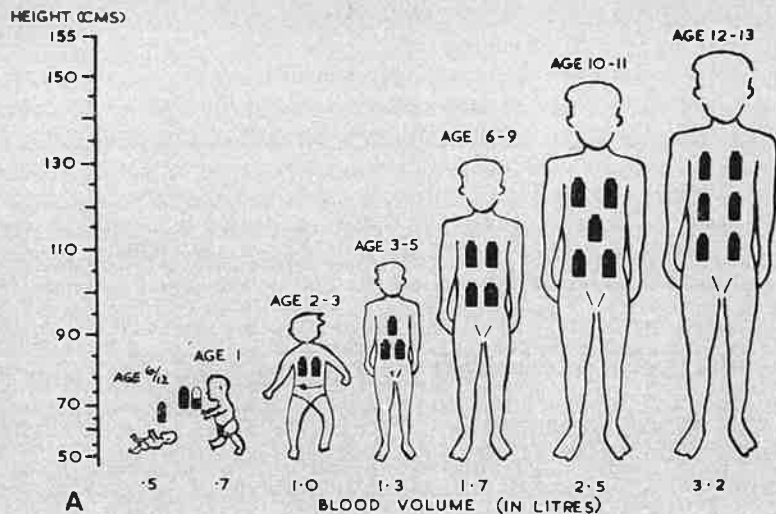
Severe external haemorrhage occurring as the result of an accident is one of the major priorities in treatment. It is, therefore, probable that

such haemorrhage will have been adequately controlled and the wounds dressed by the Rescue Squad or First Aid Parties. It is, however, important to remember that severe haemorrhage and blood loss produces a drop in blood pressure, which causes the flow of blood from the damaged vessels to be reduced. Following control of the haemorrhage and treatment of other injuries, it is possible that the patient's blood pressure may rise again, thus precipitating further haemorrhage in wounds inadequately controlled or setting up haemorrhage from other vessels which had not been bleeding obviously in the shocked state.



Rough equivalence between site and severity of injury and blood required for replenishment. Bottles underlined represent the usual order of loss, the whole row the possible need. With multiple injuries the individual losses have to be added and may considerably exceed a blood volume.

For this reason, careful watch must be kept on all dressings on patients who have lost blood. A further small loss of blood, $\frac{1}{2}$ –1 pint, could be catastrophic in a patient who has already lost a large volume of blood and whose circulation has been restored to a moderate level.



The blood volume at different ages.

The symptoms and signs of severe shock due to loss of blood, pallor, cold skin, sweating, dilation of pupils, hypotonia of muscles must be rigidly watched for, recorded and any deterioration in the patient's condition reported immediately.

INDIRECT EFFECTS OF INJURY UPON THE CIRCULATION

The most familiar example is the simple faint in which there may be no physical injury at all, just "nasty shock" of one kind or another. Apart from the occasional person that literally dies of fright, the inhibiting effects of the nervous system soon pass off unless there has been an associated injury of the circulation, in which case the process of recovering from fainting induced by fright or pain may merge into the opposing march of events resulting from damage inflicted directly upon the circulation. This is not to suggest that the mild condition of primary (or neurogenic) shock is capable of developing into the dangerous condition of secondary shock, but to emphasize that when there are two separate but apparently similar states of affairs one can follow the other so closely that the distinction between them is lost and the later stages come to be mistaken for an aggravated form of the earlier.

If "shock" that follows injuries is to be accepted as a state in which the circulation is disturbed by depletion, it must also be accepted as a state with many stages that may follow each other slowly or with disastrous speed. It would, therefore, be more apt to regard it as a train of events that is best known for its clinical manifestations and to recognize that these are preceded by changes that may either be clinically inappreciable or so variable as to be of doubtful meaning.

The early reactions to bleeding have the effect of ensuring, as far as possible, an adequate blood supply to the vital organs, and when necessary, at expense of fat, skin and muscle. Under the influence of hormones of the suprarenal medulla there is a selective vasoconstriction and a faster heart beat, and under the influence of the cortical hormones of the same glands and the anti-diuretic hormone of the pituitary — there is a tendency to replenish the circulation. The suprarenal hormones cause sodium to be retained and, consequently, to withdraw water from the cells into the extracellular space, from which it passes readily into the blood. If the loss from circulation has been insufficient to produce clinical "shock", this inflow amounts to about 20 ml. an hour. More slowly and over a much longer time the plasma proteins are restored by means of lymph.

The point at which bleeding brings about clinically manifest changes in the pattern of circulation depends upon the speed of loss as much as upon its amount. Age, emotion, pain and disturbance by examination or by transport can also effect the extent to which the circulation can compensate for falling blood volume.

Whereas the problem is difficult in a patient with obvious large wounds and external bleeding, it assumes far greater and even

graver significance if the haemorrhage is occurring internally. Injuries to the abdomen and chest with gross disruption of the components of the circulatory system are usually accompanied by severe internal haemorrhage and the well recognized sequelae of symptoms and signs. However, under some conditions haemorrhage, for example from a damaged spleen or liver, may not become manifest for some hours after injury. This may be caused by a small steady leak of blood from the injured organ or tissue, or the massive haemorrhage may not occur until the patient's general condition, and an associated blood pressure has improved.

Intra-abdominal haemorrhage may be suspected if the patient complains of severe abdominal pain. The abdominal muscles become rigid and abdominal swelling occurs in association with a history of injury and the other signs of blood loss. Severe swelling of an injured limb with or without an external wound is indicative of blood loss into the tissues.

The only treatment of value for the loss of large quantities of blood is the replacement of the lost fluid by blood preferably, plasma or plasma substitute. There is no other treatment which can take the place of transfusion. Fluids should be administered by mouth if the patient is conscious and has no internal injuries; external injuries attended to; anxieties relieved and preparation made for transfusion or transfer to hospital.

ESTIMATE OF QUANTITY OF BLOOD LOST

An approximate estimate of the amount of blood loss can be made by careful observation of the size of the pool of blood on the floor or ground. A pool of blood, including clot, on a hard surface about 2 feet square will be made by a pint of blood. Account will have to be taken also of the amount of blood saturating clothing, pools under the body, etc.

BURNS

THE FIRST THIRTY SECONDS

Few people are ever actually present at a burning or scalding accident — ever actually see a child's clothes alight or the skin actually blistering and peeling off the face. It is well known generally that a victim with his clothes alight should have the flames smothered with a coat, mat, curtain, bed clothes or any other material. It is

less often appreciated that the victim should be put on the ground while this is being done to stop the flames spreading up the trunk from the trousers or skirt to the chest and face. It is also important to stop the clothes smouldering. Clothes drenched with boiling water should be removed instantly or showered with cold water to prevent the scalding process continuing for half a minute or so, until the temperature of the clothes comes below 50°C.

The application of cold water compresses when available to the burned area will not only help to extinguish flames, but also cool the burned heated flesh and prevent further damage to the tissues.

Inhaled smoke can cause intense irritation and oedema of the lungs, which may be fatal, so immediate removal to fresh air is important if the atmosphere is smoky.

Acids and alkalis should be washed off the skin immediately by copious irrigation with water for several minutes; seconds count in removing the caustic from the skin, and half a minute's delay can be very serious, causing severe scarring for life. If the eyes are affected, irrigation with water should continue for 20 minutes: it should be as gentle as possible, but the eye must be opened against pain and spasm and forceful management by the First Aider on the spot may save the patient's sight.

Burning at the site of electrical contact should be stopped by switching off the current or pushing the victim clear with a non-conductor of electricity such as a dry piece of wood.

If the patient is not breathing, whether this is because of electrocution or fumes, the airway must be cleared and artificial mouth-to-mouth ventilation of the lungs started as soon as the injuring agent has been removed. The burned areas should be covered with a clean dressing, arrangements made for further treatment in hospital, and the patient reassured that all is being done for him.

Pain from extensive superficial burning (for example with steam) is severe, and can be relieved only by morphia. In contrast most deep burns from clothes catching fire are not particularly painful, and no analgesics are required if the patient says he has no pain.

THE NEXT THIRTY MINUTES

The transfer of an extensively burned patient to hospital should be immediate and as quick as is consistent with comfort, and the conditions prevailing at the time. The loss of plasma from the circulation on to the burnt surface and into the subcutaneous tissues is relatively slow compared with haemorrhage from severe trauma, and an hour later the patient may still regard himself as fit to return home with a dressing. This wish should be firmly denied. Most

patients with large burns travel 20 to 30 miles with safety if sent at once, and they should be taken to a Burns Centre rather than to the nearest small hospital from which they will have to be transferred later. Distance should be measured in travelling time rather than miles. Journeys of more than an hour should probably be made with an infusion running and accompanied by a nurse, but deciding whether the patient is fit for the journey is a Medical Officer's responsibility.

THE NEXT THIRTY HOURS

The next thirty hours is the Shock stage, the period of admission to hospital, examination and resuscitation if the patient's burn is extensive.

Certain disasters, bush fires, vehicle accidents, explosions, etc. are likely to be accompanied by large or small numbers of severely burned casualties. These may be associated in the same patient with other injuries of greater or lesser severity. It is important always to bear in mind the possibility of the presence of associated injuries.

The greatest danger in burned patients is the effects of fluid loss, producing a state of extreme collapse, "shock";

Interference with respiration due to direct damage to the air passages;
the inhalation of smoke and noxious gases;
the absence of oxygen in the atmosphere due to the fire, and
infection in the burn wounds.

The first priority for any burned patient, after removal from the source of danger, is the establishment of a clear airway and an adequate supply of oxygen to the lungs. Due to damage to the face, mouth or nose, tracheostomy may be a life-saving procedure and should, where indicated, be proceeded with immediately.

In patients suffering from severe burns, the area of skin involved in the burn is the criterion by which the severity of the burn can be measured. Observations have shown that when the area of damaged skin exceeds 15 per cent of the whole skin area the patient will suffer from shock of such a degree that life is endangered. In children the area is smaller than 15 per cent. A useful method of assessing the percentage of the total skin area involved in a burn is the Rule of Nines.

THE FACE

Swelling of the tissues of the face occurs within six hours and vision is impaired by the swelling and by the lids becoming stuck together by exudate. The nostrils and external auditory meatus may also be partly or completely occluded by swelling.

There is no known method of controlling the swelling; the sticking of the lids, the occlusion of the nostrils and of the external auditory meatus can be lessened by the local application of soft medicinal paraffin after wiping away the secretion. Soreness of the lips, which also occurs, can be relieved in the same way. Impairment of vision from occlusion of the eyes by swelling may cause great distress to the patient, and may necessitate the help of nurses or other attendants for guidance for some considerable time.

TREATMENT OF MAJOR BURNS

The patient should be disturbed as little as possible. The burned area should be covered with a clean sterile dressing, including any adjacent areas to which clothing has adhered. Except in the immediate treatment of burns (see The First 30 Seconds, page 22), clothing should not be removed.

The face and mouth should be cleansed, and if not directly involved in the burned area hot sweet drinks should be administered in small quantities — 1 to 2 ounces — at frequent intervals. Sodium bicarbonate should be given when available. Sweetened fruit juice is an acceptable alternative.

Patients with severe facial burns are probably best left uncovered, in order that a careful watch can be maintained on the airway, and any onset of respiratory embarrassment may be immediately noticed and attended to.

Admission to hospital, and preferably a hospital with a specialized Burns Treatment Unit should be arranged without delay.

The question of drugs for the relief of pain, both during the rescue period and at the First Aid Post and during transit requires careful consideration. At present, morphine can only be administered on the instruction of a Medical Officer. This subject is considered in more detail in another chapter. Many burned patients do not suffer from severe pain. Morphine should be given only if the patient is in severe pain and cannot be relieved by simple coverage of the burn. For lesser degrees of pain Tabs. Panadol, Soluble Aspirin or Codeine are recommended.

On arrival at the First Aid Post, a severely burned casualty will be rapidly assessed as to the extent and degree of the burn and the need for transfusion with plasma or plasma substitute. The guide to Transfusion and Bottle Index Chart will be helpful, but it must be realized that as soon as possible severely burned casualties must be transferred to a specialized Burns Unit in hospital.

TREATMENT OF BURN AREA

It is of the utmost importance to guard against infection of the

burned area. No local definitive treatment should be instituted until shock has been treated effectively and the patient's condition is judged to be satisfactory. Simple sterile or clean dry dressings should be applied to the whole area involved in the burn, and covered with a bandage. For limbs a crepe bandage is ideal, but caution must be exercised in the application of the bandage to ensure that swelling does not occur to an extent that any bandages applied constrict the circulation.

Crepe bandages should be applied around a limb starting at the periphery, i.e. from the toes or fingers respectively and then up the limb just proximal to the burned area. This will largely avoid the risk of the constricting effect at the burn giving distal and progressive oedema (swelling).

For the trunk many-tailed bandages are useful and cause least disturbance of the patient.

NO TOUCH TECHNIQUE

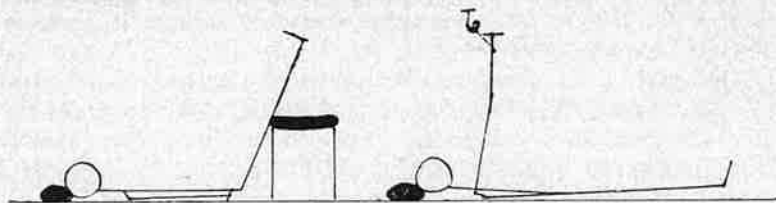
As described in Chapter 17, dressings as far as possible should be applied by a No Touch technique to avoid the risk of adding further infection to an area already raw and potentially infected.

It is equally important to maintain a strict No Peep technique.

Once applied the dressings should not be removed for a second look or further thought unless the Medical Officer considers there is some definite indication for so doing. There is no excuse for repeated observations of a dressed burn, e.g. to demonstrate the extent and severity of the burn to any interested bystander or inquisitive attendant. This in no way intends to imply that a burned patient does not require constant supervision in respect to his general condition.

SWELLING AND DISCOMFORT

Swelling of a limb and the associated discomfort may be considerably reduced by elevation of the limb.



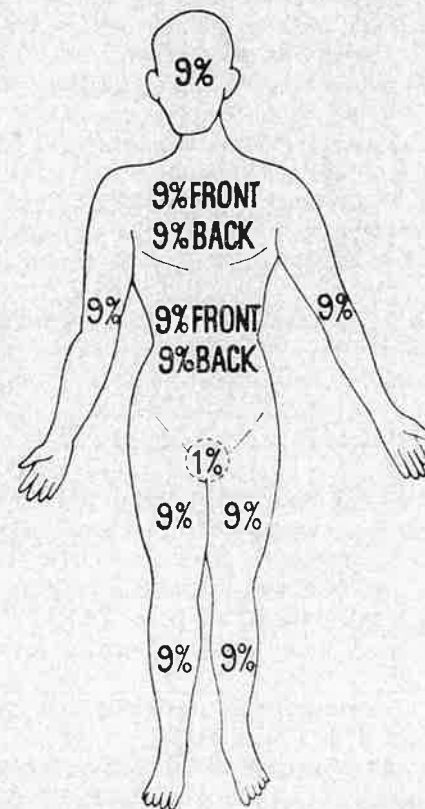
ESTIMATING THE SIZE OF A BURN

The area of burnt skin can be calculated in two ways. For small areas, it is convenient to use the size of the patient's outstretched

palm and fingers. This is 1 per cent of the total area of the body. For larger areas the "Rule of Nines" is useful. In adults the limbs and trunk each have an area that is 9 per cent of the total or a multiple of 9.

The head and neck	9 per cent
The upper limbs (9 per cent each) (hand 2.5 %)	18 per cent
The lower limbs (twice 9 per cent each) (thighs 9%; legs 6.5%)	36 per cent
The trunk (twice 9 per cent front and back)	36 per cent
	—
	99 per cent
	—

The genitals provide the remaining 1 per cent.



In children, the head and neck provide a larger proportion of the surface area (up to 20 per cent at birth) and the legs correspondingly less. Roughly speaking, a child will require urgent treatment for shock if it has had, say, an entire upper limb burned or half a lower limb, or a quarter of the trunk. With an adult, the dangerous area is roughly half as big again.

A SIMPLE GUIDE TO THE TRANSFUSION OF BURNS

1. The transfusion fluids used in combating shock in cases of burns are normally plasma and plasma substitutes and the expression transfusion refers here to these fluids. As shown in the section dealing with the prevention and treatment of shock a whole blood transfusion may be needed to overcome the blood destruction when the burn involves more than 30 per cent of the body surface, i.e. a Bottle Index of 8 or more (see below). This should preferably be given after shock has been overcome.

2. One standard bottle of dried plasma contains the equivalent of 400 c.c. of liquid plasma. For use the dried plasma is dissolved in 500 c.c. of normal saline: this gives a slightly dilute plasma solution with double the normal sodium chloride content. In the treatment of burns additional sodium chloride is needed and this method has been found to be more suitable than the use of water for dissolving the dried plasma. (Additional sodium chloride is *not* required as a rule for injury cases other than burns and for such cases dried plasma dissolved in water or dextran made up with normal saline are preferable.)

As a substitute for plasma, dextran made up with twice normal saline may be used in an equivalent quantity but as dextran contains no protein not more than five bottles should be given, after which, if further resuscitation be needed, plasma should be used in preference to dextran. If no plasma is available the use of dextran should be continued.

3. By reference to the chart (Page 29) it will be seen that the body is divided into areas each of which, if burned, requires a certain number of bottles of plasma or plasma substitute for resuscitation purposes — the extent of this requirement is indicated by a number on the chart and is called the Bottle Index (B.I.).

4. The Bottle Index is estimated by aggregating the areas involved, e.g.

- (a) a patient with a burn of all one lower limb and all one arm has a B.I. of $5 + 2 = 7$ bottles;
- (b) a patient with a burn of all the head and face and half the back has a B.I. of $2 + 2\frac{1}{2} = 4\frac{1}{2}$ bottles;

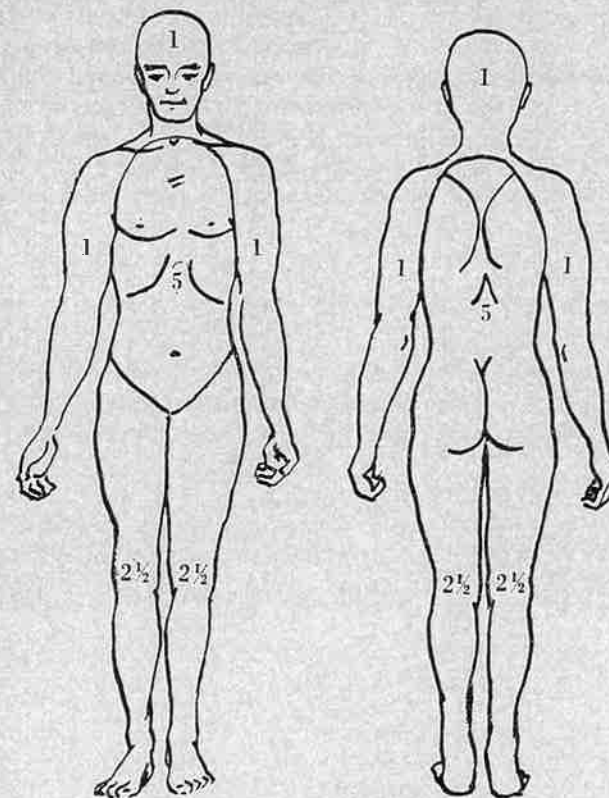
(c) a patient with a burn of a quarter of each arm and of a half of each leg has a B.I. of $\frac{1}{2} + \frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} = 6$ bottles.

5. If the Bottle Index is 4 or more, transfusion will be needed.

6. Half the indicated number of bottles should be given within 8 hours of burning and the other half during the next 16 hours of treatment. These figures will naturally require variation if there is great delay in the admission of a patient: the essential, however, is to give the major part of the transfusion in the first few hours.

An additional amount of transfusion fluid, i.e. $\frac{1}{4}$ to $\frac{1}{2}$ of the original B.I. will often be required in the second 24 hours of treatment.

7. The patient should be given as much to drink as he likes — if he



BOTTLE INDEX CHART

does not drink or remains thirsty the amount of transfusion fluid should be increased by 50 per cent. Alternatively the forced

BURNS

administration of fluid and food by means of a Ryle's tube is of great value.

8. For children the amount to be given is reduced as follows:

Age 10-15 (big school children) give $\frac{3}{4}$ of B.I. for adults
 Age 5-10 (small school children) give $\frac{1}{2}$ of B.I. for adults
 Age 2-5 give $\frac{1}{3}$ of B.I. for adults
 Under 2 give $\frac{1}{4}$ of B.I. for adults

The numbers on the chart indicate the B.I. for each area and the heavy lines show the boundaries of the areas. The chart can be used to show the extent and degree of the burn by marking the affected area with the following symbols: O = Superficial + = Deep.

RECORD SHEET FOR BURN CASES

Name: _____ Date and time of burn _____
 Age: _____ Date and time of admission _____
 For extent and degree of burn see chart B.I. = _____
 Bottles to be given in first _____ hours*
 Bottles to be given in next _____ hours*
 *Fill in the appropriate figures.
 Mark date and time of commencing each bottle in the spaces
 P = Plasma D = Dextran S = Saline B = Blood
 1 2 3 4 5 6 7 8 9 10 11 12

--	--	--	--	--	--	--	--	--	--	--	--

Morphine — give time, date and amount of each dose

Antibiotic — give time, date, type and amount given

By Vein By Mouth

Fluid Intake in c.c. or oz.

Output in c.c. or oz. Urine

1st 12 hours

1st 12 hours

2nd 12 hours

2nd 12 hours

3rd 12 hours

3rd 12 hours

4th 12 hours

4th 12 hours

UNCONSCIOUSNESS

An unconscious casualty admitted to the First Aid Post will be admitted to the Holding Area, unless the coma is considered to be due to haemorrhage or asphyxia for which adequate treatment has not already been given, or must be continued.

It is vital that all unconscious patients remain in the $\frac{3}{4}$ prone

UNCONSCIOUSNESS

or coma position — the position of safety — irrespective of any other injuries. They must be under constant supervision, and any change in their condition recorded. Regular recording of pulse, respirations, reflexes and depth of coma must be made, preferably not less frequently than every 15 minutes.

The commonest causes of unconsciousness will probably be:

Injuries to head and spine

Haemorrhage and shock

Asphyxia

Constant attention to the maintenance of a clear airway is of prime importance and takes precedence over all other procedures.

THE EXAMINATION OF AN UNCONSCIOUS CASUALTY

Speak to Patient: If no response or incoherent response:

Proceed to examine

Note Immediately

Is he breathing?

If so, how?

How is he lying?

Is he safe, Airway, traffic, etc.

Blood or bleeding Dampness Pallor

At the same time notice:

Colour of skin; moisture on skin.

Hand on radial pulse.

YOU HAVE NOW EXCLUDED OR ESTABLISHED THE MAIN DANGERS

Then examine according to method and routine.

Head: Skin temperature and moisture of forehead.
 Pupils and eyes.
 Mouth, nose, ears, face, breath.
 Scalp and skull.

Neck:

Trunk: Clavicles, shoulders, ribs.

Abdomen. Pelvis.

Spine:

Arms: } Tenderness, swelling, bruising, deformity,

Legs: } irregularity, limpness, mobility.

LOOK AND FEEL AND SMELL

Note particularly and record time of Reflexes. Response to stimuli.

If cause of unconsciousness is now established or

If Diagnosis is still in doubt

Proceed to continue treatment for unconscious person.

Safety . . . Airway . . . Hospital

S. O. S. S. O. S. Safety . . . Oxygen . . . Surgeon

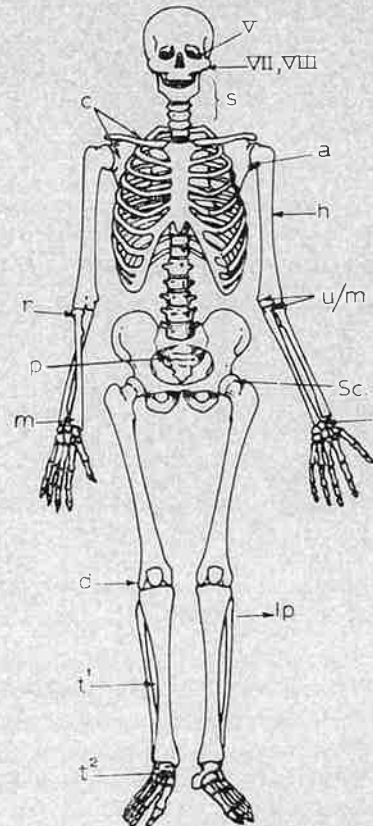
FRACTURES

The treatment of patients with fractures at the First Aid Post will depend on the type of fracture, the bone involved, the general condition of the patient and the type and adequacy of the treatment already given.

Injuries to major bones, spine, femur, etc., will require further treatment in hospital or specialized unit, and provided the general condition of the patient does not require further resuscitation, and the fractures are adequately immobilized, these patients can safely be kept under observation in the Holding area until transport is available for their journey to hospital.

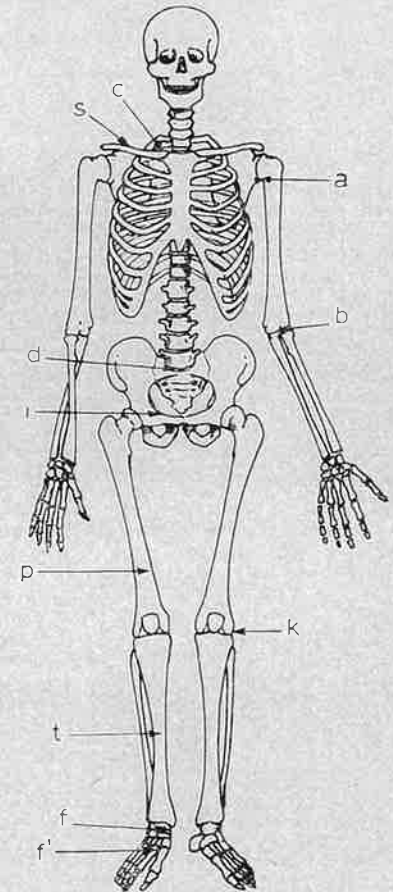
Sites where nerves may be damaged by fracture or dislocation. Those on the right of the diagram are well known, those on the left are less familiar:

- a : circumflex nerve by dislocation of the shoulder.
- c : brachial plexus by fracture of clavicle or dislocation of shoulder.
- d : posterior tibial nerve by dislocation of knee.
- h : radial nerve by fracture of the humerus.
- l : median by dislocated lunate.
- lp : lateral popliteal nerve by fracture of the neck of the fibula or by violent adduction at the knee.
- m : carpal tunnel syndrome after Colles's fracture.
- p : sacral root by fracture of pelvis.
- r : radial nerve by fracture dislocation of lateral condyle or dislocation of head of radius.
- s : cord or nerve roots by fracture dislocation of spine.
- Sc : sciatic nerve by fracture dislocation of the hip.
- t¹ : posterior tibial nerve by severe backward displacement of a tibial fragment.
- t² : posterior tibial nerve by fracture dislocation of the talocalcaneal region.
- u/m : ulnar or median nerves by fracture or dislocation at the elbow.



Fractures and dislocations that may injure main vessels. Those on the right of the diagram are well known, those on the left are less familiar:

- a : axillary artery, by fracture or dislocation and by very prolonged use of a crutch.
- b : brachial artery, sometimes by dislocation.
- c : carotid or innominate artery by retrosternal dislocation of the clavicle.
- d : common iliac vessels, by disc surgery.
- f : posterior tibial by fracture-dislocation of the talus.
- f¹ : main blood supply of forefoot by tarso-metatarsal injury.
- i : external iliac by fracture of pubis.
- k : popliteal artery by dislocation of knee or fracture adjoining it.
- p : popliteal or femoral artery by fracture.
- s : subclavian artery by fracture of the clavicle.



Minor injuries, e.g. closed fractures of the upper arm will, under normal conditions, require reduction and manipulation under general anaesthetic and subsequent immobilization in plaster; under emergency conditions with the scarcity of transport facilities and over-crowded hospital departments, it may be necessary for these injuries to be cared for by First Aiders for some considerable time at the First Aid Post.

Prolonged immobilization of the fractures will be required, and therefore, particular attention must be paid to the provision of adequate padding around the fracture site. Repeated observations

FRACTURES

at regular intervals will be necessary, preferably hourly, to ensure that the onset of swelling does not interfere with the circulation of the limb. Casualties must be warned to report any change in symptoms in the limbs, e.g. numbness, tingling, colour change or increased pain.

Patients with open limb fractures, major injuries associated with blood loss, will require general resuscitative measures, fluid intravenous infusions as first priority. Wounds will require dressing and fractures immobilizing.

Nurses should constantly bear in mind the possibility that First Aiders may have correctly (or incorrectly) applied a constrictive bandage, or applied an ordinary bandage in such a way that it acts as a constrictive bandage, or the swelling of an injured limb may have rendered bandages of correct tension at the time of application, too tight. Such constrictions must be released and only in the event of torrential haemorrhage from the wound or an amputated stump should a constrictive bandage be re-applied. Additional methods for immobilization which may be used at the Mobile First Aid Post, if the equipment is available, should include:

- Plaster of Paris Splints
- Air Splints
- Thomas Splints, etc.

STOVE IN CHEST

Stabilizing the Chest Wall

The essential causes of paradoxical movement are abnormal flexibility of the chest wall and rapid or large changes of pressure within it. It may be present from the moment of injury and require immediate attention or it may not come on for a day or two.

FIRST AID

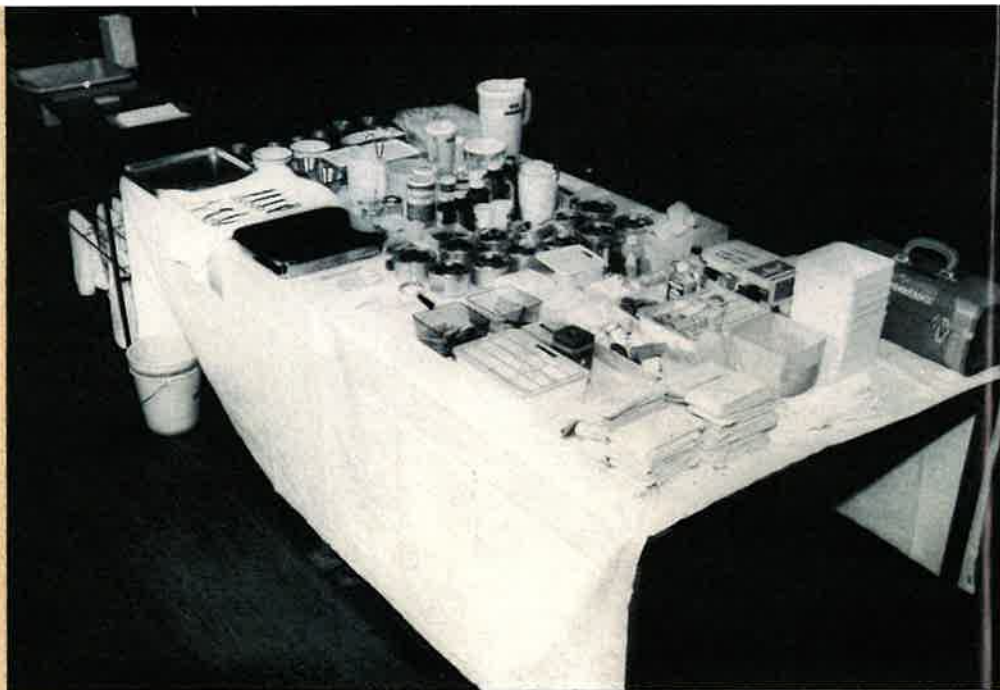
Ensure a clear airway and then, if it is still necessary, apply enough pressure to the affected area to stop the abnormal movement. This is most simply done by turning the patient on to the injured side, which has the added advantage of keeping the uninjured lung uppermost and so keeping blood from the injured lung out of it. Bandaging the chest, with or without a pad, may merely hide the abnormal movement without doing anything to stop it.



Mobile Nursing members at the ready for the reception of casualties, and prepared for summoning to attend to give treatment.

Nursing members attend casualties in a First Aid Post improvised in a hall.





Dressings and equipment neatly arranged and prepared on the Dressings Table.

A corner of a Treatment Ward improvised in a hall, showing two beds prepared for casualties, and the Dressings Table.



HIDDEN INJURIES

Although the subject is not really an entity in itself, it bears close consideration for a number of reasons:

1. Any patient may have a more serious injury than meets the eye.
2. The diagnosis of a hidden injury may be very difficult. If the Nursing members give some thought to the possibilities, their observations may be of considerable help in further medical management.

It is therefore necessary to perform a thorough systematic examination of any accident victim, and to avoid treating only the obvious injury, serious though it may be.

CLASSIFICATION

We can consider examples of these injuries in three categories:

1. Internal haemorrhage.
2. Damage to vital organs.
3. Rupture of hollow organs.

1. INTERNAL HAEMORRHAGE:

This may be:

(a) *Visible (Revealed).*

- (i) Lung — bright red, frothy blood is coughed up.
- (ii) Kidney — the urine is smoky, dark or even red.
- (iii) Bladder or Urethra — (commonly injured when the pelvis is fractured).

The patient passes red urine or frank blood or more often just a dribble of blood. He has considerable pain and commonly an intense desire to pass urine even though he may be unable to do so.

It is important to discourage such a patient from attempting to pass urine; such attempts cause urine to leak into the tissues around the bladder or urethra, resulting in further damage. However, if the patient does void, a note should be made of the colour of the urine.

- (iv) Stomach and Upper Bowel — red, brown or black blood (often "coffee grounds") is vomited or large loose offensive black motions (melaena stools) are passed.

(b) *Concealed*

The picture here is one of shock. Blood may be lost from many internal organs, but the most common concealed types are:

- (i) Ruptured Spleen.
- (ii) Ruptured Liver — this injury is more serious since this organ cannot be removed, and spilt bile may cause peritonitis.
- (iii) Rupture of Large Blood Vessels — for example, the aorta or the pulmonary artery.

These are uncommon accidents, but more common is the “internal” haemorrhage associated with fractures. Thus, two pints or more of blood may be lost into the tissues surrounding a fractured femur. If there are multiple fractures the concealed haemorrhage may be quite considerable.

2. DAMAGE TO VITAL ORGANS:

While some injuries to organs not vital to life may cause severe illness by spillage of their contents, injuries to other organs may be serious because of the very nature of the injured organ.

Under this category we may consider three systems:

(a) Cardiovascular System:

- (i) Heart. This may be damaged directly or it may be restricted by accumulation of fluid or blood in the sac surrounding it. This may accompany severe chest injuries; for example where the driver has been crushed by the steering wheel.
- (ii) Vessels — see above — 1 (b) (iii).

(b) Respiratory System:

- (i) Nose
- (ii) Mouth
- (iii) Larynx and Trachea
- (iv) The Bronchi
- (v) Lungs may be damaged by severe chest injuries. For example, the lung may be pierced by a rib, allowing air into the chest cavity and thus causing respiratory embarrassment. In burns and explosions the air passages and the lungs themselves may be seriously affected.

(c) Nervous System:

The nerve cells of the brain and spinal cord are different from most other cells in that they do not regain function after they have been damaged.

- (i) Spinal Cord. You should assume that any patient with a back injury has potential spinal cord damage. Similarly, any patient with a head injury may have a broken neck or spine and so if the victim is unconscious you must treat him as if he also has spinal damage.

Preservation of Normal Curves

A normal body curves to the front —
in the neck
at the waist
at the knees

These are “natural hollows” that you use for passing bandages under the supine patient.

With certain types of spinal fractures there is a danger that the spine will fall back into these “natural hollows” with consequent damage to the cord. It is important therefore that these areas be supported by adequate packing when the patient is on a stretcher. However, the normal curve of the neck is preserved satisfactorily without a pillow. If available, an inflatable collar splint may be applied.

If the coma position must be used because the patient is unconscious, the backward head tilt used to preserve the patient's airway will tend to protect the cord in his neck and use of the coma pillow prevents sideways flexion of the neck. A pillow should be placed to give support at his waist.

- (ii) Brain (head injuries). Any Patient who has lost consciousness as a result of a head injury and regained it should be encouraged to go to hospital. A head injury may result in varying degrees of injury to the brain, ranging from temporary loss of consciousness (concussion) to the most severe forms of brain damage.

- (a) *Concussion*. This is a condition of temporary loss of consciousness of sudden onset. Consciousness is completely regained, but there is a loss of memory for the moment of impact and a variable period before and after. Note especially that the casualty normally shows signs of recovery in quite a short time. Quite frequently consciousness has returned by the time of arrival of the ambulance, or admission to the Mobile First Aid Post.

You must be able to recognize some of the forms of behaviour of persons who have had concussion. Often the casualty seems a little dazed or confused. He may wander around the scene, appearing not to understand the situation. He may tend to attempt acts or repeat questions over and over again, forgetting what he has done each time; he may demonstrate “automatism” when his behaviour seems to be automatic and illogical.

To summarize, the important point is therefore that any person involved in an accident who cannot remember the

moment of impact has had a brain injury (either concussion or one of the more serious injuries considered below). Such a person should not be allowed to resume activities requiring skill and judgement, for example, drive a motor car or move in dangerous industrial situations, without a medical examination.

- (b) *More severe head injury.* Here the period of loss of consciousness and the duration of loss of memory are both likely to be longer than in concussion where no permanent damage has been done to the brain. If the casualty is not more deeply unconscious he characteristically tends to demonstrate the well known behaviour pattern of "cerebral irritation". The casualty is obviously confused, and reacts to any interference or stimulation by rather wild, uncontrolled and violent activity.
- (c) *Cerebral Compression.* This, if due to head injury, will be caused by continued bleeding inside the skull. It will be recognized by the signs of increasing impairment of brain function, the most important of which is a steadily decreasing level of consciousness. A particular example of this is the so-called lucid interval in which a concussed patient after regaining consciousness lapses into unconsciousness again. Such a patient needs urgent surgical treatment. The history of the lucid interval may be crucial in deciding the surgeon's actions: hence the ambulance crew member or member of Mobile Nursing must note and report any marked alteration in the conscious state.

The interpretation of other signs is outside the scope of this book. Early changing pupil signs are not always important but, at intervals, you should make a note of the pupils' size, equality and reaction to light, together with the level of consciousness, and pulse and respiration rates.

Note: Compound (open) Head Injury. Here there are two conditions to consider:

- (i) The head injury which should be treated according to indications mentioned above.
- (ii) The compound skull fracture. In this case the coverings of the brain or the brain itself may be involved in the wound. The treatment is still the same, namely sterile dressings, ring pad and bandages.

The actual brain damage in an open head injury may be no more than in a closed head injury and does not of itself call for an

emergency trip to hospital. In fact, it is possible for a person to remain conscious although he has received a compound head injury.

3. RUPTURE OF HOLLOW ORGANS:

Any organ may be ruptured, e.g.

Oesophagus (gullet)	Bowel
Stomach	Bladder

Spillage of urine, blood, pus or intestinal contents which are all extremely irritant to the body cavities may produce pain and shock. Later, inflammation occurs, but the earlier symptoms are worth noting.

Transport of Patients:

If serious hidden damage is suspected, an immediate but not dangerous trip to hospital is wise, but only after a systematic examination of the patient and accumulation of such information as is available from bystanders.

N.B.

1. Patients with head injuries may have spinal injuries.
2. Transport the patient lying on the side of the lung injury.
3. Remember your equipment — sucker, oxygen, mask, and use it.
4. Train yourself to be observant at the scene. The doctor in Casualty will not know the patient's condition at the scene unless you can tell him.
5. The size and reaction of the pupils and the state of consciousness are very important, and should be estimated and recorded at frequent intervals.
6. Use of Trilene. This is for the relief of pain. Its use must be restricted to conscious co-operative patients, preferably diagnosed.

Admission and Hospital Treatment:

If you suspect that urgent hospital treatment may be life-saving, use your radio to have the hospital Admitting Officer alerted approximately ten minutes before your estimated time of arrival. Make sure that you give as clear and accurate a diagnosis as you can. Remember your duty in handing over the patient to the doctor. If you have information, pass it on; it may be useful, even life-saving. It is imperative that you report to a doctor in all cases of head injury and in all other cases with serious injuries. If time permits, the making of notes will be helpful. Finally ask — either at the time or later — whether you were correct in:

- (a) Your diagnosis;
- (b) Your treatment.

THE RELIEF OF PAIN

PAIN AND FEAR

Most persons take it for granted that medical or surgical treatment and, even more so injury, is painful and if many are convinced by their own experience that these things do hurt the fault may be entirely the doctor's or nurse's.

Pain is an experience comprising both perception and interpretation and it is a matter of everyday observation that response to the unexpected can closely resemble that to pain. Furthermore, fearful expectation of pain often causes a stimulus that is not painful to be interpreted as though it were. The patient may hurt himself by his response to it but blame the stimulus for the pain. Given some understanding of these matters and the ability to reassure and gain confidence, it is remarkable what can be done to a relaxed person without causing pain. Furthermore, not causing pain is the most powerful aid to dispelling remaining fears and increasing co-operation. Many patients can be greatly comforted by a firmly confident approach and, subsequently, astonished by the fact that supposedly painful procedures caused little more than discomfort. This applies particularly to dressings and most especially to children.

While it is only fair to do very painful dressings with general anaesthesia, this should not be used without good cause because it so powerfully suggests that dressings are unbearably painful, and each repetition reinforces this suggestion.

Given time and patience the patient will usually admit, and sometimes volunteer, that it was nothing like as bad as had been expected, and it is even more striking to find that after a first dressing much prolonged by pauses for reassurance, and sometimes admonishment, the second is accomplished without delay because the patient is helpful as well as confident.

In the matter of pain and fear, words are often little more than vehicles for reassurance and unless the doctor has the necessary experience and self-confidence his words will not ring true and his patients will not relax.

OVERBREATHING TETANY

This is an unusual but characteristic response to the fear of suffocation and the fact that the patient is obviously breathing with great depth and vigour weighs less with him (or her), and the attendants than do complaints of being unable to breathe, of light-headedness, cramp and paralysis. The condition is usually cured as soon as the carbon dioxide in the lungs and blood is restored to

normal by holding the breath, rebreathing from a paper bag or even receiving dilute carbon dioxide from an anaesthetic machine. In the occasional resistant case, hypnosis may be helpful, otherwise large doses of sedatives are necessary, preferably those that depress the respiratory centre.

PAIN RELIEF

Pain is frequently an aggravating factor in any injury and is usually the predominant presenting feature by the patient. The relief of pain is an important part of the duties of all who attend casualties. Whereas powerful drugs are available to medically trained personnel for the relief of pain, their use is restricted in disaster situations and limited by the availability of doctors. At certain times, the administration of a powerful pain-relieving drug may mask the onset of serious complications and thus make the detailed diagnosis of a patient's injuries more difficult, or even add to the dangers of his condition by preventing an early recognition of complications requiring immediate surgical intervention. It is, therefore, important to realize that many other methods are available to assist the casualty by relieving pain and reducing discomfort.

CAUSATION OF PAIN

Pain may be caused in a variety of ways:

1. Exposure of nerve endings, e.g. burns.
2. Pressure, e.g. subungual haematoma (bruise under fingernail), ankle swelling, abscess.
3. Pressure on nerve, e.g. prolapsed intervertebral disc, pressure due to neoplasm.
4. Ischaemia of tissue, cutting off blood supply, e.g. coronary thrombosis.
5. Colic in muscle, cramp, muscle spasm, probably primarily a temporary ischaemia.

Although different types of pain, e.g. aching or dull pain, sharp or colicky pain, cutting pain, sickening pain, etc., are described, it is important not to apply too great importance to the description of a pain as a diagnostic feature. It has in the past been suggested that a joint dislocation causes a "sickening pain" with the inference that unless the patient is "sickened" by the pain a dislocation can safely be excluded, and conversely, if the patient complains of a "sickening pain" then he must have a dislocation. This is particularly true of First Aid competitions, and the inference is obviously incorrect.

With a knowledge of the causes of pain, it is possible to realize

THE RELIEF OF PAIN

that procedures other than the administration of drugs may be effective in the relief of pain.

THE EFFECTS OF INJURIES

The effects of injuries and the associated degree of pain are aggravated by several factors:

- Insomnia
- Anxiety
- Discomfort
- Fatigue

Whereas it is not always possible to remove all these factors, it may be within the competence of first aiders to reduce their effects by creating an atmosphere of calm and confident optimism, encouraging rest, relieving discomfort and attending to anxieties.

Factors which can operate to the benefit of the patient, if properly applied include:

- Posture
- Distraction
- Reassurance

Immobilization of a fracture, dressing a wound or burn, resting a sprained joint associated with reassurance and sympathetic handling can do much to lessen the effect of pain caused by the particular injury.

REASSURANCE

Emergency measures which can be used in the treatment of pain include:

- Reassurance to relieve anxiety
- Restraint to prevent movement
- Posture to prevent discomfort, e.g. elevation of an injured limb
- Distraction, by providing occupation, a cigarette, conversation
- Applications, cold and heat
- Control of respiration

All these measures should be an integral part of first aid treatment. If pain persists in spite of the proper application of these various measures the use of drugs may be indicated.

DRUGS

Pain relieving drugs readily available for first aiders include Aspirin, Paracetamol, Codeine and combinations of these drugs. As a general rule, it is probably safer to use Paracetamol (Panadol) for the relief of mild or moderate pain. Aspirin should be given in

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its soluble form. Two or three 5-grain tablets of aspirin, or 0.5 gms. Paracetamol should be sufficient to relieve moderate pain. More severe pain may require the administration of Pethidine, Morphine or one of its derivatives. These drugs may only be given on the orders of a doctor.

Individuals vary greatly in their ability to withstand pain, and the degree of pain experienced by a patient is not always an accurate pointer to the severity of an injury. First aiders must appreciate this variation in individuals' pain threshold and endeavour to relieve all pain with every means at their disposal.

CARE OF THE EYES

Damage to the eyes ranges from a minor abrasion to complete destruction of the globe and the presenting features of injury depend on its cause, severity and position. The eye and vision may be affected directly, or indirectly, by orbital or intracranial injury. The fear of blindness may be a very powerful factor in creating a situation of terror, and reassurance and sympathetic handling of all casualties with moderate or severe injuries to the eye will do much to counteract the effects of shock.

Superficial conjunctival foreign bodies can be removed by conventional methods, well described in the standard first aid textbooks. Any foreign body which is not easily removable must be attended to by a Medical Officer; the eye should be covered with a sterile dressing, and the patient reassured. It is important to advise the patient not to move either eye, and for this reason (which should be explained to him), both eyes are covered. Patients with penetrating eye injuries should be transported to hospital on a stretcher as a lying down casualty.

Irritation of the conjunctiva by smoke or contact with petrol, etc. can be relieved by irrigation with normal saline or water. The instillation of medicinal paraffin may ease the discomfort.

The eyes are more likely to be injured by chemical or molten metal splashes than by flames because the lids can save the eyes even though the rest of the face is burned severely. Exceptions occur in the unconscious patient and with electronic or atomic flash.

PSYCHOLOGICAL FIRST AID

PANIC AND HYSTERIA

Psychology is the science of the mind. It embraces such matters as the reactions of individuals or groups to certain circumstances, and the methods by which such reactions, where undesirable, may be modified or prevented.

Disasters, either from natural causes, large scale accidents, or those caused through war, present many problems that are essentially psychological.

For members of Mobile Nursing, which is intimately concerned with disaster relief, it is most necessary that we should have a knowledge of these problems and of the methods recommended for their prevention or modification.

OURSELVES

One of the first problems facing us could be OURSELVES. And of ourselves we will need to make a candid appraisal. This is an important part of our preparation for psychological first-aid.

We will need to examine carefully certain trends in our normal behaviour; for instance:

Are we impulsive?

Are we easily angered?

Are we a bit more sensitive to criticism than the average person?

Are we inclined to store up resentments instead of expressing them wisely and effectively?

Do we tend to judge people according to their race, religion or other group affiliations instead of as individuals?

None of these characteristics may have caused us any serious grief so far. But in disaster, any one of them could trip us up badly if we are so unaware of their presence that we have never developed any ways of modifying our attitudes.

The training we receive as disaster workers will in itself protect us somewhat in times of stress. Nevertheless, regardless of how thorough our training has been, it would be unwise to assume that we will be completely immune to all personal disturbances under these circumstances.

One of the important things we need to keep in mind is that no disaster plan can be perfect. We must not let a plan's deficiencies overwhelm us under disaster conditions. Hence our first job in psychological first-aid is to look to our own discipline. If we under-

stand ourselves reasonably well we may justifiably hope to endure and exercise self-control in the midst of disasters.

PEOPLE

We are here concerned, not with the mentally or physically sick but rather with the response of people caught up in some major disaster. In such disasters people involved are likely to be subjected to stresses which exceed anything they have ever experienced before. Though they may be physically unharmed, they may be suffering from emotional shock ranging from light to extremely severe.

Just as it is necessary for a first aid worker to be able to deal with surgical shock, so it is necessary for him or her to be prepared to deal with various manifestations of emotional shock and exhaustion.

NORMAL REACTIONS TO DISASTER

Some people are able to remain remarkably calm, at least for a time, under the most extraordinary circumstances.

Most of us, however, tend to show obvious signs of disturbance.

NORMAL REACTIONS TO SEVERE STRESS OR FEAR INCLUDE:

- Muscular tension;
- Headache;
- Tremor;
- Chilly or hot sensations;
- Loss of appetite;
- Vague abdominal distress;
- Frequency of urination — diarrhoea;
- Rapid pulse;
- Irregular heart beating;
- Breathlessness;
- Sense of oppression in the chest;
- Faintness and giddiness;
- Muscular weakness and lassitude;
- Marked physical fatigue.

It would, however, be definitely misleading to class as abnormal all these natural and usually temporary reactions of stress.

Subsequent events may alter the rule for some individuals, but a good general rule to follow is that psychological first-aid is only necessary for those persons who are obviously losing control of themselves or are making no noticeable progress towards resumption of normal behaviour.

It is important to assume that most people can regain some control of their emotions — if given a little time to do so.

TYPES OF REACTIONS ASSOCIATED WITH DISASTERS

Roughly there are four types of severe emotional reactions in times of disaster.

- (a) Acute Panic Reactions or Blind Flight.
- (b) Stupor or Complete Inability to Take Any Action At All.
- (c) Excitement and Overactivity (often with unstable and potentially aggressive emotional reactions).
- (d) Physical Symptoms (amounting to collapse from nervous shock).

ACUTE PANIC OR BLIND FLIGHT

This response is not very common, but because this behaviour is highly contagious, it will spread through a group unless swiftly controlled by appropriate measures. This contagiousness gives it an importance out of all proportion to its frequency. The striking thing about panic or blind flight is its blindness. There is a complete lack of judgement and appreciation of the situation shown by these people. They may, in fact, run away from safety and into danger. They may induce similar panic in others because this behaviour is not only disturbing but also infectious.

HOW TO DEAL WITH ACUTE PANIC OR BLIND FLIGHT REACTIONS

It is essential to *Check Such Reactions at Once*.

Endeavour to do this in a way that will restore a degree of confidence to the person concerned and convince them that there is another and more suitable way of meeting trouble.

This not only helps the person evincing these reactions, but makes it clear to everyone else present that this reaction is ABNORMAL and one which CAN and MUST be brought under control.

The right way to go about this depends upon recognizing:

- (a) That such people are temporarily out of touch with reality.
- (b) That they are acutely mentally ill.

Therefore do *not* expect them:

- (a) To respond to immediate exhortation.
- (b) To be capable of giving sufficient attention to what is said to them or to even hear it at all.

(Physically these individuals will be so explosive in their behaviour it will be difficult even to gain their attention.)

Thus their early separation from other victims and their adequate control is *vital*.

If there is no response to initial efforts of gentle firmness and kindness it is a sound plan to get two or three people rapidly to remove them somewhere out of sight and, if possible, out of sound of

the rest. Generally speaking a person in acute panic will quieten down in five or ten minutes if restrained firmly and patiently. As he becomes more responsive simple statements on how he can help will speed his recovery.

If physical restraint is necessary, it should never be brutal or punitive. Striking, smacking or throwing cold water over a panic-stricken person should be discouraged. Such treatment is unlikely to control his panic except briefly and will certainly increase the anxiety of others who may be on the verge of panic themselves.

Never attempt to control this type of person *single handed* — he will almost certainly break away from you and become even more disturbed. Due to the fact that panic spreads easily after a disaster you are justified in assigning two or three sensible people to the temporary care of one individual.

Every effort should be made to get him to Medical Aid.

STUPOROSE OR SLOWED-DOWN BEHAVIOUR

This behaviour may be seen among people immediately following some catastrophe which has left them numbed. They may sit or stand in the midst of utter chaos as though they were completely alone in the world. They may gaze vacantly before them and when first spoken to may not respond.

In contrast to the person in panic who seeks violent action in escape, they are likely to remain apathetic, even motionless. They do nothing to help themselves or anyone else. After particularly terrifying disasters, i.e. earthquakes, etc., some survivors may sit, surrounded by tools such as spades, etc., which they could use to help others, but in fact take no action at all.

Patients of this kind cannot take responsibility themselves or display initiative. They can, however, rapidly be helped by appropriate treatment.

HOW TO DEAL WITH STUPOROSE OR SLOWED-DOWN BEHAVIOUR

It is essential to get into personal contact with these people. A relatively short time spent with each one or even a number gathered in a small group will bring out desirable responses in many. As they sense your constructive interest, their private worlds no longer seem so desolate.

Show understanding and compassion without appearing oneself to be in any way shaken or overwhelmed. Confidence and kindness will get across to these people where any other kind of approach will fail.

Calm, realistic reassurance and particularly emphasis that there

is now something which they can and should do to help themselves and others — something which you will help them to do and show them how to do, will begin to pave the way to normal activity. Some, of course, will respond more quickly than others and you may soon find that you can get your most successful cases helping with the rest.

The supreme factor will be calmness, confidence and a sense of optimism and active reassurance on the part of the first-aid worker.

HYPERACTIVE OR EXCITED RESPONSES

Like the panic-stricken person, these hyperactive or over-excited victims may at first be difficult to reach. You may have trouble at first even getting their attention. They will explode into a flurry of activity that may seem purposeful — but is largely useless.

These persons talk rapidly — joke inappropriately and spread rumours. They manifest symptoms of:

- (a) A high degree of over-excitement;
- (b) Restlessness;
- (c) Inability to stick to any one job;
- (d) Overconfidence;
- (e) Aggressiveness.

HOW TO DEAL WITH HYPERACTIVE OR EXCITED RESPONSES

Their need for physical activity is very considerable — therefore jobs involving doing something concrete, such as removing debris or rescuing casualties by actually carrying stretchers or heavy equipment, carrying and rearranging stores or setting up equipment will be of great value. However, it will be necessary to remain in contact with such people to see that they don't continually give up one thing to fly to another. They are easily distractable and need to be encouraged to show persistence and a constant attitude to what they are trying to do.

There is another danger to be guarded against in dealing with people showing this particular response — and that is their aggressiveness. Quite often these people react to danger and disaster by becoming aggressive and critical of what they regard as the stupidity of authority in general or of some minority in the community whom they tend to blame for what has happened. In fact, they release under conditions of stress, latent and often repressed and unconscious hostilities, or long cherished grudges, which they then attach to the circumstances of the particular disaster, and find satisfaction blaming everything that has happened upon their own particular scapegoats.

Like panic such scapegoating attitudes tend to spread among dis-

turbed and frightened people and if not checked can lead to rioting, to mob law, to looting and to complications worse than the original disaster.

Therefore, it is necessary to ensure that people who show this tendency are promptly allotted an energetic and constructive job. There is no need or point to argue the rightness or wrongness of their views — there may actually be some basis for their resentment.

The immediate task is to get them working with a sense of identity with the other people who have suffered, so that for a time at least their grievances are forgotten and they are prepared to employ their excess energies for the common good. Rather than argue with them, it can be pointed out that responsibility for the disaster can be considered later, but that the crying need at the moment is to repair as much of the damage as possible.

Here again, contact and understanding will do more than mere exhortation.

BODILY REACTIONS TO EXTREME EMOTION

Abnormal reactions to severe stress or fear include:

- (a) Grossly incapacitating shaking and tremors, lasting for hours after the immediate danger is over.
- (b) Over-sensitivity to noises unconnected with the source of danger.
- (c) Continued insomnia after the immediate danger has passed.
- (d) Pathological fear with clouded consciousness and disorganized thinking and control.
- (e) Gross functional impairments, e.g. hysterical paralysis, contractures, blindness, and deafness, etc.

These hysterical manifestations are technically called "conversion hysteria". In conversion hysteria (not to be confused with the condition of wild excitement usually designated by the popular term "Hysterics") the person usually converts his great fear into a strong belief that some part of his body has ceased to function. Such conversion symptoms reduce the overwhelming fear he previously felt. A person behaving in this way is not faking (malingering). He is completely unaware that there is no physical basis for his symptoms and is just as disabled as though he had a physical injury.

HOW TO DEAL WITH BODILY REACTIONS TO EXTREME EMOTION

Persons suffering from bodily reactions are on the whole easier to deal with than the other types of reactions described, because they temporarily incapacitate the victim physically, thus rendering him susceptible to ordinary measures of first-aid, such as rest, warmth —

PSYCHOLOGICAL FIRST AID

perhaps a hot drink and reassurance. Once such people find that their bodily disturbances are accepted without alarm by those who are attempting to help them and that their rapid recovery is looked forward to with confidence, they will begin to feel better.

It is important to make them feel your interest in them as individuals. You may then be able to find a number of small jobs that they can do in spite of their symptoms. By thus by-passing their disability to some degree, you may help a number of them regain their composure gradually while waiting for medical help.

ELDERLY PEOPLE AND CHILDREN

Elderly people and children who are victims of disaster present many special problems. From the standpoint of psychological first-aid however, the methods just described will be reasonably effective. Since old persons tend to become more confused in a disaster than do the young — they cannot be expected to respond to understanding care as quickly as do younger people.

Unless it is unavoidable, children should not be separated from at least one parent in order to provide a continuity of parental care and affection. It was observed during the last war that children suffered far more emotional disturbance due to family separation than from anxiety about air-raids.

In every aspect of administering psychological first-aid to people overwhelmed in a disaster, it is of course necessary to preserve one's own judgement, sense of proportion and individual courage. To be able to offer first-aid of any kind pre-supposes that the individual concerned has retained control of himself.

DRESSINGS AND TECHNIQUES

It is not proposed to describe in detail the dressings available, their application and uses, as all members joining Mobile Nursing should be fully conversant with this subject. However it is important to remember the basic rules and functions of dressings:

1. To cover a wound and prevent further infection.
2. To treat inflammation.
3. To relieve pain.
4. To reduce swelling.
5. To arrest bleeding by pressure on a wound.

Under disaster conditions, it may not always be possible to main-



Group of buildings at Officers Training School, Portsea, suitable for use as improvised emergency field hospitals.



Improvised theatre set up in above buildings.



Air Splint.

Mobile First Aid post. Mobile Nursing: Unit 1



DRESSINGS AND TECHNIQUES

tain a "sterile technique" as training demands. Indeed there may be times, especially when there are mass casualties, when all that can be hoped for is to be "socially clean", implying an attempt to prevent the introduction of further infection.

Whenever possible and when conditions permit, the hands should be washed thoroughly with soap and water before attending to any wounds or applying dressings.

This emphasizes the need for all Mobile members to have their kits at the ready at all times, with sterile dressings in order.

Whilst working at a First Aid Post, the problem of keeping equipment sterile is made somewhat easier, as all materials required are collected from the dressings table, where the Officer in Charge is responsible to see that all required materials are handed over in a sterile condition and in sterile containers, a procedure with which all Mobile members should be familiar.

Working outdoors, the problem of sterility is made much more difficult, but no members should be guilty of using contaminated equipment, nor should be guilty of neglect or careless handling. If the "no-touch" technique is to be used (as in the case of burns, etc.), it must be applied, as members have been trained to do, with reasonable speed, but no time must be wasted on these finer points if the casualty's life is endangered. It will be appreciated that a few germs in a live casualty are preferable to a sterile corpse.

Where there are mass casualties, the aim will be to treat the most serious first, being fully aware that there could be casualties that may not be able to be treated at all. Should the latter happen, members must not dwell too long on this unfortunate situation but go on treating those that can be helped.

KITS

On joining Mobile Nursing all members are issued with a Field Kit fully equipped with the essentials for field work, and it will be the responsibility of the owners to see that these kits are kept at the ready at all times, in the manner in which they have been trained.

After exercises or emergencies, they will apply to the Officer in Charge Mobile Nursing for materials to be replaced, and there should never be any excuse for the lack of field equipment.

MORTUARY

In a major emergency with considerable loss of life orderly arrangements for the dead are required. Attention must be directed to the preservation of life but in cases where resuscitative efforts fail or a doctor pronounces a casualty dead, the body of the victim must be treated with all respect possible under the circumstances.

Where possible, a separate area apart from, but adjacent to the Mobile First Aid Post or Treatment Centre, must be established.

The bodies of victims should be laid on the ground or floor in orderly rows, labelled and identified where possible. The bodies should be covered decently with a blanket or sheet, and some support placed under the chin. The full procedure of the rites of last offices can only be undertaken when time and conditions permit.

Relatives or other persons attending for purposes of identification of the victims must be treated with kindness, sympathy and understanding. In conditions where there is a shortage of trained personnel, it may be possible to arrange for some other responsible person to take over these duties.

Records must be kept, and bodies should only be removed after permission of the Coroner or his Deputy has been granted, or on the authority of the Police Officer in charge at the scene.

The first priority after a vehicle accident is the saving of life, and every effort must be directed towards this end. However, after certain types of vehicle accident, and particularly after aircraft crashes where there is no chance of saving the lives of any of the occupants of the vehicle, certain other factors become important and assume priority. The appropriate authority will require to conduct an investigation into the cause of the accident to determine whether there is any suggestion of sabotage, or mechanical failure and also to search for clues which may give an indication of the cause or lead to modifications or improvements in design or safety standards to reduce the likelihood of a repetition of such an accident.

It is imperative for the proper investigation of vehicle crashes, particularly aircraft that where possible the position and posture of the bodies be recorded photographically or by diagram. These forensic implications are important but, of course, should not be allowed to interfere in any way with the care and treatment of the living.

It is, therefore, important for all attendants, First Aiders, Police or any other personnel to recognize this fact. Except for the purpose of extrication of casualties, no equipment or other material should be moved. If it is necessary to move equipment or parts of the vehicle,

a record must be kept of the original position. Where possible photographs or diagrams of the crashed aircraft, train, etc., should be taken. The exact location of the injured casualties or dead bodies should be recorded.

PRINCIPAL CAUSES OF DEATH FROM VIOLENCE IN ONE YEAR IN ENGLAND AND WALES

REGIONAL INJURIES	<i>Injuries</i>			<i>Deaths</i>	
	<i>Region</i>		<i>Tissue</i>	By tissues	Total
	Head and face		Bones	4162	5714
			Viscera	1273	
		Other soft parts	279		
	Limbs	Lower	Bones	3772	3809
			Soft parts	37	
		Upper	Bones	219	248
	Soft parts		29		
		Multiple	Not specified		168
Trunk	Chest	Bones	235	965	
		Viscera	699		
	Belly and pelvis	Other soft parts	31		
Spine		Bones	244	914	
		Viscera	600		
	Other soft parts	70			
	Multiple	Not specified		473	
				352	
OTHER INJURIES	Poisons				5053
	Drowning, asphyxia and strangulation				2460
	Burns				715
	Lightning and electricity				139
	Other and unspecified violence				1446
					22,456

No portion of the vehicle or contents must be removed for any purpose. Until the arrival of Police, First Aiders may have to insist upon this and restrain would-be souvenir hunters. In such circumstances, the police should summon the services of the Department of Civil Aviation, a forensic pathologist or a Police Surgeon with experience in forensic investigation.

In many major disasters, particularly aircraft crashes, victims may not be recovered whole, but dismembered limbs may be the only recognizable portions. To assist in identification and future investigation of the accident, the exact location of these parts of bodies is essential. Clothing should not be removed, and the portions of bodies should be preserved in an orderly fashion in the Mortuary area.

EMERGENCY CHILDBIRTH

First Aiders may be called upon to attend a woman in childbirth. The shock of the disaster may precipitate labour, or disruption in normal communications due to a disaster may prevent a woman in labour from reaching hospital. It is, therefore, important that members of Mobile Nursing should understand the principles of care of a woman in labour.

The duration of a normal pregnancy is 40 weeks. Labour may commence at any stage of pregnancy. Before the 28th week of pregnancy the child is considered to be non-viable, and if not born alive does not require registration as a birth.

Childbirth should be a normal natural process, and in most instances where labour commences spontaneously and prematurely, it is likely to be normal. A woman having her first child is likely to take several hours from the onset of labour before the child is delivered. This should give ample time for her to be admitted to a properly equipped hospital or maternity home. In subsequent pregnancies this does not necessarily apply.

It is important from the outset to encourage an atmosphere of calmness and confidence. Reassure the patient and ensure that there is no "flap".

The first principle is to allow a natural delivery. Cat-like observation and masterly inactivity are characteristics of a good midwife.

The three phases in dilation of the cervix uteri in labour (i.e. opening of the neck of the womb preparatory to the descent of the infant).



A.
Cervix closed.



B.
Cervix thinned and
partially dilated.



C.
Cervix fully dilated,
i.e., opened to allow
descent of the head.

and are completely compatible with safety for mother and child, provided all preparations are made for the delivery of the child during the period of waiting. Arrangements for medical aid are a priority. If a doctor is unavailable and delivery appears imminent, the first aiders and nurses must know what to do.

Labour takes place in three stages. The first stage, characterized by rhythmic and regular uterine contractions, felt as "pains" takes a variable time. During this period, the patient should be encouraged to relax, breathe deeply, and refrain from any attempts at expulsive effort. During this stage, it is wiser not to give the woman any solid food, but drinks of water or sweetened fruit juice are permissible. The first stage is completed when the cervix uteri, or neck of the womb has become fully dilated, opened, ready for the passage of the baby down the birth canal.

With the onset of the second stage, after full dilatation of the cervix, the patient's "pains" change in character and are expulsive. Under emergency conditions, it is likely that the baby's head will soon appear at the vulva, distending the vaginal opening, and perineum. The head should be gently pressed backwards towards the anus. The head should be allowed to "crown", i.e. fully distend the perineum, and then the head is born by extension of the neck.

As soon as the head is delivered, the attendant should feel round the baby's neck for the umbilical cord. If cord is felt, it should be gently slipped over the baby's shoulder. If there is any delay after delivery of the head, and before the shoulders, the airway, mouth and nose should be cleared.

Delivery of the infant should be allowed to proceed normally.

After the baby is delivered from the mother, the umbilical cord should be clamped in two places, about 1-2 inches apart, and cut between the clamps. A sterile dressing should be placed over the infant's end of the cord, and the cord tied with string or thread which has been previously sterilized by boiling.

The third stage follows. In this stage the delivery of the placenta takes place. This should be allowed to occur spontaneously. The only cause for alarm is severe haemorrhage. This may require the attendance of a doctor. In the absence of a medical officer or midwife, severe post-partum haemorrhage requires the standard treatment for haemorrhage and arrangements for transfer of the patient to hospital without delay, or preferably the attendance of a doctor.

APPENDIX 1

DUTIES OF OFFICERS

It is important that all Officers be clearly identifiable, and are fully aware of their individual duties and responsibilities, besides having a working knowledge of the duties of all other Officers at the site.

All members should be fully aware of the authority vested in these Officers. It is very important that they co-operate fully with the Officers whilst working in their section and that any direction given by them should be carried out without question.

All Officers are to be trained in their particular roles whilst taking part in exercises. There must be no doubt in their minds as to their respective duties, or what is expected of them under disaster conditions.

Whilst working under disaster conditions all Officers must have the freedom to make the necessary decisions which are required and expected of them.

If the unexpected should arise at any time and they are in doubt, they have the right to seek advice from higher authority through channels with which they should be familiar.

All Officers co-opting assistance from non-trained personnel must satisfy themselves about the reliability of such persons where it is humanly possible to do so under the circumstances.

OFFICER IN CHARGE OF MOBILE NURSING

The responsibilities of the Officer in Charge Mobile Nursing are laid down in the Rules for Mobile Nursing, but under disaster conditions she will be directly responsible to the Senior Medical Officer:

- (a) For the care of the casualties and overall efficiency in the First Aid Post.
- (b) For the setting up and staffing of the First Aid Post, being sure that all the necessary equipment available is on the site.
- (c) For all administration.
- (d) For the welfare of the staff.

- (e) For the direction of all Officers and other personnel to their respective posts.
- (f) For the provision of relief, rest periods and rotation of members.

SENIOR MEDICAL OFFICER

1. To assess priorities for treatment and evacuation. Where possible, and if sufficient Medical Officers are available, this function will be performed at the scene of the disaster in co-operation with Rescue Squads, and also at the First Aid Post with the Mobile Nursing.
2. To initiate resuscitation and treatment where required.
3. To prescribe and supervise the administration of drugs when indicated.
4. To assist the Officer in Charge Mobile Nursing and Nursing Officers when required.
5. To assist in the training of members of Mobile Nursing in theory and techniques for application at disasters.
6. To take the responsibility for all treatment carried out at the disaster scene and at the Mobile Nursing First Aid Post.
7. To direct all other Medical Officers present.

NURSING OFFICERS

All Nursing Officers will be State Registered Nurses, and should be conversant with the rules of Mobile Nursing. They will be referred to as "Sister" on all occasions.

Nursing Officers will be assigned to an area, and will be responsible to the Medical Officer in that area for the treating of casualties. If casualties are not responding or there is any deterioration in their condition Nursing Members will bring it to the attention of the Sister in charge of that area. At no time will they approach the Medical Officer direct, unless conditions make it necessary.

Whilst taking part in exercises the Nursing Officers will help with advanced training.

Training programmes and subjects to be taught will be set out by the Officer in Charge Mobile Nursing.

Nursing Officers experiencing any administration problems will bring them to the attention of the Officer in Charge Mobile Nursing.

TRIAGE OFFICER

The Triage Officer will be responsible for the sorting, checking and possibly reassessing of injuries and condition, on admittance at the First Aid Post. If there are no clerks available she will be required to take all the necessary particulars herself, and be responsible to see

that all these are handed to the Officer in Charge Mobile at the end of the emergency.

After the casualties have been admitted and checked, she will then direct them to the appropriate area for treatment.

TRANSPORT OFFICER

Under disaster conditions involving mass casualties, transport will play a major role, and much will depend on the efficiency of the Transport Officer.

The Transport Officer will work in close liaison with the Senior Medical Officer.

After assessing the nature of the disaster, it would be desirable for the Transport Officer to ascertain what ambulance or emergency vehicles are required and available. If emergency vehicles are to be used, try to assess quickly their roadworthiness, and the reliability of the drivers, which may be a very difficult task under these conditions.

The Transport Officer will see that the casualties are despatched in the order of their priority as directed by the Senior Medical Officer, also that their destinations are clearly understood by the driver.

The Transport Officer may need to appoint a Co-ordinating Officer, who will have direct contact with the Communications Officer and from whom accurate information concerning available patient accommodation of the appropriate hospitals and their estimated maximum rate of admission may be obtained.

Stretcher-bearers collecting casualties from the First Aid Post should come under the direction of the Transport Officer.

DISMISSING OFFICER

The Dismissing Officer will work in close liaison with the Transport Officer and will record the names of all casualties being dismissed or transferred, the time of such dismissal, and the destination. Disaster conditions involving mass casualties, may make it difficult to keep these records as desired, but it must be carried out wherever possible.

AT NO TIME will the Transport Officer be kept waiting to dispatch a serious casualty by recording at the dismissal point. If it is not possible for the Dismissing Officer to take these particulars, the Transport Officer will direct the driver to try to obtain this information on the way to or at the destination, and communicate same to the Dismissing Officer at some suitable later time.

RECORDING OFFICERS

All Recording Officers whilst taking particulars of casualties, will

cause as little inconvenience to the casualty as possible. This is very important.

Recording Officers will be assigned to an area by Officer in Charge Nursing, so that at no time should any one casualty be approached by more than one recorder.

At the end of the disaster the Recording Officers will be responsible to see that all records taken are handed into the Officer in Charge Nursing.

APPENDIX II

THE RULES OF MOBILE NURSING

The rules of the Mobile Nursing, subject to review and alteration, are as follows:

- (i) The name will be Mobile (Nursing).
- (ii) General Regulations will apply.
- (iii) District Officer, Rescue and Mobile Training (Ambulance) will be responsible and in command.
- (iv) The said District Officer will keep informed District Supt. (N) of personnel movements and activities as and where required.
- (v) An Officer (Nursing) will be in charge (O i/c) and answerable at all times to District Officer Rescue and Mobile Training (A).
- (vi) The Officer in Charge will be responsible for all training, efficiency and welfare of members.
- (vii) The Officer in Charge will be responsible for qualification, efficiency, etc., of recruits.
- (viii) The Officer in Charge will be responsible to see that all members are suitably uniformed and equipped.
- (ix) Special (Mobile) Dress Regulations will apply.
- (x) The Officer in Charge will be responsible for the approval of Nursing Personnel as recruits for Mobile (Nursing), giving consideration to the following basic qualifications:
 1. 75% minimum pass mark in F/A and H/N examinations.
 2. Ability to apply theory to field practice.
 3. Mobility.
 4. Age.

5. Physical Fitness.
6. Discipline.
7. Appearance.
8. Reliability.
9. Domestic and other responsibilities.
10. Divisional Efficiency and Report.

- (xi) All members must be conversant with and adaptable to the Qualities and Duties of a Good Nurse, as laid down in the current Nursing Manual.
- (xii) All nursing personnel wishing to enrol must be conversant with basic requirements and qualifications necessary, prior to application.
- (xiii) All Recruits will be subject to probationary membership pending ascertainment of suitability for full membership.
- (xiv) All members of Mobile (Nursing) must retain their respective Divisional Membership and Efficiency, and as such remain under the direction of their respective Divisional Superintendents, whilst not directly engaged in Field service.
- (xv) Divisional Rank will be retained, but at all times will be subservient to Mobile Nursing leadership from time to time, subject to the discretion of the Officer in Charge, whilst in the Field.

APPENDIX III

RECORDING

The recording of information is a vital part of emergency work, and it is important that all records be as complete, accurate and reliable as possible, and that information should be readily available. Records must therefore be concise and clear.

Recording is necessary for two main purposes:

1. Identification and location of casualties.
2. Assessment of injuries and progress.

It is also important that as accurate records as possible are available for subsequent scrutiny and assessment in order that improvements can be made in the emergency services organization and to assist in future planning to meet emergency conditions.

Records will be commenced at the disaster scene by members of First Aid Parties, and Rescue Squads. These records may be in the

APPENDIX III

form of labels pinned to the casualty's clothing, and may have no further information than a brief description of injuries and relevant treatment, e.g. morphia injection, application of constrictive bandage, etc.

Such brief records will be assessed by the Triage Officer on the arrival of the casualty at the Mobile First Aid Post. Her duties will include the commencement of the Casualty Record Card. Whenever possible, as stated elsewhere (Chapter 6) clerical assistance should be provided for the Triage Officer to assist her in this task.

Casualty Record Card

The Triage Officer's records must include, whenever possible:

- Full name.
- Age.
- Sex.
- Married/Single.
- Religion.
- Address. Telephone.
- Next of kin.
- Date and time of admission.
- Injuries.
- General condition on admission.
 - Level of consciousness.
 - Degree of shock.
 - Pulse.
 - Respiration.
 - Reflexes.

Transfer to area.

In addition to the card which will accompany the casualty, the Triage Officer will be required to have a complete duplicate of the information on the Casualty Record Card.

Clinical records of patients' progress in the First Aid Post will be made by members of Nursing Mobile under the supervision and instruction from the Medical Officers and Nursing Officers.

These records will include regular recordings of Pulse, Respiration, Level of Consciousness, reflexes etc. when relevant.

Transfer and Discharge Records

On transfer from the Mobile First Aid Post records must be kept of the patient's condition on discharge or transfer, and the place of disposal, e.g. hospital (named), doctor, home etc.

Time of discharge must also be noted.

Close liaison will be required with Police, Red Cross or any other authority who may be dealing with enquiries from relatives, Press, etc.

ST JOHN AMBULANCE BRIGADE VICTORIA DISTRICT MOBILE NURSING SQUAD CASUALTY RECORD

Date: Location: Type of Incident: Age: M/F

Patient's Name:

Address:

Married/Single Rel.

DIAGNOSIS on ADMISSION:

SHOCK (degree) Severe/Moderate/Slight

BLOOD LOSS (if known)

Prior Treatment given

CONDITION on ADMISSION: Haemorrhage:

Pulse:

Respirations:

Fracture:

Burns: Degree

Area

TREATMENT GIVEN:

DISPOSAL:

CONDITION on DISPOSAL:

PULSE

160
150
140
130
120
110
100
90
80
70
60
50

RESPIRATIONS

30
25
20
15
10
5

FLUIDS GIVEN

Time

By mouth

Intravenous

DRUGS GIVEN

Time

APPENDIX IV

COMMUNICATIONS PROCEDURE

By Corps Supt. L. G. Thorogood

Mobile Nursing units can use Communications to their advantage if the following principles are followed.

When in transit to a disaster scene, the Base Radio should be informed either by direct radio contact or alternatively by relay message through a Mobile-Rescue unit of the estimated time of arrival. "E.T.A."

This is important as the Duty Officer at Base is responsible for the overall co-ordination of all Brigade units and if a change of destination is required for any unit, time and mileage will be saved.

Mobile-Rescue units contact Base on the nature of injuries they are transporting to the Mobile Nursing units. Early warning of the number of patients to expect and their type of injuries is given in this way.

The Mobile Nursing unit may at some stage be located at a distance away from Base Radio. Should this occur, it is their responsibility to maintain contact with the Mobile-Rescue units en route to them.

The Radio Operators attached to Mobile Nursing must maintain a constant listening watch during duty hours and this should be rostered between the Nursing Radio Operators.

If there are insufficient personnel available, Radio Base should be notified and available operators will be allocated to Mobile Nursing.

Wherever possible, Mobile Nursing will be given the use of either a P.M.G. type phone or Army type field phone connected to the Control operating in their area.

Radio should not be used for transmission at an Aid Post if telephones are available to contact Control.

CALL SIGNS

When commencing transmission of a message, the call sign allotted to each unit should be used as well as the call sign of the unit for whom the communication or message is intended:

e.g. Nursing One to Base. Over.

Nursing One to Mobile Two. Over.

The answer to a call should be given in the same way:—

e.g. Nursing One receiving Base. Over.

Nursing One to Base. Message received and understood. Out.

During radio transmission the following "Pro words" may be heard:

"PRO WORDS"

E.T.A.	Estimated time of arrival.
E.T.D.	Estimated time of departure.
XMIT	Transmit . . . or transmission.
G.R.	Grid Reference (Golf-Romeo).
E.N.C.	Estimated number of casualties.
NEGATIVE	No, nil or incorrect.
AFFIRMATIVE	Yes or correct.
RODGER	Will do or attend to.
STAND BY or WAIT	(Is expressed) When information has to be sought for reply to the unit calling.
OVER	Indicates you are expecting a reply to your transmission.
OUT	Indicates you have ceased transmission, but will remain on receive position or listening watch until told to close down the radio.

"PHONETIC ALPHABET"

The following "Phonetic Alphabet" is to be used for clarity when transmitting names, locations or general important information. Each letter is to be read phonetically to indicate the spelling.

A ALFA	N NOVEMBER
B BRAVO	O OSCAR
C CHARLIE	P PAPA (PUP-PAR)
D DELTA	Q QUEBEC
E ECHO	R ROMEO
F FOXTROT	S SIERRA
G GOLF	T TANGO
H HOTEL	U UNIFORM
I INDIA	V VICTOR
J JULIET	W WHISKY
K KILO (KEEL-O)	X X-RAY
L LIMA (LEEM-A)	Y YANKEE
M MIKE	Z ZULU

Example: Bendigo —

Bravo, Echo, November, Delta, India, Golf, Oscar = "Bendigo".

"NUMERALS"

0 Spoken as	ZERO	5 Spoken as	FI-YIV
1 " "	WUN	6 " "	SIX
2 " "	TOO	7 " "	SEVEN
3 " "	THUH-REE	8 " "	ATE
4 " "	FO-WER	9 " "	NINER

APPENDIX IV

"TIME"

Time is indicated by using the 24 hour clock system as used by the essential services. This eliminates A.M. or P.M. (Always spoken as "Hundred Hours".)

0100 = 1 A.M.	0900 = 9 A.M.	1700 = 5 P.M.
0200 = 2 A.M.	1000 = 10 A.M.	1800 = 6 P.M.
0300 = 3 A.M.	1100 = 11 A.M.	1900 = 7 P.M.
0400 = 4 A.M.	1200 = 12 NOON	2000 = 8 P.M.
0500 = 5 A.M.	1300 = 1 P.M.	2100 = 9 P.M.
0600 = 6 A.M.	1400 = 2 P.M.	2200 = 10 P.M.
0700 = 7 A.M.	1500 = 3 P.M.	2300 = 11 P.M.
0800 = 8 A.M.	1600 = 4 P.M.	— 12 MIDNIGHT

When minutes are involved in the time they take the place of the last two zeros.

Example:

1.35 A.M.	Spoken as	0135 hours
2.04 A.M.	" "	0204 hours
4.17 P.M.	" "	1617 hours
9.50 P.M.	" "	2150 hours
11.55 P.M.	" "	2355 hours

A simple method to use for conversion is as follows:

Add hours to 12 noon.

<i>Example:</i>	6 P.M. . . 12 noon + 6 P.M.	12 noon = 1200
		6 P.M. = 600
	Spoken as	1800 hours

"BATTERIES"

It must be ensured that a spare set of dry cell batteries are retained in the unit to suit the transceiver installed as the occasion may arise when poor transmission or reception is caused by deterioration of cells installed in the radio.

The wet battery supplying ignition, lighting, etc., for the mobile radio should also be checked regularly and the correct level of battery retained by filling with distilled water to the manufacturer's specification, normally $\frac{3}{8}$ " above the level of the plates. ($\frac{3}{8}$ " is approximately the thickness of a pencil.) Batteries should be removed when radio is not in use.

