



Issues On Care At The End Of Life

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CARDIOPULMONARY RESUSCITATION: FACTS AND FANTASY?

Medicine has made many advances in the care and treatment of disease over the last century. Technologies now exist to allow individuals to live much longer than their counterparts did just a few decades ago. Along with the new advances have come unexpected consequences from living longer. Our burgeoning elderly population must now face medical decisions which ultimately determine a choice between quality of life versus quantity of life. Some people wish to maximize the length of life “at all costs” and will utilize all modern technical advances to do so. Others choose a more *laissez faire* or natural approach to living and dying, hoping to maximize their quality of life by eschewing the unpleasant iatrogenic effects of some life prolonging therapies. With all of these advances in treatment options and the subsequent consequences of these technologies we are still behind in one area. The area of study and training of young physicians that has lagged behind is the development of the physicians’ skills which address communications about end-of-life (EOL) issues including negotiating goals of care and managing the dying process. Although everyone knows that death is inevitable, the use of modern medical technology and its effect on patients’ expectations almost suggests that death may be an option. The reasons for the aversion to EOL discussions are many, including overly optimistic

prognoses, discomfort of the physician with delivering information or misunderstanding by the patient about the short and long term effectiveness of a given intervention.

One important potentially life-prolonging intervention is cardiopulmonary resuscitation (CPR). Every critically ill elderly patient who must endure an ambulance ride to an emergency room must also endure early rapid fire questions to determine his wish to be resuscitated if his heart stops or fails. This is the do not resuscitate (DNR) question. Immediate care in urgent situations demands that health care personnel follow patient care wishes in a crisis which may lead to death. Although initial efforts at CPR are unlikely to “restart” the heart, its primary purpose is to maintain a flow of oxygenated blood to the brain and the heart, thereby delaying tissue death and extending the brief window of opportunity for a successful resuscitation without permanent brain damage. Defibrillation and advanced life support are usually required to restore normal and physiologic heart function. Currently in the United States a DNR or a do not intubate (DNI) order or designation is reserved for terminally ill patients or those of advanced age who prefer to die peacefully avoiding the often painful and burdensome effects which accompany CPR, intubation, and artificial ventilation. In far too many situations, patient preference is not known until after the CPR/intubation process has already occurred and these interventions are already in place. What may follow is the daunting task of withdrawing unwanted interventions which will then lead to death. Discussions with the patient and

family members by the primary care physician, leading to the creation of advance care documents, can prevent unwanted and painful attempts to restore life to someone who was, in fact, ready to die.

Procedure

A form of resuscitation was described over 2000 years ago in a Bible verse from The Book of Kings (II 4: 34) in which Elisha warms a dead boy’s body and places his mouth over his. The modern version of the procedure has been around for about 50 years. CPR is a combination of artificial blood circulation and of artificial respiration which is usually delivered with chest compressions and positive pressure breaths using mouth to mouth (MTM) ventilation. In March 2008 the American Heart Association (AHA) reversed its endorsement of chest compressions and respirations in CPR to supporting a compressions only method. This reversal was done as a result of mounting data that the compression only method has superior results (this procedure is sometimes referred to as cardiocerebral resuscitation). It is an emergency medical procedure used on victims of cardiac arrest, or less commonly, respiratory arrest. It can be performed in hospitals or out in the community by lay-people such as emergency response individuals. CPR is generally continued, in the presence of advanced life support, until the return of a pulse (termed ROSC—return of spontaneous circulation) or the person is declared dead.

The traditional Red Cross procedure is delivered by a universal compression-ventilation ratio of 30:2, which is recommended for all single rescuers of infants (less than one year old,) chil-

dren (one year to puberty,) and adults (puberty and above). The primary difference between the population groups is that the two-handed method is used for adults, while the one-handed method is used for children, and a two-finger (index and middle finger) method is used for infants. The AHA cardiocerebral method of resuscitation is simply the delivery of chest compressions at a rate of approximately 100 per minute without the MTM respirations. Current data supports the idea that continuous compression improves the movement of blood, perfusing the critical organs which are compromised when a single rescuer stops performing MTM respirations.

Outcomes

Many studies have quantified the effectiveness of CPR in different situations. Overall, the procedure has only a minimal to modest success rate, but, more importantly, select patient populations have a dismal prognosis. The three main populations usually studied are inpatient (Adult and Pediatrics),

outpatient and residents of skilled nursing facilities (SNF's). Current data show:

Inpatient: Survival rates for non-ICU hospitalized adults undergoing attempts at CPR were reported as 17.6% (Cooper & Cooper, 2008) and 10-36% (Wik et al., 2006) in two different studies. Survival rates of ICU adults are reported as 10-32% (Wik et al., 2006). Pediatric survival rates are similar to the adult non-ICU (24-29%) and ICU (23-30%) situations respectively (Wik, *ibid.*). Another study attempted to stratify the risk of survival by comparing the outcomes of witnessed versus un-witnessed inpatient cardiac arrests and reported an astounding 22% versus 1% survival rate.

Outpatient: Outpatient cardiac arrest has a poorer prognosis with three different studies reporting 3, 5 and 6.4% (Wik, *Ibid*, Stiell et al., 2004, and Cooper, *Ibid*) survival respectively.

Skilled Nursing Facilities: SNF's have the worst prognosis with a 2% survival rate for cardiac arrest for all comers. (Shah et al., 2006)

The data reported above is a floating average of all patients, but some of the studies divided the data into the different types of cardiac arrest: Ventricular fibrillation/ventricular tachycardia (VF/VT), pulse less electrical activity (PEA) and asystole (complete cessation of the heart beat.) There was a significantly worse prognosis for patients with asystole and PEA versus VF/VT for all the studies who reported stratified information. In general cardiac arrests which are un-witnessed and occur in outpatient settings or in SNF's all carry an extremely poor prognosis (1-6.4%). This is much lower than the commonly perceived view of CPR success rates. In fact, one study in the New England Journal of Medicine (NEJM) which measured CPR success rates in television hospital dramas reports a 75% success rate (Diem et al., 1996)!



Side Effects

While CPR is far from a perfect intervention, it is certainly better than doing nothing when death is almost inevitable. However, the procedure is not without serious side effects which present a hazard when using such a technique. The most common consequence is fractured ribs, which have been reported in as many as 90% of victims undergoing CPR. Other side effects

include fractured sternum, bruising, and perforation of the lung. More importantly, when CPR has been initiated late, continued too long, or performed ineffectively, devastating brain damage can occur. This can leave patients who survive in a coma or persistent vegetative state, at worst, and brain damage with significant disability at best. These very poor survival statistics, as well as the potential for life-altering brain damage among those who do survive, means that patients with life threatening conditions and those who are elderly and reaching the end of their natural life should create advance directives or have clear conversations with their loved ones and doctors. These discussions should indicate their preferences for CPR and artificial life support well in advance of a time when sudden death may occur. The Latin phrase *Primum non nocere* (First do no harm) becomes paramount when considering CPR for critically ill patients.

Implications

When CPR is successful there is no question about its utility. When a patient is in the 2% survival category from a nursing home, she may (or may not) be glad she was resuscitated. That population must also then recognize that 98% of the time they will not survive a resuscitation attempt. The question of when to use CPR thus becomes more complicated. Everyone will die at some point and most Americans have difficulty talking about and making EOL decisions which may result in someone dying sooner rather than later. The bottom line is that most people want to live. Therefore, although many families and individual patients may have no problem intervening in and postponing the dying process by adding life extending therapies such as CPR or different forms of artificial life support such as tube feedings. On the other hand, many have great difficulty in withholding or withdrawing the same support. Many [Continued on page 37]



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Specialty: Oncology

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times we have heard, "I want my mom to die a natural death," but then they follow with a directive to continue artificial life support. Also, they might say, "I am not going to play God and cannot withdraw life support." Yet, even worse, they might say, "I will not be responsible for letting my father die. It would be killing him." How can we assist our patients in these difficult settings?

First, we must portray the dying process as a normal and expected part of living, one that takes an unpredictable length of time. Next, we are quick to add life prolonging therapies, and we rarely view these as performing or intervening in God's work. But when it is time to withdraw them, there is much angst. Individuals die of the "terminal illness," not the withholding

or withdrawing of life support. Withdrawing these therapies allows the dying process of the terminal disease to proceed on its natural timetable. Finally, artificial life support was intended to provide a bridge from sickness to health, not provide continuous life support for dying indefinitely. While these therapies can prolong life, they can also prolong suffering and prolong the dying process.

When a person is confronted with a life-threatening diagnosis, careful consideration must be given to each and every intervention that follows, attending to the potential benefits as well as the possible burdens of each treatment, including CPR. The ultimate question then becomes, "How do I want to die?" Discussions about CPR and DNR are meant to address

these issues at the EOL, and it can't be left to simple yes/no questions which have too little substance. Thoughtful and sensitive discussions regarding the prognoses of the current illness, as well as the probable outcomes of an attempt at CPR from an evidence-based perspective must be held in a timely fashion. Although we can always hope for the best of outcomes in dire situations, being prepared for the worst is a wise counterbalance. §

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