

A COUNTRY DOCTOR'S VIEW OF ACCIDENT ORGANIZATION AND EMERGENCY CARE

C. R. G. HOWARD, M.B., Ch.B.

Burley, Hants

THE care of the patient in transit to hospital has received relatively no systematic investigation by accepted medical standards. Opinions have been voiced authoritatively by various specialists, such as surgeons, medical officers of health and lay ambulance officers, but on analysis few if any have experience of 'hot' incidents, when reports come to them second-hand, or they only see the results in hospital. The emphasis has been on speed of transport to hospital for resuscitation with the minimum of previous treatment.

This has led to by-passing the local facilities in the belief that very little can be done to help a patient before he gets to hospital. The figure of 100 accidents per 1,000 of the population in the *National Survey of Morbidity*¹ presupposes there must be some buffer organization before the six serious accidents per 1,000 that need hospital treatment. It is assumed that this filtration will be dealt with by casualty departments near a hospital and the general practitioners in their surgeries when not near a hospital. This organization looks good on paper, works moderately well in urban areas, but is open to criticism when viewed from the rural angle².

1. What is the critical time-delay acceptable for transport without definitive treatment?
2. Ideally, skilled medical care should be present at any severe accident³.
3. More accidents occur in the rural areas than urban¹.
4. Life saving depends on early definitive resuscitation. This can be started without delay, at the site or in transit, by doctors experienced at working in rugged conditions.
5. Owing to traffic congestion, time in transit to 'accident centres' will become longer.
6. There are no published figures for preventable death in transit to confirm

the continental ones of six to ten per cent⁴. J. Brooks in a recent unpublished investigation into road accidents in Wiltshire gave the first English figures for possible preventable death in transit. These confirmed those reported from the Continent.

In the past, criticism in England on these lines has provoked a common 'sacred cow' reaction by those in charge of accidents and transport. (In America it was readily admitted that emergency care was a problem.) It was considered that the cause of this attitude was the responsibility of those concerned. The hospitals treat the patients when they are brought to them by another organization, the medical officer of health of the local health authority. Neither have field experience of peripheral care. What is necessary or possible? The situation has been further bedevilled by:

1. The demands of clinic doctors for a medical bus service which has swamped the ambulance service and resulted in their demands being considered of more importance than the transport of the seriously ill.
2. The excessive standards of some local authorities for housing vehicles because of prestige, in spite of the modern commercial custom for vehicle storage, i.e., in the open⁵.
3. Lack of medical qualification of the county ambulance officers who are taken as experts on the subject.

The result of all this divided responsibility and interest has been to produce an ambulance service that superficially looked efficient but is actually second class and may cause unnecessary loss of life. Ambulance transport has not advanced beyond converted lorries. Fewer and fewer doctors know what should be done in this critical period of transit and the skilled medical attention is delayed until arrival at an accident centre. (I do not consider a first-aid training course, however elaborate, given to an ex-lorry driver, can replace years of medical training.)

If this accident service is to be efficient and avoid public complaints a radical change in organization is necessary. No adaption or improvement of the present system of emergency care can give a first class service. Attempts to do so must result in mediocrity and increasing loss of life.

The radical changes which are suggested here will have little chance of being accepted unless research is done to confirm the continental figures of preventable death. There are too many rigid ideas and vested interests in the present organization.

Aims of reorganization

1. To get a doctor to the site of every serious accident to start definitive treatment. (Obviously, this is necessary only for a given transit time from a

hospital, or in trapped injuries nearer a hospital.)

This is not impossible, as is often stated both here and in the U.S.A. The cities of Baltimore and San Francisco manage to do it by different methods⁵; our own obstetricians have shown us the effective life-saving methods of the maternity flying squad.

2. To train selected crew to a standard as high as the army paramedics.
3. The medical bus service functions of the ambulance service must be separated from the 'acute incident service' of the ambulance service. As long as these two services are combined, both will be second class.
4. To have a transport vehicle designed *ab initio* to package the human body.

Methods of reorganization

1. Information of a serious accident first reaches the police, but often in country districts the local doctor is also informed and will reach the site first. Alternatively, the police only may be informed and they may summon an ambulance or police car from ten miles away when skilled help is half a mile away.

The argument that local help may not be available in 20 per cent of incidents (doctor on his rounds, etc.), so that it is no good trying to contact him appears to condemn as useless any system that is not 100 per cent all the time⁶. A similar statement might be made of the ambulance availability or of specialists in hospital.

A practical way of organizing emergency care can be based:

- a. On the rural fire service, who can turn out at five minutes notice.
- b. On a system that is based on airfield accident organizations. Areas are allocated to specific doctors who can be informed of a serious accident. This could be organized by the police. These areas would vary in size and the distance to be run to a hospital; i.e. areas near a hospital would be covered by the hospital itself—as in the Baltimore and San Francisco schemes.

The well-known boggy of delay due to 'waiting for a doctor' may be a result of not knowing what can be done outside a hospital. I do not think it has ever been put forward as an argument against the institution of the obstetric flying squad, whose major life-saving activities are resuscitation before transport.

A doctor *can* be on the site of severe accidents, often before an ambulance—given an organization based on the police, using the methods of the fire service and the maternity services, and perhaps those of airfield controllers. The local well-trained civil defence units should also be integrated.

2. *Training of personnel.* This varies from county to county and the vigilance of the medical officer of health and ambulance officer. A Red-Cross first-aid certificate is not sufficient.

- a. The standard should be that of army medical auxiliaries.

- b. Regular examinations should be taken—weak spots commented on—viz., the regulations concerning airline pilots. The Casualties Union⁷ should have official support.

3. *Medical bus service.* If the radical step of hiving off the accident service transport from the medical bus service is made by making the accident ambulances based on hospitals, then the crew would be usefully employed in hospital work in the 'stand by' times. This should keep their standards up to those of their hospital. There is the added bonus of extra hospital staff and the useful employment of men who would be otherwise idly waiting.

These accident crews would have higher pay and standing than the bus service crews from which they would be promoted. The standard objection to this rational step, is that the National Health Service Act prevents it. A minister suitably instructed could alter this by regulation laid on the table of the House.

4. *Vehicle.* In the commercial world it is possible to package securely a fragile object but no really suitable transport for carrying the damaged human body has been produced; the exception is the torpedo-carrying trailer of the Royal Navy. The fallacious argument that there is not a large enough market for a special vehicle is accepted, and we continue to transport the most complicated organisms in the world in diesel-engined lorries. Pending the development of the Canadian pneumatic envelope splint, compromise attempts at solving this problem have been made. Each person who puts in a modification of springing or stretcher tends to claim success. The number of these show their inadequacy. We make special vehicles for many purposes of commercial use, but not for the human body.

A vehicle must be designed *ab initio* for its job and should fulfil the following requirements:

- a. Suitability for the export market.
- b. Load capacity and adaptability for either bus service or accident service. Sufficient headroom.
- c. All round independent suspension of either pneumatic or oleopneumatic type, but research on cushion craft should be encouraged.
- d. Small turning circle (under 30 feet).
- e. Enough power to maintain high speeds if necessary (i.e. 80 m.p.h.), for two reasons:
 - i. Export market, motor and 'thru' ways;
 - ii. Comfort: a car driven at half its maximum revs. is better than one driven near maximum revs.
- f. Low loading capabilities, chiefly for medical bus use.
- g. Simplicity of construction using a standard type of engine.
- h. A cost comparable to present lorries, e.g. £2,000 to £2,500.

The Bothwell Ambulance Design fulfils all these requirements.

If produced, it has a large potential export market. It needs £15,000 to develop the prototype.

Equipment of an ambulance

Discussion on what should or what should not be carried as standard equipment is again hampered by the questions, "How many times will it be used?", "Is it worth it?", or statements, "No need has been expressed by the ambulance crews for this".

In the present elaborate development of preventive medicine, any advance must be expensive, from the detection of phenylketonuria to the symptomless diabetic or carcinoma of the cervix. The frequency of usage acceptable for equipment in general practice may be that of carrying a drip in a car: used twice in five years, each time saving a life, or a stomach pump, used once in ten years. Some take the view that nothing except bandages and cotton wool are necessary in an ambulance. 'Well leg' splinting can cope with anything, and is content with a stretcher designed 50 years ago.

Two standards of equipment seem rational. One for the medical bus service, the other for the accident vehicles. A basic minimum must be kept in the medical bus for use when backing up the accident vehicles. Equipment should not be standardized further than a requirement that the standard should not fall below a specific level.

1. The medical bus service would be equipped up to a 3 B level. Three "B's" = facilities for dealing with Birth, Breath, Bowels.
2. The accident service would be equipped to a 6 B level. Six "B's" = Birth, Breath, Bleeding, Breaks, Bowels, Burns.

Each person who has to deal with casualties and emergency care have their own ideas as to what is best. Nothing should be discouraged, as advances are rapid in gadgetry, and crews' ideas tried out are a stimulus to morale.

However, the basic needs of suction and positive pressure O₂, water and some type of splintage will probably be admitted.

Site usage. The accident service will need further equipment for on-the-site usage where casualties are hard to get at or to move with ease. The commercial heavy jack, as used by builders, combined with the tool pack, issued by the civil defence, should cope with most situations. Both are easy to stow and are cheap.

REFERENCES

1. *Studies on Med. and Pop. Subj.* No. 14, 1, pp. 88-9. (1960). General Register Office: H.M. Stationery Office.
2. *Lancet* (1962). 1, 1337.
3. *J. Trauma* (1962). 2, 102.

4. *Pros. of Danish Aneas. Congress* (1956). Dam, W., Edmund, H. H., Ibsen, B., Pahler, H., Poulson, H. and Romer, O. (1958). *Ugeskr. Læg.*, **120**, 875. Lind, B. (1962). *T. norske Lægeforen.* **82**, 427. Solheim, K. (1964). *Brit. med. J.*, **1**, 81. Nordisk Kirurgisk For. Congress (1957).
5. Mem. to Health Comm. Hants C.C. ambulance service (1961), Howard, R.
6. Gissane, W. *Practitioner* (1955), **175**, 450; *Lancet* (1963), 698.
7. "Casualties Union": a voluntary organization which provides realistic effects of trauma for first aid training.

THE AMBULANCE-MULE

. . . Cowan, thinking he would be too much fatigued by riding down to Balaclava, we procured an ambulance-mule to carry him. On each side of a strong mule, is swung a couch with a cover or awning, so that the sick man can lie—or if he likes, the couch can be folded up like an arm-chair. When there are two sick men to balance each other, the driver leads the mule, but as there was only one, the driver sat opposite to Cowan, guiding the animal with the reins. . . . Maunder and I did not set off till the mule had started some time; and when we came up to it, about three miles from camp, we were not prepared for the singular mode of progression which the animal had adopted. It appears that all had gone well for a couple of miles, but something had occurred to cause a slight scimmage between the muleteer and his beast, in the progress of which the animal seems to have become aware that his driver was not at his head, but seated on the pannier; and so the mule at once took his own way, and indulged in a series of motions, no doubt amusing to an onlooker, but far from pleasant to poor Cowan. Irritated beyond toleration by the spasmodic evolutions, Cowan adjured the muleteer to control the animal; so, pulling with all his might, to bring it to a stop, he got the head all to his own side, and so round went the mule. The more he pulled the more the brute came round: so here they were gyrating like a windmill, but not advancing a single step. Annoying as it was to Cowan, words cannot convey the ridiculousness of the position. I nearly fell off my pony laughing at it. Here was the driver, whipping, pulling, shouting; Cowan imploring him to jump off, even though the whole affair was overbalanced and fell to the ground—preferring to run the risk of being crushed or kicked, to having his brain reeling and giddy, and through it all the mule grinding away in a circle, as if practising for some performance at a circus. When we came up, of course, we at once put a stop to it; and I took the couch opposite Cowan, to leave the muleteer free to lead the animal, and the motion was then quite smooth, for these animals never miss a step.

GEORGE BUCHANAN, *Camp Life*, Glasgow, 1871.