

# Long-stay views from the hospital bed: patient perspectives of organisation of care and impact of hospitalisation

Anne Johnson, Bev Gaughwin, Natasha Moore and Rita Crane

## Abstract

This study aimed to determine the perspectives of a group of patients categorised as “long-stay outliers” at a large South Australian metropolitan hospital about aspects of organisation of care and the perceived impact of long-term hospitalisation. Nineteen patients were interviewed using a semi-structured questionnaire. Eighty-nine percent of participants stated that they had no knowledge of how long they were to be in hospital. Forty-two percent indicated that they did not know when they would be discharged from hospital. This was of concern, especially considering the vulnerability of this patient group and the known benefits of patient involvement in decision making and the improvements this can make to health outcomes and early discharge. Participants indicated concern about sleep deprivation, diet, ability to return to paid employment, and missing their family as the main areas of impact of their long hospitalisation. Concerns about being discharged from hospital included: apprehension as to whether they were well enough to leave; the recurrence of infection; whether they would be able to sleep well when they got home; their recent loss of appetite and associated weight loss; mobility concerns; and what supports they would have when they were discharged home. All these issues require staff to be more patient and family-centred in their approach to preparing for discharge.

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## What is known about the topic?

Hospitals have been looking for ways to address issues leading to longer-than-expected patient length of stay.

## What does this study add?

Few studies have considered the patient and family perspectives associated with patients with longer-than-expected hospital lengths of stay. This study provides a description of the perspectives of 19 patients.

## What are the implications for practice?

The authors suggest the need for staff to understand the patient and family perspectives and incorporate more participatory patient- and family-centred care and discharge planning processes.

INCREASED DEMAND and patients requiring long-term admission have impacted significantly on access to hospitals. Patients who have longer stays than determined by casemix formulas for specific conditions are termed “long-stay outliers”. The long-stay outlier population at a large metropolitan tertiary referral hospital in South Australia had been analysed from many perspectives, but patient perspectives had not been considered. It was suggested that seeking patient perspectives on factors contributing to and associated with their length of stay may identify additional strategies to improve management of these patients and assist in understanding the impact on this patient group and their families.<sup>1</sup> Patient feedback and involvement in decision making about care is a priority area for action and is strongly integrated into the safety and quality agenda in Australia being led by the Australian Council for Safety and Quality in Health Care (<http://www.safetyandquality.org>).

Emerging evidence supports patient participation in health, demonstrating that active patient participation in decision making in individual care leads to improvements in health outcomes and that access to quality information facilitates decision making. This supports an active role for patients and carers in managing care.<sup>2</sup> The purpose of this

study was to provide a long-stay outlier patient perspective into the organisation of care and the impact of their long-term hospitalisation.

## Method

### Patient interviews

Information was collected by semi-structured individual face-to-face interviews during the hospital admission (see Box 1 for the list of questions asked). An experienced consumer interviewer (RC) was employed to conduct the patient interviews. Notes were taken during the interviews and additional information was added after the interviews to ensure comprehensive records were made of each interview.

Hospital inpatients with a length of stay between 14 and 30 days were identified over a 9-day period in March 2003 from a daily list of long-stay outliers produced by the hospital's Department of Clinical Epidemiology. Length of stay of between 14 and 30 days was specified as it was the hospital definition, at that time, of a "long-stay outlier". The month of March was selected for this study as it was a specified period of time which would be compatible with other clinical epidemiological studies related to the long-stay outlier issue which were being conducted by the Department of Clinical Epidemiology.

Potential participants were selected according to the following inclusion criteria.

Patients who were:

- Adult (18 years or older)
- Inpatients of the hospital between 14 and 30 days post admission
- Well enough to be interviewed and deemed cognitively aware by ward staff directly involved in their care
- Able to understand the purpose of the study and provide informed consent.

Exclusion criteria included patients who were:

- In the critical care unit
- In the psychiatric ward or admitted with a psychiatric condition
- Awaiting nursing home placement following assessment
- Unable to communicate.

Responses from the 19 interviews were collated for each question. Thematic analysis techniques

were employed where key themes were identified in the data and used to categorise the results. Thematic analysis was initially conducted by the research assistant and further refined by the researchers.

## Results

A total of 19 participants (13 females and 6 males) were recruited and interviewed within a 3-week period commencing 11 March 2003. Box 2 shows the demographic data of the patients, which was extracted from case notes. The average age was 72.9 years, (range, 25–92 years). The average

### I Interview questions

*We are interested in your views about your stay at this hospital during your current admission and whether anything could have been done differently, in your opinion, to facilitate you leaving this hospital earlier.*

You are now at day \_\_\_\_\_ of your admission. Have you been told when you will be leaving this hospital?

How long did you expect to be staying in hospital this admission?

If your stay is longer than expected, what do you think were the reasons for that occurring?

How do you feel about the length of time you have had to stay in this hospital for this admission? (eg, is it too short, too long or just right).

If the length of time was too long, when would you have preferred to leave hospital?

If you have been given a time that you will leave hospital, and consider the length of time to be too short, when would you prefer to leave hospital?

Has your stay in hospital affected you in any way? Yes/No

If so, how have you been affected?

Has your stay in hospital affected your family in any way? Yes/No

If so, how has your family been affected?

Where would you prefer to go when you leave this hospital?

Where do you expect to go when you leave this hospital?

Do you have any particular concerns about leaving hospital to this destination? Yes/No

If so, what are they?

What help will you (or your family or carers) need to ensure you are cared for safely when you leave this hospital?

Has this been organised for you yet? If not, why do you think this hasn't happened yet?

length of stay (LOS) at the time of interview was 19.37 days (range, 15–27 days).

### **Reasons for admission**

Participants were admitted to the hospital for a variety of reasons (see Box 2). Four participants were admitted for injuries sustained after a fall, three of these with fracture injuries and one with infection of a wound sustained in a fall that occurred a week before admission. Two participants were admitted for acute on chronic renal failure.

### **Location of patients**

Only 26% ( $n=5$ ) of the participants had stayed in the one ward during their hospital stay to the time of interviewing. On average, participants were subjected to 2.26 ward changes up to the time of the interview. One participant was moved eight times to four different wards. However, this was due to deterioration in condition and the need to transfer to the critical care unit and then the high dependency unit. Forty-two percent of participants ( $n=8$ )

were transferred to the convalescence ward before discharge.

### **Expected length of stay**

When asked how long they expected to be staying in hospital, 89% ( $n=17$ ) stated they did not know. The two participants that provided a time frame indicated that they initially expected to be in hospital for only a couple of days or up to 1 week. A predicted stay of 6 weeks was indicated in the case notes of the 92-year-old patient interviewed with a subtrochanteric fracture of the right femur, but, when asked, she stated she did not know how long she expected to be in hospital. In all, 42% ( $n=8$ ) indicated that they did not know when they were due to be discharged from hospital.

### **Perceived impact of length of stay on patient**

Sixty-three percent ( $n=12$ ) of participants perceived that their length of stay in hospital had a significant impact on them. Of these twelve, three

## **2 Demographic data of participants**

ID	LOS at time of interview (days)	Number of ward changes	Age (years)	Gender	Reason for admission
1	25	2	92	F	Subtrochanteric fracture right femur
2	22	2	84	F	Seizures/burr hole brain tumour
3	20	3	78	F	Dislocated shoulder and leg pain following fall
4	17	3	82	M	Abdominal pain for investigation
5	16	2	87	F	Fracture distal radius & ulnar following fall
6	26	3	77	M	Right lower lobe pneumonia
7	16	2	62	M	Nausea/vomiting
8	24	2	77	F	Cerebrovascular hemiplegia
9	18	1	54	F	Aspiration pneumonia and urinary tract infection
10	16	1	25	F	Sciatic pain/buttock pain
11	15	3	81	F	Right metastatic lung cancer and oesophageal mass
12	16	2	43	F	Infected defibrillator wound site
13	19	2	72	F	Chronic obstructive pulmonary disease exacerbation
14	23	2	84	F	Bowel obstruction
15	27	8	74	F	Small bowel obstruction
16	18	1	88	F	Skin tear left leg
17	20	2	76	M	Acute on chronic renal failure
18	15	1	83	M	Diarrhoea for investigation
19	15	1	66	M	Acute on chronic renal failure
<b>Average</b>	<b>19.37</b>	<b>2.26</b>	<b>72.89</b>	<b>6M/13F</b>	

LOS = Length of stay; M = male; F = female.

identified disturbed sleep and tiredness. One of the participants stated that they “couldn’t sleep because of ward noise”. Two other participants stated they missed their family, while two felt that their diet had affected them, one due to having to adjust to nasogastric feeds and the other not being happy with the meals. One participant was concerned that he would not be able to return to paid employment due to his age and the impact of two recent long stays.

### ***Perceived impact of length of stay on family***

Forty-seven percent ( $n=9$ ) of the participants responded that they perceived their long length of stay in hospital had an adverse effect on their family. Twenty-five percent identified the effect being due to their families having to visit them in hospital. Two participants had family living at a nearby coastal town and one participant was from a distant coastal town. One participant felt that the distance to travel and the cost of visiting was an issue for her family, combined with the added pressure on her husband of also having to care for their infant.

### ***Discharge destination and issues***

Seventy-nine percent ( $n=15$ ) of the participants preferred to go home when they left hospital, with one participant wanting to go as near as possible to her home area. Of the other three participants, two wanted to go to other hospitals nearby and one participant was not sure where she would prefer to go. Of the 15 participants that preferred to go home, 12 of them expected to go home from hospital.

Twenty-six percent ( $n=5$ ) of the participants expressed concerns about leaving hospital to their expected discharge location, while 58% ( $n=11$ ) had no concerns. Sixteen percent ( $n=3$ ) were unsure. The participants shared no common concerns, with each concern specific to their individual situation. Participant concerns included:

- whether they were well enough to leave
- the recurrence of infection
- whether they would be able to sleep well when they got home
- their recent loss of appetite and associated weight loss
- mobility concerns, in particular managing a wheelchair and an eleven-month-old baby

- getting in and out of bed unaided, and showering
- the supports they would have when they were discharged home.

## **Discussion**

### ***Lack of knowledge about their length of stay***

Participants were generally unable to give specific detail of factors that had resulted in their stay being longer than expected. Considering the average length of stay was just over 19 days when they were interviewed, the fact that the participants were unable to accurately predict their length of stay suggests that participants were not given information about the potential length of stay, or they were given the information at a time when they were too unwell to remember. If they were not given the information by staff, this may have been due to the fact that the length of stay was difficult to predict. It is recognised in the literature that patient participation in decision making in individual care is critical to improving health outcomes.<sup>2</sup> It was evident that patient participation in decision making about their individual care was limited or did not occur for the group of participants involved in this study. The fact that nearly half the participants seemed to have no understanding about how much longer they would be in hospital also suggests a lack of involvement in discussions and planning with regard to their discharge date and after-care requirements.

### ***Perceived impact of long stay on the patient***

Participants identified issues such as missing their family and tiredness due to disturbed sleep. A problem for participants who had disturbed sleep during the night was that they slept more during the day. This included meal times and therefore compromised their nutrition intake and possibly increased their recovery time.

Frequent movement of participants to different wards was evident in the study (see Box 2). In particular the convalescence ward was used as a location for a number of the participants before discharge. However, the effect of these moves on the patients and staff must be considered. The interview questions did not ask participants their thoughts on ward transfers; however this would be a useful issue

to explore in future studies. It is possible that the change of staff and environment may have a negative impact on many patients who have had to adjust to being very ill and in hospital. Staying in one ward is likely to promote a better relationship and understanding between patient and staff and minimise the stress and risks associated with changing environments. There is also the potential of an increased risk of inadequate communication between ward staff upon transfer, which brings to question the safety of patients and the risk of adverse events occurring through frequent ward changes. No literature was found to support or disprove this identified potential risk and is an area which would merit further study.

### **Perceived impact of long stay on families**

The issue of visiting and travelling for families was identified by participants as the main impact on their family while they were in hospital. Three participants had families living in the country, which required travelling long distances to the hospital. The involvement of families in decision making about care and discharge was identified as a significant area of concern for participants. Patient's families are often required to make major decisions regarding care, and in some cases are involved in placement decisions. It is important that families and patients are provided with appropriate support and adequate information to make informed decisions. As emphasised by the Consumer Focus Collaboration<sup>2</sup> and a Cochrane Systematic Review,<sup>3</sup> access to quality information facilitates decision making and supports an active role for patients and their families in managing care.

Involving families in discharge planning early in the patient's admission is vital. It appeared that these participants were often not involved in discharge planning despite being in hospital for 19 days on average. Involvement of patients and their families in discharge planning is a well known contributing factor to decreasing a paediatric patient's length of stay, and would be worthwhile investigating in an adult population where the notion of partnership in care is not as well developed as a model of care.<sup>4,5</sup>

### **Limitations**

The sample size was limited to 19 due to the funding available for the small research project to

gain a snapshot of issues for some long-stay outlier patients. This research identifies issues about organisation of care and impact of hospitalisation for this particular group of patients. The results are not generalisable to all long-stay outlier patient populations, but do provide important insights into areas for more in-depth research for this vulnerable group of patients.

### **Conclusion**

Overall, it was evident that the participants in this study had been medically unwell and required a lengthy hospital admission because of their medical problems. In this study the participant perspectives about their experiences as long-stay outliers highlighted some key issues about organisation of care and the impact of hospitalisation which need to be considered when providing care and planning discharge for this group of vulnerable patients. The issues included limited or lack of involvement of participants in decision making; lack of knowledge about anticipated length of stay; and lack of early involvement of participants and their families in discharge planning. The perceived impact on the participants of their long stay in hospital included sleep deprivation and diet, as well as missing their family. Concerns about being discharged from hospital included: apprehension as to whether they were well enough to leave; the recurrence of infection; whether they would be able to sleep well when they got home; their recent loss of appetite and associated weight loss; mobility concerns; and what supports they would have when they were discharged home. All of these issues require staff to be more sensitive to patients' concerns and more family-centred in their approach to providing care and planning discharge.

It became apparent through this study that seeking patients' perspectives is important when exploring the problematic issue of managing long-stay outliers. The participants in this study provided valuable perspectives which contributed to identifying some issues facing the organisation of care and the impact of hospitalisation on this vulnerable group of patients. The study also identified areas of further research, such as the impact of frequent ward transfers on patients and the possible risk of adverse events occurring, and patient and family

# Blood transfusion prescribing in the ACT: an insight into clinical decision making

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## Abstract

Medical practitioners with varying levels of experience may make medical decisions in hospitals. Little is known about who is responsible for these decisions. We determined transfusion appropriateness during an audit of blood transfusion, before developing practice improvement strategies, by concurrent medical record review. The prescriber could be determined in 78% of transfusion episodes: most were specialist staff. Registrars and after-hours staff prescribed significantly fewer inappropriate transfusions. The findings have significant implications in understanding clinical decision making in the hospital setting and for the targeting of quality improvement strategies in particular.

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## Background

### *Medical decision-making in hospitals*

In hospitals, each clinical team member, in conjunction with the patient, makes management decisions according to their professional discipline. Decisions about medications, infusions, investigations and

#### **What is known about the topic?**

Inappropriate decisions to transfuse patients are relatively common (16% to 35% in Australian studies). Quality of transfusion practice is related to knowledge of transfusion indications, receptivity to input from colleagues, and the practice context. Junior medical staff may be influenced by senior staff to prescribe transfusion inappropriately.

#### **What does this study add?**

Specialists made the majority of transfusion decisions in the ACT. Registrars in the major public hospital made fewer inappropriate transfusion decisions.

#### **What are the implications?**

Quality improvement initiatives in transfusion practice should be targeted to senior medical staff, because of their involvement, and because of their influence on junior staff.

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invasive procedures are generally the domain of medical staff, with the specialist in charge assuming overall responsibility for the direction of patient management. However, there are several tiers in the medical staff hierarchy and decisions may be made at any level. Common decisions having to be made daily or more frequently, decisions with few adverse reactions or cost implications, decisions with well defined clinical guidelines and decisions having to be made urgently would appear suited to the role of junior staff. Decisions signifying major changes in patient management, involving invasive procedures, with a high risk of adverse outcome or with significant cost implications would appear more suited to specialist involvement in the decision making process. Decision making beyond the level of training or experience of medical staff may put the patient at risk, whereas consultant involvement in every decision would require significant resources and may hinder junior staff training.

Although protocols and guidelines assist in the standardisation of clinical decision-making, it remains true in the era of evidence-based medicine that the majority of decisions are based on an integration of knowledge from clinical studies and the experience and interpretation of the practitioner that is a part of the "art" of medicine.<sup>1</sup> Surprisingly, despite the importance of clinical experience in decision making, little is known about which practitioners participate in various clinical decisions.

The decision-making process has been studied from the viewpoint of the patient–doctor interaction. Research is largely based on outpatient settings, with a clear one-on-one doctor–patient relationship. Frosch and Kaplan<sup>2</sup> indicated that patients focus on the major treatment approaches, based on expectations of the likely outcomes, with less interest in the daily technical decisions required to implement the strategy. Many of the decisions in hospitals fall into this latter category, functioning to enable the larger treatment plan. It therefore may be that the routine daily decisions, seemingly more amenable to delegation to junior medical staff, are those in which the patient is least involved, and least vigilant.

### **Why do we need to know who decides?**

Planning decisions in health care systems can be improved by a better understanding of the opera-

tions within them. In quality improvement, understanding who the decision makers are may help to target interventions. This information will also enable targeting of appropriate personnel when information is disseminated, or dialogue is initiated. An understanding of the bedside process is important to better management.

### **What work has been done on clinical decision making in transfusion?**

There is very little information on the process of clinical decision making in transfusion. Salem-Schatz and colleagues<sup>3</sup> showed that at the request of their consultant junior medical staff often prescribe transfusions that they consider inappropriate. The cited reason for prescription against their own judgement was the authority of the consultants. This same study demonstrated that consultants had greater confidence in their abilities in transfusion medicine than residents, but that their knowledge of transfusion indications, receptivity to input from colleagues and the organisational context (site of practice) have been shown to predict the quality of transfusion practice.<sup>4</sup> The latter factor suggests strong influence of local peers in the decision-making process.

Transfusion decisions would meet most of the criteria outlined above for being made by junior doctors. With the current level of pretransfusion testing, transfusion is now a safe procedure compared with many other medical interventions, although the viral epidemics in the recent past may colour this perception and appropriately suggest caution for the future. In Australia, blood products are presently provided to patients and institutions at no cost. There are well-developed guidelines for transfusion. Transfusions are also frequently part of a comprehensive treatment plan, serving to enable other treatments such as resuscitation, surgery or chemotherapy, rather than being the primary therapy. On this basis we hypothesised that many transfusion decisions would be suitable for delegation to junior medical staff.

## **Methods**

### **Setting**

The audit was conducted across three hospitals. The

Canberra Hospital had the majority of the transfusions and is a tertiary referral centre for the ACT and surrounding south-east NSW. With the exception of allogeneic bone marrow and solid organ transplantation, a full range of tertiary services is offered and the hospital serves as the base for regional trauma and retrieval services. Although there was a transfusion committee, there were no universally accepted criteria for the use of blood products, although for reasons of supply, platelets were usually audited against local criteria by transfusion laboratory staff before issue. Calvary Public Hospital is a metropolitan general hospital offering a broad range of services, including the majority of elective joint replacements within the ACT. Calvary Private Hospital is collocated with Calvary Public Hospital and offers a similar range of services to its public counterpart. During the 2 years before the current audit, the Calvary hospitals had engaged in a transfusion quality improvement exercise, establishing a transfusion committee, disseminating guidelines and educating clinicians.

### **Overview of the audit**

The ACT Haemovigilance Project collected data for consecutive transfusions of red cells, fresh frozen plasma, cryoprecipitate and platelets in participating hospitals, reviewing the medical records concurrently with patients' admissions where possible to determine transfusion indications and adverse events. Patients were identified from the transfusion laboratory information system and laboratory work lists. The majority of episodes were reviewed within 48 hours of transfusion. Where records could not be found during the admission, attempts were made to review these after discharge in the medical records department (at Calvary Hospital) or on patients' electronic medical records (at Canberra Hospital). Where the records could not be found by these procedures, the episode was excluded. At Canberra Hospital, red cell transfusions were audited over 3 months from March 2003. For all other products, and for all products at the Calvary Hospitals, the audit continued for 6 months from March 2003.

Data were extracted by two of the authors (P.C, B.C) using a standardised form on inpatients and outpatients. Information on transfusion indica-

tions, major diagnoses and procedures, comorbidities, signs and symptoms, relevant pathology results and the responses to transfusion were collected. After the information was entered into a database, two authors (P.C, A.M) then assessed each transfusion for compliance with the National Health and Medical Research Council/Australasian Society for Blood Transfusion Clinical Guidelines on the Use of Blood Components<sup>5</sup> to judge the appropriateness of transfusion. Transfusions in neonates (less than 3 months old), and patients having massive transfusions (defined as more than 10 units in a 24-hour period), were excluded.

### **Determining the prescriber**

In order to identify the most productive areas in which to intervene, the identity of the prescriber was collected. In doing so we defined the prescriber as the most senior decision-maker noted in the medical record, rather than the officer who wrote the request or order. In doing so, the following rules were adopted:

- Where there was no alternative documentation, other than the transfusion request and order, no prescriber was determined, unless the order was clearly written by a consultant.
- Where the transfusion occurred as a result of one medical officer consulting another about transfusion, the officer consulted was determined to be the prescribing officer.
- Where transfusions occurred as a result of a group process, such as a ward round, the transfusion decision was assumed to have the approval of the most senior clinician documented to be involved.
- Where a transfusion was documented on an anaesthetic chart the most senior anaesthetic medical officer was deemed to have made the decision, unless documented to the contrary.

### **Ethical considerations**

The audit was conducted as a quality improvement project, reporting to the Transfusion Committees of the respective hospitals. The project met the criteria for ethical conduct of quality projects of the National Health and Medical Research Council.<sup>6</sup> The project was supported by a grant from the ACT Quality and Safety Forum.



## Statistical analysis

The primary end point was the number of transfusion episodes attributed to prescribers at each level of experience (specialist or consultant, registrar and residents). Secondary analyses of the rate of inappropriate transfusions were by the Chi-squared test.

## Results

The number of transfusion episodes audited at Canberra Hospital was 537 for red cells (an estimated 89% of all eligible episodes during the audit period); 170 for fresh frozen plasma (FFP; 97%); 276 (98%) for platelets; and 28 (96%) for cryoprecipitate. At the Calvary Hospitals combined there were 360 red cell and 35 FFP transfusions audited, accounting for an estimated 98% of transfusion episodes.

### Number of prescribers, by designation, at Canberra Hospital

The prescriber could be determined in 790 cases (78%) from the medical record at Canberra Hospital. Of these, the majority were attributed to a specialist practitioner, with the most junior medical staff prescribing in only a small minority of cases (see Box 1). In 60 episodes (7.6%) the prescriber was a resident or registrar after hours, managing patients on units to which they were not usually attached.

### Number of prescribers, by designation, at Calvary

The prescriber could be determined in 305 cases (77%) at the combined Calvary Hospitals, and the majority were also attributed to specialist practitioners (see Box 1).

## Transfusion appropriateness across the ACT

Transfusion episodes classified as inappropriate constituted 14.2% of red cell transfusions, 34.1% of FFP transfusions and 4.0% of platelet transfusions at the Canberra Hospital. Comparative figures at Calvary Hospital were 24% of red cell transfusions and 26% of FFP transfusions.

At Canberra Hospital, 96 of 1012 transfusions (9.5%) were considered possibly inappropriate (could not be assessed as either definitely appropriate or inappropriate). At Calvary 63 of 395 (15.9%) were possibly inappropriate.

### Appropriateness of transfusions, by prescriber designation

At Canberra Hospital, registrars had a significantly higher rate of appropriate transfusions and a lower rate of inappropriate transfusion compared with other prescribers (see Box 2). This difference was not detected at Calvary Hospital. Residents or registrars after hours had lower rates of inappropriate transfusions (2 of 62 episodes [3%]) compared with other prescribers (193 of 1031 episodes [18.7%];  $P = 0.002$ ) across the ACT.

One resident of interest had rotations through two units with large numbers of transfusions. The first clinical unit had a high inappropriate transfusion rate and the second a low inappropriate rate. During the first term, the resident transfused inappropriately in seven out of eight episodes, compared with only one out of 15 in the second term.

## Discussion

Our results show that senior medical staff prescribed transfusions in the majority of episodes

### I Decision makers in transfusion, Canberra and Calvary Hospital audits

Prescriber designation	Transfusions, Canberra	Transfusions with undetermined prescriber (%) (n=790)	Transfusions, Calvary	Transfusions with undetermined prescriber (%) (n=305)
Consultant	405 (40%)	51.3%	193 (48.9%)	63.0%
Registrar	316 (31%)	40.0%	82 (20.8%)	27.0%
Resident	69 (7%)	8.7%	30 (7.6%)	10.0%
Not known	221 (22%)	—	90 (22.8%)	—
Total	1011		395	

where the prescriber could be determined. This was contrary to our expectations and may indicate that the decision to transfuse is already considered more seriously than interventions with similar immediate risk profiles, perhaps because of concern over the uncertain long-term risk of infectious agents contaminating the blood supply, or immune modulatory effects of transfusion. Alternatively, it may indicate that specialist medical staff are more actively involved in routine decision making than we had anticipated.

The rates of prescription by senior staff were higher at the Calvary Hospitals than at Canberra Hospital. As a smaller hospital, most registrars are employed on secondment from larger centres and it may be that these general trainees are less inclined to make the decision to transfuse than subspecialty trainees at a tertiary centre, or that the consultants in the smaller centre were more actively involved in routine daily decision making.

Our findings indicate that registrars have a better pattern of transfusion prescription than others, although there was some discrepancy between the two hospitals, and dispel the myth that residents are frequently responsible for inappropriate practice. Salem-Schatz and colleagues<sup>3</sup> suggested that senior clinicians are more confident in their decision making, but have an inferior level of knowledge of transfusion practice. Our report suggests that this may translate into less appropriate prescribing.

The influence of specialists may be underestimated by our results. In one case, a change of prescribing patterns from a resident on different rotations suggested that the ward environment or consultant expectations played a major influence on prescribing, in the absence of documented specialist involvement.

Residents prescribing after hours without any documented consultation may be less influenced by the opinions of senior staff. In these cases, transfusions were overwhelmingly appropriate. However, there may be a general reticence to transfuse after hours, so that only those patients with clear clinical indications are transfused without consultation, and the decision deferred if the indication is not clear or urgent.

Our overall rates of inappropriate transfusion were similar to the rates of between 16% and 35% in other published Australian prospective<sup>7</sup> and retrospective<sup>8</sup> audits. The similarity of the results suggests a common problem with transfusion requests and improves the confidence with which our results on prescribing patterns may be extrapolated to other Australian settings.

### Limitations of the audit

As an audit of clinical records, the results reflect only those records where documentation allowed a prescriber to be determined. We found 78% of records identified a prescriber. Episodes without an identifiable prescriber did not differ significantly from the whole population in terms of the rate of inappropriate blood use, but we cannot exclude the possibility they were biased towards certain prescribers.

Medical records may misrepresent the prescriber if they failed to accurately record the circumstances surrounding transfusion, particularly where a consultation with, or request from, another practitioner was not noted. In these cases it is likely that the true prescriber was at least as senior as the prescriber recorded in the notes. Occasionally a designated prescriber may have not been specifically involved in the transfusion process, such as if an anaesthetist

## 2 Appropriateness of transfusion, by prescriber designation

Canberra Hospital			Calvary Hospital		
Prescriber	Appropriate	Inappropriate	Prescriber	Appropriate	Inappropriate
Consultant ( <i>n</i> = 405)	294 (72.6%)	70 (17.3%)	Consultant ( <i>n</i> = 193)	116 (60.1%)	45 (23.3%)
Registrar ( <i>n</i> = 316)	257 (81.3%)*	38 (12.0%) <sup>†</sup>	Registrar ( <i>n</i> = 82)	49 (59.8%)	22 (26.8%)
Resident/intern ( <i>n</i> = 69)	46 (66.6%)	16 (23.2%)	Resident/intern ( <i>n</i> = 30)	20 (66.7%)	8 (26.7%)

\* *P* = 0.002 compared with other Canberra prescribers

<sup>†</sup> *P* < 0.05 compared with other Canberra prescribers

overseeing an operation was absent when a transfusion was initiated by the registrar, and this was not appropriately recorded in the notes.

Finally, the judgement of appropriateness depends upon the quality of the clinical information recorded in the medical records. As far as possible we endeavoured to review the clinical notes concurrently with each admission and infer the reason for transfusion when it was not explicitly stated. However, it is possible that significant influences on the decision to transfuse may not have been considered when the assessment of appropriateness was made, as they were not documented.

### **Implications for quality improvement intervention strategies.**

In our audit, determining the major prescribers has directed us to focus our improvement interventions on senior clinicians. Although junior medical officer education and credentialling to prescribe has been suggested in an effort to improve the quality of transfusion,<sup>9</sup> our results challenge the potential effectiveness of these suggestions.

There is (limited) evidence from our audit indicating that residents may take on the prescribing patterns of the unit to which they are attached. This is concordant with the previous studies of hospital doctors, where residents reported prescribing transfusions they knew were inappropriate due to pressure from senior colleagues, and where the site of practice was a major influencing factor on the quality of transfusion practice.<sup>3,4</sup> The effect of senior clinicians influencing the local expectations on each ward means their influence on transfusion practice is likely to be greater than our results indicate. We strongly recommend focusing improvement interventions in transfusion on senior clinicians. On the basis of these results, we have targeted quality improvement initiatives and educational strategies primarily at specialists.

We have investigated the decision makers, as recorded by the hospital records, across the ACT, in order to identify areas for practice improvement and provide an insight into the decision making processes within hospitals. Our results suggest an immediate focus on practice improvement strategies targeting senior clinicians, rather than junior staff, in transfusion medicine. The results were unexpected,

as we anticipated a large degree of junior staff involvement in the decision making process. The findings also highlight a need for a greater understanding of the participants in decision-making processes at the point of care if we are to understand the way our hospitals function and proceed rationally with quality improvement interventions.

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### **Competing interests**

None identified.

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