RESUSCITATION IN HOSPITAL

In hospital it is important to consider the areas where resuscitation may be required because the logistics of delivery are very different.

**Intensive care areas**—In the intensive care unit, accident and emergency department, coronary care unit, anaesthetic rooms and operating theatres, and special care baby units skilled personnel with appropriate equipment should be readily available to start advanced life support immediately. Most patients will be monitored and many will have established intravenous lines. The number of successful resuscitations in these areas should provide an example to the rest of the hospital, as should the skill in resuscitation shown by their staff.

**General wards**—Here varying degrees of nursing and medical skill and equipment may be available. The emphasis has to be on immediate basic life support, usually by nursing staff, with the cardiac arrest team being summoned to provide advanced life support. Basic life support should be taught to all ward staff; they should appreciate that effective basic life support procedures are essential until the cardiac arrest team arrives and that the survival of patients is greatly affected by the speed at which basic support is started and the adequacy with which it is maintained.

**Non-ward areas**—In x-ray, radiotherapy, physiotherapy, nuclear medicine departments, etc, the emphasis is again on basic life support until the cardiac arrest team arrives. In the past very little effort has been made to train paramedical staff, such as physiotherapists, radiographers, medical physicists, in basic life support or even to explain to them how the cardiac arrest call system works. If properly trained there is no reason why they cannot apply adequate basic life support until the team arrives.

**Other areas** where the patient may attend adjacent to the hospital include psychiatric day hospitals and facilities for the physically or mentally handicapped. Again all attending staff should be taught basic life support and there should be a well rehearsed procedure for them to summon help, whether it be the cardiac arrest team if they are within the confines of the hospital or an ambulance if they are too far removed.

**General thoroughfares of the hospital**—basic life support should be provided by any staff available. Ideally any person working in a hospital should be able to provide basic life support, so training should ultimately be extended to all grades and categories, to include such groups as clerical, administrative, and portering staff. Obviously they must know how to alert the hospital cardiac arrest team, and the patient will then usually be removed to the nearest clinical area for treatment unless the necessary equipment can be brought to the patient.

Clearly, only in the intensive care areas will advanced life support be started immediately. In a well run intensive care or coronary care unit it is reasonable to expect the nursing staff to have resuscitated many of the patients, especially those in ventricular fibrillation, well before the doctors arrive.
Cardiac arrest team

In all other areas the staff on the spot must immediately initiate adequate basic life support and maintain it until the cardiac arrest team arrives. In these areas the start of advanced life support may be delayed by four to five minutes or more because in most hospitals patients on the open ward and other areas are not monitored and the nurses are not specially trained or allowed to defibrillate and have no equipment immediately available except for airway equipment. They will have to dial an emergency telephone number, which should be marked on every telephone, and be taught to give a clear message stating the exact location of the cardiac or respiratory arrest.

If there are enough people to apply basic life support other members of staff should position themselves so that they can direct the cardiac arrest team immediately to the patient.

In many hospitals the cardiac arrest team consists of the duty medical and anaesthetic registrars, a more junior doctor, one or two senior nurses, and a porter who will bring the emergency trolley. All will carry special bleeps which will be simultaneously alerted by the switchboard operator in case of cardiac arrest. These bleeps should have a speech channel so that the operator can give the location of the emergency. The operator should speak slowly and clearly and repeat the message at least once—for example, “Tavistock ward—third floor, north block.” If the message is not clearly understood by any member of the cardiac arrest team he or she should dial the emergency number and speak directly to the operator, making it clear that the inquiry is about location of the cardiac arrest and not a second cardiac arrest call. In multistorey hospitals special emergency keys to the lifts should be provided for the two senior doctors and the porter with the emergency trolley to enable them to commandeer the nearest lift and reach the patient as soon as possible.

Until the team arrives basic life support with expired air respiration (with or without the use of an airway or mask or ventilation using a face mask and a self inflating bag) must be provided. If patients are known to be suffering from contagious diseases an airway or face mask with a non-returnable valve must be used.

In many ways the situation in non-intensive care areas is identical to a cardiac arrest in the street in a city where emergency medical technicians or paramedic crews have a very rapid response time of three or five minutes such as in Seattle, Washington State. If the ward staff can maintain basic life support effectively until the arrest team arrives hospital discharge rates would be much higher. The Seattle figures suggest that 30% of patients who receive bystander basic life support are defibrillated outside hospital and survive to leave hospital. As the aetiology of cardiac arrest in hospital is often more complicated the survival figures would probably be lower, but the concept remains the same.

Everyone concerned in hospital resuscitation must be prepared and properly trained. A cardiac arrest call must initiate a well rehearsed, well orchestrated sequence of events—much the same as action stations being called on a warship.

Each hospital should have a subcommittee or panel, meeting at least quarterly to discuss problems and general policies. It should report directly to the hospital medical executive committee. The subcommittee should include senior and junior hospital doctors, nurses, pharmacists, the infectious diseases control officer, technicians, and an administrator and should have the power to coopt or invite to meetings anyone with special knowledge or who has a particular problem to discuss. The problem may be one of communications because of bleep black spots, there may be lift problems, or there may be problems of standardising drugs or equipment. The resuscitation protocols for both basic and advanced life support must be displayed throughout the hospital and taught by the resuscitation training officer and medical and nursing staff. The final article in this series discusses the ethics of resuscitation, and one of the duties of the subcommittee is to remind senior doctors of their responsibilities. Any patient of any age or suffering from any disease will rightly be subjected to an attempt at resuscitation unless a contrary instruction has been left by the medical staff and entered into the medical and nursing records.
Resuscitation training officer

All hospitals need a designated person responsible for training staff in basic and advanced cardiopulmonary resuscitation. The resuscitation training officer will organise and document training courses, take care of training equipment and audit cardiac arrest calls. A suitable person would have had extensive experience in resuscitation either as a sister or charge nurse or as a paramedic in the ambulance service. The officer should be responsible to one or two consultants on the resuscitation subcommittee but is expected to act independently.

Included in the training programme are all junior medical staff, any medical students, all trained nurses, paramedical staff such as physiotherapists, ancillary staff, and probably in future, ambulance crews and even the lay public.

Once staff become aware of the availability of such courses it becomes difficult for training officers to find enough time to teach all staff personally and they will have to delegate some of the work. At our hospital the teaching of the student nurses is shared with the teaching staff of the school of nursing. This should ensure uniformity of teaching from the time a nurse starts training in the hospital to the time he or she achieves a more senior appointment.

Most hospitals no longer have a regular rotation of nursing staff between day and night duty and therefore the training officer has to spend some time on night duty training at least the senior night staff in areas where cardiac arrests are likely to occur. Also if nights are not worked any logistic problems peculiar to cardiac arrests occurring at night will not be identified.

In future we hope that the training officer will train groups of instructors who will continually be subject to retraining and revision and these instructors will teach other members of staff. Larger hospitals may need more than one training officer.

Retention of resuscitation skills is known to be poor. There is no substitute for teaching on proper manikins, and the major part of any training session should be devoted to manikin practice. Training in resuscitation and the range of manikins and models available are reviewed in subsequent papers. Because of the time taken to set all the equipment up and arrange a simulated cardiac arrest, it is important that the hospital should have a designated room for resuscitation training.

It is to be hoped that in future no doctor or nurse will qualify who cannot perform adequate basic life support. Hospitals and perhaps community bases will provide regular revision courses. For those who need to practise advanced life support the hospital will arrange proper training and retraining. Accreditation of posts should include evaluation of resuscitation practice and training procedures.

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What is known of the South American Andes cocona fruit used in native medicine for the treatment of diabetes, apparently over a wide area ranging from Peru to Argentina?

The cocona fruit is obtained from the plant Solanum sessiliflorum Dunal (syn S toporo Humb and Bonpl.), which is classified in the family Solanaceae. The plant is therefore related to the potato and, more distantly, the tomato. Other local names for cocona fruit include jibara and uvilla. Several plants have been subjected to laboratory investigation for their reputed antidiabetic activity, but there appear to be no scientific, or indeed folklore, reports on the effects of cocona fruit on blood sugar concentrations. Nevertheless, “there are always unrecorded indigenous practices. Diabetes is a popular, self-diagnosed, ailment . . . and numerous plants are believed to be remedies for it” (J F Morton, personal communication). That said, however, it does seem difficult to reconcile the implications of the question being answered here with the recorded fact that cocona fruit is “edible.”—RICHARD J SCHMIDT, lecturer in pharmacetical phytology, Cardiff.

Workers in the lead industry have intravenous blood samples taken every three months. Are there any long term sequelae to this procedure? Would a test using a spot sample of blood be preferable?

Not all workers with lead need to have intravenous blood samples taken every three months. Certain workers need them only annually and some not at all. All invasive procedures carry a risk, though sometimes quite remote. When serious lead poisoning was a possibility the risk of routine phlebotomy was obviously worth taking. Now that the lead working environment is generally under control so that cases of lead poisoning are now becoming rare (fewer than five a year) it is perhaps right to ask under what circumstances should we continue to use the blood of workers for biological sampling to ensure that administrative regulations are being correctly met. I do not know that this advantage/disadvantage balance has been looked at under present day conditions. It is possible under strict laboratory conditions to get accurate blood lead measurements from spot samples of blood but the accuracy falls when used on large numbers under field conditions. Furthermore, some workers prefer giving intravenous blood samples to having repeated pricking of the ear lobes.—W K LEE, professor of occupational medicine, Manchester.

