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How long is long enough, and have we done everything we should?—Ethics of calling codes

Primi-Ashley Ranola[1], **Raina M Merchant**[2], **Sarah M Perman**[3], **Abigail M Khan**[4], **David Gaieski**[2], **Arthur L Caplan**[5], and **James N Kirkpatrick**[6]

[1]Medical Humanities & Bioethics, Northwestern University Feinberg School of Medicine, Chicago, USA

[2]Department of Emergency of Medicine, University of Pennsylvania, Philadelphia, USA

[3]Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, USA

[4]Cardiology Division, University of Pennsylvania, Philadelphia, USA

[5]Division of Medical Ethics, New York Univerity Langone Medical Center, New York, USA

[6]Cardiovascular Medicine Division, Department of Medical Ethics and Health Policy, University of Pennsylvania, Philadelphia, USA

Abstract

‘Calling’ a code can be an ambiguous undertaking. Despite guidelines and the medical literature outlining when it is acceptable to stop resuscitation, code cessation and deciding what not to do during a code, in practice, is an art form. Familiarity with classic evidence suggesting most codes are unsuccessful may influence decisions about when to terminate resuscitative efforts, in effect enacting self-fulfilling prophesies. Code interventions and duration may be influenced by patient demographics, gender or a concern about the stewardship of scarce resources. Yet, recent evidence links longer code duration with improved outcomes, and advances in resuscitation techniques complicate attempts to standardise both resuscitation length and the application of advanced interventions. In this context of increasing clinical and moral uncertainty, discussions between patients, families and medical providers about resuscitation plans take on an increased degree of importance. For some patients, a ‘bespoke’ resuscitation plan may be in order.

INTRODUCTION

The duration for resuscitative efforts on patients with cardiopulmonary arrest involves considerable uncertainty. The ethics of resuscitation often centre on discussions about whether or not to initiate cardiopulmonary resuscitation (CPR).[1-4] Once CPR is begun, however, there are other ethical dilemmas. The process is highly subjective and may be prone to bias.

Correspondence to Dr James N Kirkpatrick, Cardiovascular Medicine Division, Department of Medical Ethics and Health Policy, 3400 Spruce St., HUP 9021 Gates, Philadelphia, PA 19104, USA; james.kirkpatrick@uphs.upenn.edu.

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In this paper, we will illustrate the need for new paradigms in resuscitation by showing the current limitations of code duration practice. In doing so, we will address recent studies demonstrating improved outcomes with longer resuscitation times, new technologies that have changed the field of resuscitation, and the potential for bias in deciding when to 'call' a code. We will then discuss a different framework for making decisions about resuscitation that applies the concepts of advanced care planning.

THE PRACTICE OF 'CALLING THE CODE'

A decision to terminate a code may constitute a self-fulfilling prophecy. Many medical providers are aware of data showing that, even in resuscitation efforts performed in a medical setting, around 85% of patients who receive CPR do not leave the hospital alive.[5, 6] What they often do not know is which patients those are. The well-known Lazarus phenomenon, by which apparent autoresuscitation occurs <10 min after the cessation of CPR and declaration of death, is a rare event, but it illustrates the difficulty in correctly declaring resuscitative efforts futile.[7]

It has been recommended that, for out-of-hospital cardiac arrest (OHCA), cessation of CPR in adults should follow system-specific criteria under direct medical control. There is limited clinical data to guide this decision in neonatal and paediatric OHCA and in-hospital cardiac arrest.[8] A large study recently demonstrated that performing CPR for longer periods of time increases chance of survival in adults in hospital settings and contradicts the widely believed notion that CPR is useless after 10–20 min.[4] In this study, patients who survived prolonged CPR had similar neurological outcomes compared with those who survived after shorter CPR duration, an important factor in light of the concern that 'successful' CPR, defined narrowly as return of spontaneous circulation (ROSC), may condemn a patient to a life with severe neurological damage.[9]

The myriad factors that could, theoretically, help guide decisions about termination of resuscitation are often difficult to apply in the clinical setting. Especially in OHCA, variables such as collapse-to-treatment intervals are important but difficult for bystanders to estimate accurately. Use of presenting rhythm is controversial, since it can be derived from unreliable sources such as field monitors, which may not record adequate rhythm strips. Markers, such as troponin, though sensitive indicators of the amount of cardiac damage, take hours to peak and, therefore, are not clinically useful for prognosticating in the arrest setting.

Additionally, perceptions about the potential success of codes may be influenced by patient social status, provider experiences, fear of litigation or concerns about prudent stewardship of scarce resources. It is unclear to what extent a 'gestalt' about a patient's chances (based on how the patient looks to the resuscitation team leader and which of these factors are integrated, even at the unconscious level) plays a role in ending CPR. The potential for unconscious bias based on socioeconomic and demographic factors also raises concerns about the application of minimum standards for resuscitation. Medical providers may be more likely to extend resuscitative efforts for a patient with a well-connected, medically savvy family, as opposed to a homeless, drug-addicted patient without friends and family at the bedside. Questions of fairness pertain to patient socioeconomic status and also to age and

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infirmity: do those who are younger and show more vigour get coded for longer periods of time? Are older, frail patients coded for a shorter length of time? Consider the choice to stop resuscitating an 85-year-old with metastatic cancer versus a 20-year-old with metastatic cancer.

Moreover, even in the hospital setting, resuscitation teams may be meeting the patient for the first time during CPR. This lack of knowledge of the patient's wishes, comorbidities and baseline function/health status can diminish code length decision-making capabilities and fails to integrate important patient-specific factors and, therefore, cannot make CPR 'patient-centred.'[10] Those who have OHCA are relying on responders who are even less likely to know anything about the patient.

In an emergency, individuals with little background information about the patient are unable to properly consider an over-riding, crucial issue: will resuscitation prolong an irreversible clinical state of unnecessary suffering, leading to the consumption of scarce medical resources and exacerbation of intolerable functional and cognitive disabilities? Or will it return a patient to an acceptable quality of life?[11] These decisions are better made once a patient has been stabilised (if possible), when patient goals and values (often expressed by a surrogate decision maker) and clinical trajectory can inform decisions about withholding and withdrawing therapies.

EMERGING RESUSCITATION TECHNIQUES CLOUD AN ALREADY MURKY PICTURE

Emerging technologies promise to cloud the ethical picture by improving resuscitative outcomes. Therapeutic hypothermia (TH) is becoming a standard tool of resuscitation, even cited by the American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.[811-12] It has long been known that environmental hypothermia, when present at the time of cardiac arrest, enhances the chances of recovery without neurological damage. These observations led to studies validating the use of TH in comatose postarrest patients. Interestingly, patients with good outcomes in these studies demonstrate a mean code duration time of 25 min to achieve ROSC. TH has provided significant improvements in neurological outcomes for survivors of cardiac arrest. Nonetheless, a study by Perman et al found that poor prognosis was documented prematurely, during the cooling or rewarming phases of TH or within 15 h after rewarming, in more than half of 58 patients. While small numbers in this study precluded finding a statistically significant difference, and important clinical factors were not matched between groups, it is remarkable to note that 20/28 patients with early documentation of poor prognosis died, with seven who had life-sustaining care withdrawn within 72 h of arrest. Of the 21 patients who did not have early documentation of poor prognosis, 14 survived with good neurological status.[13] Whether early documentation of poor prognosis was simply accurate or led to inappropriate withdrawal of life-sustaining measures (early after arrest or otherwise), cannot be determined.

The use of emergency cardiopulmonary bypass (ECPB) is increasing for patients who suffer a cardiac arrest and do not achieve ROSC.[14] ECPB employs a 'heart-lung' machine to

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support the circulatory and respiratory functions until recovery or an intervention which stabilises the patient. Blood is withdrawn from a large cannula in a vein, enters an external device, which then pumps the blood through another cannula into a large artery. These devices can be attached to oxygenators which function as external lungs. Rapid transport to a cardiac centre and the use of ECPB has been advocated in sustained cardiorespiratory arrest.[8] This intervention may change the standard paradigm for code duration since it represents an option for salvaging patients who do not respond to traditional CPR.[15]

In light of these technologies, code length decisions become even more complicated. Is it inappropriate to define 20 min of advance cardiac life support (ACLS) as ‘everything we could’ when ECPB could have been done? Should newer resuscitation techniques change the perception of chances of success, translating into longer codes, especially for certain groups of individuals (ie, younger patients, patients who might become organ donors, patients from high socioeconomic strata, etc.)?

ADVANCE CPR PLANNING

Currently, advance care planning pertaining to resuscitation revolves around the decision whether to perform CPR, but it is time to include a discussion of when to stop and what to do in the meantime. It may be argued that specific code durations reflect presumed patient values, in that patients would only want short durations of resuscitation attempts, anyway. We contend that such decisions should be informed by discussions with patients, not just assumptions about patient values. Certainly, minimum standards for duration of resuscitation may eventually be replaced by analysis of data from trials and observational databases incorporating newer resuscitation techniques, but ambiguities, and of course, potential for biases are likely to persist.

With increasing complexity of resuscitation outcomes and techniques, CPR is no longer a ‘one size fits all.’ A discussion of resuscitation specifics (including duration) in light of overall patient goals, values and expectation of efficacy, should accompany discussions about do not resuscitate (DNR) status. Incorporating resuscitation specifics in advance directives, out of hospital life-sustaining treatment forms or scripted DNR discussions should not consist of a ‘laundry list of choices’ presented to patients. Rather, the inclusion of resuscitative measures in advance care planning should consist of clinicians eliciting patient values and goals and recommending a tailed resuscitation plan. Certain patients may not want prolonged ‘heroic measures’, but would be accepting of a single shock to attempt to restore rhythm. A patient who feels strongly that ending up in a persistent vegetative state would constitute a ‘fate worse than death’ might still receive CPR, but the duration of code might be limited to 20 min and would not involve ECPB. Other patients might gladly welcome ECPB to allow them to become organ donors.

Such plans should not include measures that make no physiological sense (eg, shocking a non-shockable rhythm, such as asystole) or are otherwise highly unlikely to achieve desired outcomes (in terms of survival or acceptable quality of life). Furthermore, resuscitative measures which may have temporary physiological effect but little chance of long-term benefit may be discussed and discarded without being formally offered.[16] Examples include

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ECPB in a patient with end-stage heart failure and metastatic cancer who is not a candidate for cardiac transplantation or permanent mechanical circulatory support.

FUTILITY

Ideas about what constitutes a futile resuscitative intervention are a crucial component in this decision making. In the poetic words of Edmund Pellegrino, 'The common sense notion that a time does come for all of us when death or disability exceeds our medical powers cannot be denied. This means that some operative way of making a decision when 'enough is enough' is necessary. It is a mark of our mortality that we shall die. For each of us some determination of futility by any other name will become a reality.'[17] Of course, futile interventions lead to outcomes other than death. Treatments may be considered futile if the patient remains in a permanent vegetative state (biologically surviving without consciousness), the patient cannot survive outside of an intensive care unit (completely preoccupied with treatment and can achieve no other life goals) or if the patient suffers negative consequences (such as unintended neurological damage) of 'successful' CPR. Some commentators acknowledge that there is also an even more subjective aspect to medical futility, which can be traced to Platonic–Asclepian thought, 'For those whose lives were always in a state of inner sickness Asclepius did not attempt to prescribe a regimen to make their life a prolonged misery….A life of preoccupation with illness and neglect of work is not worth living.'[18] Modern physicians may argue that this definition applies to many patients seen on a regular basis in the medical system, including patients living with chronic debilitating disease, moving from appointment to appointment, or in and out of the hospital.[19]

In order to help guide decisions about resuscitative measures and in light of the consequences of premature code termination, the degree of certainty about futility should be higher than usual for therapeutic interventions and ideally akin to tests for death. However, the perfect 'futility-meter' in cardiopulmonary arrest does not exist, leaving room for gestalt in decisions about the length of resuscitative interventions. This ambiguity is a reality to be acknowledged openly. Patients and families may define futility very differently than medical providers. Therefore, the ways in which medical providers, patients and families define and determine and discuss the futility of resuscitation requires further study. For instance, it has been suggested that medical futility policies might be used to avoid discussing end-of-life issues with patients, to disguise issues of rationing or to avoid resuscitation.[20]

PRACTICAL CONSIDERATIONS

The respect for autonomy is an important goal, but we must ensure that patients have adequate assistance in the form of information, perspective and advice from experienced clinicians who participate with them in shared decision making.[21] Patients and surrogates would learn more about resuscitation in the process. Some, perhaps most, patients may not care for details, but this is an assumption we should not make for all patients. Without not downplaying the inevitability of death and potential downsides of a resuscitation attempt, we should institute more transparent discussion of resuscitative measures in light of patient

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values, incorporating code termination and withholding and withdrawing of resuscitative interventions into advance directives.

Since not all patients have executed advance directives, it may be that a relatively small number of patients take the opportunity to discuss code duration and other aspects of resuscitation during advance care planning. It is common practice, however, for practitioners to establish 'code status' for patients or surrogate decision makers upon admission to the hospital. These discussions could consider a broader picture of resuscitation, not just the 'full code or DNR' that is so often misinterpreted and miscommunicated.[20] Admittedly, such an approach runs the risk of confusing some patients (and clinicians), as 'yes/no' is much easier to understand. Communicating the specifics of the resuscitation plan would be of paramount importance and would remain challenging, even in the era of electronic medical records. The plan would have to be passed along to covering providers in the same way that other patient-care plans are described. It remains to be seen whether code teams could receive, interpret and implement such plans under the duress of a code situation. Outpatients would require communication of plans through out-of-hospital life-sustaining treatment order sets.[21] Several states have authorised these orders, but the evidence of their adoption and efficacy is mixed, even without the added complexity of a resuscitation plan.[2223]

Nevertheless, a tailored approach to resuscitation, with a clear recommendation from the provider, based on both the clinical picture and what can be gleaned of the patient's values, would likely both support autonomous decision making and avoid at least some unnecessary and irrational resuscitative measures when a patient defaults to 'full code'.[2425] Advances in resuscitation technology suggest that the traditional view of what should be done during codes and when codes should end, is becoming more ambiguous. It is time to adopt where possible, a more nuanced and transparent approach to running and 'calling' codes.

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