

CURRENT TOPICS

The ethics of cardiopulmonary resuscitation.

I. Background to decision making

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The ethics of cardiopulmonary resuscitation (CPR) have been closely studied in adults where there has been wide experience.¹⁻¹⁷ Children and babies have been less well studied.¹⁸⁻²⁶ Most successful CPR of adults occurs in primary cardiac arrest, whereas paediatric and neonatal cardiac arrests are usually secondary to disturbance in other systems, and the child's heart can often be revived long after the brain is irreparably dead. Is extrapolation from work on adults to medical practice with infants feasible or desirable?

'Everyone who dies suffers a cardiac arrest',¹⁶ the last stage in the process of dying.^{1 12} Prompt CPR from bystanders⁴ or professionals²⁵ may be beneficial for some, but in other cases may be futile,¹⁰ harmful,¹¹ and cruel.⁶ CPR frequently prolongs dying,^{5 6 11} and occasionally results in a persistent vegetative state as the heart is more tolerant than the brain of hypoxia.^{5 6} Indeed Youngner stated that 'CPR is so invasive and potentially damaging that it symbolises the worst excesses of medical technology'.¹² We have observed that CPR may be so distressing that parents frequently leave the room when their child is dying or being confirmed as dead by failed CPR.

Choices

Hospital death rates greatly exceed CPR rates,^{2 5} so choices are being made but paediatric statistics are not widely available.

The apparent choice between CPR and 'do not resuscitate' orders is a 'chance for life versus certain death',⁶ but the true choice may be between prolonged,^{5 11} 'multiple invasive, painful and dehumanising procedures'⁶ versus a dignified death in familiar surroundings and company, with adequate analgesia.

Those 'choosing' CPR may often be choosing something that does not exist—the chance for the patient to live.⁶ CPR has to be started immediately⁴ so any decisions must be prospective, but inappropriate use may be inevitable in many situations.^{1 5 11}

By using simple arithmetical formulas and clinical examples¹³ medical decision making has been analysed from the medical and economic viewpoint balancing the uncertainties of aggressive potentially life sustaining treatment and the greater certainties of supportive treatment. Paediatric and neonatal practice cannot escape choices resting on this balance between needs, outcomes, preferences, and resources. Further research is required regarding outcomes in

specific subgroups as well as consensus studies of informed preferences of these subpopulations.

Prediction in critically ill adults²⁷ has been very accurate regarding death and fairly accurate for 'awakening' after out of hospital cardiac arrest.²⁸ Predictions of death in very low birth-weight infants have also been studied and used in comparisons of medical performance.²⁹

Medical and surgical complications of CPR

All degrees of brain injury, cardiac complications (in particular heart failure, hypotension, and arrhythmias), thoracic and mediastinal injuries, bone marrow emboli, renal failure,³⁰ and gastric rupture³¹ are described in adults. Retinal haemorrhages are well recognised features of non-accidental injury (NAI) in children,³² yet they may be a consequence of CPR,^{33 34} though some claims have been doubted.³⁵

Inadvertent rib fractures may occur in successful CPR, but we have seen an infant whose parents alleged that old bruising and even older rib fractures were caused by their own resuscitation attempts which had not come to medical attention; most such fractures are due to NAI not CPR.³⁶ We have also seen oesophageal rupture due to NAI blamed on subsequent CPR: a potential for diagnostic and legal enigmas. Many paediatricians will have seen the consequence of pulmonary air leaks and pharyngeal or laryngeal trauma after CPR.

Risks of transmission of HIV

There is no evidence that contact with saliva,³⁷ or mouth-to-mouth resuscitation,³⁸⁻⁴⁰ has resulted in HIV infection; but most mouth-to-mouth resuscitation is given to familiars,³⁹ and 'zero numerator does not necessarily mean no risk'.⁴¹ HIV transmission by needlestick injury is well recognised.³⁹ There is an increased risk of HIV transmission in emergency departments⁴² and to health workers,^{43 44} but studies from San Francisco have not so far indicated a decline in bystander CPR or lay training.³⁹ The balance of probabilities in the case of an unknown victim favours the safety of CPR⁴⁰; this must particularly apply to bystander mouth-to-mouth resuscitation of children in the UK at present.

Brain resuscitation

The outcome of CPR is governed partly by the pre-existing status and partly by the effects of

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the arrest on the brain, ranging from death,³⁰ brain death,⁴⁵ persistent vegetative state,⁴⁶ handicapped survival,²⁵ or intact survival.³⁰

The aims of treatment are to provide rapid effective CPR, the control of brain swelling and fits, and the maintenance of normal homeostasis. Much neuronal injury and death occurs after circulation has been restored, so research into the use of calcium antagonists, phenytoin, prostacyclins, free radical antagonists, and amino acid antagonists is proceeding. Current views suggest that it is premature to incorporate these experimental measures into clinical practice.⁴⁷⁻⁵¹ Success with these drugs would tilt the balance towards CPR in the case of previously normal individuals who have suffered from delays in effective CPR.

The concept of futility

The concept of futility is well reviewed in adult practice.^{3 6 8 10-17} Providing CPR for a patient with absolutely no chance of success is clearly futile, but the concept can be extended to cases with a probability of survival greater than, though approaching, zero^{8 10 16} as it recognises the rarity of exact prediction^{6 10 11} and the counterbalancing medical costs to the patient.^{10 11 13} The concept involves investigation of, and respect for, achievable goals of the patient and family^{3 8 10 11 14} but excludes financial or resource considerations and choices between patients.¹⁰

Apart from medical judgments there are at least three other near imperatives involved in making decisions not to resuscitate: patient or family autonomy, legal and judicial opinion and local, temporal, or universal availability of scarce medical resources.

Medical futility versus patient autonomy

There are limits to a doctor's obligation to meet a patient's request for specific interventions and the risk of a 'slippery slope' of inappropriate requests. There needs to be 'a modicum of potential benefit as seen from the medical perspective'.⁵² Although Brett and McCullough did not specifically discuss CPR, their analysis and guidelines have become a benchmark for dealing with aspects of this problem in adult^{6 8 10 15 16 53} and paediatric practice.⁵⁴

Patients may suffer when autonomy overrides the medical judgments of the futility of CPR^{3 6 11} and these differences of opinion require further discussion to reconcile realistic goals of the doctor and patient or family, as there may be a trade off between quantity and quality of survival.⁵⁵

Patients and families who are offered treatment are not accustomed to turning it down and usually assume there must be benefit.^{6 11} Therefore futile CPR should not be provided as a 'high technology placebo' in hopeless cases,⁶ it should not even be offered,^{6 10 11} though there should be full discussions,^{3 12} which must be sensitive¹⁶ and realistic,¹⁴⁻¹⁶ so better forms of communication and management may be required.

There is a need for informed consent and

autonomy when true choices exist and an effective social dialogue to ensure a shared understanding of 'what counts as a reasonable chance for worthwhile benefit relative to an acceptable risk of harm'.¹⁰

Legal aspects

After the death of baby Jane Doe in Bloomington, Indiana in 1982, new legislation and bureaucracy was introduced in the USA to ensure that all newborns receive maximal life saving treatment except where there is irreversible coma, where death would merely be delayed, or where such treatment would be futile or inhumane. Baby Doe's parents, with the concurrence of her physicians, had refused consent for possibly life saving alimentary tract surgery on the grounds of handicap by Down's syndrome.

The legislation has been well reviewed from both the legal⁵⁶ and medical²¹ angles, with significant reservations about the effects and design of the laws, though no actual cases are quoted.

Withdrawal of CPR might diminish potential or actual extension to life, but should not inevitably be opposed by the courts or jeopardise the physician responsible for good well documented medical care and judgments,^{7 57} and this opinion was upheld in the case of baby L whose doctors refused in court to continue futile treatment with repeated CPR after profound acquired brain damage. Restraint may sometimes be advisable in the face of parental request to 'do everything possible'.⁵⁴

Conversely a Grand Jury indicted for manslaughter the parents of a child who died after they refused bowel surgery in favour of faith healing.⁵⁸

Consultant paediatrician, Leonard Arthur, was charged with, but acquitted of murder after prescribing dihydrocodeine before the death of a British baby with Down's syndrome.^{59 60} In another case the Court of Appeal ordered life saving surgery in 1981 after the parents had refused treatment for their baby with Down's syndrome.¹⁹

A doctor in Scotland in 1987 was accused of failure to provide CPR in the case of a neonate that he considered was not viable because of extreme prematurity.⁶¹ He was acquitted but admonished for poor communication.

In the case of a multiply handicapped ward of court, baby J, who had undergone repeated CPR, the Court of Appeal in 1990 ruled that 'the court is entitled in the best interests of the child to say that deliberate steps should not be taken artificially to prolong its miserable life span' and there should be no absolute rule 'to preserve life at all costs', but they should not set down 'an all-embracing test since the circumstances of these tragic cases are infinitely various' so that 'the issue in these cases is not a right to impose death but a right to choose a course of action which will fail to avert death'.⁶²

Scottish, English, and American law all differ, but British courts should make decisions in medical cases on the basis of medical evidence with the intent of supporting good medical practice. Unfortunately, bad legislation is more

often the consequence of difficult cases, pressure groups, and party politics.

Except where the infant is a ward of court, going to court ought to be the last resort, because courts are not the appropriate place to resolve the agonising problems that underlie the 'right to die' cases.⁵⁷ The clumsy involvement of the judiciary and legislature in 'distant ethics' of difficult paediatric and neonatal problems is due to the failure of paediatricians to grapple with 'close up ethics' of individual professional relationships with distraught parents.²³

The American Medical Association in April 1991 published guidelines regarding the use of do not resuscitate orders, but did not consider children or the role of parents.¹⁵ However, the Critical Care Society has recently spelled out its views on withdrawing life support in the critically ill, with particular reference to paediatric problems.¹⁴ They recognise parental pre-eminence in decision making with a commensurate role for the older child,²² but reject the full application of the baby Doe regulations as being ethically unjustified.

On 1 December 1991 the Patient Self Determination Act came in to force in the USA.⁶³⁻⁶⁵ This defines the status of, and requirement for, advance directives with regard to life sustaining therapies including CPR. Both concern⁶³ and cautious welcome⁶⁵ have been expressed, but the effects on paediatric practice may be marginal.

Where there is time, decisions regarding prolongation of dying should preferably be taken by senior doctors^{18 19 24 66} acting within the law after appropriate discussions and consultations in individual cases, rather than by the courts. Each decision must be documented and notified and communicated to any staff attending a cardiopulmonary arrest. It is unfortunate that the parliamentary health service commissioner has needed to become involved in the problem of CPR in hospital,^{67 68} which is essentially a medical response to medical indications.

Summary

Futile cardiopulmonary resuscitation (CPR) may prevent humane care of the dying child and deprive parents of the opportunity to express their love, grief, and dedication at a critical moment, while appropriate and successful CPR may restore intact their child. Attempted resuscitation of corpses or children with terminal illness indicates inadequate knowledge, discrimination, and decision making. CPR is a medical procedure applicable to certain medical problems; weighing up the risks and benefits in each individual case is a medical function that is constrained by the law and must take full note of patient and family preferences, but cannot be governed by them and should not be over-ruled by laws based on complex but different cases. Time limits on occasions may curtail the full process of consultation and decision making. Applications of skills and resources in the right time and place requires understanding of the medical logistics and study of the potential for good outcome.

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