

IMMEDIATE CARE

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1977

W. B. Saunders Company Ltd London · Philadelphia · Toronto

W. B. Saunders Company Ltd: 1 St Anne's Road
Eastbourne, East Sussex BN21 3UN

West Washington Square
Philadelphia, PA 19105

1 Goldthorne Avenue
Toronto, Ontario M8Z 5T9

Library of Congress Cataloging in Publication Data

Zorab, John S M
Immediate care.

I. Critical care medicine. I. Baskett, Peter J F, joint author.
II. Title. [DNLM: 1. Emergencies. 2. Emergency health services.
3. Wounds and injuries—Therapy. EX215 Z89i]
RC86.7.Z67 616'.025 77-23008

ISBN 0-7216-9715-1

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Text set in 11 pt Photon Times, printed by photolithography, and bound in Great Britain at The Pitman Press, Bath

Last digit is print no: 9 8 7 6 5 4 3 2 1

Immediate Care

To Shirley and Meg

Preface

Any doctor, irrespective of his training or specialty, may have to take responsibility for the initial management of the seriously injured or suddenly ill. Medical emergencies occur in the home, at work, on the roads and in the hospital wards, but many doctors find that they are unprepared and untrained to cope adequately in crisis situations which fall outside their chosen field.

We believe that the progressive specialization of medicine has to some extent hampered the development of first-class emergency care. Although the basic steps in resuscitation and immediate care are very similar in all emergencies, irrespective of the underlying causes, immediate care extends beyond support of the vital functions and the relief of pain to the skilled management of many differing conditions; and while specialty advice exists in abundance, a search through a wide variety of books is necessary to provide the broad spectrum of knowledge required. We have therefore attempted to gather together in one volume information concerning many of the illnesses and injuries which need immediate care. In particular, we have tried to emphasize the points of difference in the early management of the various conditions.

The early management of trauma has always attracted interest, partly as a result of experience gained in war. Mobile obstetric care teams have been with us for many years and there is now an explosion of interest in emergency care for myocardial infarction. Indeed, it is difficult to imagine that there is *any* emergency condition the management of which would not be improved by early skilled care. All medical practitioners should therefore have a broad knowledge of such care irrespective of their specialty. Immediate care must develop and retain a multi-disciplinary approach.

Inevitably, a book attempting to cut across the traditional specialty demarcations will present some difficulties for both authors and readers. To individual specialists certain parts may appear somewhat elementary, but what is elementary to the trainee anaesthetist may be of value to the accident and emergency doctor and what is very basic information to the surgical registrar could be appropriate for the general physician or internist. For many years we have been involved in

various aspects of the initial management of medical emergencies and we think that most of the information included in the book is relevant to all those doctors who have first-line responsibility for handling such emergencies wherever they may occur. We also believe that there is much here to interest family practitioners, especially those who are already actively involved in immediate care schemes. Indeed, we owe a debt of gratitude to one such family practitioner, Dr Ken Easton from Catterick, England, who was partly responsible for developing our own interest in this field.

The writing has proved to be a daunting task and of course there may be some omissions, but we hope we have met the challenge in a reasonable way. If this book fills the need which we believe exists, then the effort will have been worth while and immediate care will be recognized as a therapeutic area worthy of the attention of all clinicians.

ACKNOWLEDGEMENTS

We could not have completed this book without the help and encouragement of a great number of our colleagues and friends. In particular, we should like to thank the following: Mr John Capel, Consultant in Accident and Emergency Medicine; Mr Brian Cummins, Consultant Neurosurgeon; Mr Colin Davidson, Consultant General Surgeon; Dr Joy Fowles, Consultant Radiologist; Dr Michael Gibson, Consultant Radiologist; Mr Jack Ross, Consultant Oral Surgeon; and Dr Gordon Thompson, Consultant Radiologist.

We are also grateful to Dr Tom Boulton, Consultant Anaesthetist and Editor of *Anaesthesia*, for his encouragement and assistance, especially in the difficult early stages, and to Professor John Dundee, Professor of Anaesthesia, Queen's University, Belfast, who provided most helpful comments on the manuscript.

As in all our work, we have received unstinting help from our secretaries, Miss Jackie Foster and Mrs Esther Allen, and we should also like to thank Mrs Clare Burford, Medical Artist, and the Department of Medical Photography of Frenchay Hospital for all they have done. Our publishers, too, have been extremely helpful and endlessly patient.

Professor W. Mushin of Cardiff provided us with the initial inspiration, guided us with his wise counsel and has freely devoted much of his time in assessing and commenting on the manuscript.

Finally, we should sincerely like to thank our wives, who have seen much less of us during the preparation of the manuscript, for their understanding and support.

J. S. M. Zorab
P. J. F. Baskett

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Introduction and Basic Care

Introduction

Development of Immediate Care

'Immediate Care' is a term that requires definition and yet is difficult to define. It might be said to embrace *the initial care appropriate to the seriously injured or suddenly ill*. It includes resuscitation but extends beyond the concept of the preservation of life to the prevention of complications and the provision of pain relief. It will vary in its degree and extent depending upon the available skills and equipment.

The concept of immediate care has evolved out of developments associated with intensive therapy, other types of special care units and resuscitation services. It is apparent that the mortality and morbidity of certain patients at risk can be reduced if the right measures are taken, in the right order, and at the earliest possible moment. At an early stage, anaesthetists found that the knowledge and expertise acquired primarily for use in the operating theatre in supporting the functions of ventilation and circulation are widely applicable outside. The most dramatic example was during the poliomyelitis epidemic in Copenhagen in 1951 when many lives were saved by the therapeutic use of intermittent positive pressure ventilation. Now, in many instances, intensive therapy units have become areas where the patients, although usually remaining under the care of their admitting consultant, are supervised and often treated by an anaesthetist. From this situation, it has been a natural development in many hospitals for anaesthetists to organize a resuscitation service. This is usually based on the intensive therapy unit and aims to provide a trained and equipped resuscitation team within a few minutes at any point within the hospital buildings. The advantages of providing early and skilled treatment to patients who had become seriously and suddenly ill were obvious and it was inevitable that an extension of this sort of service to patients outside hospital should be considered.

This was not a totally new departure from anything that had gone before, however. The obstetric 'flying squads' have many years' experience of taking emergency treatment to the patient. West Germany has developed road accident

teams equipped with complete mobile operating theatres for managing major disasters (Gögler, 1965) and an experimental project along these lines has been tried in the United Kingdom (London, 1975; personal communication). Pantridge and Geddes (1967) showed what could be achieved in the early management of myocardial infarction by setting up a mobile coronary care service and a number of other hospitals (Gearty et al, 1971; Grace, 1971) have followed this example.

All these schemes to bring early, skilled help to the patient had one thing in common. They were each aimed at a selected and relatively small group of patients and were, correspondingly, economically less than ideal. What is needed now is a team, trained and equipped to provide immediate care to patients, irrespective of the nature of the emergency. In the United Kingdom, distances between hospitals are such as to make sophisticated, mobile operating theatres unnecessary, but a great deal may be achieved if a team can be equipped and trained to provide the three main objectives of immediate care: emergency life-saving measures; procedures aimed at the prevention of complications; and the provision of pain relief. Treatment along these lines is effective whether the patient has had a serious post-partum haemorrhage, a myocardial infarction, is in status epilepticus or has had a serious injury.

While the concept of providing mobile immediate care by a hospital-based team was evolving, another related development was taking place. This stemmed from the pioneer work of Easton, a general practitioner in Catterick, Yorkshire (Easton, 1970). He too had realized that many patients who had been injured or become suddenly ill were deteriorating or even dying before they reached hospital, but that if expert treatment had been given at an earlier stage the situation could have been radically improved. Patients in the areas around his practice were particularly at risk since the local terrain caused difficulties which tended to prolong the period between onset of the emergency and subsequent arrival in hospital. In an attempt to overcome this problem, Easton conceived what might be described as the first immediate care scheme in the United Kingdom. The concept was simple:

- (a) Build up a team of enthusiastic family practitioners covering a prescribed area.
- (b) Set up a communications system in conjunction with the emergency services and arrange a call-out roster so that a member of the team could be available to those services when required.
- (c) Train and equip the members of the team to perform skilled treatment for those urgently in need.

The concept was simple but its execution presented considerable problems. Finding a team of fellow enthusiasts was the easiest part. Plans to set up a communications system led to a number of difficulties, not the least of which was the heavy financial lay-out required. A radio transmitter/receiver in each team member's car was found to be the most satisfactory solution, and an exceptional degree of co-operation from the emergency services succeeded in producing a workable system.

Training and equipping the team members was another major hurdle. At that time, only a little well-designed, portable emergency equipment was available. Whilst ambulance crews were trained in basic resuscitation and first aid, very few doctors had thought of what could be achieved with the usual medical training

and some basic tools. An exception was Snook, a full-time specialist in accident and emergency medicine in Bath. He had furnished his own car with a wide selection of equipment and was providing a one-man service working through his local ambulance control (Snook, 1972). Both Easton and Snook began to accumulate valuable first-hand knowledge and experience of the skills and equipment needed by a doctor engaged in this type of work.

Once the work of these pioneers was publicized, further interest developed and, in 1972, the Medical Commission for the Prevention of Accidents held a two-day symposium in Manchester on 'The Care of the Injured and Suddenly Ill' (Documenta Geigy, 1973). The majority of those attending were family practitioners and the symposium provided a useful forum for the exchange of views. It was clear, even then, that several teams of family practitioners from different parts of the country had followed Easton's lead and that much expertise had already been acquired. Nevertheless, it was also clear that such schemes were mainly suitable for relatively rural areas where, with a good system of communications, a family practitioner could often arrive at the scene of the emergency before an ambulance. It was apparent that the provision of a mobile immediate care team by a hospital might provide a service in urban districts which would complement that of the family practitioners in rural areas.

Baskett, Diamond and Chochrane (1976) have reported such a scheme, started in 1972. A specially designed and equipped ambulance, stationed at a hospital though remaining under the control of the local ambulance brigade headquarters, would be dispatched together with an anaesthetist, if necessary, whenever the headquarters received an urgent call indicating that immediate care would be of value. As part of the scheme, the ambulance crew would receive a carefully arranged programme of in-hospital training aimed at raising their standard of competence in the field of immediate care. This scheme was started at a time immediately following the introduction of premixed nitrous oxide and oxygen (Entonox) into the ambulance service – trials of which were pioneered by the same ambulance brigade (Baskett and Withnell, 1970). Thus, this aspect of immediate care was already familiar to these men who co-operated in providing an even better standard of care to their patients.

The details of this hospital-based Mobile Resuscitation Unit (MRU) are discussed in Chapter 17 but the experience gained from this scheme, together with the experience of family practitioners running rural schemes, convinced the authors that immediate care has emerged as a reasonably well-defined discipline in which anaesthetists, among other doctors, have a legitimate interest and an important role to play. It is in order to pursue that interest that this book has been written.

Role of the Anaesthetist

There are several reasons why anaesthetists should take an active interest in the field of immediate care. The training of an anaesthetist develops an awareness and expertise directed at the management of a patient as a whole rather than at the management of a particular part or condition. Irrespective of the cause or nature

of the emergency, anaesthetists are trained to provide treatment aimed at the preservation of life, the prevention of complications and the relief of pain. In terms of active participation in immediate care, anaesthetists are currently more likely to have acquired the requisite skills than any other group of doctors. Their value was well illustrated in the Moorgate Underground rail crash in 1975 when, of the 18 doctors at the rescue site, 16 were anaesthetists (*British Medical Journal*, 1975).

An equally important role is that of actively encouraging the better training of other groups of personnel who may be called upon to provide immediate care in a variety of situations. These other groups may be medical or non-medical. In the medical group, in addition to anaesthetic trainees, all junior hospital staff and medical students should have thorough training in basic resuscitation. Those working in accident and emergency centres should have their training extended to cover, in particular, priorities in treatment. Finally, as has been stressed already, many general practitioners will seek and need specially designed training opportunities if they are to play a useful part in immediate care schemes. The details of such training programmes are considered later but there is no doubt that anaesthetists have a role to play in both the organization of teaching and in the teaching itself.

This role of teacher and organizer of teaching must also extend to and include the non-medical group. Many anaesthetists already take part in teaching programmes for nurses in subjects such as resuscitation. This role needs to be expanded both in terms of audience and content. All hospital staff who take part in patient care need some training in resuscitation whether they be nurses, physiotherapists, radiographers, occupational therapists or in any of the other professions ancillary to medicine. Perhaps of most importance, however, are those in the ambulance service. Selected ambulance men can and should be trained to a far higher standard than has been customary in the United Kingdom. Opinions on this subject are divided, however. Such questions as 'Should an ambulance man be taught to intubate?'; 'Should an ambulance man be taught to put up a drip?'; and 'Should an ambulance man be taught to defibrillate?' have no simple yes or no answer. If the questioner is asking whether an ambulance man should be withdrawn from service for a week or two, taught the technical skill of intubation and then returned to service, the answer should be an unequivocal 'no'. If, however, the questioner is asking whether ambulance men should be provided with a planned programme of in-hospital training which would include the learning of such practical skills as intubation, then the answer is 'yes'. The essential difference is that in the planned programme of training, the ambulance men would not only be learning the practical skill but also the indications for its use, the alternative methods available and the dangers of its mis-employment. Experience has shown that such training has benefited a substantial number of patients and no untoward effects from using these skills have been reported (Documenta Geigy, 1973).

Since the essential nature of immediate care is its immediacy, it is logical to examine ways in which trained assistance can be made available to patients in need even before the arrival of an ambulance or other mobile team. The obvious answer is further education of the public. This is a field of training in which anaesthetists may well be required to take part. The subject is considered in more detail in Chapter 19 (see 'The general public').

So far, the roles of active participant and educationalist in immediate care have

been considered. An additional role is to design and assess equipment for immediate care use. There has been a vast improvement in the equipment available during the past few years but it is worth noting that equipment should be assessed by those who are familiar with the needs for which it has been designed. This applies both to therapeutic equipment and teaching equipment, such as intubation models. The manufacturers are always grateful for informed opinion on their products and, within this field, anaesthetists are the best source of such opinion. The concept of the resuscitation teaching room (Baskett et al, 1976) which forms both a small group learning area and a test bench of equipment is discussed in more detail in Chapter 19 (see 'Individual study').

Priorities in Immediate Care

In a book aimed at those concerned with immediate care, it should almost be unnecessary to point out the importance of dealing with emergencies in the proper order of priority. Experience suggests, however, that it is far from unnecessary and that lives are lost or endangered simply because those attending the patient have not learned, or do not fully understand, the importance of a careful and orderly approach.

To encourage such an approach, the basic techniques of immediate care can be considered under the following headings:

- (a) Procedures aimed at preserving life;
- (b) Procedures aimed at preventing complications;
- (c) Procedures aimed at relieving pain.

The importance of priorities in management is fundamental to the whole concept of immediate care. Two examples may serve to reinforce this point:

CASE ONE. A patient was admitted to an accident department with a severe compound fracture of the left tibia and fibula. He had no other obvious injuries but did complain of some chest pain. After a quick general examination, the fractured leg was carefully inspected and then wrapped in a sterile towel. The patient was sent to the radiology department for x-rays of the leg. While there, he became acutely dyspnoeic and cyanosed. Help was sent for and a tension pneumothorax was relieved just in time to save his life. It was then realized for the first time that the patient had sustained a chest injury with two fractured ribs.

In this instance, correct priorities were not observed. Both the patient and the examining doctor had all their attention focused on the dramatic and painful injury to the leg. Little attention was paid to the chest pain and the quick examination failed to elicit either the tenderness over the broken ribs or the almost certain presence of a pneumothorax. There is no urgency over x-raying a fractured limb. Full assessment of the respiratory and cardiovascular systems must come first.

CASE TWO. A pedestrian was involved in a road accident and sustained a head injury together with dramatic lacerations and fractures of one leg. He was unconscious and bleeding severely from his lacerations. He appeared to be breathing satisfactorily and attention was therefore diverted to the leg injury. A few moments later, it was noticed that he was cyanosed and pulseless. Examination revealed that he had silently regurgitated and aspirated stomach contents. Attempts at resuscitation failed.

Subsequent autopsy revealed no skull fracture and only a minor brain contusion. The lesson is similar to that of Case One. The patency of the airway and the effectiveness of ventilation in an unconscious patient must have priority over all else. Attention must not be diverted by other injuries until the airway is safeguarded by an endotracheal tube, or at the least by constant observation.

At the risk of being repetitious, it is necessary to state again and again that lives are endangered and lost by a failure to appreciate priorities. Obstructed airways *must* be relieved and safeguarded before attending to bleeding lacerations. Chest injuries *must* be looked for, assessed and, if necessary, treated before considering limb fractures. The maintenance of ventilation and cardiac output *must* take priority over everything else. These are the procedures aimed at preserving life and they must always take first priority.

The procedures listed under the other two headings, those aimed at preventing complications and those aimed at relieving pain, are to some extent interrelated and the relative priorities between them are less clear cut. It is convenient, however, to consider them separately.

Procedures aimed at preventing complications fall under two headings – general measures and specific measures. The general measures are often an extension of those aimed at preserving life so that good respiratory care will reduce subsequent respiratory complications. Avoidance of hypoxia and protection of the lungs from aspiration of blood or stomach contents are the two most important measures. Similarly, arrest of haemorrhage and early intravenous infusion will help to maintain a good circulation and reduce problems arising from poor tissue perfusion and the development of metabolic acidosis.

Specific measures aimed at reducing complications will depend to a large extent on the nature and environment of the emergency. These measures are considered, under their appropriate headings, in subsequent chapters.

The relief of pain is the third aspect in this general consideration of immediate care procedures. It is, moreover, an aspect that has been sorely neglected until recent years. Pain relief is important not only for reasons of compassion and humanity but also because pain contributes to the release of catecholamines and hence has a deleterious effect on tissue perfusion. Pain should always be relieved as soon as the circumstances permit. The methods available are considered in detail in Chapter 4.

Priorities in management are the keystone of good immediate care. Anaesthetists, of all people, must appreciate this fully, and they have a duty to see that this knowledge is passed on to all those who are involved in the management of the injured and the suddenly ill.

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