WORLD HEALTH ORGANIZATION
REGIONAL OFFICE FOR EUROPE

WELTGESUNDHEITSORGANISATION
REGIONALBÜRO FÜR EUROPA

ORGANISATION MONDIALE DE LA SANTÉ
BUREAU RÉGIONAL DE L'EUROPE

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ЗДРАВООХРАНЕНИЯ
ЕВРОПЕЙСКОЕ РЕГИОНАЛЬНОЕ БЮРО

Technical Group on Planning and
Organization of Emergency Services

Toulouse, 24-28 February 1979

ICP/ADR 040/6
9 February 1979

ORIGINAL: FRENCH

Emergency health services

TENTATIVE CLASSIFICATION OF EMERGENCY SITUATIONS

by

Professor M. Cara
Necker University Hospital Centre, Paris

The concept of an emergency or urgency (from the Latin urgens, pressing) is ill defined: what is urgent has to be done without delay. However, as there is inevitably some delay before action is taken, an acceptable interval must be specified. One's assessment of this interval necessarily differs, depending on whether one is seeking action and therefore wants it to be immediate or whether one is being asked to take action and therefore wishes to have more time and sometimes justifies this.

In the medical field, surgery in wartime has shown how greatly the time elapsing before an operation affects mortality: statistics compiled by Santy (6) are particularly revealing. Mortality among the wounded was recorded as follows:

Hour of operation after wounding	Mortality
1st hour	10%
2nd hour	11%
3rd hour	12%
4th hour	26%
5th hour	33%
6th hour	41%
8th hour	75%
9th hour	75%

However, these statistics do not take into account those who died before being operated, hence it is difficult to draw further conclusions from them.

Nevertheless, surgeons have established a conventional classification of the degrees of emergency (1):

- first emergency, what must be done within a few minutes or hours
- second emergency, what must be done within 6 hours
- third emergency, what must be done within 24 hours.

When faced with a precarious vascular condition, the decision has been taken to delay surgery in order to improve this condition: this is a delayed emergency - for the surgeon but not for the resuscitator who must do all he can immediately.

The above classification of emergencies is somewhat outdated today; it must in any case be complemented by the notion of an emergency perceived by the person seeking action as compared with the appraisal of the physician. Indeed, the public is becoming increasingly demanding each year. Since 1945 the French penal code (Art. 63 section 2) has made it compulsory to render assistance; and article 5 of the medical code of ethics requires all physicians, whatever their function or capacity, to give extreme emergency aid to a patient in immediate danger if other medical care cannot be assured. We can therefore no longer be bound by the conventional terms: and, in 1973, we introduced the term "distress" to describe situations which rapdily have a fatal outcome if suitable treatment is not started (3). In our view the "extreme emergencies" in the code refer only to danger to life or possibly loss of an essential function such as eyesight. These extreme emergencies should be termed cases of distress to avoid any confusion with other emergencies (which are in fact second or third emergencies).

To clarify the problem of emergencies it seems essential to consider the sequence of the physiopathological events following a traumatic or medical "accident". Accident here has the sense of a morbid phenomenon occurring unexpectedly: thrombosis, sharp pain indicative of a perforation, injury, etc. This notion of the chronology or "sequence" of pathological or therapeutic events is referred to in an INSERM report on operational research relating to emergency aid (6). A distinction must be made between two extremes: that where the patient is left without treatment, with the condition developing towards death in a case of distress, the natural sequence; and that where the patient is properly treated without delay - the optimum sequence.

From numerous animal experiments and observations in man, toxicologists have shown that the mortality curve according to dose is a logarithmic normal function, the lethal dose being 50% (median) or LD 50; and it seems logical to apply this function to the sequence of the natural outcome of a distress (2). Thus three phases may be described (Fig. 1):

- Within a given interval there are no deaths and sequelae are minimized if the cause is removed (simple treatment generally suffices). With infectious diseases, this phase corresponds to that of incubation.

- Within a further interval, the subjects die steadily, even if the cause is removed; mortality is not halted with certainty. Canty's statistics mentioned above provide an example of this process. Special observations have also enabled us to show that during this phase, treatment is very lengthy and difficult and that there can be extensive permanent disablement (Fig. 2).

- After a certain point all the subjects die and treatment therefore serves no purpose however, as some time is needed to diagnose the death, medical aid cannot be withheld.

Thus if arrangements to treat such accidents are to be effective, action must be taken before the third phase. Indeed, to be really effective and also inexpensive having regard to the length and difficulty of treatment and to sequelae, action should be taken before the start of the second phase.

If mortality is in fact evident at the beginning of the second phase, the reason is that vital damage is taking place. It kills weaker persons and causes irreversible lesions in those who are stronger or protected: that is the retarding role of first aid.

However, the outcome can be more or less rapid depending on the pathology (Fig. 3). The most serious emergency is that of cardiac arrest: everything takes place within a few minutes. In asphyxia there is one minute more because of the reserve of oxygen in the lungs. In haemorrhage the outcome naturally varies considerably according to the rate of flow and only an average can be given; each case is somewhat different and the loss of blood must be assessed for greater accuracy.

But it is known that haemorrhage causes tissue trauma, shock and actual intoxication which then develops on its own bringing substantial mortality within a few hours, even with hemostasis. Thus the sequence of an accident is not uniform; there can be multiple effects developing more or less separately and provoking secondary effects such as shock.

Therapy is designed to alleviate these effects if possible; and that is why the outcome of an emergency is progressively altered by different measures (Fig.4).

It is clear therefore that the time factor is crucial. Certainly the sequence develops more or less rapidly according to the pathology. If the outcome will be fatal, a case of distress is involved and it is important to act very fast. In cardiac arrest there are only one or two minutes, which accounts for the organization of emergency trollies in hospitals with an alarm system in the wards - an arrangement that is not highly developed in France. Patients at very high risk must be watched at all times - hence the importance of wards for recovery and intensive care wards (cardiac and other) which have proved effective. The same precautions should be taken in hospital emergency wards.

Cases of distress occurring outside these special surroundings can only be handled through the organization of first aid and public education. It is out of the question to expect medical practitioners in a town to be responsible for cases of distress, since the sequence is so rapid that generally they cannot intervene until the third phase. In France only an organization such as SAMU (emergency medical aid service) can take action in the first few minutes - and then only in towns, where an alarm can be given promptly and distances are short.

The outcome of other accidents is less rapid; there is about half an hour in which to act. This is the sequence of most traffic accidents. They often develop into a case of distress; it would seem difficult for practitioners in a town to take action in sufficient time and, even if they could, this would not be very effective owing to lack of facilities.

In conventional pathology (oral poisoning, severe infection, convulsion, digestive perforation, etc) the sequence is less rapid; we therefore propose to retain the established terms of first and second emergencies. Such conditions develop into cases of distress only after a certain interval (more than an hour), they are within the normal scope of medical practitioners who are familiar with them and are used to taking the necessary action - although they often hospitalize patients since attention at home may be inadequate.

Finally, the least serious situation is that of the third emergency, a term that should preferably be avoided in this context: even if the patient cannot be treated at home at least he can be kept under observation there and any hospitalization should not have to take place outside working hours.

Finally, there are emergencies which are perceived but possibly not confirmed; they must be taken into account since they congest emergency services and are evidence of unsatisfactory functioning of a health service. Such cases should be screened immediately in order to identify those of distress and other genuine emergencies. Advice over the telephone, as given by SAMU, is crucial; and we consider that the system of the single telephone number, being developed in many countries, represents a major advance. France, despite project "15", is falling behind the USA which is promoting the "991". There remains a need for medical advice at the telephone exchange so that, if there is any doubt, a practitioner can be sent to review the situation on the spot and, in cases of distress, arrange for the immediate dispatch of a medical team. This is being done increasingly in France and such systems have been established at Grenoble and Rouen in particular.

In conclusion, emergencies should be classified taking into account the rapidity of the outcome for different pathologies. Although this cannot always be done accurately, it is essential to estimate the timing of the initial accident in order to plan correctly.

- If the outcome will be fatal in a short interval, say up to 2 hours, a case of <u>distress</u> is involved.

- If the outcome is slower and will not necessarily be fatal, a <u>medical emergency</u> is involved; action must be taken promptly, ie within a few hours (first emergency less than 2 hours, second emergency less than 6 hours).

Finally, the less serious situations, described somewhat unjustifiably as emergencies (third emergencies), should not be so termed, although they may require attention by a physician within 24 hours. They do warrant priority visits by physicians in the town, who can judge whether there really is an emergency.

Immediate medical or paramedical (depending on the organization) attention is required in cases of distress.

In medical emergencies a practitioner must be sent or the patient hospitalized.

Perceived emergencies call for careful screening through a switchboard with medical advice. Normally the patient should be sent for outpatient attention during working hours or receive a priority visit if he does not wish or is unable to go to a medical centre.

REFERENCES

1. Brocq, Poilleux et al, Traitement des urgences en chirurgie, Paris, Masson, 1956.

2. Cara, M., L'acharnement thérapeutique, Gestions Hospitaliéres No. 162, January 1977, 17-26.

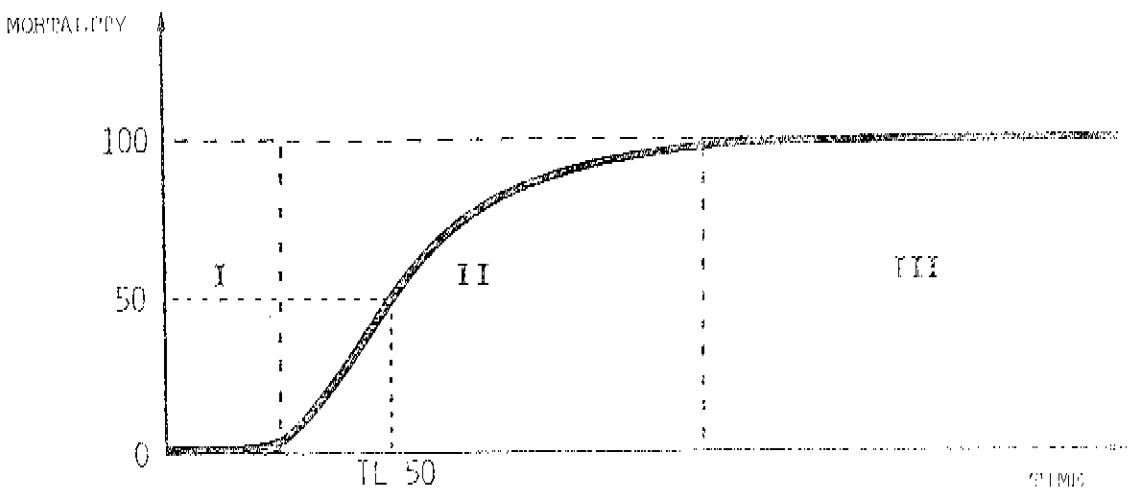
3. Cara, M., & Poisvert, M., Premiers secours dans les détresses respiratoires. Paris, Masson, 1963.

4. Creyssel, J. & Suire, P., Choc traumatique, Paris, Masson 1944.

5. INSERM, Secours d'urgence, Recherche opérationnelle, Paris, 1970 (report).

6. Santy, Letraitement du shock chez les grands blessés. In: Congrès de chirurgie interallié. Lyon Chirurgical January 1917, 14, 54 - quoted in (4).

Fig. 1



STANDARD CURVE FOR FATAL OUTCOME AGAINST THE TIME DURING WHICH THE PATIENT IS LEFT WITHOUT EFFECTIVE CARE.

TM: TIME 50 PER CENT MORTALITY

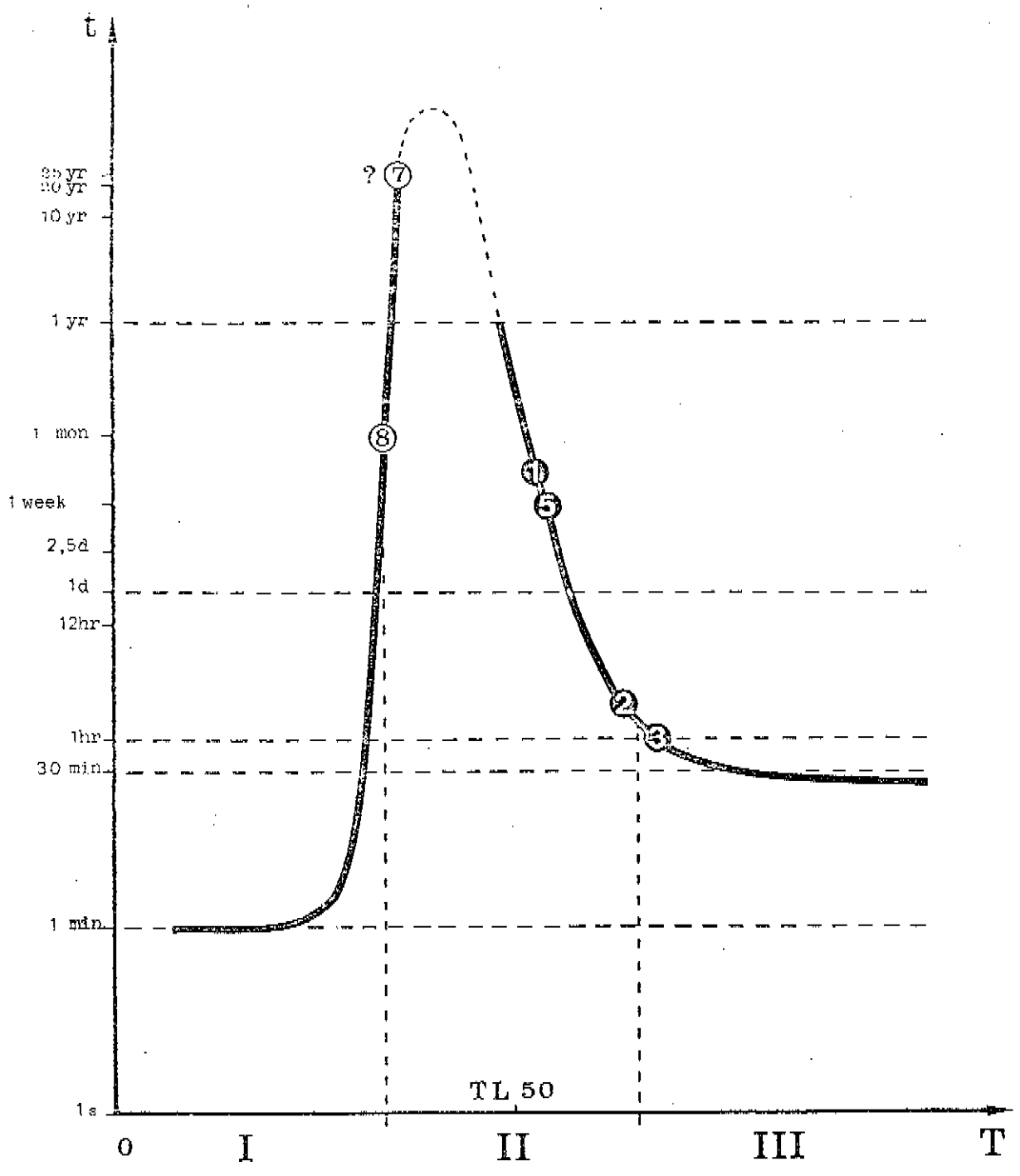
CORRESPONDING TO:

I - PHASE WITHOUT MORTALITY

II - PHASE OF STEADY MORTALITY

III - TOTAL MORTALITY

Fig. 2



DURATION OF INTENSIVE CARE t, AGAINST DURATION OF T BETWEEN THE INITIAL ACCIDENT AND THE EFFECTIVE AID (DELAY IN FIRST AID). TL 50, MEDIAN LETHAL TIME (CORRESPONDING TO 50% MORTALITY).

Fig. 3

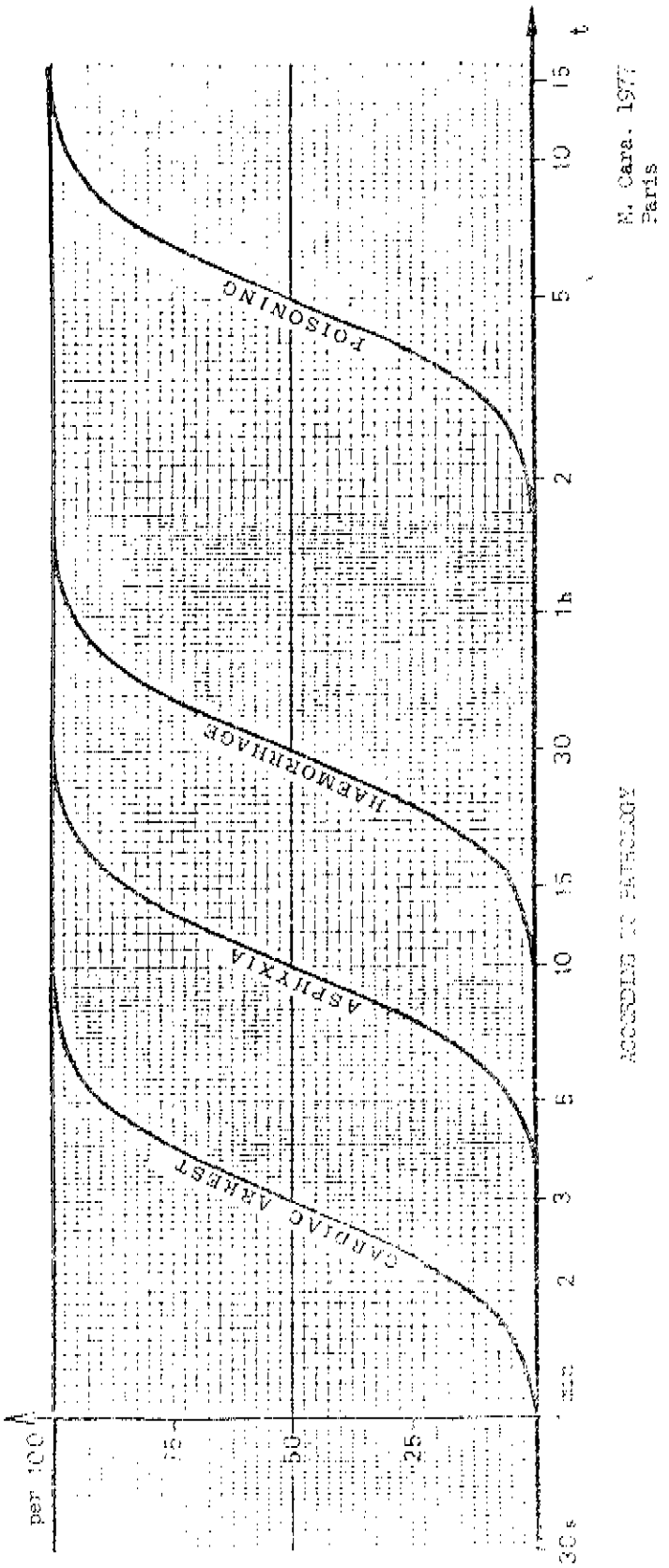
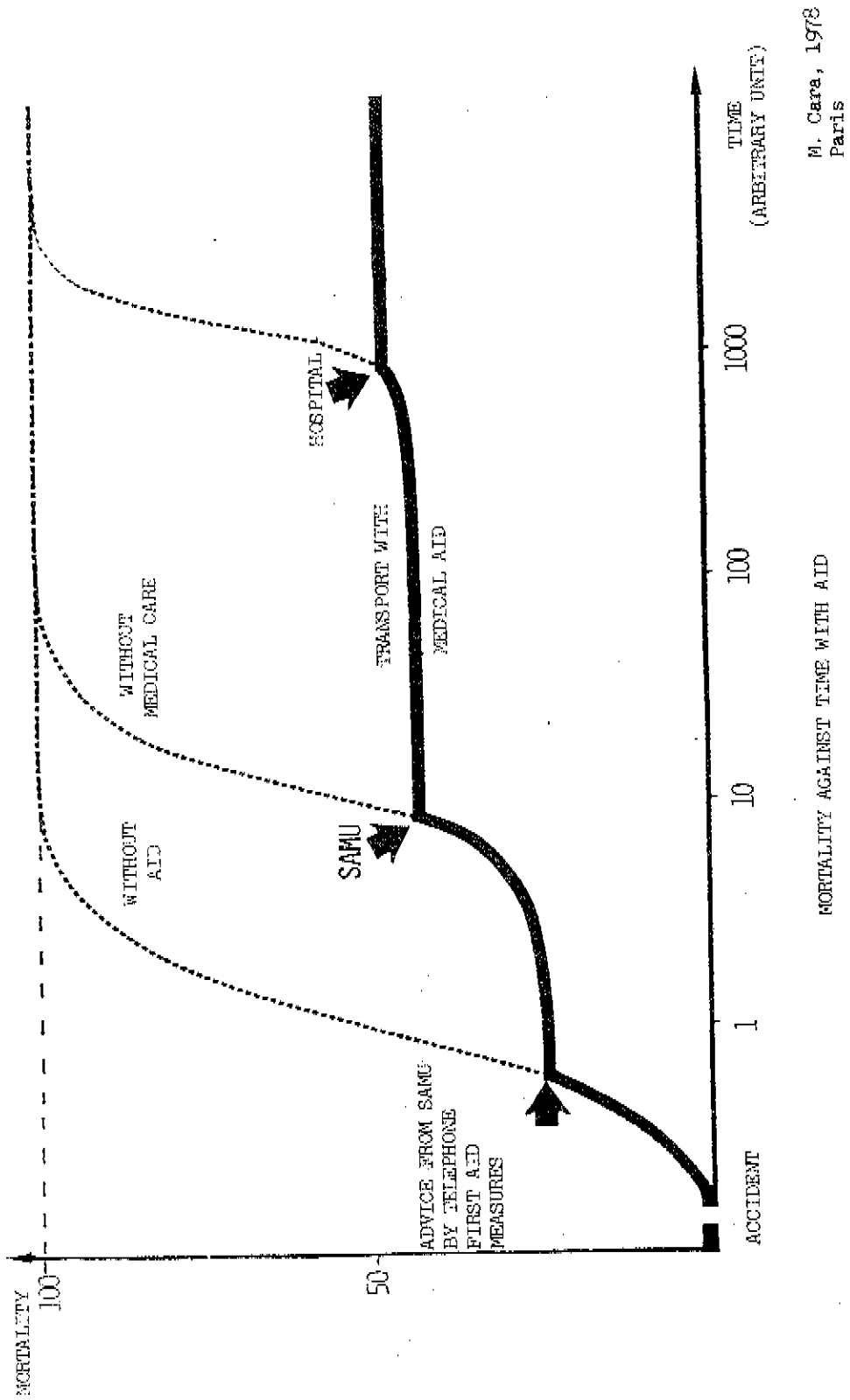

POISONING
HAEMORRHAGE
ASPHYXIA
CARDIAC ARREST
per 100
75
50
25
30s
2
3
5
10
15
30
1h
2
5
10
15
t
M. Cara. 1977
Paris

Fig. 4



MORTALITY AGAINST TIME WITH AID

M. Cara, 1978
Paris