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Mobile medical emergency units in France — part II

N DROUET

Pour l'urgence, c'est déjà parti (If it is an emergency, we have already left)
Pour l'impossible, nous partons immédiatement (If it is to attempt the impossible, we are leaving now)
Pour le miracle, nous demandons quelques instants (If it is to work a miracle, we ask a few moments).
 Dr P Cadoz*

St Julien-en-Genevois is a small town on the Franco-Swiss border, five miles from Geneva. Its borough has about 7000 inhabitants and it has a hospital of 550 beds for a population of 70 000 people. The mobile medical emergency unit based at this hospital covers about the same area (fig 1), which is mainly rural with some plains and low mountains. There is some industry, notably at Bellegarde; a section of the Lyon-Geneva motorway passing Bellegarde is due to open in 1982. The "Centre d'Etudes et de Recherches Nucleaires" (Centre for Nuclear Studies and Research) near Geneva has plans for a major construction site which will involve tunnelling under the French Jura. St Julien is at a major European crossroads—between northern and southern Europe and western and south-eastern Europe. Consequently, there is very heavy lorry and holiday traffic in both winter and summer.

Service Mobile d'Urgence et de Reanimation (mobile emergency and resuscitation unit)

The mobile emergency and resuscitation unit at St Julien was established in February 1977.¹ Despite a modest beginning, the unit is now called on two or three times a day. Because of

the distances covered, each call takes between 30 minutes and two hours. If a lengthy rescue procedure is required, such as extricating a driver from his flattened car, the time can be considerably longer. The helicopter can be used to reduce this time, but to transport a patient to a teaching hospital at Lyon or Grenoble takes about one hour's flight time each way.

PERSONNEL

The medical personnel of the unit includes two house officers detached from the armed Forces for the duration of their military service with 2-3 months special training in a regional mobile emergency unit; one or two senior house officers in anaesthetics and intensive care; and two consultant anaesthetists. Only one house officer is on duty at a time. Should a second doctor be required the senior house officer is called. The consultants are available also as reinforcements if more than two calls are received simultaneously or in the event of a major accident or a serious intensive care problem at the scene of the accident. Finally, the house officer second-on-call for the teaching hospital can be called on, particularly for transferring patients between hospitals.

The paramedical personnel include one nursing sister; five nurses from the accident and emergency unit (including one nurse in charge of all the medical equipment of the unit); three paramedics from the accident and emergency unit and intensive care units with an ambulance driver's diploma, including the chief technician; and three other paramedics with first-aid certificates.

*Service d'Aide Medical Urgente (Grenoble).

FIG 1—Area covered by the mobile emergency and resuscitation unit is defined by a line joining the Jura Mountains to Bellegarde, Seyssel, Frangy, Cruseilles, and Annemasse. The unit does not cover Swiss territory.

VEHICLES

These include a Renault 18 TS estate car (fig 2); a Renault 18 TL estate car; access to private ambulance/taxis; and free access to the helicopters of the civil defence (at Annecy) and the "gendarmerie" (at Megeve).

FIG 2—Emergency equipment carried by a mobile emergency and resuscitation unit.

MEDICAL EQUIPMENT

The equipment carried in the car is given in the appendix. Additional equipment kept at the hospital for immediate use includes a helicopter red toolbox; a helicopter blue toolbox; two identical rucksacks for mountain rescue and helicopter rescue; a disaster case; and a second electrocardiograph. The helicopter toolboxes are kept for use during the transfer of patients by helicopter from one hospital to another. In this event heavy intensive care equipment, such as the toolboxes, the electrocardiograph, and oxygen cylinders, can be carried, but for helicopter rescues only very light equipment is taken. The rucksack, which contains all the equipment necessary for setting up intravenous infusions and for intubating and manually ventilating adults and children, is used for this purpose. A small box also contains a minimum number of drugs. The disaster case contains enough equipment for setting up intravenous infusions and for intubating 10 people. Cards for the sorting of casualties on site are also carried.

RADIO EQUIPMENT

This includes a telephone bypassing the hospital switchboard (whose number is known only to the public services and general practitioners); a permanent paramedical listening service on the "departement" fire service frequency (the house officer on duty is always available to take over if necessary); and the ability to listen on the emergency frequency and on the supplementary frequency (in the event of disasters).

CASE REPORTS

The following case reports illustrate the work of the mobile emergency and resuscitation unit and indicate some of the difficulties as well as the potential capabilities of the unit.

Case 1—In a serious accident on a motorway bridge construction site five people were injured, one was killed, one was seriously injured, and three were injured but able to walk. The mobile emergency unit consisting of two doctors and a nurse intubated the seriously injured patient and set up two intravenous infusions (one by way of the jugular vein). The convoy of two ambulances were escorted by a police motorcycle escort. During the journey cardiac arrest occurred, which was immediately reversed. Despite continued resuscitation and blood transfusion at hospital, the patient died.

Case 2—After the fire services at Thonon had received a call of an accident about 20 km away a fire service ambulance was immediately sent to the accident. During the journey further details arrived; it was in fact an accident involving a chain-saw in woods near another village. The ambulance team went on foot to the scene of the accident and radio contact was lost for several minutes. The initial report was of serious thoracic and head injuries after a tree had fallen on a woodcutter. The emergency unit immediately called on the civil defence helicopter at Annecy, which picked up the doctor, nurse, and medical equipment about 15 minutes later. Meanwhile, the ambulance team had taken the patient to a nearby crossroads, where a temporary landing zone was marked out by the firemen. The helicopter arrived five minutes later. The doctor was able to perfuse the patient and monitor him electrocardiographically. The patient had a temporary loss of consciousness, several rib fractures, but no clinical pneumothorax or haemothorax, and a probable spinal fracture (about D12-L1). He was transported to St Julien-en-Genevois by helicopter. In this instance incorrect information was given to the public services concerning the accident. This is common and is expensive, as incorrect or inappropriate action is taken. The helicopter and medical team were delayed until the proper information was obtained. Radio communication between the unit doctor and the hospitals in the area enabled the patient to be taken to an intensive care unit without undue delay.

Case 3—A motorway construction worker was admitted to the intensive care unit at the hospital of St Julien-en-Genevois with necrotic haemorrhagic pancreatitis. Several weeks later, after several major complications and a partial pancreatectomy, he began to recover. To transfer him nearer to his home in the north of France a formal application was made by the mobile emergency and resuscita-

tion unit for use of the "gendarmerie" plane, as the patient was too weak still to withstand the 1000 km journey by road or by train. The department of emergency medical services at Arras was contacted to meet the patient at the airport and transfer him to hospital. During the entire journey the doctor was able to monitor the patient and administer drugs.

Case 4—The mobile emergency and resuscitation unit was told of a climbing accident by the police. Two doctors with mountaineering experience, who were familiar with the area, joined the mountain rescue team. The victim who had fallen several metres had been brought down to the nearest ledge by the time the rescue team arrived. The two doctors climbed to the ledge; the young man had a displaced closed fracture of the left tibia and fibula. An intravenous infusion was set up, the leg immobilised, and the victim brought down the mountain.

Discussion

Many medical workers concerned with the setting up of similar emergency units or schemes consider that they can be run just as efficiently with highly trained paramedics. Some units in America work that way.² Many of the calls received by the unit at St Julien-en-Genevois and even Grenoble could be handled by trained nurses or paramedics alone. Although no statistics exist, perhaps as many as 50-70% of calls do not specifically require a doctor at the scene of the accident. The abilities of paramedics³ are certainly impressive—in evaluating an emergency, giving cardiopulmonary resuscitation, protecting the airway, performing endotracheal intubation, defibrillation, and emergency splinting and bandaging, and in setting up intravenous infusions. Although paramedics are certainly valuable assistants for the doctor they can only be technicians in medical emergencies. The diagnostic and therapeutic decisions must remain with a properly trained doctor, preferably at the scene of the accident or at the end of a radiotelephone. A recent study⁴ shows that paramedical staff do have a very definite place in the emergency team. This is certainly true for the mobile emergency and resuscitation unit at St Julien-en-Genevois. A doctor, preferably a junior anaesthetist (at senior house officer or registrar grade) is needed at the scene of action. Sleet⁵ recently stressed the role of doctors, particularly in high-risk areas, and the need to increase the training of the public, paramedical staff, and medical personnel in the management of emergencies. This is true for France and Britain as well as for the rest of the world. The creation of new diplomas in emergency medicine should help in this.

The ideal of the French system is for a reasonable working diagnosis to be made by a doctor, preferably a fully qualified anaesthetist properly trained in "oxyology" or emergency medicine with the assistance of properly trained paramedical staff, who can then set up correct resuscitative and therapeutic procedures at the scene of the accident or illness. Unfortunately, at the moment this is possible only in large centres like Creteil, Toulouse, Grenoble, and Paris.

Although officially 17 years old the "Service d'Aide Médicale Urgente" and the "Service Mobile d'Urgence et de Réanimation" are still in their infancy. They are one answer to the problem of bringing skilled help and treatment to the site of an illness or accident but they are not the only answer. The system in France could be improved, and although some major problems are coming to light—such as the non-uniformity of the system, the role of the general practitioner, the financing of the system, and the use of medical time—it can serve as an example to others in the field. Despite the difficulties, many people already owe their lives to this service, and the implementing of this type of scheme in other countries seems to be imperative.

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APPENDIX—Medical equipment carried in the car

- Red toolbox:**
- Emergency drugs for resuscitation and short-term intensive care
 - Syringes and needles
 - Equipment for blood sampling
 - 1 Haemostat
 - 1 Pair of scissors
 - Equipment for endotracheal intubation:
 - 5% lignocaine spray; 5 adult intubation cannulas (4 sizes); Mayo cannulas (3 sizes)
 - 2 Oxygen nasal catheters
 - 10 Tracheal aspiration catheters (5 sizes)
 - Equipment for intravenous infusions (except solutions)
 - 1 Adult sphygmomanometer
 - 1 Small torch
 - Sterile swabs
- Blue toolbox containing the same equipment in paediatric sizes**
- Dressings case (including sterile sheets for burns)
 - Electrocardiograph (incorporating defibrillator) with rechargeable batteries
 - Aspirator (AMS 12) (with rechargeable batteries)
 - Respirator (Airox)
 - Ambu manual ventilating bag
 - Oxygen cylinders (8 l and 2 l at 150 atmospheres, 1200 l and 300 l)
 - Entonox cylinder (8 l at 150 atmospheres, 1200 l)
 - Shell mattress stretcher (made of polyethylene ballbearings to take the shape of the victim)
 - Intravenous solutions (Haemacel; tromethamine; mannitol 20%; glucose 5% and 10%; saline 0.9%)
 - Venous catheters (internal jugular; long central)
 - Large scissors for cutting clothes
 - Battery-operated torches
 - Antidote box (with specific antidotes for certain poisons)
 - Reserve sterile swabs and antiseptic agents
 - Sterile thoracic drainage equipment with a Heimlich valve
 - 2 Blood pump systems (allowing an operator to empty a 500 ml infusion bottle in a few seconds)
 - 1 Low-reading thermometer
 - Scalpel and blades
 - 3 Isolation aluminium paper covers
 - 2 Heavy leather jackets for use during rescue work

If a woman becomes pregnant with a copper intrauterine device in place is the fetus likely to be harmed?

If the device is left in place there is a 50% chance¹ that the pregnancy will abort, but this chance is reduced to around 20% if the device is removed as soon as pregnancy is diagnosed (provided that removal does not require excessive traction on the tails). If the device is not removed there is no increased risk of fetal abnormality.² Although there have been case reports of fetal abnormalities associated with failure of copper devices, large series of such pregnancies have shown no increase in the abnormality rate.¹ The effects of copper on pregnancy are not fully understood; copper may exert toxic effects on very early embryonic development, but fetuses that survive to viability seem to develop normally. Long-term follow-up of such infants has not been done. Increased copper concentrations have been found in cord blood from fetuses conceived in association with copper devices, but tissue copper concentrations in such fetuses do not seem to be increased³; nevertheless, the numbers of cases examined have been very small. In a study⁴ of pregnant rats with coils of copper wire in utero there was an increase in intrauterine mortality and increased copper concentrations were found in fetal tissue, but there was no apparent teratogenesis or growth retardation.—J O DRIFE, lecturer in obstetrics and gynaecology, Bristol.

¹ Edelman DA, Berger GS, Keith L. Intrauterine devices and their complications. London: Martinus Nijhoff, 1979.

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