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## Characteristics and outcomes of patients assessed by paramedics and not transported to hospital: A pilot study

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## Research

# Characteristics and outcomes of patients assessed by paramedics and not transported to hospital: A pilot study

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## Abstract

### Introduction

Patients seen by ambulance paramedics but not transported to hospital have not previously been studied in Australia. The purpose of this pilot study is to determine the feasibility of telephone interviews to describe and analyse patient factors, and determine short-term patient outcomes associated with paramedic no-transport decisions.

### Methods

Twenty patients participated in semi-structured telephone interviews 13-30 days following an episode of care from an Australian urban ambulance service. Data analysis was conducted in two phases: a quantitative description of the patient characteristics and their outcomes, and a qualitative analysis using a thematic framework to determine if there were any common themes emerging from the interviews.

### Results

Only three patients refused to participate in the interviews and none were unable to be located. The reasons patients expressed for not accepting transport were varied, though a common factor related to patient expectations of the service provided by paramedics. Patients had poor recall of advice provided by paramedics. All except one patient were successfully diverted from the emergency health system. Overall, patients expressed high satisfaction with their experience.

### Conclusion

The reasons patients choose for not being transported require further study, but appear to be driven by their expectations of the service provided by paramedics. Telephone interviews are a viable method for collecting data on non-transported ambulance patients.

### Keywords

ambulances; emergency medical technician; emergency medicine; paramedics

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## Introduction

Cases in which a patient is assessed by paramedics and not transported to hospital represent a significant clinical risk for ambulance services. Based on a limited evidence base, concerns have been raised that paramedics cannot safely determine which patients require transport to hospital (1-2). Furthermore, several studies have shown adverse events following non-transport cases (3-4). However, these studies were conducted in the United States (US), and it is unclear if this research can be generalised to the Australian context.

While a source of risk, non-transport cases may also present an opportunity for patients to be diverted from emergency departments (ED) to primary healthcare services, if these patients do not subsequently present to the ED. US studies have used surveys and computerised record matching to examine the outcomes of non-transported patients but have not explored in any detail the characteristics, motivations or expectations of this patient group (5-7). There is no published evidence examining the characteristics and outcomes of non-transported patients in the Australian context.

The Australian Capital Territory Ambulance Service (ACTAS) is an urban government run ambulance service, and is part of the ACT Government's Justice and Community Safety Department, rather than the Health Department. ACTAS charges a fee for paramedics to attend and assess a patient, whether they are transported or not. Concern about fees may be a significant factor in patients deciding whether or not to accept ambulance transport.

The purpose of this pilot study is to determine the feasibility of telephone interviews to describe and analyse patient factors, and determine short term patient outcomes associated with paramedic no-transport decisions, as well as to validate the data collection methodology.

## Methods

### Study Design

This is a mixed-method pilot study of patients assessed by paramedics in July to August 2012 and not transported to hospital.

### Setting

In financial year 2012-13, ACTAS attended 33,333 emergency incidents; 3833 (11.5%) of these did not result in a patient being transported to hospital (8).

ACTAS has a policy governing non-transport of patients to hospital; ACTAS paramedics can make this decision mutually in consultation with the patient or their carer without reference to a doctor or medical control. Patients can also refuse care or

transport by ambulance against paramedic advice; in this case, paramedics assess and document the patient's competence and leave the patient, again without reference to a doctor or medical control.

### Participants

Patients accessed the ambulance service using the 000 emergency telephone system and an ambulance was dispatched using standard dispatch protocols. No attempt was made to determine whether the patient was suitable for transport or not prior to the arrival of the paramedics. Patients were assessed by either an ambulance paramedic (diploma or degree qualified) or an intensive care paramedic (advanced diploma or degree qualified), and an electronic patient care record (PCR) was completed for each episode of care.

Potential participants were identified from the PCR and an information sheet about the study sent prior to making telephone contact. The inclusion criteria were:

- English speaking
- 18 years or over at time of assessment
- Sufficient detail recorded on the PCR to make contact with the participant, including name, address and telephone number
- Did not request an ambulance attendance up to 48 hours following their assessment by paramedics.

Exclusion criteria were:

- Non-English speaking (as recorded on the PCR)
- Under 18 years of age at time of assessment
- Insufficient detail on the PCR to allow contact
- An ambulance attended to the participant up to 48 hours following the original assessment.
- Deceased patients or patients where resuscitation was attempted and ceased.

### Instrumentation

Participants undertook semi-structured telephone interviews designed to elicit information about their experience prior to, during and following an episode of care. The interview explored the participant's experiences, along with their understanding of the decision, the factors influencing that decision, and the consequences of not being transported to hospital. The interview protocol was developed for the purpose of this study and contained a mixture of closed questions designed to elicit demographic and outcome information, as well as open questions encouraging participants to discuss their experience (Table 1). The semi-structured telephone interview was adopted, as it was believed to be the most efficient method of gathering information about a little-known cohort. Interviewers were trained and encouraged to explore issues raised by participants in order to maximise the chances of gathering useful data to inform further research.

The interviews were conducted by paramedics working in the Quality, Safety and Risk Management Section of ACTAS. The interviewers received 2 hours of training in interview techniques and data collection (conducted by Toby Keene), prior to commencing. The training covered the scope and purpose of the research, consent procedures, use of open-ended questions, and procedures to follow in the event of participant distress or a participant wishing to provide feedback on the service they received.

**Procedure**

Participants were selected by a random sampling of potential participants as determined from the electronic PCR. Potential participants were identified and included in a Microsoft Access 2007 database (Redmond, WA). Participants were then randomly selected from the database using a random number generator in blocks of 20.

Interviewers made up to five attempts to make contact with the participants by telephone. Attempts were made between 7:00 am and 9:00 pm 7 days per week depending on the shift pattern of the interviewer. When they made contact, they introduced themselves, explained the purpose of the study, and invited the person to participate. If the person wanted to

participate but could not at that time, an alternate time was arranged. The interview was recorded by the interviewer on standardised answer sheets but was not audio recorded due to technical limitations with the telephone system.

**Data analysis**

The interviews were recorded on standardised answer sheets and analysed in two stages. Stage 1 was a descriptive analysis of patient demographics, disposition and outcomes following assessment by paramedics. Stage 2 was a qualitative analysis using framework analysis techniques (9). Toby Keene and Megan Davis reviewed the answer sheets separately and conducted a thematic analysis. They then met and reviewed their individual findings and determined common themes. The quality and completeness of the information derived from each interview question was considered, along with the sequencing of the questions. Responses were then coded and elements organised under each theme; diagrams and thematic mapping were used to explore the elements of each theme and examine any relationships between them. The emphasis was on evaluating the interview protocol and developing practical information to inform future risk management strategies and research, rather than developing a full theoretical understanding of non-transported patients.

**Table 1. Questions and additional information used to elicit information.**

(Text in brackets is prompts for the interviewer to consider and explore information if not mentioned by the participant)

Question 1.	On ....., an ambulance came to you and paramedics assessed you. Can you tell me about what led to the ambulance being called? [Explore: where the participant was, did they call the ambulance or someone else, who they were with, had they previously been assessed by ambulance, what expectations did the participant have (if any)]
Question 2.	When the paramedics arrived, what do you recall they did? [Explore: what assessment was provided, any treatment, discussions about transport or other options]
Question 3.	Tell me about the decision not to go to hospital by ambulance. [Explore: who made the decision, was the participant involved, who initiated the discussion, what were the factors considered, did they go by some other means]
Question 4.	How involved were you in the decision to not go to hospital by ambulance? How comfortable were you with the decision?
Question 5.	Do you recall the paramedics giving you any advice before they left? What was it?
Question 6.	What happened after the paramedics left? [Consider the immediate aftermath, 6-12 hours afterward, 12-24 hours after, 24-48 hours after]
Question 7.	Did you consult with any healthcare practitioners after the ambulance left? [Including: ED, GP, CALMS, mental health, allied health, community nursing etc. Check if this consultation was for the same reason they called ambulance. Check if paramedics referred to this practitioner]
Question 8.	What was result of your consultation with healthcare practitioners? Did they end up going to the ED anyway? [Investigations, imaging, diagnosis, further referrals?]
Question 9.	How do you now feel about the decision to not go hospital? [Did they get better/worse/stayed the same, was it the right decision, do they regret it, would they do it again?]
Question 10.	Is there anything we haven't covered that you wish to add?

## Ethics

The study and interview protocol was approved by the ACT Health Directorate Human Research Ethics Committee. Potential participants were sent an information sheet about the study prior to any attempt to telephone them and provided informed consent at the start of the interview. Participants were identified on response forms using a code number and no identifying information was recorded on the response forms.

## Results

### Participant demographics

Twenty participants completed interviews, and three additional participants were contacted but declined to be interviewed. None of the potential participants were unable to be located. The participants ranged in age from 24-91 years (median: 77, IQR = 60-86); 10 (50%) were male (Table 2). Interviews were conducted a median of 25 days following the ambulance attendance (range: 13-30 days, IQR = 19-26). Interviews took a median of 10 minutes to complete (range: 7-30 minutes, IQR = 10-20.5).

### Stage 1. Quantitative analysis

For those people agreeing to be interviewed, it took a median

**Table 2. Participant characteristics**

Gender	Age (years)	Presenting problem
Female	69	Motor vehicle crash
Male	24	Post seizure
Female	91	Vomiting
Female	24	Soft tissue injury
Male	85	Febrile illness
Female	62	Fall
Female	74	Chest infection
Female	79	Motor vehicle crash
Male	86	Soft tissue injury
Male	65	Febrile illness
Male	87	Fall
Female	86	Fall
Male	89	Apparent syncope
Male	37	Chest pain
Female	74	Laceration
Male	28	Laceration
Female	80	Hypoglycaemia
Male	53	Apparent syncope
Male	89	Laceration
Female	88	Fall

of two telephone calls to arrange the interview (IQR = 1.75-3). Two participants required five telephone calls and one required four. Six of the 20 had interviews conducted out of standard office hours (0830-1630), the latest commencing at 8:00 pm. No participant was successfully interviewed earlier than 10:00 am and most interviews (19/20) were conducted after midday. No interview lasted longer than 30 minutes (median: 10 minutes; IQR = 10-20 minutes; range 7-30 minutes).

Approximately half (9/20) of the participants reported a mutual decision where the paramedics and patient agreed that transport was not required for the patient. In this group, every participant stated that they felt involved and informed in the decision to not go to hospital; none reported any undue pressure or influence from paramedics to not go to hospital. In one case, the patient recalled the paramedics mentioning how busy the ED was that night as a possible reason to not go.

In eight cases, the participant clearly indicated that they refused transport against the advice of the paramedics; in three cases it was unclear whether the decision was mutual or against advice. For those who refused against advice, participants recalled they were advised to go to hospital several times but still refused. There were no obvious differences in terms of outcomes between those who refused transport against advice and those who mutually agreed that transport was not required.

Six participants attended their general practitioner (GP) or other health service (not the ED) following their ambulance call; an additional two had GP appointments or other appointments arranged by the paramedics while they were at the patient's residence. Of the 12 patients who did not attend a GP or health service, none reported any further problems or concerns at time of interview relating to the reason for their ambulance call. For those that attended a GP or health service:

- One participant attended the GP, was subsequently referred to the ED, received an appendectomy approximately 36 hours after being seen by ambulance, and was discharged home without complication
- One attended the GP, and was referred to a diabetes educator
- One attended the GP, had a neck X-ray, and was diagnosed with whiplash
- One attended their psychiatrist and had their medication changed
- One was referred to additional support services, and received increased in-home support
- Three attended the GP, and did not receive a diagnosis.

The participant who attended the ED received an appendectomy approximately 36 hours after been seen by ambulance. A review of the PCR did not reveal any obvious signs or symptoms that would indicate appendicitis. The patient refused transport against advice but did attend his GP the following day on the paramedics' recommendation.



During interview, the patient stated that he would not have gone to hospital regardless of paramedic advice. Furthermore, even knowing the consequences, he was happy with this decision and would do so again.

## Stage 2. Qualitative analysis

The interview instrument generated comprehensive and useful information for analysis. The chronological sequencing of the questions appears to have assisted in providing structure to the interviews. The handwritten notes made by the interviewers were of sufficient detail to allow for analysis. There were no obvious missing data, although the lack of an audio recording of the interviews means this assertion cannot be validated.

Framework analysis identified three major themes from the interviews:

Theme 1. Reasons for not accepting transport are highly variable and poorly understood

There were many reasons given for not wanting to go to hospital. The most common were:

- Just wanted reassurance, assistance, advice or support/referral
- Symptoms had resolved prior to arrival or during assessment
- Concern over ED waiting time/ED workload
- Prior negative experience with a hospital
- Personal reasons: (eg. 'I just didn't want to go'. 'I was embarrassed by all the fuss').

There were no consistent underlying motivations found for not wanting to go to hospital. Participants often expressed strong views about going to hospital, particularly if they had a prior negative experience with the hospital. Other participants were more ambivalent and found it hard to articulate why they chose not to go to hospital. No participant mentioned cost or billing arrangements as a factor in their decision not to go to hospital, and none recalled these being mentioned by paramedics.

It appears that patient expectations about transport to hospital were formed prior to the arrival of paramedics but what is unclear is what role, if any, the paramedics played in altering these expectations. The desire for assessment, advice and reassurance was commonly expressed and these patients saw the paramedics as providing more than just a transport service.

Theme 2. Advice given by paramedics is only occasionally recalled and acted on

Participants' recollection of advice given by paramedics was mixed: some (7/20) very clearly recalled receiving advice, others either didn't recall getting any or what the advice was (9/20). Participants did consider paramedic advice in deciding

whether or not to go to hospital and all expressed positive views of the advice received from paramedics, even if that advice was not always recalled. When participants did recall advice given, the most common advice was to call back if concerned (5/20), although none did so. Participants were not given any written advice, and relied upon memory for verbal advice.

Theme 3. There were high levels of participant satisfaction with their experience

All participants (20/20) were happy with their interaction with the ambulance service. Many participants asked the interviewer to pass on their thanks to the attending crew. All participants stated they were happy with the decision to not go to hospital and believed they would make the same decision again if the situation was repeated. Although the study did not set out to measure participant satisfaction, the strength and consistency of this sentiment warranted its inclusion as its own unique theme.

## Discussion

Ambulance services in Australia, New Zealand and the United Kingdom have developed specialised 'extended care' models of paramedic practice and successfully implemented these (10-12). These models however, involve only a small number of paramedics and relatively few patients who are carefully screened and chosen for these programs. This study is the first published Australian study we have been able to locate on ambulance non-transport cases by 'non-extended care' paramedics where the patients were not screened as potential non-transport cases.

Telephone interviews appear to be a viable option for studying this patient cohort. In this pilot study, 20 out of 23 patients agreed to participate in the interview. No interview took longer than 30 minutes and half were completed in less than 10 minutes. The sequencing of the questions and the questions themselves worked well in terms of structuring the interview and guiding participants and interviewers. The interviewers received minimal training in interview techniques, yet were able to elicit comprehensive and useful information. This may reflect their training as paramedics and their experience in talking to and questioning patients, albeit not usually over the phone.

The study was initially designed to have the interviews audio recorded and transcribed for analysis but technical difficulties prevented this. The use of handwritten notes, while not as comprehensive as a transcription, still provided data of sufficient quality and completeness for analysis. The lack of transcriptions means that some bias may have entered the data but this is unable to be determined. Even so, this appears to be a simple and low cost method of gathering data on ambulance patients.

Other researchers have used telephone surveys on non-transported patients with varying degrees of success. Pringle attempted to contact participants only during office hours and limited attempts to four. They were only able to contact 35% of the participants they attempted to (7). Burstein et al were more successful, managing to contact 62% of their cohort by making up to three attempts during office hours (5). The current study achieved a much higher rate of contact (87%), which may be attributable to not limiting attempts to office hours. This was also found by Schmidt et al who made up to 10 attempts to contact non-transported patients at all times of the day and days of the week (13). An inability to contact large numbers of participants can lead to significant bias in the results; future study designs using telephone surveys should not be limited to office hours and/or only a few attempts to contact participants.

Non-transport cases represent a risk to patients and ambulance services, but also an opportunity. The results here, although limited, suggest that the opportunity may be greater than the risk: the patients in this study were successfully diverted from the ED and into community healthcare without adverse consequences. One patient attended the ED after seeing his GP; no other patient attended the ED. Those patients who attended their GP received investigations and diagnoses appropriate to community care, rather than the ED. Twelve patients did not attend any form of healthcare following their experience with ambulance and no adverse events were recorded.

The current study differs significantly from those previously conducted in the United States in that those either required paramedics to seek approval from online medical control before making a decision to not transport a patient, or expressly forbade paramedics from not transporting patient unless that patient refused against advice. Even with extensive medical support, published reports from the US found 9-64% of non-transported patients subsequently presented to the ED or other medical care (5,7,13). These differences make it difficult to compare across studies and it is unclear why the rates of patients attending healthcare vary so dramatically across studies.

The present study found no obvious differences between those participants who 'refused' transport against paramedic advice, and those who mutually agreed with paramedics that transport was not required. There was no difference between the groups in terms of outcomes, attending GP or other health services, or overall satisfaction with care. The line between a 'mutual' decision and a 'refusal' sometimes appears blurred except in a few cases where the paramedics clearly wanted the patient to go to hospital and the patient refused against the paramedics advice. Considering the lack of adverse consequences in those who refused transport against advice, it suggests that paramedics are conservative in their decisions about who

should be transported and are over-triaging patients, although further research is needed to confirm this.

Participants gave a range of reasons for not wanting to go to hospital, with many of those reasons poorly understood, even by the patients themselves. Concerns about ambulance billing or costs were not mentioned by participants as factors in their decision not to go to hospital. Patient expectations of ambulance attendance and what paramedics can do for them probably plays a role in their decision to not go to hospital. Lacking a comparison group of transported patients it is difficult to draw conclusions about the role expectations play in patient decision making. Future research should consider the role of expectations in decision making about transport.

Patients left at home by paramedics may be given advice for follow-up care. However, advice given by paramedics is poorly documented by the paramedics themselves and only occasionally remembered and acted on by patients. Verbal advice from paramedics was either not recalled or poorly recalled nearly half the time. The most common form of advice recalled was 'to call back if worried'. Written advice was never provided; indeed it is not standard practice for paramedics in this ambulance service to provide written advice to patients. Schmidt et al examined this issue and found that only half of their patients recalled advice given by paramedics and less than one-quarter recalled risks explained to them by paramedics (13). Schmidt's study interviewed patients a median of 37 days following their episode of paramedic care, compared to 22 days for the present study. Advice given by paramedics 3-4 weeks earlier is probably of limited utility so it is perhaps not surprising that it is poorly remembered.

## Limitations of this study

As a pilot study, this study suffers significant limitations. It was neither designed nor powered to detect rare adverse events, so no reliable conclusions can be drawn about the relative safety of the practice. There was no comparison group of patients who were transported. So it is unclear how non-transported patients are different from those transported.

Large-scale data matching or other research designs should be conducted to determine what the adverse event rate is for non-transported patients in the Australian context. The original study design aimed to interview patients 72 hours to 7 days following an episode of care to limit memory and recall issues. For various reasons, participants were interviewed on average 22 days after their experience. This may have adversely affected their memory of the event, particularly recalling specific details such as advice given at the time. Future research should aim to interview participants closer in time to the episode of care.

## Conclusion

This is the first study we are aware of that interviewed Australian non-transported patients following an episode of care by a non-specialist paramedic. This pilot study described a small number of non-transported ambulance patients, limiting the generality of the results. However, it does show that it is possible to track the outcome of non-transported patients using telephone interview techniques. Additional research is needed to determine the incidence of any adverse events from this practice and to further explore patients' expectations when they call for an ambulance.

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## Conflict of interest

The authors declare they have no competing interests. Each author of this paper have completed the ICMJE conflict of interest statement.

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