CHAPTER 50

Introduction

50.1 A system of traumatology

Trauma is so universal that the Declaration of Alma Ata included the care of the common injuries as an an essential part of Primary Care. This manual, the second in the series, describes how you as a non-specialist doctor can prevent much of the death and disability that are, the result of trauma—for every patient who dies, at least two are permanently disabled, most of them at or near the most productive period of their working lives.

Here are the injured patients you will see:—

(1) A few patients whose injuries threaten their lives, and who may die at various intervals after the accident: (a) Patients who die immediately, within minutes, from lacerations of the brain, brain stem', or spinal cord. Most of these patients present at the mortuary, and account for about half of those who eventually die. (b) Patients who die within a few hours of the accident from bleeding into the skull, thorax, or abdomen, or from niultiple lesser injuries. (c) Patients who die days or weeks later from infection or multiple organ failure. There is little you can do for patients in groups (a) or (c); those in group (b) are your main challenge, because you can usually save them using quite simple technology—if you apply it soon enough—within four hours of the accident and if possible much sooner. This needs rapid transport and rapid surgery.

(2) Some patients who need admitting to hospital, but are in no danger of death. You will probably find that about half the beds in your hospital will be surgical and about half the patients in them will have been injured.

(3) Some patients with quite severe injuries whom you can treat as out–patients.

(4) Very many patients with only minor injuries. Although the injuries may look trivial, many of these patients are wage earners and want to be back at work quickly. If you don't treat them carefully, complications may keep them away from work for weeks.

We have classified the methods of treatment that injured patients need into the three levels shown in Fig. 50-1. Like most classifications it is only a working compromise.

Level One, the care of a severely injured patient as a whole. When you first see a severely injured patient start with Section 51.3 and approach him systematically.

Level Two, the general methods. Some of these apply anywhere in the body and are those for shock (53.2), burns (58.1), split skin grafting (57.5), plastercraft (70.6), skin traction (70.10), skeletal traction (70.11), and amputations (56.1). Other general methods, such as opening and closing the abdomen, and making a colostomy, are described in Book One.

The general methods for particular regions of the body are those for injuries of a patient's eyes (60.1), his face (61.1), his maxillofacial region (62.1), his lower jaw (62.7), his head (63.1), his spine (64.1), his chest (65.1), his abdomen (66.1), his lower urinary tract (68.1), and his hands (75.1).

Level Three, specific methods and specific injuries, form most of the book, and assume a knowledge of the methods in Level Two. For example, the methods for each particular amputation describe only the details peculiar to each site, and assume that you know the general method.

If a patient is seriously ill with many injuries, you may need to work through all three levels. But if he only has a minor injury, such as a subungual haematoma (75.5), you can work at Level Three only. You are unlikely to forget Level One, but you may forget to refer to the general methods in Level Two. For example, don't treat a severe finger injury without following the 'General method for a hand injury' (75.1).

USE THE METHODS AT ALL THREE LEVELS

After first aid at the scene of the accident, we describe the care of an injured patient as a whole, the care of his airway, and the management of shock. Then come wounds, and with them artery, nerve, and tendon injuries. This is followed by methods for skin grafting and for the burns they are mostly used to treat.

After a brief discussion of radiation injuries, the rest of the book is arranged anatomically, starting at a patient's head and working down his trunk. Then come general methods for his limbs (plaster, traction, and amputations), followed by specific injuries of his arms and then his legs, the more proximal ones first.

DIDIER (34) said that he had been hit on the scrotum by a bag of coffee. His scrotum was large and swollen and a quantity of bloody fluid was aspirated from it. Two days later he started vomiting and complained of abdominal pain. He had not passed flatus or a stool since admission. A strangulated inguinal hernia was diagnosed and 50 cm of necrotic gut was removed at laparotomy, after which he

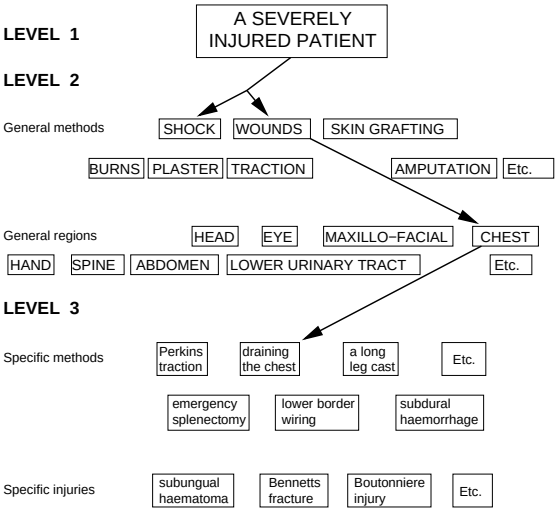

Fig. 50.1: *THE STRUCTURE OF THIS BOOK is in three levels: (1) The care of a severely injured patient. (2) The general methods for the body as a whole and for partricular regions. (3) Specific methods and specific injuries. The patient shown here with the arrows was severely injured, so he needed the methods in Section 51.3 for a severe injury, and also those for airway obstruction (52.1), shock (53.2), a chest injury (65.1), and an intercostal drain (65.2).*

Fig. 50.2: *ALL SET FOR TRAUMA, especially head injuries (63.1), crush injuries of the chest (65.6), and fractures of the pelvis (76.2), femur (78.4), and tibia and fibula (81.1). Adapted from a Kenyan newspaper.*

recovered uneventfully. LESSON patients quite often ascribe the onset of their condition to some quite coincidental trauma.

50.2 Preventing trauma

Trauma—the tearing apart, burning, crushing, maiming, lacerating, and irradiating of the human frame is potentially one of the most preventable of mankind's afflictions. Injuries are the result of accidents or of violence, either personal, communal, or international. Almost all of them could be prevented, so what we say now about the absolute importance of prevention, applies to all injuries in later pages. Common prudence would prevent most of the injuries described here.

Road accidents are a major cause of death and disability in the developing world, so that measures to prevent them are urgent. Among other things, this means: (1) Seat belts for all front and, if possible, back seat passengers also. (2) The absolute rule that nobody should ever drive after having taken any alcohol whatsoever, not even a single drink. (3) The strict enforcement of traffic regulations and the separation, where possible, of motorized traffic from pedestrians. (4) In many developing countries better driving instruction and more strictly examined driving tests are an urgent need. Most of us are much more likely to die early from trauma than from anything else, so the personal precautions in this list apply particularly to ourselves.

Accidents with agricultural machines are often gravely mutilating, especially in rural communities using such machines for the first time. Proper precautions would prevent many injuries, so would elementary preventive measures in factories. Very often the same hazard causes the same injury in a succession of patients, so always ask how an injury was caused. If it was caused by something that might injure someone else, do your best to see that the danger is removed.

Many injuries, particularly burns to children, happen at home, and these too can be prevented by simple precautions.

In many societies social disintegration is causing increasing violence. As the result, many of the injuries you see will be due to fists, teeth, bottles, knives, sticks, and bullets, many of them inflicted under the influence of drink.

No form of trauma is in such desperate need of prevention as the 'megatrauma' from a nuclear holocaust. Many thoughtful people are now asking not if it will occur, but *when* it will occur. Preventing it is so important that it is considered separately in Chapter 59.

50.3 At the scene of the accident

A severe accident kills some patients instantly. Other patients die shortly afterwards from causes that could have been prevented, if they had been properly treated immediately after the accident. It is the purpose of first aid to prevent this unnecessary death and disability *before the patient ever reaches hospital*. The first people to help are usually the public passing by, so that the average knowledge of first aid in the community as a whole should be high. Try to do all you can to increase it, and particularly to teach the police first aid.

If possible, send a nurse or medical assistant with the ambulance. You will probably be unable to keep one on permanent standby, so put your most intelligent and interested driver in charge of the ambulance and teach him the first aid described below. Interest him by letting him see how you care for injured patients in the theatre. His tasks include the care of a patient's airway, and transport in the recovery position. An ambulance driver should also be able to immobilize the joints on either side of a fracture until a patient reaches hospital, so as to minimize pain, bleeding, shock, and further damage to the tissues.

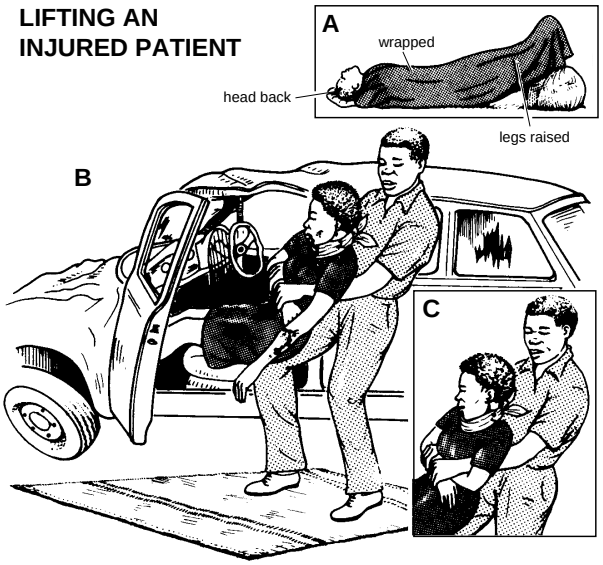

Fig. 50.3: LIFTING AN INJURED PATIENT. When a shocked patient is waiting for transport, lie him as in A,—horizontal, his legs raised, and his head tilted backwards. Wrap him up for warmth, but don't overheat him. B, lift him onto your thighs, kneel, and then slide him onto a blanket or a stretcher. If his arm is injured let it hang free. C, if both his arms are normal, lock your arms under both of his. These passers–by have no headboard to slide behind him and steady his cervical spine. Adapted from Hans Pacy with kind permission.

THE MINIMUM REQUIREMENTS FOR AN AMBULANCE

THE AMBULANCE BOX The contents of this should include a self inflating (AMBU) bag, face masks, oral airways, firm pads of sterile dressings, slings, crepe bandages, a headboard, a sucker, and Thomas splints or padded fracture boards. Pillows are also useful for splinting.

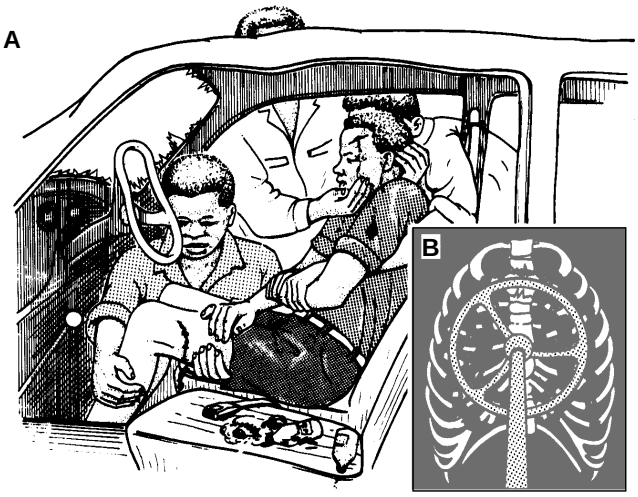

Fig. 50.4: Fig. 50-4 EXTRACTING A TRAPPED PATIENT. One man uses the grip shown in the previous figure., another stabilizes the patient's neck and keeps his airway clear, while a third eases his legs out. B, shows what the steering wheel has done to his chest. After Hans Pacy with kind permission.

If you can send a suitably competent nurse or medical assistant with the ambulance, include bottles of a plasma expander or 0.9% saline, drip sets, and intravenous cannulae.

If you are called to the scene of an accident yourself, take a laryngoscope, an intubation set, a self-inflating bag, and a non-rebreathing valve.

IF YOU ARE FIRST AT THE SCENE OF AN ACCIDENT, you may be in command, so your first duty is to supervise. Warn other traffic by displaying a red triangle, or hazard warning lights, or other lights, or by any other means. Extinguish lighted cigarettes or other fire hazards and ask drivers to switch off their engines. Get uninjured people out of vehicles onto a place of safety, then remove the casualties.

THE MINIMUM FIRST AID Here are some of the things to teach your ambulance driver. He should be able to: (1) Clear the patient's airway by holding his jaw forward and removing blood, vomit, and foreign bodies from his mouth. (2) Insert an oropharyngeal airway. (3) Use a sucker. (4) *Place the patient in the recovery position for transport back to hospital.* Not doing this is a common critical mistake. (5) Lift and carry a patient appropriately, particularly if he is suspected of having a spinal injury, as in Fig. 64-4. (6) Fit a temporary cervical collar. (7) Control bleeding by raising a wounded limb, by applying local pressure to a wound, and by pressing on the pressure points. (8) Ventilate a patient with a self-inflating bag. (9) Close an open chest wound. (10) Give external cardiac massage and mouth-to-mouth ventilation. (11) Treat shock by putting a patient into the legs-up position.

CAUTION ! (1) Transporting an unconscious accident victim on his back without proper attention to his airway is a major cause of unnecessary death. (2) The use of a tourniquet (55.1) is likely to do more harm than good.

FIRST AID FOR FRACTURES

Spine Move the patient with great care as in Section 64.3. If necessary, move him on a board or a door, or strap him to a plank.

Pelvis Tie three triangular bandages firmly round the patient's pelvis, put pads between his legs and tie them together.

Arm (1) Put his arm in a sling and bandage it firmly to his body. Or, (2) tie his arm to a splint which reaches to his axilla.

Fractures above the knee Put the patient's leg in a well padded Thomas splint. Take especial care to pad the neck of his fibula to prevent paralysis of his common peroneal nerve. If necessary, pad his leg well and hold it in place in a Thomas splint with a few plaster bandages.

Lower leg fractures If no Thomas splint is available, pad a piece of wood or bamboo, or even a palm branch, and tie this to the patient's injured leg, or bandage his injured leg to his normal one.

Other sections describe the first aid for obstruction of a patient's upper airway (52.1), burns (58.1), tension pneumothorax (65.5), and flail chest (65.6).