

# Understanding and Influencing Blood Prescription

**A Market Research Report prepared by Eureka Strategic  
Research for the Clinical Excellence Commission and  
the National Blood Authority.**

December 2007



**BLOOD WATCH**  
every drop counts



**CLINICAL  
EXCELLENCE  
COMMISSION**

# Understanding and Influencing Blood Prescription

A Market Research Report prepared by Eureka Strategic Research for the Clinical Excellence Commission and the National Blood Authority.

December 2007

© Clinical Excellence Commission 2007

This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without prior written permission from the Clinical Excellence Commission (CEC). Requests and enquiries concerning reproduction and rights should be directed to the Director, Corporate Services, GPO Box 1614, Sydney NSW 2001.

This publication is part of the CEC's *Blood Watch* Series. A complete list of CEC publications is available from the Director, Corporate Services (address above) or via the CEC's web site <http://www.cec.health.nsw.gov.au>.

### **Suggested citation**

Clinical Excellence Commission (CEC) 2007. *Understanding and Influencing Blood Prescription*. Sydney: A Market Research Report, CEC.

### **Clinical Excellence Commission**

Board Chair: Prof Bruce Barraclough, AO  
Chief Executive Officer: Prof Clifford F Hughes, AO

### **Any enquiries about or comments on this publication should be directed to:**

Ms Bernie Harrison

Director, Organisational Development & Education  
Clinical Excellence Commission  
GPO Box 1614  
Sydney NSW 2001

Phone: (02) 9382 7600

Email: [information@cec.health.nsw.gov.au](mailto:information@cec.health.nsw.gov.au)

# Understanding and Influencing Blood Prescription

## Table of Contents

|   |           |
|---|-----------|
| <b>Acknowledgements</b>                         | <b>4</b>  |
| <b>Foreword</b>                                 | <b>6</b>  |
| <b>Exective Summary</b>                         | <b>8</b>  |
| <b>Research context</b>                         | <b>13</b> |
| 2.1 Background                                  | 13        |
| 2.2 Research objectives                         | 19        |
| <b>Research design</b>                          | <b>21</b> |
| 3.1 A qualitative approach                      | 21        |
| 3.2 Sample structure                            | 22        |
| 3.3 Conduct of the qualitative research         | 23        |
| <b>Research Findings</b>                        | <b>25</b> |
| 4.1 Current practice                            | 25        |
| 4.2 Attitudes and knowledge                     | 32        |
| 4.3 Inappropriate transfusions                  | 38        |
| 4.4 Communications                              | 41        |
| <b>Conclusions and Recommendations</b>          | <b>46</b> |
| <b>Appendix A – Blood Watch Interview Guide</b> | <b>50</b> |



## ACKNOWLEDGEMENTS

The Clinical Excellence Commission would like to thank the authors of this report, Ms Jennifer Crawford, Mr Liam Downing and Mr Andrew Griffiths of Eureka Strategic Research, for their professional input and expertise in bringing together the final report.

The CEC acknowledges the valuable contribution of the National Blood Authority and thanks them for their financial input and expert advice during the research process.

The CEC also thanks Ms Sally Francis, Dr Amanda Thomson, Ms Bernie Harrison, Ms Carolyn Der Vartanian and Dr Lesley Survela for their contributions and expert advice regarding the market research.



## FOREWORD

The Clinical Excellence Commission (CEC), in collaboration with the National Blood Authority (NBA), commissioned market research consultants- Eureka Strategic Research- to identify the influencing behaviours of clinicians who prescribe blood components: specifically, the prescribing of red cells to haemodynamically stable (i.e. not bleeding) adult patients with normal bone marrow. This timely report gives us some insight into what the current transfusion practice amongst senior surgeons and physicians in NSW.

Communicating the messages of appropriate and safe blood transfusions to all clinicians within our health system remains an ongoing challenge, especially in light of the growing evidence of immunomodulatory effects following transfusion. Furthermore, the persistent issues around the rate of adverse events from human error, incompatibility reactions, and bacterial contaminations remain important considerations in the decision to transfuse a patient. The CEC's Blood Watch program is working to improve the safety and quality of fresh blood product transfusion in all NSW Public Hospitals.

I commend this report to you and recommend that it be reviewed by Area Health Service Transfusion Committees, Heads of Department of Surgery and Medicine, relevant professional associations and all clinicians who prescribe and transfuse red cell transfusions.

The CEC will use the insights gathered in this report to inform the development of a communications strategy for the Blood Watch program in NSW and recommend strategies applicable at the national level to enhance appropriate prescribing of blood components.

Clifford F Hughes AO  
Chief Executive Officer



**The executive summary highlights the key results from the study and Eureka's recommendations in light of these findings**

## EXECUTIVE SUMMARY

### Research context

Although red blood cell transfusions are an important part of the treatment of some haemodynamically stable patients, there is evidence to suggest that a number of transfusions in such settings are inappropriate. This means that some patients are being exposed unnecessarily to the risks associated with transfusion. It also means that blood, a scarce and precious resource, is being overused.

Accordingly, there is a need to reduce the number of inappropriate transfusions. With this in mind, the National Health and Medical Research Council (NHMRC) formulated a set of guidelines to help guide doctors' decisions to prescribe.

To achieve system-wide compliance with the guidelines, and to promote best practice in red blood cell transfusion, the Clinical Excellence Commission (CEC) has initiated a Blood Watch Program. Eureka Strategic Research was commissioned by the CEC and the National Blood Authority to conduct research to inform the development of a marketing and communications strategy for the CEC Blood Watch program in NSW, and to recommend strategies applicable at the national level to enhance appropriate prescribing of blood components.

### Research design

Eureka conducted 21 depth interviews with clinicians across 9 public hospitals in 7 Area Health Services (AHSs) in NSW. The majority of interviews were conducted face-to-face, with three conducted via telephone to ensure greater representation in some regional areas. The interviews were stratified according to seniority and speciality, with registrars and specialists/surgeons interviewed in four key areas of specialisation.

## Research findings

### Current Practice

Doctors generally said that they took into account a range of factors when prescribing blood. Predominantly, however, haemoglobin levels were the key indicator used when prescribing blood.

When asked about how low haemoglobin levels would need to be to justify a transfusion, many doctors found this to be a difficult question to answer because most believed the patient would be symptomatic before reaching low levels, although the tendency to prescribe blood on this indicator alone tended to increase once Hb reached 8g/dL.

All doctors, when asked about how many units they typically prescribed, stated that they prescribe a minimum of two units, and felt that one unit would make little to no difference to patients. Importantly, this position was often the result of habit, or through following standard, well-established practice, and few doctors were able to offer evidence-based support for this aspect of blood prescription.

All doctors felt confident in prescribing blood, or as confident as any other aspect of their practice. Blood prescription was not seen to be exceptional to other 'normal' aspects of clinical practice.

When queried about the level of consultation that took place regarding blood transfusions, doctors generally reported that they were predominantly individual decisions, although consultation on more complicated cases was not uncommon. More specifically, registrars often reported that they conferred with their consultants if they felt a case was borderline, and some practitioners reported that they consulted with haematologists and anaesthetists, who are seen as the experts in blood component therapy.

When asked how they would feel if someone questioned their decision to prescribe blood, doctors indicated that they were open to questioning by colleagues regarding 'legitimate' concerns. However, it was clear that there was some resistance to having their clinical judgment queried, although they may be happier to be questioned by more senior or specialised staff.

Generally, patients were seen to be comfortable with the process of red blood cell transfusion, with the obvious exception of Jehovah's Witnesses. The main questions asked of doctors regarded the necessity of the transfusion, and blood-borne infections, such as HIV and hepatitis. Practitioners said that they were generally proactive in supplying information to patients. Importantly, doctors did say that they would be open to influence if patients expressed genuine concerns about transfusion.

## **Attitudes and knowledge**

Doctors indicated that they had a high level of confidence in the current blood supply, and believed that it was clean and disease-free. Most had a good knowledge of the strategies in place to ensure that this was the case. As a result of this confidence, doctors generally believed that blood transfusions are safe. Although the adverse effects of blood transfusions were perceived as severe, they were seen as extremely unlikely to happen.

While all doctors could name some of the risks associated with transfusion, very few could name all the risks unprompted. Some of the risks were not as salient to doctors as other risks, and some risks, such as GVHD and increased length of hospital stay, were disputed altogether.

There is a widespread awareness that blood is not free, but most were only guessing at the cost of blood. That said, cost is unlikely to factor into doctors' decisions to prescribe.

Despite the perception of the safety of blood transfusions, most doctors felt it was important to minimise the number of transfusions that they perform. Predominantly, this was because they perceived blood as a scarce and precious resource, and one that should only be given to those who really need it. Several doctors also mentioned that blood was given in good faith in Australia, and that this should be respected. Risks and cost were mentioned as factors, although to lesser extents.

There is a common belief that practices have become more conservative over the years, although anecdotally, some said transfusion is seen as the 'safer' option than not transfusing.

When asked about methods for minimising the need for blood, most doctors could name some, but few were aware of the full range of techniques, nor their potential. There was variation in the levels to which these methods were employed, and some mentioned it would be difficult to tell which patients would benefit from these alternatives, and which patients would suffer from not having a transfusion.

## **Inappropriate transfusions**

Most doctors significantly underestimated the proportion of inappropriate transfusions, with the majority of estimates between 0% and 10%. Although a few doctors were not surprised by the 30% figure, most were. Among those who were surprised, some expressed a desire to see the study from which the figure was drawn.

Most commonly, doctors felt that the rate of inappropriate transfusion was likely to be the result of younger, inexperienced doctors 'going by the numbers'. Other reasons mentioned included a lack of education and a lack of knowledge of the guidelines. Doctors generally felt that their own practices fell within the guidelines, and were extremely reluctant to consider their own transfusions as possibly being inappropriate. Education, particularly for junior

doctors, was seen as the best solution, along with arming patients with knowledge. However, as they believed their practices fell within the bounds of appropriateness, doctors were generally uninterested in participating in any education programs themselves.

Two systems designed to reduce inappropriate transfusions, the approval system and targeted audits, were put to participating doctors. Although there is some support for approval systems within hospitals where such a system exists, the overall response to this model was lukewarm. Doctors' concerns mainly related to the case knowledge of approving consultants or registrars.

The audit system was generally welcomed, as doctors believed that it would highlight where practice could be improved. Importantly, however, given doctors' beliefs that their own prescribing behaviours are appropriate, many doctors do not believe that an audit will identify their own practices as inappropriate.

## **Communications**

Most doctors assumed that a set of guidelines existed, but very few had specific knowledge of the NHMRC guidelines. Some talked about the 'Red Cross' guidelines, while others said they had seen guidelines but were unable to recall where they had seen them. Some also mentioned hospital-specific guidelines that were in place.

There was a common perception that doctors' own practices fell within the guidelines, even when they had described practices earlier in the interviews which would not comply. The guidelines were felt to be of limited utility, although many thought that they could be useful early in doctors' careers. Some felt them to be useful for reinforcing their own practices, although some also felt that they were not tailored specifically to their specialisation. Guidelines were not seen to constrain clinical judgment, although clinicians rarely, if ever, used materials to guide their transfusion decisions. Consequently, the RCBS lanyard card was seen to be of little utility. Guidelines related to other blood products, such as FFP and platelets, were seen to be more useful.

The NHMRC is seen as a reputable and trustworthy authority, as well as haematologists and specialist colleges. The Red Cross was also mentioned. NSW Health is not seen as a reputable authority, as many perceive it to be primarily interested in financial rather than clinical outcomes. Some of those who knew that the CEC is related to NSW Health placed it in the same category, although others believed that the CEC is a reputable organisation. However, CEC is a new organisation which only commenced in 2004 and the Blood Watch program has only been active for 12 months. Hence, most had not heard of the Clinical Excellence Commission.

There was little consensus on the best ways to receive information, with mixed support for seminars, journals and direct mail or email.

## Conclusions and recommendations

Based on the findings of the research, the key challenges for any program designed to reduce the number of inappropriate transfusions are to stimulate interest in best practice transfusions, and to encourage doctors to perceive their own practices as potentially inappropriate.

In developing appropriate messages, there are a number of points which should be emphasised:

- The high percentage of **doctors** giving inappropriate transfusions, rather than the percentage of inappropriate transfusions.
- The severity of the risks of transfusion, and that these negative consequences do sometimes happen. Awareness of the risk of increased length of hospital stay was particularly low. There is potential to increase doctors' awareness of this risk, although the information will need to be supported by sound evidence.
- The importance of not exposing patients unnecessarily to these risks.

Messages about cost should be carefully crafted, because doctors prioritise patient care, and knowledge of the cost of blood is unlikely to influence prescribing habits. Furthermore, messages about the cost of blood alone or in isolation are likely to reinforce a widely held view of administrators as solely interested in financial outcomes. However, cost is an outcome of clinical care and every clinical decision has a resource impact which is inescapable.

A key deficit in doctors' current practice is prescribing a minimum of two units of blood. Therefore, the demand for blood could be reduced significantly by encouraging doctors to give a single unit (or a combination of one unit and other methods), then reassess the patient, when they would otherwise have prescribed two units of blood. This message would need to be accompanied by persuasive evidence to support it.

Given doctors' low interest in further information in blood transfusion, communication strategies which do not rely on the motivation of doctors are more likely to be successful. A number of examples are provided in this report. Consideration should also be given to implementing targeted audits, as well as an approval system governing the prescription of blood.

Finally, to assist with planning the logistics of communicating with senior clinicians, we recommend that the Clinical Excellence Commission and the National Blood Authority seek specialised advice.

**This section outlines the background to the project, and specifies the research objectives**

## RESEARCH CONTEXT

### 2.1 Background

#### Blood product use

The transfusion (or infusion) of blood components can be an important component in the treatment of non-acute, haemodynamically stable patients with normal bone marrow. Such conditions include:

- Anaemia;
- Iron Deficiency;
- Platelet function disorders;
- Surgical blood loss;
- Gastro intestinal bleeding or “occult” blood loss
- Fibrinogen deficiencies (which can lead to the blood not clotting);
- Non-bone marrow related thrombocytopenia (lack of platelets in blood); and

- Inherited deficiencies of coagulation inhibitors.<sup>1</sup>

Although the use of blood component therapy in the above circumstances may be beneficial to patients, it is important that its benefits are balanced against its possible negative effects when making any treatment decision; a consideration which constitutes the heart of the *Clinical Practice Guidelines on the use of Blood Components* (hereafter the guidelines):

“Blood component therapy should only be given when the expected benefits to the patient are likely to outweigh the potential hazards.”<sup>2</sup>

The potential hazards of blood transfusion include:

- Incompatible blood transfused to patients;
- Acute and delayed transfusion reactions;
- Transfusion-related acute lung injury;
- Graft-versus-host disease;
- Infection transmitted by transfusion, and
- Long term adverse outcomes e.g. post operative infection/increased length of hospital stay.

As stated in the guidelines, while these negative effects are rare, they may be life-threatening.

## Past and current practice

Generally, treatment decisions have been primarily based on lower thresholds (or ‘trigger levels’) of particular blood components. For example, the infusion of red blood cells has typically been prescribed when a patient’s haemoglobin level falls below ‘100g/L (or a haematocrit of 30 per cent)’<sup>3</sup>. Thresholds have also been used when prescribing platelet infusion.

The prescription of blood component therapy, however, has often not necessarily been based on sound evidence. While blood component therapy in some clinical applications is well

---

<sup>1</sup> National Health and Medical Research Council and the Australasian Society of Blood Transfusion, *Clinical Practice Guidelines on the use of Blood Components*, retrieved 8 May 2007 from <http://www.nhmrc.gov.au/publications/synopses/files/cp78.pdf>: pp 17-28

<sup>2</sup> Ibid. p xiii

<sup>3</sup> Ibid. p 2

understood and documented with comprehensive evidence, in other clinical applications it has become common practice through advocacy rather than through support from rigorous research<sup>4</sup>. As a result, there has been a lack of consensus about particular blood component therapy treatments, and consequently, there are significant differences between hospitals in Australia and New Zealand in both quantity of blood product used and forms of treatment for specific conditions. Specifically, evidence indicates that there exist:

- Significant variability in the use of blood in the same clinical situations, implying that there is both overuse and potential under-use of blood;
- Misuse of blood components (with the rate of transfusion errors being higher than that of transfusion-transmitted viral diseases); and
- Lack of documentation about the process, rationale and outcomes of blood component therapy.<sup>5</sup>

Further, the guidelines state that the rate of inappropriate use is 'unacceptably high'<sup>6</sup>, and the fact that the rate of complications arising from transfusion errors is higher than transfusion-transmitted viral diseases indicates that there may be areas in which transfusion practice can be improved.

## The guidelines

To reduce the inappropriate use (and consequent possible overuse and under use) of blood products, in 2001, the National Health and Medical Research Council and the Australasian Society of Blood Transfusion formulated a set of sixteen guidelines designed to:

"Support clinical decisions about the use of red blood cells, platelets, fresh frozen plasma and cryoprecipitate, by discussing the current evidence underpinning the indications for their use."<sup>7</sup>

While not serving as indications for use, the first twelve guidelines address the clinical decision to transfuse blood. While component thresholds are an important aspect of the decision to prescribe red blood cells and other forms of blood component therapy, the guidelines indicate that thresholds should **not** be used as the primary basis of the treatment decision; a finding

---

<sup>4</sup> Ibid. p viii

<sup>5</sup> Ibid. pp 6-7

<sup>6</sup> Ibid. pp vii- viii

<sup>7</sup> Ibid. p vii

supported by the World Health Organization<sup>8</sup>. For example, while the guidelines state that the prescribing of red blood cells may be of benefit when haemoglobin levels are between 70g/L and 100g/L, caution should be exercised and comprehensive clinical assessments of patients' situations should be conducted.

In addition to the twelve guidelines which specifically address the clinical decision to transfuse blood, four of the guidelines relate to organisational practice, and relate to:

- Record-keeping – to generate and store records of blood use and ordering, and clinical process;
- Clinical review processes – to monitor the safety and appropriateness of blood transfusion;
- Resources – to ensure that health systems provide adequate resources for the implementation of the guidelines; and
- Informed consent – to ensure that patients are informed of all the risks and benefits so they can contribute to the decision to use blood component therapy.

### **National Blood Authority**

The National Blood Authority (NBA), a cosponsor of this research, is an independent statutory agency established under the National Blood Authority Act (2003) in response to recommendations of the Review of the Australian Blood Banking and Plasma Product Sector (the Review), chaired by Sir Ninian Stephen. The primary role of the NBA is 'to improve and enhance the management of the Australian blood banking and plasma product sector at a national level'<sup>9</sup>.

The National Blood Agreement requires the NBA to:

- facilitate coordination, integration, cooperation and information exchange between the NBA and other bodies with a safety and quality role in the Australian blood sector; and
- facilitate the development of national information systems for safety and quality issues in relation to the Australian blood sector.

All parties under the Agreement, are required to develop and implement specific safety and quality strategies in the following areas:

---

<sup>8</sup> World Health Organization, *Developing a national policy and guidelines on the clinical use of blood*, retrieved 8 May 2007 from [http://www.who.int/bloodsafety/clinical\\_use/en/WHO\\_BLS\\_98.2\\_EN.pdf](http://www.who.int/bloodsafety/clinical_use/en/WHO_BLS_98.2_EN.pdf)

<sup>9</sup> *National Blood Authority: About Us*, retrieved 10 May 2007 from <http://www.nba.gov.au/about.htm>

- development, implementation and review of evidence-based national clinical practice guidelines for blood products, blood related products and blood related services to ensure best practice in the management and use of such products and services;
- specific administrative systems to bring about quality improvements in the management and use of blood products, blood related products and blood related services within the public and private health systems;
- promotion of best practice management and use of blood products, blood related products and blood related services by persons (including health professionals) and organisations involved in the management or use of such products and services in the health system; and
- development, implementation and review of appropriate indicators and means of measurement of best practice management and use.

The initial focus of the NBA was on contract management and supply arrangements. The Blood Counts 'Aim' and 'Program' were conceptualised in the latter part of 2005 and a team was assembled in February 2006 to commence work and further develop a program within the policy parameters set down in the National Blood Agreement, the National Blood Authority Act (2003) and the Stevens Review (2001). The aim of the Blood Counts program is to "Support the States, Territories and health care professionals in improving patient outcomes through appropriate utilisation of blood and blood products". The NBA is delighted to be working with the CEC to improve the appropriate utilisation of blood and blood products throughout Australia.

## Clinical Excellence Commission

Previously, many decisions regarding clinical errors and complaints were dealt with at a local level, with decisions resting with hospital or area health service (AHS) administrators. However, currently, there is a shift to adopting uniform standards and processes system-wide.<sup>10</sup>

In response to this need, the Clinical Excellence Commission (CEC) was launched on August 24 2004. The CEC is a board-governed statutory health corporation with the CEO reporting directly to the NSW Minister for Health.<sup>11</sup>

---

<sup>10</sup> *Clinical Excellence Commission*, retrieved 16 May 2007 from <http://www.cec.health.nsw.gov.au/>

<sup>11</sup> *About The Clinical Excellence Commission*, retrieved 11 May 2007 from <http://www.cec.health.nsw.gov.au/about.html>

The CEC's mission is to "to build confidence in healthcare in NSW, by making it demonstrably better and safer for patients and a more rewarding workplace"<sup>12</sup>. It achieves this through monitoring clinical quality and safety processes in Area Health Services and using this information to improve the performance of the NSW Health System.

## Blood Watch

In keeping with system-wide uniformity of accountability, solutions and best clinical practice, the CEC-administrated Blood Watch program commenced in 2006 with the overall aim of improving the quality and safety of fresh blood product transfusion in NSW public hospitals. The program is endorsed by the eight AHSs in NSW.

It is currently staffed by 13 Project Officers/Transfusion Clinical Nurse Consultants, whose roles include conducting regular audits of blood transfusion in key facilities within their respective AHSs. In addition to the Project Officers, the Blood Watch program also involves one or more Clinical Leads in each AHS, whose roles involve engaging other clinicians with the goals of the programs.

Overall, the mission of the program is to achieve excellence in transfusion medicine.

## The need for research

While the guidelines are in place and supported by all AHSs in NSW, and while the Blood Watch program has commenced with the support of the eight AHSs, it appears that the actual behaviours of clinicians prescribing blood component therapy have not significantly changed as a result. In addition, similar programs have not effected ongoing improvements. As discussed in the brief, the NSW Blood Transfusion Improvement Collaborative (BTIC) project did effect change in some prescribing behaviours in 2002-2003, with 5 out of 17 teams involved meeting the aim of reducing transfusions defined as inappropriate by 50% (in line with recommendations contained within the guidelines). This was achieved through blood banks vetting requests for blood in accordance with the guidelines. However, the reduction was found to be unsustainable over the longer term due to blood bank staff being placed in direct conflict with clinicians who were unaccustomed to having their clinical judgement and decision making questioned, indicating some significant resistance to behavioural change in regard to blood transfusion practice.

Currently, while there is quantitative evidence supporting the hypothesis that clinicians continue to inappropriately prescribe blood components in some contexts, there is insufficient research to understand **why** clinicians do so, and what sorts of communication could serve to

---

<sup>12</sup> Ibid.

influence clinicians to change behaviour in accordance with the guidelines. The research was required to develop this understanding, to allow for the formulation of recommendations to address the need to change behaviours.

## 2.2 Research objectives

The research aimed:

1. To develop an understanding of clinician's perspectives and knowledge relating to:
  - transfusion indications and risks,
  - understanding of personal risk and risk estimates
  - the impact of peer influence
  - patient preferences
  - blood product cost
  - knowledge of availability of blood products
  - transfusion guidelines – the use of clinical protocols, guidelines or pathway to manage patients of which blood component therapy is a part
  - their practice style
  - confidence in prescribing blood
  - blood management
2. To identify marketing and communication strategies to improve prescribing practice from both a national and a state perspective;
3. To identify how and where the target audience prefers to receive key clinical messages;
4. To help inform a marketing and communications strategy for the Blood Watch program in conjunction with the other Blood Watch initiatives.

5. To provide recommendations to assist in the development of a national program to enhance compliance with the NHMRC guidelines.<sup>13</sup>

The methodology used to address these recommendations is detailed in the following section.

---

<sup>13</sup> Ibid. pp 8-9

**In this section, details of our research design are provided, as well as our rationale for this methodology**

## RESEARCH DESIGN

### 3.1 A qualitative approach

In order to achieve the research objectives outlined in Section 2.2, a qualitative research program was undertaken. Qualitative research is exploratory, allowing for a detailed and flexible examination of the nature of clinicians' perceptions and their decision-making with respect to blood transfusion. Importantly, qualitative methods are oriented towards open discovery. This flexibility is advantageous, in that it allows participants to raise topics, enabling facilitators to identify the issues that are of greatest significance to the target group, and potential points of leverage for the communications campaign.

#### Depth interviews

Depth interviews were selected for this research. There are a number of reasons as to why depth interviews were preferable in this context, including:

- **Confidentiality** The topic of this research necessitated discussing medical decision-making processes that clinicians may not have been willing to discuss openly in a group setting, where they may have felt that their professional judgement was being scrutinised. This fact alone warranted the use of a qualitative technique in which participants had complete anonymity and confidentiality, so that they felt more confident in providing honest feedback.

- **Convenience** It would have been too difficult to coordinate a group of clinicians given the significant demands clinicians’ jobs place on their time. Depth interviews allow us to work around clinicians’ schedules.
- **Depth of feedback** The nature of this assessment required obtaining detailed and specific information, and accordingly, required that the methodology be of a similar nature. Depth interviews are ideal for garnering this information.

Most of the interviews were conducted face-to-face, although three of the 21 interviews were conducted over the phone. This maximised the representativeness of the sample, because, by interviewing some people over the phone, the research was able to include a more geographically diverse sample.

### 3.2 Sample structure

Eureka’s sample structure for the depth interviews is illustrated in the table below:

|                  | Metro   | Regional   |
|------------------|---|--|
| Cardiac          | 3 x Cardiac Surgeons<br>2 x Cardiac Registrars            |  |
| Orthopaedic      | 2 x Orthopaedic Surgeons<br>2 x Orthopaedic Registrars    | 1 x Orthopaedic Surgeon<br>1 x Orthopaedic Registrar     |
| Gastroenterology | 2 x Gastroenterologists<br>1 x Gastroenterology Registrar | 1 x Gastroenterologist<br>1 x Gastroenterology Registrar |
| Anaesthetists    | 2 x Anaesthetists<br>1 x Anaesthetic Registrar            | 1 x Anaesthetist<br>1 x Anaesthetic Registrar            |

Three key variables were taken into account within this structure, namely:

- **Location type** – Eureka segmented the sample by location. Specifically, clinicians were grouped according to whether they work in a metropolitan or regional hospital. As mentioned, three of the regional interviews were conducted over the telephone, with the other three conducted face-to-face in two regional locations. All of the interviews in Sydney were conducted face-to-face.

- **Area Health Services** – Eureka conducted interviews with clinicians in nine hospitals from seven of the eight Area Health Services (AHSs). Doctors from the following hospitals were included in the research:
  - RPA
  - Royal North Shore
  - Blacktown
  - Nepean
  - St Vincent’s
  - Prince of Wales
  - Dubbo
  - Lismore
  - Wagga Wagga
  
- **Areas of specialisation** – Eureka segmented the audience on the basis of the four key areas of specialisation identified in the brief; namely cardiac, orthopaedic, gastroenterology, and anaesthetic. This served to illustrate key differences in practice between these areas.
  
- **Surgeons/Registrars** – Eureka interviewed both surgeons and registrars to determine the possibility of differences in seniority and training which might affect blood product prescribing behaviours.

### 3.3 Conduct of the qualitative research

#### Recruitment of research participants

All participants for the depth interviews were recruited by a professional recruiter with extensive experience in working with medical professionals, or by Eureka’s consultants. The recruitment process ensured that participants had not participated in market research for the last six months.

## **Guides and research tools**

Eureka worked in consultation with the CEC to develop a comprehensive discussion guide, which is attached at Appendix A. A pilot interview was conducted to test the utility of the discussion guide.

## **Duration and incentives**

The depth interviews averaged approximately 1 hour in length. Incentives for registrars were \$250, \$300 per orthopaedic surgeon and anaesthetist, and \$350 per cardiac surgeon and gastroenterologist, which are in line with industry standards for conducting research with these specialist doctors.

**This section reports the findings from the qualitative research into the prescribing habits of NSW surgeons and registrars in public hospitals**

## RESEARCH FINDINGS

### 4.1 Current practice

#### Typical prescription circumstances

Participants were asked about the circumstances in which red blood cells would typically be prescribed. Although exact prescription circumstances varied, the most commonly cited by specialty are reported in the following table:

|                  |  |
|------------------|--|
| Gastroenterology | Gastrointestinal bleeding; significant anaemia; chronic liver disease  |
| Cardiac          | Heart surgery patients (aortic, bypass and valve) both intra- and post-operatively                               |
| Anaesthetists    | Vascular surgery; obstetrics; pre-op to optimise patient status for operation; intra- or post-op if losing blood |
| Orthopaedic      | Arthroplasty (particularly hip replacements); intra- or post-op if losing blood                                  |

#### Factors influencing prescribing decisions

Predominantly, Hb level was mentioned as the key factor in the prescribing decision. All clinicians, however, said that they took other factors into account.

*Age, co-morbidities, intra-operative blood loss from the procedure and general wellbeing. (Ortho Registrar)*

In particular, many mentioned specific co-morbidities such as ischemic heart disease and anaemia, which would increase the likelihood that the patient received a transfusion. Doctors also named a range of speciality-specific symptoms.

The following were the factors most consistently mentioned as influencing the prescribing decision:

- Co-morbidities - particularly ischemic heart disease
- If the patient has anaemia
- Level of blood loss by volume - many doctors cited intra-operative blood loss, where this could be measured, as a key factor
- Anticipation of potential blood loss - where doctors felt, through clinical experience and judgment, that they could anticipate a certain level of blood loss for particular operations, they would prescribe blood in such a way that would keep patients at a safe level throughout the operation
- General health (no co-morbidities) - most doctors felt that a healthier patient was able to tolerate a lower Hb level
- Age - older and more frail patients were seen as being more likely to require transfusions, while younger patients were more able to withstand lower Hb levels
- Rehabilitation - clinicians often expressed the view that it was necessary to get particular patients mobile as quickly as possible following their operations, especially in orthopaedics. (It is worth noting that transfusion does not necessarily lead to mobilisation, despite the fact that this was a widely held view among participants. Transfusion should only be given to improve oxygen transportation for the patient.)

*If you just replace someone's knee, you want them to get up fairly quickly and early so they can start their rehabilitation. (Ortho Registrar)*

Some emphasised that Hb triggers should not be used in isolation, and that transfusions should be given to treat particular symptoms, rather than simply to improve a patient's 'numbers'.

*We're not really supposed to think purely on numbers. You take it on a patient by patient basis on what sort of co-morbidities they've got. (Anaesthetist)*

*Yeah, you get the result and then you think about the patient and you go, "Do I think they can tolerate that? What are they like at the time?" You wouldn't do it just on the basis of a number. (Orthopaedic registrar)*

Participants were asked how low a patient's haemoglobin level would need to be to justify a blood transfusion on its own. Many doctors found it difficult to provide an Hb trigger 'threshold' figure in the absence of any other symptoms. They felt that transfusions would generally only take place when patients are symptomatic. However, to some extent, it appeared that some were relying on the Hb as the main indicator, and expected that a low Hb would usually be accompanied by symptoms, such that the Hb was the primary focus for their prescribing decisions. From the answers provided by doctors in the research, it seems that any tendency to make decisions based on Hb alone increased when Hb reached 8g/dL or lower.

### **Number of units prescribed**

Doctors were queried about how many units of blood they would generally prescribe for haemodynamically stable patients, and, without exception, the participants in this research indicated that they would normally prescribe two units or more, and stated they had never prescribed a single unit. When asked about why they generally prescribed two units, doctors' answers indicated that this practice was not necessarily the result of evidence-based practice, but more of a sense of it being 'the done thing', or an unsupported 'theory'.

*My theory, that I can't back up scientifically, is if they need it, they get two. (Ortho Surgeon)*

Importantly, many practitioners had never thought about the reasons for their adherence to the two-unit rule, and many mentioned it was a result of their training.

*We were taught that it's not much use giving one unit of blood and when it is needed. You may as well give two units. That is the only reason. Teaching. (Gastro Registrar)*

Prescribing one unit was generally perceived as meddling, rather than treating. Indeed, a single unit was felt to be unlikely to make a noticeable impact on patients' health. One doctor argued that, given that a donor can donate a unit of blood without suffering any adverse consequences, receiving only one unit of blood would likewise make little difference. Similar views are expressed in the following quotes.

*I don't think one is going to have enough of an effect. (Anaesthetist)*

*If you're transfusing one, then they probably don't need it. (Ortho registrar)*

Some doctors also mentioned that prescribing one unit was impractical in an outpatient setting, particularly one where the patient has travelled for significant periods of time. It was argued that one unit would probably be ineffective, and that prescribing a single unit would show little concern for the patient who would, in all likelihood, need to make another appointment to receive more blood.

## Confidence in prescribing blood

When queried about confidence in their own prescribing behaviour, all doctors in the research expressed that they were very confident in prescribing red blood cells; and at least as confident as they are in their other practices.

*As confident as anything else I do. (Ortho Registrar)*

*You're either a good doctor or you're not, and it's part of being a good doctor in the field. You're confident about your other practices, why wouldn't you be about that? (Gastroenterologist)*

Through further discussions, it was clear that doctors were highly confident in their own ability to prescribe blood appropriately in most situations. Some did indicate that they might seek advice from other doctors in more complicated cases (for example, if the patient had co-morbidities), but that these were unusual situations.

## Colleagues

Most specialists and registrars reported independent decision-making about prescribing blood. However, (as mentioned) consultation on complicated cases was not uncommon. Doctors were less certain about prescribing blood products other than packed red blood cells, and so many indicated that they would often seek advice when making decisions about other blood products. In general, these other blood products were seen as the domain of haematologists.

*If we are getting into other products, like factor VII or Prothrombinex, I'd probably ask someone... but just talking about packed cells, I am fairly confident. (Anaesthetic Registrar)*

*In more complicated patients, you tend to call the haematology team or the blood bank haematologists. (Cardiac registrar)*

*I think it's helpful to hear another opinion, especially a haematologist. We often consult them. (Cardiac surgeon)*

When registrars were asked about which of their colleagues they seek advice from, many indicated that they sought information from their supervising consultant. However, in cases where consultants were not available, or where the decision to prescribe was seen as relatively straightforward, registrars would often defer to their own perception of consultants' practice as a guide to their own decision.

*If I have doubt whether to give or not, I'll ask my consultant and see what they think. (Anaesthetic Registrar)*

*My patient has an ischemic history. She had haemoglobin of 84, and I transfused her two units. My consultant is in Sydney at the moment, and I wasn't able to contact him immediately. I have contacted him subsequently and he agrees. (Ortho Registrar)*

When asked whether they would be open to having their decisions critiqued by colleagues of differing levels of seniority, most participants stated that they would be open to questions, assuming it was what they saw as a 'legitimate' concern.

*If they have a reason to be nervous about what I am doing, that is fine. If they want to correct me or if they know something that I don't know, that's alright. (Ortho Registrar)*

*You've just got to discuss it with them like you would question anything, any other treatment, and explain why you want that treatment. If they've got some good reason that you've overlooked, then you're silly not to hear their reason. (Gastroenterologist)*

Obviously, this question carries significant demand characteristics, meaning that doctors probably felt that they should say that they were open to their decisions being questioned. Particularly when exploring reactions to a system where requests for blood are vetted, it was clear that many were resistant to the idea that their clinical judgement was being questioned. That said, there is a degree of respect for both seniority and specialisation, and doctors may be more open to critique from more senior and specialised personnel.

*If it was a haematologist [questioning my decision,] I think that if it was a situation that wasn't dire, I would probably want to know what their reservation was about. (Anaesthetic Registrar)*

## Patients

Doctors were asked about the levels of concern of patients in relation to blood transfusion, and participants believed that most patients were relatively comfortable with the process of receiving red blood cell transfusions. (It is worth noting that patients are seen to be more concerned about their illness and the procedures that they may be undergoing than they are about receiving blood.) Doctors reported patients asking very few questions about blood transfusion, although many indicated that they tried to pre-empt questions by proactively telling patients about some of the risks involved. Doctors reported that, when patients did ask questions, these questions normally related to the risk of viral infection and the necessity of transfusion.

*Well, to be honest, they have very little questions. I can't quite remember when the last time my patients questioned my decision. (Gastro Registrar)*

*The only thing they are worried about is HIV. They rarely ask about the others. I've never had a question about anything else except when patients ask about donating blood. (Cardiac Surgeon)*

The one major exception was Jehovah's Witnesses, who have a religious objection to transfusion.

*If they are Jehovah's Witness, then there is not much choice but not to transfuse. (Gastro Registrar)*

In addition, some doctors mentioned that it had been hospital policy to make Jehovah's Witness minors wards of the state in situations in which transfusion was likely or necessary.

*That was a hospital policy, and the hospital would actually be prepared to make the child a ward of the state, if it came to a clash with the parents. (Anaesthetist)*

In terms of information delivery to patients, doctors generally reported that they did so verbally.

*I just handle it verbally. And I always document what I've said to a patient, if I've spoken to a patient. (Anaesthetist)*

*I first explain why they need this and then what are the adverse affects of a blood transfusion. This is done verbally and then a consent form for the transfusion. (Gastro Registrar)*

When queried about the use of written materials to inform patients, many doctors indicated that they used them rarely, if at all. Many pointed out that it was difficult to access such materials, or said that they were not aware of their existence.

*I don't have any written material about blood transfusions. (Anaesthetist)*

A notable exception is that some orthopaedic surgeons mentioned brochures distributed by the Australian Orthopaedic Association which contain information about blood transfusions.

*The Australian Orthopaedic Association provides leaflets on arthroplasty. I don't know that I've got one to show you, but they do. (Orthopaedic Surgeon)*

*I also give all my patients a few handouts. I give them a handout from the hospital which talks about general medical care and it talks about rehab' and stuff like that... but I also have a special handout from the Australian Orthopaedic Association that I give to every person that has had an operation from my practice and that has relevant information on it. (Orthopaedic Surgeon)*

In addition, one of the cardiac surgeons mentioned a patient brochure on coronary artery bypass graft surgery distributed by the Australasian Society of Cardiac and Thoracic Surgeons which included information on blood transfusion.

While very few had seen the NHMRC or BTIC brochures, many doctors commented on their usefulness once they had sighted them.

*Can you get them for your practice? (Ortho Surgeon)*

*Yeah it looks good. That should answer most questions of a patient. (Gastro Registrar)*

Some doctors felt, however, that the format of the brochures may be less than enticing for patients.

*It [the NHMRC brochure] doesn't look very human-happy. I'd probably think something a bit brighter would be nice, and maybe a humorous cartoon on the front. It looks like something out of the army. (Anaesthetist)*

Although, as reported earlier, questions from patients were rare, doctors did mention that younger patients were more likely than older patients to ask questions, and to have sought knowledge about their conditions independently.

*Younger patients have read more. They're more aware. (Cardiac Surgeon)*

In addition, older patients were said to be more likely than younger patients to be comfortable with doctors' decisions.

*You have a subset of the population that will say, "Whatever you think is best, doctor." They tend to be the older patients. And then the younger patients say, "Well, if you think I really need it, I don't like the idea of getting someone else's blood but if it means that I am going to get better and get out of hospital quicker, then I will take it." (Anaesthetic Registrar)*

Although most patients are believed to be comfortable about receiving blood, there was evidence that there is significant potential for patients to influence doctors' prescribing behaviours, particularly if patients were more proactive. As illustrated in the following quotes, patients are already exerting some influence over doctors' prescribing behaviours.

*We will listen to the patient and if they have any problems and if they decide not to have the transfusion, there is nothing we can do! (Gastro Registrar)*

*If a patient doesn't want a blood transfusion and I can't see any immediately life threatening problem, I'm happy to let them not have it. (Ortho Registrar)*

*I think if it was very borderline, the decision, and the patient was very against the whole issue, it might influence you. (Gastroenterologist)*

## 4.2 Attitudes and knowledge

### Transfusion risks

When asked about the safety of blood transfusions, specialists and registrars generally felt that blood was very safe and clean. Specifically, most knew about the strategies employed to keep the blood supply clean and free from disease, and there was a high level of confidence about the screening techniques practised by the Blood Bank. These strategies were often mentioned in conjunction with the fact that Australia has one of the safest blood supplies in the world.

*Is it safe? Well, it's safer in Australia than it is overseas, because we have a better population that volunteer blood. (Orthopaedic Registrar)*

*I feel very confident because the blood bank is so good in Australia. It doesn't mean I take the decision lightly but if I decide to give it, I don't give it a second thought. (Cardiac surgeon)*

When asked about the risks associated with transfusion, all interviewees were able to name some of the risks. Most commonly, doctors cited allergic reactions, infections, and mismatched blood as potential risks.

*There are long-term effects; infections, such as HIV and Hep C. (Anaesthetist)*

*Infection, allergic reactions, wrong blood/wrong labelling. (Cardiac Surgeon)*

*Some people can get quite severe reactions like allergies, like allergic reactions to blood. (Cardiac Registrar)*

*Well there's incompatibility – the patient's given the wrong blood type. (Ortho Registrar)*

*I haven't seen any patients react really badly, but I have seen patients with a mild allergic reaction. (Gastro Registrar)*

Despite some knowledge about the risks of blood transfusion, none of the doctors were able to name all risks unprompted. Only some were aware of risks such as transfusion related acute lung injury (TRALI) and graft versus host disease (GVHD). These risks were felt to be highly unlikely to occur, or even disputed altogether, as illustrated in the following quotes.

*I don't know. Can you get [GVHD] from transfusion? That must be very rare. (Ortho surgeon)*

*I've never witnessed one. (Gastroenterologist)*

*There's something called 'TRALI Transfusion' when there's an acute lung injury, which I don't know much about. (Anaesthetist)*

*In the population we're talking about, where they've got a normal bone marrow, I just can't imagine [GVHD]. No, it can't. It can't. I cannot see a way that that would happen. (Ortho registrar)*

*Can you get [GVHD] from transfusion? (Ortho Surgeon)*

*[TRALI] is something that people in ICU get which isn't generally covered in my patient population. The whole phenomenon as I understand it is not related to blood transfusions but to someone who is quite sick in general for whatever reason, say if they're septic. I wasn't aware that it was specifically linked to blood transfusions. (Ortho Registrar)*

Similarly, most believed that a blood transfusion would be more likely to reduce, rather than extend, a patient's length of hospital stay. There were only a couple of doctors who were aware of the increased risk of extended hospital stay as a result of blood transfusion.

*If you transfuse at the right time, you can shorten the stay. If you have this patient, say, who lost blood during the procedure, and after the procedure they're showing signs of anaemia, most times, if you transfuse at the right time, you can shorten the stay. (Cardiac Registrar)*

*I don't know about [increased length of stay]. The thing is, if you have a patient who's debilitated – for example an elderly patient with multi-system problems, like heart disease, kidney disease, heart failure, whatever and they come in and say it's a trauma case like a broken hip in an elderly patient... sometimes it is important to give those patients blood so that they can heal if they are very frail and very debilitated. It is interesting if it is written there that there is an increased risk of infection, I would have thought that the risk of infection were greater if they were debilitated. So I will check on that. That is interesting. (Ortho Surgeon)*

Having explored doctors' knowledge of the risks of transfusion, interviewers then asked doctors about the likelihood and severity of these risks. Although adverse outcomes were mentioned, and although some could be extremely severe, doctors felt that they were highly unlikely to happen. Interestingly, this was usually because they had never witnessed severe adverse outcomes or reactions.

*Well, there are risks, but the risks are incredibly tiny. (Anaesthetist)*

*So when you get the blood to give it to the patient in the end, there is that full risk that what it says is not really what it is, and that risk, even though that's small, that's very tiny, is the one that can kill a person. (Anaesthetist)*

*I would say very safe. I don't recall ever having to deal with an adverse reaction such as infection or allergic reaction or blood being given to the wrong patient. I could not remember any incidents from transfusion, so I would think it is rather safe. (Gastro Registrar)*

*Well I think that they are actually pretty safe. I have never had a patient get AIDS off a transfusion. I've not had anyone develop significant problems from a blood transfusion, so those terrible problems that do happen are rare. (Ortho Surgeon)*

Conversely, doctors who had had personal experience of the severe negative effects of blood transfusion tended to be more cautious about their prescribing practice.

*I actually had a friend whose cousin was a haemophiliac and he got AIDS from bad blood, and that was in the early 80s. He was a doctor and he was dead at 42 from AIDS and that was absolutely horrible. So tragedy happens from blood and you just want to minimise it as best you can. (Ortho Surgeon)*

*I think our people are much more respectful of blood as a treatment, and they accept that there is a risk. In our hospital, the first unit of AIDS infected blood was given. It was a terrible thing to be part of. (Anaesthetist)*

## Cost of blood transfusions

When asked about the cost of blood, most doctors admitted that they were unsure of the per-unit price, but were aware that blood is not free. When asked to estimate the actual cost of a unit of blood, estimates ranged from a couple of hundred dollars to approximately a thousand dollars. Many of these estimates were based upon vague impressions.

*I'd be guessing \$200-300 a unit. I don't know what that figure includes. (Anaesthetist)*

*Everything else is almost a by-product to [Factor VIII], so I don't think it's very expensive, but I don't know. Maybe a couple of hundred dollars? (Anaesthetist)*

*I don't know. What a good question! I've always had this idea of three or four hundred dollars. (Ortho Registrar)*

*I've heard three hundred dollars and I've also heard a thousand dollars which includes donation and testing etc. I'm not sure which the right answer is. The blood itself is 300 dollars but there are other costs as well. (Ortho Surgeon)*

*I don't know. I'd say around five hundred dollars per unit. (Ortho Registrar)*

*It must be very expensive. I have no idea. But considering all the logistics involved, say you know to get the blood, to process the blood, to store the blood, to have it available, it must be very expensive. (Cardiac Registrar)*

However, the price of blood is unlikely to factor into doctors' prescribing decisions, as the decision is made for clinical, rather than financial, reasons. Indeed, most doctors admit that the health and wellbeing of their patient is their priority, and the cost of blood has little bearing on their decision to prescribe it.

*I think I am pretty careful prescriber so I will prescribe it no matter what it costs. And there really isn't anything else that can replace it. (Ortho Surgeon)*

## Minimising need for blood transfusions

Most participants agreed it was important to keep transfusions to a minimum. A prevalent view exists that blood is a scarce, precious resource and as such, doctors should be very judicious in its use.

*It is a precious resource that we should consider carefully before prescribing. (Gastro registrar)*

*Most countries I've worked in, blood is a rare resource, and it's a resource that is very precious. (Cardiac surgeon)*

Additionally, some recognised that blood is donated in good faith and that donors expect this to be respected, and expect that their donated blood is prioritised for those most in need.

The risks associated with transfusion were often mentioned as a reason to reduce the number of blood transfusions. However, when asked why they felt it was important to minimise the amount of blood that they prescribe, doctors were more likely to mention the scarcity of blood. A very small number of participants mentioned the cost of blood as an important reason to minimise its use.

*Each bag of blood carries a small risk, a small, real risk. (Anaesthetist)*

*The upfront problem is cost, we do know it does cost. (Anaesthetist)*

There was a common belief among participants that blood prescription attitudes and practice have become more conservative over the years, and especially in the last ten years or so.

*The education has changed gradually over the years, so that you are more conservative with your blood usage. (Cardiac surgeon)*

*In the old days, we'd try to fill them up with lots of blood or another fluid [prior to the operation]. But these days, we tend to run them dry. With this quite revolutionary new...philosophy, we're giving a lot less blood. (Anaesthetist)*

*Over a period of time, there has been increasing emphasis on conservatism and giving less and less and less. (Anaesthetist)*

*Ten years ago, you'd transfuse people if they were under 100, and you'd hardly think about it. Now we're a lot more conservative about it. (Ortho registrar)*

Even so, some say that transfusion is seen by some of their colleagues as the conservative path of action. The use of the word 'safer' in the following quote illustrates this point of view.

*Some sorts of operations we transfuse if the Hb is below 70. Some other surgeons prefer to go a bit safer; they say 'Oh if it drops below 80, you transfuse'. Some other specialties go even safer, say plastics and orthopaedics. They prefer to keep the Hb above 100. (Cardiac registrar)*

Participants were asked to name methods or techniques available for reducing the need for blood. All were able to name at least some techniques, but few seemed aware of the complete range of techniques, how and when they are used, or their full potential for reducing the need for blood transfusions. There was also some scepticism about the effectiveness of some of the techniques. For example, some doubted the utility of iron tablets.

*There's a study that's been done that shows that all iron pills do is make your poo black. (Ortho Registrar)*

Others felt that iron tablets were not something that they could easily use. For example, anaesthetists may only see their patient a day before the operation, when it would be too late for iron tablets to have any effect.

The range of methods mentioned for limiting the number of transfusions were:

- Wait and see/observation
- Meticulous surgical technique
- Iron tablets/transfusion/injection
- Cell savers, cell salvage and reinfusion drains
- Identify and control the source of blood loss
- Maintaining volume with other blood products or volume expanders
- EPO
- Transemic acid
- Stop use of anti-coagulants, such as aspirin
- Bone wax on bones so they do not continue to bleed

- Vasoconstrictors
- Giving Factor VII instead of blood
- Education of nurses and junior staff

Some mentioned it was difficult to identify which patients would suffer if not transfused, and as such, they would tend to err on the side of transfusion rather than simply monitoring the patient or utilising one of the above techniques.

*I could get away with fewer transfusions. I probably tend to over-transfuse than under-transfuse. It's difficult to know who's going to suffer without a transfusion. (Gastroenterologist)*

## 4.3 Inappropriate transfusions

### Awareness

There was little awareness among clinicians of the extent of inappropriate transfusions, either in total number or in prevalence across hospitals and specialisations. The majority significantly underestimated the proportion of transfusions that were inappropriate, with most estimates ranging between zero and 10%, although a few estimated figures that were closer to the actual rate of 30%.

*I think it's not very many. 5%-10%, nothing more than that based on what I've seen. (Cardiac Registrar)*

*I think it would be rare. (Anaesthetist)*

As such, most were surprised to learn that the number of inappropriate transfusions across NSW was 30%. Some were even sceptical about the accuracy of this figure. A small number of respondents also expressed a desire to see the research and methodology behind this finding.

*I'm surprised. I'm really surprised. (Anaesthetist)*

*Well, yes it does surprise me. I would think 30% is too high. [But]... depending on your definition of appropriate you may have a different percentage. (Gastro Registrar)*

*It does [surprise me] a bit. But a lot of studies don't probe deeply enough into individual cases, and there sometimes might be a whole lot of good, valid reasons. (Gastroenterologist)*

When asked about why the rate of inappropriate transfusions was as high as it was, there was a commonly-held belief that such transfusions were being carried out by junior doctors and interns, rather than senior or more experienced doctors.

*I think one of the sources is junior doctors who are transfusing patients according to numbers. (Anaesthetist)*

Some felt that a lack of education at all stages of training, including for senior doctors, was also felt to contribute to the high figure.

*If there were that many [inappropriate transfusions], you would have to say it was poor education. (Ortho Registrar)*

*I think it's probably a lack of information. Blood transfusion is an area where you sometimes go with the patient's symptoms, so it can be hazy. (Gastroenterology Registrar)*

There was also felt to be a concurrent lack of knowledge of guidelines relating to transfusion.

*I don't think people are trying to actively go away from the guidelines. Maybe they just aren't aware of them. (Gastro Registrar)*

When discussing the possible reasons for the large number of inappropriate transfusions, it was clear that there was an extreme reluctance for doctors to consider their own practice as potentially falling outside the guidelines. This was probably primarily due to very high confidence levels in their personal practices. As such, a common belief was that it must in fact be 'others' who were prescribing inappropriately; whether these were other doctors, units, or hospitals.

*I haven't seen any inappropriate transfusions. (Cardiac Registrar)*

*I am not involved in inappropriate transfusions. (Ortho Registrar)*

*I can't recall a case where someone has inappropriately transfused blood. (Anaesthetist)*

## Reducing inappropriate transfusions

Education is seen by most as the best way to reduce the number of inappropriate transfusions. Indeed, education is seen to be relevant to all levels of training and seniority, from including transfusion material in student teachings, to education for practicing doctors in the form of seminars, journal articles, provision of information and so on. While most (including junior doctors themselves) felt that education was most relevant to students and juniors, senior doctors showed similar awareness of the guidelines and best practice, and were strongly influenced by long-standing habits, so the need for education for these clinicians would appear to be equally pressing.

Having said this, most doctors are not particularly interested in learning more about inappropriate transfusions for the simple fact that they believe their current practices are not deficient, and that it is others who need to be encouraged or educated to change their practices.

Some doctors felt that another possible method of reducing inappropriate transfusions would be to encourage patients to be more proactive in their interactions with doctors; that is, doctors' patients should have greater access to information about blood transfusions, and be prepared to ask questions of doctors about the necessity of transfusions.

Participants were asked about their opinions on, and experience with, two forms of system that have the potential to reduce inappropriate transfusions. These were an approval system, where requests for transfusion which are outside accepted guidelines are referred to a registrar or consultant for approval; and an audit system, wherein one's blood prescriptions are assessed against the guidelines (and potentially against other doctors, units and hospitals).

Support for the approval system was somewhat mixed. Those who currently or had previously worked in hospitals or units where such systems were in place were more likely to support their use. They did note, however, that prior to experiencing these systems, they had resisted their introduction, as we found with doctors with no experience with such a system. One of the main concerns held by these doctors related to the extent of case knowledge of the consultant or registrar in charge of approval (and their ability to make clinical decisions based on this knowledge or lack thereof). Indeed, many disliked the idea that their clinical judgement would be questioned, particularly by someone who had not assessed the patient personally. Another objection was that this system may be impractical or unworkable; there were concerns about staffing, practicalities of putting every request through for approval, and so on. These types of reactions are illustrated in the following quotes.

*I don't think putting in a consultant as a barrier and multiple steps for clinical justification to block transfusion is a very good way of doing it. (Anaesthetic Registrar)*

*If that person comes and assesses the patient with me, then that's fair enough, but if they're going to give me their opinion based on a number and an assessment which they might not be able to make over the phone, I might be reluctant. (Cardiac Surgeon)*

*It's a copout, inhibitory. People are intimidated by that. (Gastroenterologist)*

*If it meant that I had to get on the phone and explain to them in detail why I was doing it, I just don't have time for that. It would lead to more animosity than solving anything. (Ortho Registrar)*

The audit system received a more positive response from participants. There was a strong interest in comparing one's prescribing habits to both other doctors, and to the guidelines; especially because they had been made aware at that stage of the interview of the high rate of inappropriate transfusions. Many felt that audits would influence their prescribing because they could see where they were over- or under-prescribing, and because they knew that their decisions would be scrutinised. Having said this, many assumed that an audit system would not find fault with their behaviour, but instead identify the other doctors who were inappropriately prescribing.

*That would be a good idea – internal audits. Always a good idea for quality assurance. We haven't done one for transfusions but we do them for a variety of different things. (Gastroenterologist)*

*I think it's worth it to monitor an institution and doing the audit would be the right way. I think it's important, otherwise you have no idea about what's going on. (Cardiac Registrar)*

*That would be interesting. I would have no problem with that. It would influence my decisions. (Gastro Registrar)*

## 4.4 Communications

### Guidelines

There was a broad assumption that guidelines exist, but little knowledge of details such as by whom they were written or distributed, what format they come in, or where they might have come across them. The NHMRC guidelines were not spontaneously mentioned by name, and most were not familiar with them when they were presented for inspection. Some, however, did mention being familiar with some (unspecified) Red Cross guidelines.

The limited knowledge about existing guidelines is illustrated in the following quotes.

*I'm aware of guides in the blood bank, but I haven't seen one recently. (Anaesthetist)*

*Australian guidelines? I have heard during our teaching but I haven't seen any actual document with the criteria. (Gastroenterology Registrar)*

*We're all quite familiar with the guidelines that are issued by the Australian Red Cross service. (Ortho Registrar)*

*Oh, I've come across in my time - but not recently I think - guidelines from the NSW blood bank. But the details, I couldn't give you. (Ortho Surgeon)*

Others felt they had seen guidelines from other sources, but could not specify from whom, although a few referred to hospital- or unit-specific protocols.

There was a common perception among clinicians that their own practice was already consistent with guidelines and, as such, that the guidelines merely reinforced their own prescribing habits and did not contain any new information.

*I am aware of most of the information [in the guidelines]. (Gastroenterology Registrar)*

Some went further, believing the guidelines to be unhelpful and insufficiently specific for their specialty.

*They are motherhood statements.*

*They are baby guidelines. For cardiac surgery, the guidelines are far more specific. You couldn't decide whether to transfuse based on those guidelines. (Cardiac Registrar)*

Many, however, had previously reported practices which would not comply with the guidelines, including a few who had indicated that they had previously assumed the lower threshold for transfusion was at 8g/dL.

There was a general perception that the guidelines would be of the most utility for those in the early stages of their career, or during university studies again, highlighting that it is felt to be others, especially juniors, who are not complying with best practice.

*I would certainly think particularly useful at a junior level. (Ortho Surgeon)*

However, some admitted that it would be useful for reinforcing one's own practice, and to have as a reference to provide a sense of reassurance that one was following best practice. Additionally, the guidelines were not seen as constraining clinical judgement.

*I think they're practical, easy to follow and they offer enough flexibility that you need. (Ortho Registrar)*

Guidelines related to other blood products were often seen as more useful than those relating to red blood cells, as RBC transfusions are typically seen as a more routine and less complicated procedure than some other types of blood product transfusions. Materials to guide red blood transfusion decisions were rarely, if ever, used by any of the research participants.

## Communication tools

Participants were shown a range of existing collateral materials designed to increase awareness of, and reference to, the guidelines. Most said that they would be unlikely to use the RCBS lanyard as it was felt that doctors were already inundated with similar tools, diluting any effectiveness or novelty.

*I'm not sure if most people would carry it because there are so many of these things. (Cardiac registrar)*

Similarly, most saw little use for the wallet cards summarising the guidelines. As mentioned above, the patient information brochures were felt to be useful materials that could save them a significant amount of time.

## Sources of information

The most trustworthy sources of information on blood transfusion were seen to be the NHMRC, haematologists and the specialist medical colleges. The Red Cross was also spontaneously mentioned by a few participants in this context.

Conversely, NSW Health was not perceived as a reliable source of information about blood transfusion, with some scepticism surrounding the motivations and primary concerns of a government body in relation to health provision.

*I don't take medical advice from government bureaucracies just as I don't take tax advice from lawyers. (Ortho registrar)*

*They have no interest in health or patient outcomes. They're only interested in financial outcomes. (Gastroenterologist)*

Some participants were aware that Clinical Excellence Commission was part of NSW Health, and therefore tarred it with the same brush. However, others assumed it was a reputable authority, often basing this perception on the 'prestigious sounding' name alone.

## Channels of information

There was little consensus across participants on the best ways to keep up with or receive relevant information about blood transfusion. Some felt that seminars or in-service were the best options, but generally enthusiasm for and interest in the topic were low.

*I personally like workshops and seminars and educational environments.  
(Anaesthetist)*

*I think... it is pretty difficult to get to workshops. (Anaesthetic Registrar)*

*It's just another topic. Probably not one of the more interesting topics either.  
(Anaesthetist)*

There was a moderate amount of interest in reading transfusion articles in journals, but most doctors said they will only read articles or journals that are relevant to their specialty, and certainly will not seek out such articles.

*I have too many journal articles that I should read that pertain to orthopaedics that I don't have time to read. (Ortho Registrar)*

Some reported that they do not have time to seek out information and claimed that they would prefer direct mail or email so that it was presented to them and they would not miss it. There are, however, some doubts as to whether direct forms of communication would make it past 'filters' such as auxiliary staff or even junk mail email filters, and whether it would be read even if it did reach doctors.

Ward walls are widely seen as already too cluttered to viably support any message on blood transfusion. Material on walls is liable to be overlooked or go unnoticed regardless of placement or prominence. When asked specifically about whether messages in bathrooms or on toilet doors would be read, some doctors were hesitant about this idea.

*I don't know about the toilets. (Ortho Surgeon)*

*I don't think putting it in the toilet would be useful. (Gastro Registrar)*

That said, however, there were no specific objections to the idea, and some even saw the value in targeting captive audiences in this particular setting.

*Oh yeah, anything that is on the back of the toilet door gets read! [laughs] It is one place where people read things, isn't it! It is a fantastic advertising space. (Ortho Surgeon)*

*I saw some information in areas where you scrub up before surgery. You spend 3 minutes in there before each surgery so you will read it every time. (Cardiac Surgeon)*

**This section outlines conclusions and recommendations**

## CONCLUSIONS AND RECOMMENDATIONS

The research has identified a number of key attitudes which have relevance to communicating successfully with doctors on the subject of appropriate blood prescription. Most notably, it was found that doctors have a high level of personal confidence in their prescribing habits, and generally assume that their behaviours represent best practice and fall within the guidelines. This assumption is often incorrect, yet there is a significant reluctance among clinicians to recognise their own practice as suboptimal, even when presented with the guidelines.

Consequently, doctors expressed a low level of interest in receiving information about blood transfusion. Indeed, consultants and registrars appear to be comfortable with their existing knowledge levels on the topic of blood transfusion, and tend to prioritise information related to their specialisation or what they see as 'more important' facets of surgery.

Although most doctors were surprised by the high rate of inappropriate transfusions, nearly all assumed that it was other doctors at fault.

Thus, there are two key challenges for any communication or strategy aiming to reduce the number of inappropriate transfusions; namely, stimulating interest in best practice transfusions and encouraging doctors to perceive their own practices as potentially inappropriate.

### **Avenues for influencing doctors**

Doctors expressed a willingness to accept input from colleagues, especially senior colleagues or those who were more specialised, including anaesthetists and haematologists. This willingness suggests a potential to convey prescription messages through senior colleagues. In particular, doctors respect information that they receive from their specialist college. In light of

participants' comments about the extent to which they trust administrators to provide authoritative medical information, it is critical that the National Blood Authority and the Clinical Excellence Commission continue to actively support clinical groups, such as ANZSBT.

On the basis of the research results, it is clear that the attitudes and behaviours of both specialists and registrars need to be targeted. Consultants exert considerable influence over the practice of their registrars, and registrars are generally unwilling to challenge the decisions of their supervising consultant. Hence, targeting communications at junior doctors alone would be insufficient to address the problem of inappropriate transfusions.

Given that the research found that doctors generally perceive their own practices as being appropriate, there is a lack of impetus to engage with materials aimed at reducing inappropriate transfusions. To raise awareness among doctors of the need to change their practices, it is therefore likely that some face-to-face communication will be required. That communication will need to engage doctors and help them see why improving blood transfusion practices will be relevant and useful for them personally. To assist with planning the logistics of communicating with senior clinicians, we recommend that the Clinical Excellence Commission and the National Blood Authority seek specialised advice.

Another potential influence on doctors' behaviours is patients. Patients were shown to have an as yet underutilised influence on prescribing behaviours, suggesting that arming consumers with carefully targeted information may serve to moderate over-prescription of red blood cells. This said, it is clearly important to ensure that these messages do not scare consumers, lest some patients who really do require transfusions refuse to have them.

## Potential messages

When devising messages aimed specifically at specialists and registrars, there are a number of potential points of leverage. Firstly, messages should emphasise the high percentage of **doctors** who give inappropriate transfusions, rather than the proportion of inappropriate transfusions *per se*. Such a message would be less likely to result in doctors self exempting themselves from suboptimal practice. It is unlikely to be a minority of doctors who are responsible for the inappropriate transfusions which take place. For example, it cannot be the case that 30% of doctors are prescribing blood inappropriately 100% of the time. Instead, it is likely that the vast majority of doctors prescribe blood inappropriately at least some of the time. It would be useful for the NBA and CEC to obtain an estimate of the proportion of doctors who prescribe blood inappropriately, and use this information as part of their communications. This information would be more likely to encourage doctors to view their own practices as requiring attention.

It has been found that some of the risks associated with blood transfusion are often not salient in the minds of doctors, and there is an opportunity to improve knowledge about some of the

lesser known negative consequences of transfusion. For example, there is scope to increase awareness about the potential of blood transfusions to increase patients' length of hospital stay. Critically, this (as with other messages) will need to be backed with evidence, as currently doctors believe that the opposite is true. Hence, program messages should emphasise the severity of the potential risks, and that they do sometimes happen. Doctors need to be encouraged to see it as critical that they do not expose their patients to these risks unnecessarily.

Any messages regarding the cost of blood need to be carefully crafted; doctors prioritise patient care, and knowledge of cost is therefore unlikely to influence prescribing habits. Additionally, messages about cost alone are likely to reinforce views of administrators as solely interested in financial outcomes.

Strategies which reinforce a perception of blood as an inherent good (or 'gift of life' type messages) need to be handled adroitly. There is the potential for such messages, which may be presenting blood as the 'best' treatment, to encourage doctors to continue over-prescribing, as doctors understandably want to provide the best possible treatment to their own patients.

The most striking finding from the research is the common practice of prescribing a minimum of two units of blood. There is the potential to save significant amounts of blood if doctors are encouraged to give one unit of blood (or a combination of one unit and other methods), then reassess the patient, when they would otherwise have given two. This will need to be supported by persuasive evidence, as the prescription of two units is a deeply entrenched practice. It is important that the message emphasises considering a single unit of blood **when they would usually have considered two**, or else the message risks increasing the demand for blood.

Given the low interest in further information about blood transfusion, communication strategies which rely on doctors' motivation are less likely to be successful than those strategies which place doctors in a position where they need to process information about transfusion. There are numerous examples of potential strategies:

1. The blood order forms could be designed in such a way that doctors cannot order blood without processing the guidelines and 'checking off' the criteria. This strategy should also help with the auditing process. The form could also ask doctors to indicate whether they have considered alternatives to transfusion. Including a list of possible alternatives would help to increase the salience of some of these methods.
2. Include educative material in mainstream surgical seminars (which are of greater interest to doctors), rather than running seminars focusing solely on transfusion.

3. Target captive audiences in places such as bathrooms, toilets and scrub areas; places where communications materials targeted at health professionals have already been used with some success.

Targeted audits (i.e. auditing those requests where the haemoglobin falls between 7 g/dL and 10 g/dL) have the potential to help doctors recognise deficiencies in their prescribing, thereby creating interest in the guidelines. Conducting targeted audits may also encourage more conservative practice, if doctors are aware that their decisions may be scrutinised. In addition, it may be worth allowing data to be viewed on a hospital versus hospital basis, or comparisons between units, because encouraging competition among doctors is likely to engender positive outcomes.

Despite the likely resistance from doctors to the idea of an approval system for blood prescriptions, there is evidence that such systems are effective at reducing the demand for blood. Also, the research findings suggest that doctors become more accepting of such systems after a period of time working within them, and consideration needs to be given to more broadly implementing these systems. Of course, approval systems are resource intensive, and the CEC needs to assess the likely benefit of introducing these systems in a greater number of hospitals in light of their potential costs.

# A

## APPENDIX A – BLOOD WATCH INTERVIEW GUIDE

### Introduction

- Thank for participating
- Interviewer's role: to raise topics and issues and then for you to tell me what you think. Not medically trained, so please use everyday terminology.
- Audio taping. Reassure confidentiality, anonymity
- Interview will take up to an hour
- Topic: Prescribing blood
- Provide incentive (sign and check contents of envelope)

### Current practices

*I'd like to ask you a few questions about when and how often you prescribe blood. Specifically, we'll be talking about red blood cell transfusion. For all of our discussion, I'd like you to think about those patients who are **haemodynamically stable adults, with normal bone marrow.***

- How often would you prescribe a red blood cell transfusion? For which patient group? Is it a daily occurrence?
- In what sorts of situations do you normally prescribe blood? What factors do you typically take into account?
  - How low would a patient's haemoglobin level need to be to justify a blood transfusion on its own (i.e. in the absence of other symptoms)?

- Would you normally take into account clinical indicators other than their haemoglobin level?
  - What other clinical indicators?
  - To what extent do these other indicators influence your decision to prescribe blood?
- When was the last time you prescribed blood? Could you please describe the circumstances? Why did you decide to prescribe blood on this occasion? Did you refer to any materials to support or guide the decision? If not on this occasion, on other occasions? If so, what materials?
- It is not always clear-cut whether or not a patient would benefit from a blood transfusion. Would that be a fair comment?
  - Can you describe a situation in which it would be a 50/50 call? How would you make your decision? Would you err on the side of transfusing or err on the side of some other course of action or simply observe the patient's symptoms?
- When you do decide to give a patient a transfusion, how many units of blood would you normally prescribe? Why?
  - Would you usually give all units of the blood at once? Why?/Why not? In what circumstances might you order more blood than you need immediately?
- How confident do you feel in prescribing blood? If confident... what helped to engender that sense of confidence?
- If a nurse, JMO or Haematologist questioned your decision to transfuse, how would you react? Would you see it as helpful or be offended at having your clinical judgment questioned?
- Would you consider seeking advice when deciding to transfuse?
- Prior to giving their consent to a blood transfusion, what questions, if any, do patients normally have about receiving blood?
  - How do you normally address their questions? (e.g. information brochure, verbal communication, other team member) Do you have access to patient information material? Do you feel that it meets your needs?
  - How comfortable do you think they are about receiving blood?

- To what extent do patients have an influence on your decision to prescribe blood?

## Knowledge of risks, costs

- On balance, how safe or risky do you think blood transfusions are?
- Do you see it as important to minimise the number of blood transfusions that you prescribe? Why?/Why not? *(Note mention of cost of blood, its scarcity, risks to patient)*
- What do you do in your clinical practice to minimise the possibilities of giving your patient a blood transfusion?
- Do you know how much blood costs? Roughly how much do you think a unit of red cells costs?
- What are the risks for the patient in receiving a transfusion? *Note mention of the following (if possible try to ascertain what they consider are the most significant risk of transfusion):*
  - *Incompatible blood transfused to patients; (ABO or Wrong blood to patient)*
  - *Acute and delayed transfusion reactions; (allergic reaction eg rash, hives, symptoms-eg breathlessness or hypo)*
  - *Transfusion-related acute lung injury; (TRALI or acute lung injury, ARDS (adult respiratory distress syndrome))*
  - *Graft-versus-host disease; (GVHD)*
  - *Infection transmitted by transfusion; (Bacterial contamination or Hepatitis or HIV)*
  - *Long term adverse outcomes eg. Post op infection/increased length of stay; (recurrence of malignancy)*
- How significant are these risks (likelihood & severity)? How do they compare to the risks associated with not prescribing blood?

## Awareness and knowledge of guidelines

- Are you aware of any guidelines regarding the appropriate prescription of blood? What do you know about these? *Probe as appropriate:*

- What are the guidelines called?
- Who developed the guidelines?
- What do the guidelines recommend?
- How much flexibility do they give the treating doctor?
- Have you received any information regarding the guidelines?
  - [If yes] Where did that information come from?
  - What was the information about?
- Show participant a copy of the guidelines, and ask them to spend one or two minutes reading them.
- Do you feel that there is any new information in the guidelines of which you were previously unaware? What?
- How useful do you think these guidelines are? Why? Why not?
- What kind of support for transfusion decision making would you like to see eg. point of care decision support?
- Show participant NH&MRC tools and ask about their utility.

### **Reasons for, and solutions to, inappropriate transfusion**

- How commonly do you believe inappropriate transfusions occur? Why?
- There have been studies which indicate that, among haemodynamically stable adults with normal bone marrow, approximately 30% of blood transfusions are unnecessary, according to the guidelines. Why do you think this is the case? Do you think this is the case in your hospital?
- What do you think would be the best way to reduce the number of inappropriate transfusions? What needs to be done?
- Do you feel that it is appropriate that requests for transfusion of blood components which are outside accepted guidelines are referred by the laboratory to a registrar/consultant for approval? Have you had experience of such a system?

- What do you think about the role of audits in assessing your own prescribing against the guidelines? Would this influence your prescribing?

## Information and education

- Where did you learn what you know about blood transfusion? When do you feel is the best time to learn about blood transfusion?
- How have your views on prescribing blood been shaped, over the course of your training and career?
- To what extent do you think other doctors influence your decision to prescribe blood these days? In what ways?
- To what extent does anyone else influence your blood prescription decisions? [*probe as to nurses, administrators, patients*] In what ways?
- Are you interested in finding out more about appropriate blood transfusion? Why? / Why not? If not, what would stimulate your interest? What else would be helpful to know? How would you like to receive this information?
- How easy is it to keep up-to-date with knowledge that is relevant to blood transfusion? How do you do this?
- What sources of information would/do you trust? Why?
- What would be the best ways for you to receive information/messages about best practice blood transfusion? *Assess reactions to following ideas:*
  - Fact sheets, on display in wards, staff rooms, toilets
  - Journal articles
- Are you aware if there is a local or Area Transfusion Committee at your place of work?
- Are transfusion decisions discussed at all at M & M meetings?

## Closing

This research is being conducted on behalf of The Clinical Excellence Commission. The findings will be used to inform the Blood Watch program. This is a transfusion medicine improvement program designed to enhance the appropriate prescribing of blood components.



Level 3, 65 Martin Place  
Sydney NSW 2000

1st Floor  
Administration Building  
Sydney Hospital  
8 Macquarie Street  
Sydney NSW 2000

**Correspondence**

GPO Box 1614  
Sydney NSW 2000  
Tel 61 2 9382 7600  
Fax 61 2 9382 7615

[www.cec.health.nsw.gov.au](http://www.cec.health.nsw.gov.au)