



Contents lists available at ScienceDirect

## International Emergency Nursing

journal homepage: [www.elsevier.com/locate/aaen](http://www.elsevier.com/locate/aaen)

## Grey areas: New Zealand ambulance personnel's experiences of challenging resuscitation decision-making

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### ARTICLE INFO

#### Article history:

Received 22 May 2017

Received in revised form 30 July 2017

Accepted 4 August 2017

Available online xxx

#### Keywords:

Cardiac arrest

Emergency medical services

Cardiopulmonary resuscitation

Clinical decision-making

Paramedics

Prehospital care

Qualitative research

Interpretative phenomenological analysis

### ABSTRACT

**Introduction:** When faced with a patient in cardiac arrest, ambulance personnel must rapidly make complex decisions with limited information. Much of the research examining decisions to commence, continue, withhold or terminate resuscitation has used retrospective audits of registry data and clinical documentation. This study offers a provider-perspective which characterises uncertainty and highlights clinical, cognitive, emotional and physical demands associated with decision-making in the cardiac arrest context.

**Method:** Semi-structured interviews with a purposive sample of sixteen demographically diverse ambulance personnel, currently employed in a variety of emergency ambulance response roles across New Zealand.

**Results:** All participants readily identified clinical, cognitive, emotional and ethical challenges associated with resuscitation decision-making. Four main themes were identified: grey areas; exceptional cases; scene challenges; and personal responses. A lack of information or a mix of favourable and unfavourable prognostic factors created decision-making uncertainty or "grey areas". Exceptional cases such as first-encounters also increased uncertainty and presented emotional, ethical and clinical challenges. Cardiac arrest scenes were often challenging, and participants described managing bystander expectations and responses and logistical limitations including adverse environmental conditions, fatigue and task-overload, and crew resource management.

**Conclusion:** This unique research presents a provider-perspective on the challenges faced by ambulance personnel deciding to commence, continue, withhold or terminate resuscitation efforts. Knowledge of personal values and strategies for managing personal responses appear to be central to certainty and coping. Simulated training should move beyond resuscitation task performance, to incorporate challenging elements and encourage ambulance personnel to explore their personal values, stressors and coping strategies.

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### 1. Introduction

For the majority of out of hospital cardiac arrest patients, the event heralds imminent death [1]. For those with a reversible cause, prompt initiation of the aptly-named chain of survival is vital, as delays reduce the odds of return of circulation, and increase subsequent morbidity and mortality [2]. Emergency ambulance staff attending cardiac arrests are often expected to make rapid judgements in demanding circumstances, with limited available information [3]. With increasingly aged and comorbid populations, initiation of resuscitation or prolonged resuscitation efforts may not be appropriate for all patients found in cardiac

arrest in the community [4,5]. In recognition of the limitations of resuscitation, select emergency ambulance providers in many countries are authorised to commence, continue, withhold or terminate resuscitation in accordance with local guidelines [6,7]. Evidence-based rules for termination of resuscitation have been developed and implemented [6,8], but intra-arrest prognostication can be fraught with uncertainty and there is a lack of international consensus [5,9,10].

Resuscitation decision-making research designs commonly involve retrospective analysis of cardiac registry data and clinical records, and although this has significant utility in associating arrest variables with patient outcomes, it may not capture the complex and idiosyncratic experience of resuscitation decision-makers [11]. The purpose of this study was to identify the clinical, ethical, cognitive and emotional challenges that emergency ambulance personnel experience when making decisions to commence,

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continue, withhold or terminate resuscitation. Identifying challenges encountered by emergency ambulance personnel called to patients in cardiac arrest has important implications for guideline development and the preparation and support of ambulance personnel.

### 1.1. Research setting

In New Zealand, cardiac arrests in the community are usually attended by ambulance personnel with varying levels of qualification and skill authorisation. Intensive Care Paramedics are the definitive prehospital resuscitation providers attending most community cardiac arrests, although basic life support ‘co-responders’ – often the New Zealand Fire Service – are commonly first on scene. Medical advisors can be consulted by phone, but doctors rarely attend emergency callouts [7,12].

## 2. Method

### 2.1. Recruitment and data collection

A purposive quota sample of ambulance personnel currently employed in emergency clinical roles across New Zealand, was recruited via an email-advertisement sent-out by St John New Zealand. All interviews were conducted face-to-face at a mutually agreed location and recorded using a digital recording device. Probes from a pilot-tested interview guide were used to elicit specific narratives of challenging decisions to commence, continue, withhold or terminate resuscitation. All interviews were conducted and transcribed by the first author, an experienced research interviewer with a dual background in emergency nursing and psychology.

### 2.2. Methodology & data analysis

An interpretative phenomenological analysis (IPA) methodology informed research design and data analysis. This methodology is particularly suited to exploring participant experiences of complex and significant life events, allowing detailed examination of thoughts, feeling and actions [13]. The researcher seeks to understand the meaning that individual participants have attributed to their experiences, creating a double hermeneutic (the researcher making-sense of the participant’s sense-making) [14]. A rigorous and auditable approach to data analysis – outlined in Fig. 1 – resulted in the development of superordinate and subordinate

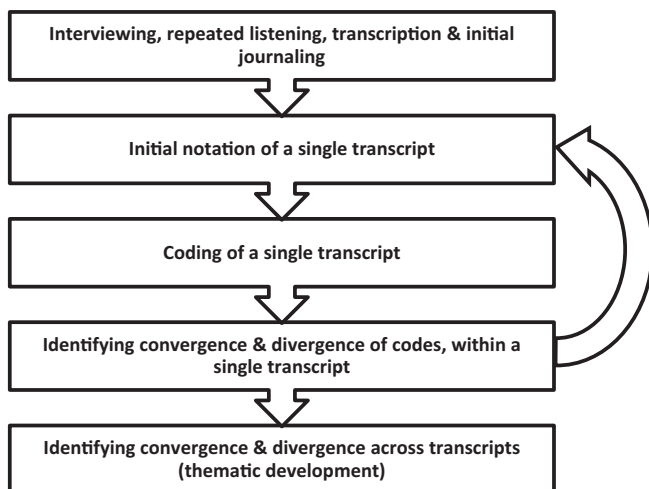


Fig. 1. Stages of data analysis.

**Table 1**  
New Zealand ambulance levels of practice.

Practice level	Qualification (or equivalent)
First Responder (FR)	Short-course in advanced first aid
Emergency Medical Technician (EMT)	National Diploma in Ambulance
Paramedic (P)	Bachelor of Health Science in Paramedicine
Intensive Care Paramedic (ICP)	Bachelor of Health Science in Paramedicine ± Postgraduate Certificate or Diploma

themes. A combination of strategies and tools were used during data analysis, including reflexive journaling [15], manual coding on printed transcripts and use of Nvivo 11 [16]. Whilst data analysis was primarily undertaken by the first author, JS and MG regularly cross-checked coding and critically questioned the development of themes Table 1.

## 3. Results

Sixteen ambulance personnel from geographically diverse areas of New Zealand volunteered and all were interviewed. Select demographic information is presented in Table 2. Highly-experienced Intensive Care Paramedics readily volunteered for inclusion in the study, but further, targeted recruitment was required to ensure less-experienced provider perspectives were included in the sample. Interviews were conducted in private spaces on the university campus and in participant homes and workplaces and ran from 55 to 145 min ( $\bar{x}$  = 90 min). Four participants requested review of their interview transcripts, with no resulting changes.

All participants readily recalled experiences of resuscitation decision-making which were challenging, and examples were often provided without prompting. Four over-arching themes captured challenging decision-making:

1. Grey areas – situations where key information was unavailable or conflicting
2. Exceptional cases – first-encounters, arrests of secondary aetiology and those involving children or young people
3. Scene challenges – including the expectations and responses of bystanders, limited resources or difficult patient access
4. Personal responses – the idiosyncratic impact of individual values and emotional triggers.

These major themes and their associated subthemes are presented in Table 3, along with source frequency and illustrative quotes. The meaning and importance of these themes is discussed in the following section, with generous anonymised verbatim extracts, to provide grounding in data.

### 3.1. Grey areas

*“With cardiac arrests you go along and think ‘Yip! It’s a goer’ or ‘No it’s not.’ But then you get the grey areas.”*  
[Morgan, ICP, 38 year’s experience]

Incomplete knowledge of key background information about the patient and circumstances of arrest, or a mix of favourable and poor prognostic factors would create what participants described as “grey areas”. Such incomplete or conflicting information could make decision-making more challenging:

*“I guess the ones that are a little bit tough at times are the ones where you don’t really know, it was not witnessed. Or perhaps it was sort-of witnessed but nothing’s been done in the fifteen minutes or ten minutes that you’ve responded to the scene. And*

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