

1962

Organization and Management of Trauma Surgery in Austria

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JÖRG BÖHLER, M.D., Linz, Austria

MECHANIZATION IN OUR CENTURY has exacted a fearful toll in the ever increasing number of accidents. Trauma is not only one of the leading causes of death but also the outstanding cause of illness. Statistics from our social agencies indicate that illness due to trauma accounts for 25 per cent of days of labor lost, or one out of four days of employment. No other condition has such great importance for the individual or such great impact on the economy. The number of accidents is not the only cause of this terrible 25 per cent figure: In many cases inadequate treatment is at fault.

To reduce the consequences of accidents we must:

- Prevent accidents and injuries by means of safety procedures such as seat belts in automobiles.
- Improve lifesaving first-aid methods on a nationwide scale. We should start by teaching school children how to maintain a free airway in an accident victim, and methods of resuscitation such as mouth-to-mouth respiration. Ambulances and doctors' private automobiles should be equipped with hand operated respirators, suction pumps and plasma expanders for intravenous application to prevent and to combat shock. In Austria the highway patrol cars are equipped with plasma protein solution for intravenous use.
- Improve teaching facilities and organization for the treatment of accident victims. That accidents have such a tremendous impact on the economy is a fact not yet fully recognized in many countries. It is impossible to consider improving the treatment of trauma cases unless there is improvement in teaching and organization. In many countries this fact is leading to an independent specialty, trauma surgery.

SOLUTION YET TO BE ACHIEVED

Although we have in Austria a number of hospitals and services for the treatment of accident cases a general solution of this problem has not yet been achieved.

In 1925 Lorenz Böhler, in co-operation with the compulsory accident insurance company, founded in Vienna the first independent hospital for accident cases. Since that time, mostly in the last 12 years, five other accident hospitals and two rehabilitation centers have been established by the same insurance company, with a total of 970 beds for the treatment of accident cases and 270 beds for re-

habilitation. In addition, there are in Austria two other accident hospitals not operated by the insurance company, as well as several independent accident services in general hospitals, with 940 additional beds. Also the three surgical university clinics have accident services with a total of 320 beds, but they are not operated independently from the general surgical service. Altogether there are now 2,500 specialized accident beds available in Austria, a number not yet sufficient for a population of seven million.

We consider it important, that the accident services in the general hospitals are financially independent and not dependent on the general surgical service. Thus they have their own personnel, x-ray facilities, operating theaters, plaster rooms and separate rooms for outpatient treatment and physical therapy.

TRAUMATOLOGY DEGREE

In order to insure the availability of a specially trained staff of doctors in the accident hospitals and independent accident services, since 1947 in Austria the degree of "specialist in traumatology" has been conferred. The postgraduate training for this degree includes two and a half years of general surgery, one half year of orthopedic surgery and a minimum of three and a half years of trauma surgery. Of these final three and a half years the trainee must be a senior resident for at least two years. Since every accident hospital has only two openings for such residents, the whole course of training usually takes eight years or more. As a result we end up in our

Orator

SO DEDICATED to improving the care of the injured is Dr. Jörg Böhler that he and his family reside in the Accident Hospital at Linz, where he is director and chief surgeon. It is one of the several accident hospitals established throughout Austria by his father, Dr. Lorenz Böhler, whose life-long crusade on behalf of the injured is continued by the son in the accompanying Oration on Trauma. This thirtieth oration, first by a surgeon from continental Europe, was delivered on Tuesday, October 16, 1962, at the Clinical Congress in Atlantic City.

accident hospitals with a sufficient number of thoroughly trained doctors capable of treating the severely injured and also able to take charge of new accident services in general hospitals.

Although the accident hospitals are owned and operated by the workmen's compensation board all accident cases are admitted, whether insured or not. This we consider particularly important, as we note that the course of recovery and the therapeutic reaction of patients with and without insurance frequently varies considerably. One might say this gives us additional clinical experience.

All types of injuries are treated in Austria's accident hospitals. We believe that a patient with multiple injuries should be treated by one surgeon alone, who assumes the entire responsibility, rather than dividing the treatment and responsibility among many different specialists. Of course, when necessary we will call in a consultant from another field for his opinion and treatment, and our hospitals have consultants in all specialties available at all times.

RAPID CHANGE SHORTENS TIME

As is well known, a severely injured patient is in need of immediate treatment and the course of events can change rapidly. Frequently there might not be time enough to call in the many different consultants. For example, the sudden onset of brain compression due to an intracranial hemorrhage demands that priority be given to a craniotomy. In the case of an uncal herniation compressing the brain stem, only rapid relief of pressure within from 10 to 15 minutes will save the patient's life. In a transection or rupture of a major artery the arterial flow must be restored within six to eight hours. Delay beyond this time will lead to loss of an extremity and endanger life itself because of conditions similar to tourniquet shock. Frequently it will not be possible in a given time limit to find a vascular surgeon to do the necessary arterial suture or graft.

Therefore the organization must be so established that at any given time of day or night a fully competent trauma team is available. How we attempt in Austria to fulfill this requirement may well be demonstrated by the organization of the accident hospital in Linz, where I work.

Our hospital has 200 beds with rooms containing not more than six patients. We have four nursing units, one for septic cases, with a separate operating room. On the second floor are rooms for treatment

as well as rooms for admission and primary examination of all new patients, outpatients as well as inpatients. Severely injured patients are delivered immediately to the resuscitation room, where the anesthetist immediately clears the airway and starts intravenous shock therapy. On this same floor are the x-ray department, plaster room, emergency operating room and aseptic operating rooms. The plaster room is adjacent to the x-ray department and directly opposite the examining room. We have additional x-ray facilities including closed circuit television radioscopy in our operating theaters and on the wards.

MORE THAN 20,000 PATIENTS A YEAR

On the ground floor are located the follow-up clinics, the gymnasium for individual and group exercise treatment, a swimming pool and physical therapy room. Each year are admitted some 5,000 inpatients and between 20,000 to 25,000 outpatients, or about 15 to 20 inpatients and 60 to 100 new outpatients daily. In addition 250 to 300 outpatients visit the hospital daily for check-ups, x-rays or aftertreatment. Our patients are drawn from a city of 200,000 and the surrounding area covering altogether about 400,000 inhabitants. Severe acute cases come as far as 80 miles, sometimes by helicopter.

In order to assure individual treatment by the same group of doctors for each patient, despite such a high number of cases, our doctors are divided into three teams. Each team has alternating duties—one day it supervises admissions, the next day follow-up clinics, and the next day it operates. Each team has a nursing unit for its patients. Each team is headed by an experienced senior assistant, each of whom has been with me for at least 10 years. The anesthesiologist is independent of the three teams, but for emergency cases at least one or two doctors in each team are experienced in anesthesia and intubation. I strongly believe that any doctor concerned with trauma should know the technique of intratracheal intubation.

Furthermore each team has adequate secretarial help, so that the doctor can immediately dictate his findings and reports. During the night dictating machines are used.

The septic unit, the children's ward and the intensive care unit are shared by all three teams.

The necessary contact between the three groups is maintained by daily staff meetings, where all admissions and all cases to be operated on are discussed; and by x-ray conferences three times a week where all x-rays taken in the previous two days of in- and outpatients are reviewed.

As every severely injured case must be shown to me, I am in continuous close contact with all three teams. To assure my availability at any time, without delay and undue loss of time, my private office, my private patients' beds and also the apartment where my family and I live are in the hospital. This means that I can enjoy some family life and still have close supervision over the hospital.

Besides fractures and wounds we also treat head injuries, as they constitute about 20 per cent of all our cases, and include contusions and minor lacerations as well as severe craniocerebral injuries. We also treat intra-abdominal and intrathoracic injuries, injuries to the urogenital system, to the arteries, to the peripheral nerves, and burns. Also of great importance is the treatment of hand injuries and we try to apply to the freshly injured hand the principles of hand surgery with regard to primary or secondary reconstruction. In addition we do reconstructive surgery of the locomotor system. For all injuries to the eye and for maxillofacial surgery a consultant comes in. We also have consultants for ear, nose and throat, for neurology, for internal medicine, for urology and for general surgery. Although an artificial kidney is readily available, we plan to install one in our hospital, under the supervision of our internist.

EVERY BODY AREA IN ACCIDENT SERVICE SCOPE

Every accident service should be capable of taking emergency care of every body area. Less urgent measures can be taken over by a specialist or can be done by the accident surgeon according to the time available and to the special interest and training of the individual doctor. In Linz, for instance, we are especially interested in reconstructive surgery of the hand, in peripheral nerve surgery, using millipore

sheathing, in plastic surgery, especially in old burn cases, and in neurosurgery, secondary to trauma. In fracture treatment our special interest at present is the development of safe and sufficient methods of percutaneous internal fixation with the help of the x-ray intensifier and closed circuit television.

Now for our plans in the future. The system and the organization described works well, but it is not yet sufficient to cover all accidents in our country and to give adequate facilities to all accident surgeons we train. We therefore plan to establish an organization to cover as many accident cases as possible and to provide the necessary centers for teaching, training and research.

DISTRIBUTION OF ACCIDENT BEDS

In order to have beds for specialized accident services it is not necessary to build new hospitals or new hospital departments, because also today the accident cases are brought to different hospitals and are treated there on various surgical services. It is therefore necessary simply to change the distribution of the accident beds. Right now 30 to 50 per cent of all surgical beds are occupied with accident cases.

Usually in a town with a population of 150,000 to 200,000 there are several hospitals with a total of about 400 surgical beds. Generally, accident cases are brought to the nearest hospital; or the different hospitals alternate daily in receiving emergencies and trauma cases. With such an organization it is of course impossible to have a team of doctors with experience in severe trauma cases available in every hospital at any time of day or night or during week-

The 200-bed Accident Hospital at Linz, Austria, is directed by Dr. Jörg Böhler, who is also chief surgeon. It is one of several such institutions established throughout Austria by his father, Dr. Lorenz Böhler.





Dr. Jörg Böhler (third from left) attends the Symposium on Trauma at the 1962 Congress in Atlantic City. To his right is Dr. Glenn P. Schoettle, West Memphis, Arkansas; to his left, Dr. Yorke Jacobson, U.S. Navy, Camp Pendleton, California.

ends and the required x-ray facilities staffed around the clock.

Therefore, all trauma cases should be concentrated in one hospital in which a major independent accident service should be established. This service then would have sufficient doctors, personnel and equipment available for any severe case. This change in organization would not cost much more, since it means only a redistribution of beds. The actual cost might even be less as the time of hospitalization in a specialized service is usually shorter.

CONSULTANTS IN TRAUMA

To afford the trained accident surgeons an opportunity to practice privately, the German system of the trauma consultant should be adopted. His duty is to see all compensation cases as soon as possible. They are sent to him by the general practitioner or they come directly. Minor cases are sent back to the practitioner, a certain proportion of cases he treats himself, and more difficult cases are sent to a specialized hospital. In smaller communities with only one hospital and an insufficient number of cases to justify a special accident service, the trauma consultant could be appointed to the staff with a certain number of beds assigned to him.

In cities with a population of about 30,000 and with one district hospital a lesser independent acci-

dent service with about 40 to 60 beds should be established.

In bigger cities a major accident service with 120 to 150 beds in one of the general hospitals is necessary. In addition, in big cities and industrialized areas separate accident hospitals with about 200 beds are necessary, and in Austria are now established.

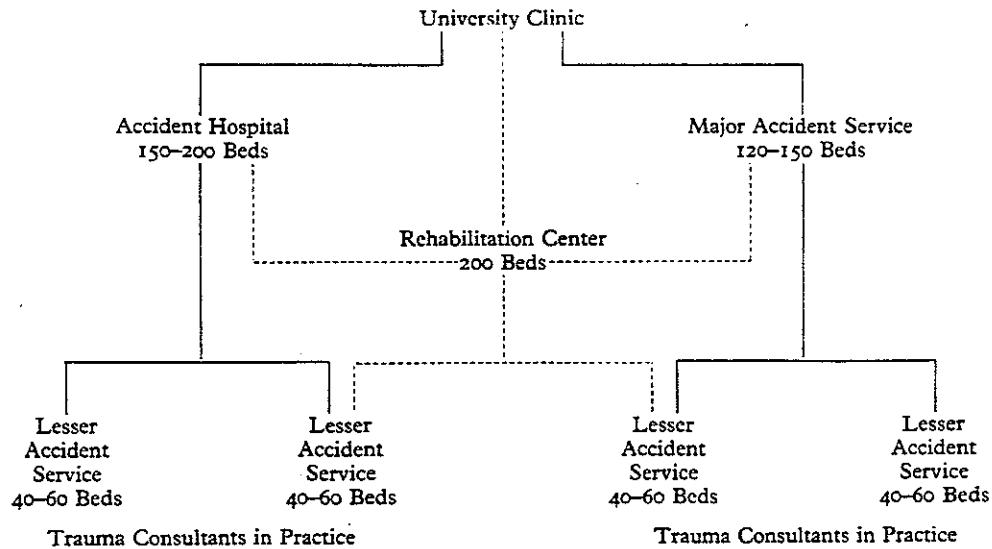
At the universities a chair for trauma surgery, and a clinic for accident cases, should be created. In this clinic students and general practitioners will learn what they themselves can treat in their private practice and what they should pass on to a specialist or to an accident service (chart on opposite page).

The distribution of cases would be as follows: The trauma consultant in general practice would see most of the patients, thus lessening the number of outpatients in the hospitals, a number now far too great. He also could care for cases sent to him from the hospitals for aftertreatment. He would, when necessary, co-operate closely with the hospital sending the cases in for consultation.

WHAT PATIENTS ARE TREATED WHERE

The lesser sized accident service should be capable of caring for most acute injuries, but some cases will necessarily have to be transferred to a major service or to an accident hospital after the acute

Organization of Trauma Services in Austria



treatment is given. This applies primarily to cases which require special equipment and personnel, and who will have to be hospitalized for a long time. They include patients with severe burns, spine injuries with paraplegia, and severe brain injuries with prolonged unconsciousness, necessitating close supervision in an intensive care unit. Chest injuries requiring mechanical respiration or thoracotomy, anuria with the need of an artificial kidney and cases with special reconstructive problems can be transferred to centers where this type of work is done regularly. The principle of delayed operation where the primary operation of a fresh accident wound is delayed for one or two days, makes it possible to transfer difficult open crush injuries of the extremities to a major center.

This then outlines the work of the major accident service and the accident hospital as regional centers for all accident services. Furthermore the evaluation and long-term follow-up of cases in order to find the adequacy of a certain type of treatment can be performed in the accident hospital. It should also be the major training center for trauma surgeons.

TRAUMA CLINIC TEACHES AND INVESTIGATES

The task of the university clinics for traumatology is mainly the teaching of students and general practitioners, and also giving postgraduate courses to traumatologists to keep them abreast of new

developments. Here also trauma research should be performed in close co-operation with the other fields of medicine. Adequate laboratory facilities and the opportunity for animal experiments should be available. The university clinics should be in close contact with the accident hospitals and accident services to give advice whenever needed. Teaching and research should not be restricted to diagnosis and treatment of accident cases, but should include as well the prevention of accidents and evaluation of the consequences of trauma for insurance purposes and for the law courts. Lawyers and judges involved in accident cases should understand the consequences and the evaluation of accidents.

ROAD DIFFICULT BUT MUST BE TAKEN

We realize of course that it will be a long and difficult road to create this ideal organization if, indeed, it ever will be possible to achieve it. Unfortunately personal pride and professional jealousy will sometimes make it difficult to establish independent trauma services and university chairs. Nevertheless, the ever increasing number and importance of accident cases will force the development in the way outlined. In any event, we hope that the future will see at least part of this plan achieved. We set our goals high and with them set high we know that in part at least our crusade will be successful.