Pietri in front of the royal box as he led the 1908 Olympic marathon, and the photograph of his being helped across the finish line became a sports classic. Pictures of Jim Peters disorientated and confused from hyperthermia as he led the 1954 Vancouver marathon in weather conditions far too hot for such an event are also frequently shown, giving the impression that marathon running is inherently dangerous.

The reality is very different. The common medical risks of marathon running and training are not alarming and they can be prevented (p 1355). For women marathon training produces a small "risk" of amenorrhoea, but the commonest reason for withdrawal from the London marathon (for either sex) in the four months to date has been pregnancy. Most problems on the day are trivial: blisters, chafing from constant friction with fashionable nylon running shorts and vests, muscle cramps, and exhaustion make up the vast majority of "casualties" recorded at popular marathons.⁴ These are preventable to some extent by adequate training, correct shoes and clothing, and perhaps use of petroleum jelly on friction points. Musculoskeletal problems are common during training, and more than a third of these are knee injuries, which often become chronic.⁵ Accurate diagnosis of musculoskeletal problems is not possible in a "major disaster" setting with 1000 or more casualties at first aid stations at popular marathons, so that the actual incidence of fatigue fractures is not known, but fractures of the neck of the femur as well as the commoner "march fractures" may occur.

Constitutional problems are usually related to the weather and dehydration. Heat stroke may occur even in mild weather conditions, but hypothermia is commoner in Britain. Apart from advice on drinking frequently and wearing adequate clothing in cold weather, the prevention of real damage from hyperthermia probably requires education of the public not to encourage the dazed disorientated runner to carry on but to get him to first aid as soon as possible.

Major cardiac events are surprisingly uncommon, and the occasional death from heart disease is perhaps inevitable with the numbers of participants.⁶⁻⁸ Canadian experience of exercise testing has shown it to be of very limited cost benefit in mass screening of potential joggers. Such tests tend to give frequent false positive results in normal populations, and a better approach uses a preliminary health questionnaire to identify those at particularly high risk.⁹ The best form of prevention is better public knowledge of coronary disease and its symptoms. Inevitably occasional death in a marathon is given a great deal of press coverage⁸ but necropsy usually shows extensive coronary disease.^{10 11} Possibly we are all susceptible to the legend of Pheidippides, but over 96% of the 36 000 runners in the last two London marathons finished the course, and perhaps after a century this romantic legend will be laid to rest.

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The dynamic approach to residential care of the disabled

Disabled people, it is often said, should be able to choose how to live—just as the rest of us do; and indeed even the most severely handicapped can now be enabled to live in the community. But many disabled people have to be content with residential care because they cannot marshal the intensive support they would need at home. Others become too exhausted or incapable to organise themselves, and some just want the companionship of a group. The individual stories of those who succeed in the community show how much toughness is called for.¹

Improving the quality of life in residential settings and creating links with the community for those who all too easily feel outcasts is, then, important and was the theme of a recent seminar, held in London under the patronage of the European Community, on "The Dynamic Approach to the Residential Care of Disabled People in an Integrating Society." Among the more general topics discussed were choice and opportunity, flexibility, and independence and the need for more research and better dissemination of information.

The general requirements were well summarised by A Klapwijk from the Netherlands: making plans always in conjunction with the disabled people themselves, remembering that it is their life; offering a choice of living arrangements, and providing for privacy; making both medical and other services and social facilities readily available; and having a system of funding that makes for easy transfer from one type of accommodation to another. Choice means money among other things and, said several speakers, people should have the money to spend on the kind of care they want, in or out of the community. But there was the proviso that funds need to go directly to institutions as well as to individuals to provide a short term haven for emergencies and intermittent relief and facilities for repeated assessments and rehabilitation.

For residential care, as John Wedgwood emphasised, should no longer be thought of as a static or all or nothing affair. Long term care, short term or intermittent care, and outpatient or day care may coexist in a single unit or institution, giving a service that is both more economical and more appropriate²; one person may make use of all the types of care at different times. This kind of blurring of boundaries needs to be encouraged. The 300 Netherlands "nursing institutes" provide not only long term care but also day care for people who are independent or in special accommodation in the community and they admit those who become more incapacitated; there is also an invaluable facility for admission for limited periods—within hours in an emergency.

Dependence clearly is one of the most taxing problems of residential life—both physical dependence and the wider loss of autonomy.^{3,4} Independence at a modest level is the subject of a new research project at the Royal Hospital and Home for Incurables at Putney. After suitable nursing dependency scales for the severely disabled residents have been developed educational programmes for nursing and remedial staff will be worked out to encourage independence and to make the best use of the skills of the different staff. In general, experience there has shown that people should not be too precipitately labelled as irrevocably helpless.

In making a plea for more research, Philip Davies suggested that the clinical ideal of the randomised controlled trial puts many people off doing research studies on topics in rehabilitation, but it is not in any case appropriate. What is needed, he said, is observational research, to compare different models of care, facilities, and programmes, evaluating them in relation to the people they are for. As it is the patients themselves tend to get left out—but they can speak for themselves and their preferences and priorities should be studied, and so should those of their carers.

The theme of information was taken up by Richard Langton Hewer in his summing up—the scope for different patterns of care makes it essential to have well constructed basic data available for study and good scientific publications on the subject. More audit is needed, with defined criteria. We cannot be complacent, he said, while there are many disabled people who are not being looked after as well as possible. A salutary guideline was put forward by an earlier speaker: in providing personal care strive to give what you would want for yourself. Since spreading information about the best practices is so important, it was good to hear of the plan to set up a permanent European group to arrange meetings for discussing progress in residential care, to organise information centres, and to evaluate projects.

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Cardiopulmonary resuscitation: chances of success

External cardiac massage came into clinical use in 1960 and cardiopulmonary resuscitation is now routine both in the community and in hospitals.¹ Most of the evaluation has been on cardiac arrest out of hospital, however, with little being published on resuscitation of inpatients.^{2,3}

The outcome from resuscitation varies among reports, largely because the series are not comparable. Somewhere between 8.2%⁴ and 32.0%⁵ of patients resuscitated are likely to go home. The likelihood of survival depends on many

variables, the most important being the patient's fitness before the cardiac arrest; the underlying illness; the site of the arrest; its nature; the mechanism and duration of resuscitation; and the patient's condition after resuscitation. Patients who are housebound before the arrest are less likely to survive (4%) than those who had pursued activities outside the home (27%).⁵ Metabolic or respiratory acidosis before the arrest is rarely associated with survival,⁶ and this correlates with the underlying disease categories in which few patients survive—pneumonia, renal failure, acute stroke accompanied by a neurological deficit, and hypotension secondary to intrinsic myocardial failure or sepsis.⁵ Other workers have found no survivor in 25 patients who developed cardiac arrest from trauma or gastrointestinal haemorrhage.⁷

The location of the arrest within the hospital is important, patients resuscitated in the intensive therapy unit having a hospital discharge rate of 48% as opposed to 16% of those in the ward.⁸ Clearly, the success rate in the intensive therapy unit greatly depends on the type of patient admitted to the unit and the severity of the illness. Patients who do particularly well are those suffering from a recent myocardial infarction associated with sudden onset cardiac arrest in the absence of preceding hypotension or cardiac failure. Ventricular fibrillation is more likely to be associated with a successful outcome than asystole.⁴ Asystole, however, may be reversible when there is a rapidly correctable cause of hypoxia. An arrest which lasts over 15 minutes is associated with a mortality of over 90%,⁵ and this may well reflect the potential of the heart for recovery as opposed to the efficiency of resuscitation. If the patient needs intubation, again the mortality is high.⁵ In some centres, however, patients are electively intubated and ventilated when there is an unstable cardiac rhythm, when maintenance of an adequate arterial oxygen tension on spontaneous ventilation is unlikely, when the patient requires numerous procedures which would be stressful if he were conscious, or when resuscitation had been prolonged and cerebral oedema is a likely complication.⁹ Patients who regain consciousness within 15 minutes of the arrest and who do not require vasopressors to maintain adequate cardiac output have a survival rate of over 90%.⁵

Many patients who develop a cardiac arrest have had a recent myocardial infarction. In these patients ventricular fibrillation may not be preceded by warning arrhythmias¹⁰; indeed, warning arrhythmias are not reliable indicators of ventricular fibrillation.¹¹ The exceptions are malignant ventricular arrhythmias (three or more consecutive premature beats or R on T ventricular premature beats) occurring more than 48 hours after a myocardial infarction; these are predictive of ventricular fibrillation,¹¹ and their suppression reduces the incidence of early cardiac death.¹²

Both nursing and medical personnel should be aware of which of their patients are considered unsuitable for cardio-respiratory resuscitation, since doubts should not arise at the time of the arrest. The outcome of resuscitation appears to be related to the underlying disease and not to age.⁵ In critically ill patients factors which may precipitate an arrest must be corrected in the hope that it may be prevented. Factors of particular importance include electrolyte imbalance, hypotension with attendant inadequate cellular oxygenation, and respiratory failure associated with hypoxia with or without retention of carbon dioxide. Patients with such conditions should be assessed by a senior clinician, and where the underlying illness is potentially reversible but correction requires skilled supportive care arrangements should be made for the patient to be managed in an intensive therapy unit.