Rethinking resuscitation: moving the goals
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ABSTRACT
Cardiopulmonary resuscitation (CPR) techniques have developed remarkably since first described. CPR is now both a default treatment and a public expectation. However, anticipated outcomes are not matched by reality. The differences between in- and out-of-hospital cardiac arrests are often not recognised and almost never taught. ‘Do Not Resuscitate’ orders developed to provide the ability to opt-out of this treatment. Nevertheless, CPR is still inappropriately used in settings where reversibility and likelihood of benefit are not meaningfully considered or discussed with the patient. Further, treatment escalation is a continuum, so resuscitation orders present a false dichotomy of ‘do’ or ‘do not’ resuscitate. Asking patients about their goals, and only offering treatments aligned with those goals, allows consideration of the burden of treatment and the likelihood of success. Shared decision models improve communication and patient autonomy. Tools are available to help clinicians with the difficult conversation and document the outcomes. Now, in both our training and practice, it is time to move beyond the stark and often irrelevant choice between CPR and ‘Not for Resuscitation’.

Mouth-to-mouth resuscitation of the victims of drowning was first performed in Paris in the 1700s. It was another 250 years until a group led by surgeon James Jude first described closed chest cardiopulmonary resuscitation (CPR), ostensibly as a treatment for the effects of excessive anaesthetic induction agents. Their technique replaced the previous method (an emergency sternotomy). Internal cardiac massage ensued until defibrillation or time did—or more often did not—restore spontaneous cardiac output. Modern CPR, a much less invasive closed chest technique, was born in a case series describing the technique in twenty patients and reporting 70% survival. That paper ends with an appropriately optimistic assessment: “Anyone, anywhere can now initiate cardiac resuscitative procedures. All that is needed are two hands.”

Outcome of arrests in a modern healthcare setting
Fast forward 50 years and CPR has become a standard of care. Indeed, it is one of few medical interventions provided by default, regardless of likely success or underlying condition, and without consent. If you are an in-patient in a New Zealand hospital and suffer a cardiac arrest, staff will perform CPR, unless you have formerly opted out.

In-hospital CPR is generally an ineffective intervention. A recent US review reported in-hospital arrest mortality at 80%—without CPR, it is 100%. This difference is small but important. We presume a small survival benefit is the reason CPR became a de facto treatment for all. However, in doing so, at least in a hospital setting, an important consideration has been overlooked. CPR does not treat most conditions leading to in-hospital arrest: for example, metastatic cancer, end-stage chronic obstructive pulmonary disease, worsening multi-organ failure from sepsis or extreme frailty. To put it simply, CPR works best when the heart is the first, not the last, organ to stop.

Further, outcomes should not just be considered through the binary lens of survival. A recent Australian study has shown that, of the minority who survive in-hospital cardiac arrest, nearly a third can expect a reduced level of function, and some will become fully dependent. Not surprisingly, survival diminishes as age increases, and most elderly survivors subsequently require institutional care. Longer hospital admission duration prior to in-patient arrest is also associated with worse patient outcomes. These outcomes are despite...
cardiac arrests being directly witnessed in over three out of four in-hospital arrests.\textsuperscript{4}

**In-hospital versus out-of-hospital cardiac arrests**

The aetiology and outcomes of in-hospital and out-of-hospital cardiac arrests (IHCAs, OHCAs, respectively) vary markedly. Yet the management of both is taught as if they were the same.

The largest published review of IHCAs describes 81\% of presenting rhythms as non-shockable (asystole or pulseless electrical activity) compared to 61\% of OHCAs in New Zealand in 2020.\textsuperscript{2,5} There is also significant extrapolation of evidence-based guidelines from OHCAs to IHCAs. A systematic review of 92 randomised clinical cardiac arrest trials involving at least 50 patients between 1995 to 2014 only included four studies exclusively involving in-patient arrests.\textsuperscript{2}

**The ‘Do Not Resuscitate’ dilemma**

We now find ourselves in an uncomfortable situation. A treatment that is futile in most situations, and arguably harmful in others, has become an expected standard of care. We continue to extrapolate, in both evidence and practice, from an out-of-hospital to an in-hospital setting, despite material differences in these cohorts.

Negotiating this dilemma is further complicated by the large gap between public perceptions of the success of CPR (often informed by television medical dramas and selective media reporting of success) and the actual reality of poor outcomes.\textsuperscript{6}

Efforts to communicate and document when cardiopulmonary resuscitation is not appropriate have evolved since the 1970s. ‘Do Not Resuscitate’ (DNR) or ‘Not for CPR’ orders in turn became ‘Do Not Attempt CPR’. Subsequent terminology (‘Allow a Natural Death’) changed the language to reflect futility and that intervention may be unnatural. Whatever words are used, it is clear that we struggle with our own and public expectations and the difficulty of discussing futility. This has been especially true when decisions have been made without patients or their whānau being involved. Ostensibly this is no different to not offering other futile therapies; emotionally, this difference is significant.

Further, despite the development of DNR or equivalent orders, their coverage in New Zealand is poor, even among patients where futility is strongly supported by evidence.

In a study of elderly patients within an older adult rehabilitation ward (with a mean age 87 years, and half of whom were clinically frail), CPR forms were completed for 63\%, with one third of these (12 patients) for ‘full CPR’. Only one patient had had this discussed with them.\textsuperscript{6} A subsequent review by the same authors two years later showed that electronic documentation of CPR status had improved recording of a decision to 81\% of patients; however, only 38\% of these documented any communication with the patient or their whānau about the decision.\textsuperscript{8}

An audit of community-acquired pneumonia in a New Zealand hospital found resuscitation decisions were only documented in a minority of cases, even among those at the highest risk of subsequent mortality.\textsuperscript{10}

A study in a single tertiary New Zealand hospital of 71 ward patients who had deteriorated acutely, to the point they required urgent review by a medical emergency team (MET), showed documentation of treatment limitation doubled from 32\% to 62\% after deterioration.\textsuperscript{11} Although this may reflect new irreversible decline for which further escalation would be futile, it also likely includes a significant number of patients for whom futility had either not been recognised, documented or discussed by the admitting team.

This poor coverage of DNR orders undermines two reasons that DNR orders were created to support: patient autonomy and harm caused by default provision of futile treatment.

**Time for a more nuanced approach?**

The current false dichotomy of ‘do’ or ‘do not’ resuscitate—even when this is documented—fails patients and clinical staff in several ways. Firstly, by giving such prominence to an end-stage and often fatal event,
such orders often detract from the actual treatments that may or may not still be indicated, each with their own risks and benefits. Secondly, a recommendation, or even suggestion, to not resuscitate may be perceived by patients and their family as a lack of commitment to other (more appropriate) treatments, straining trust at a time of critical vulnerability for the patient. Most importantly, traditional ‘resuscitation decisions’ invariably happen the wrong way round. They offer a treatment before a diagnosis and convey intention on the clinician’s part before gaining an understanding of the patient and their priorities. They make us talk first and listen later.

In part to address these issues, a study of the significant variability in systems used by New Zealand public hospitals to detect deterioration in hospital patients led the Health Quality and Safety Commission (HQSC) to fund a five-year national patient deterioration programme.\textsuperscript{12,13} Part of this programme for adult in-patients, perhaps most importantly, was the Shared Goals of Care (SGOC) initiative. This national quality improvement initiative was designed to listen to and talk with patients about their treatment expectations, with the intent of reducing unwanted or unwarranted treatment provided at the end of life. Workshops with clinicians, consumers and healthcare organisations were held in early 2018 to develop a series of key principles. These led to development and testing of a single A4 double-sided form to enable conversations and clear documentation of decisions.\textsuperscript{14}

A SGOC approach to treatment planning addresses several of the shortcomings of DNR. It enforces a partnership between clinician and patient to improve informed, shared decision-making. Rather than a clinician making assumptions about patient preferences and providing options accordingly, the process begins with a discussion around the patient’s goals. These are framed by establishing what the patient would accept, both in terms of outcomes and the treatment burden required to realistically achieve them. Rather than ‘do’ or ‘do not’ resuscitate, treatment options are determined in the context of aligning with one of four goals. Each goal with its corresponding intent is shown in Table 1.

Table 1: Summary of the four categories within the Shared Goals of Care approach.

| Goal A | Treatment is curative or restorative. CPR is both clinically recommended and in accordance with the patient’s wishes. Any adverse sequelae would be acceptable to the patient. |
| Goal B | Treatment is curative or restorative but also aims to prolong life and enhance quality. CPR should not be attempted as it is unlikely to be successful if required, or because if it is likely to be successful, it would cause more harm than benefit, or because it is not wanted by the patient under any circumstance. |
| Goal C | Treatment is aimed primarily at improving quality of life rather than prolongation at all costs. This involves controlling symptoms, enhancing wellbeing and providing treatments that are easily tolerated. CPR should not be attempted. |
| Goal D | The provision of comfort while dying. Treatment aims to alleviate suffering in the last hours or days of life and allow a natural death to proceed, which will not be achieved by CPR or MET review of escalation to intensive care. |
Discussing goals of care

Talking to patients about not doing things is difficult. But avoiding these conversations leads either to futile escalation where ‘everything’ is done (it is easier to do so than to talk about not doing so), or treatment limitations are placed by clinicians without discussion with patients, whānau or families.

The Shared Goals of Care approach gives an alternative. Rather than discussing what we will not do, it frames conversations by what we will do to reasonably meet a patient’s goals.

In further recognition of this difficulty, the Serious Illness Conversation Guide was developed in the US and adapted for use in New Zealand with Māori and consumer consultation. This simple, structured communication tool, along with an associated training programme supported by most district health boards, better equips clinicians to have difficult but meaningful conversations.

This tool has subsequently been used in the Bay of Plenty, New Zealand, to improve shared decision-making with complex patients where the risks versus benefits of surgery were not immediately clear. Patients and their families or whānau were invited to attend a pre-assessment clinic with specialists in anaesthesia and intensive care. Using the structure of the Serious Illness Conversation Guide, supplemented with risk scoring tools (including the clinical frailty scale), enabled goals-of-care conversations. Over eighteen months, 49 high-risk patients were referred from a variety of surgical specialties. Once surgery was contextualised within the likelihood of achieving the patient’s goals, over half (53%) chose non-operative management of their condition.

Rethinking resuscitation training

This raises a pertinent question: how do we train doctors to negotiate this complexity of care, over and above learning the technical aspects and algorithms of CPR?

Currently, all junior medical staff must acquire certification for advanced cardiac life support by the end of their first post-graduate year in order to gain Medical Council of New Zealand registration. The New Zealand Resuscitation Council’s 14 guidelines, each with up to 11 subsections, contain less than 400 words on ‘Do Not Attempt Resuscitation’; by comparison, there are over 1,400 on ‘Duty to Rescue’. There is no recognition of the differences between OHCA and IHCA and the implications this may have for resuscitation.

Junior doctors must be trained in CPR to gain registration, yet they receive no training—and certainly not mandatory training—in the risks of this procedure or in how to ‘consent’ a patient for the procedure. The Medical Council’s policy on consent requires doctors to “communicate and work with the patient to help them make the best decision for themselves.” The Health & Disability Commissioner’s Code of Rights includes patients’ rights to effective communication, to be fully informed and to make an informed choice and give informed consent. These requirements from both national organisations have never been part of resuscitation certification in New Zealand.

The authors believe current resuscitation training requires some rethinking. Advanced cardiac resuscitation skills are absolutely required by community responders and in emergency departments, intensive care units, coronary care units and catheter labs. But junior doctors must also be taught to determine when these skills are not indicated and when they are likely to fail, alongside the skills themselves. Further, rather than teaching skills that are required when the patient has already arrested, training needs to be provided around the earlier detection of, and management for, deteriorating patients.

Perhaps most importantly, clinicians need the skills to talk about not doing any of these things. This could improve access to resources for those patients who would be most likely to benefit and save other patients from poor outcomes they wish not to live with. Replacing binary resuscitation orders with a Shared Goals of Care approach recognises the continuum of modern healthcare treatment. But most importantly it puts the patient at the centre of decisions that may have been previously made about them without them.
Competing interests:
Nil.

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