

# The ORBCoN Report

Ontario Regional Blood Coordinating Network

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## Hot Topics in Transfusion Medicine

Spring was a very busy time for the Transfusion Medicine community in Ontario with multiple opportunities for professional development. In April, the 6<sup>th</sup> Annual Northern and Eastern Videoconference Transfusion Medicine Symposium was held. It was followed by the CSTM/CBS/Héma-Québec Joint Scientific Conference in May and then the Massive Transfusion Consensus Conference (MTCC) held this past June.

This summer edition of the ORBCoN report will feature “Hot Topics” in Transfusion Medicine including articles about: the interpretation of the “30 minute rule”, a code for the management of massive transfusion, the age of blood and a brief summary of the MTCC.

### ORBCoN continues to provide resources for Ontario hospitals. Our recent releases include:

- Mobile web application for the IVIG guidelines and dose calculator
- Bloody Easy 3 English version (French available Sept 2011)
- 2011 Provincial Bedside Audit Report

### Coming soon:

- Bloody Easy 3 online
- Online tracking at each site for: Bloody Easy for Nurses

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## How Do We Interpret the “30 Minute” Rule?

By: Yulia Lin <sup>1</sup>, Marianne Lavoie <sup>2</sup>

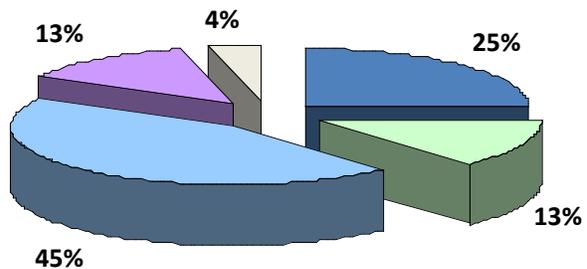
<sup>1</sup>Sunnybrook Health Sciences Centre and <sup>2</sup>Hotel-Dieu de Québec Hospital, Laval University

How long can a red blood cell (RBC) unit be out of the blood bank refrigerator before its quality is affected? This is a question that we have all encountered (and been frustrated by) in the blood bank. The CSA Z902-10 standard 10.10.5 states that “a blood component that has been returned to the transfusion service shall not be re-released unless a suitable temperature monitoring system indicates that the blood or the blood component has not reached an unacceptable temperature since being released or, in the absence of a temperature-monitoring system, that the blood component has not been outside of a controlled environment for more than 30 minutes (measured by occurrence, not cumulatively).” CSA standard 9.5.2.2 states that “blood components may be transported in a validated transport system that will maintain an environmental temperature of 1 to 10 °C.” The “30 minute rule” and 10°C threshold have long been the thresholds used by blood banks to determine suitability for re-issue, with the intent being to reduce the risk of bacterial growth in contaminated units. However there is little data supporting the 30 minute rule or defining what storage temperatures are acceptable in order to avoid excess bacterial growth.

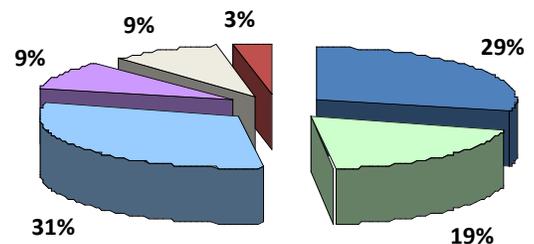
## How Do We Interpret the “30 Minute” Rule? *continued*

So what is the current state of affairs? We conducted a survey of 151 Ontario hospital transfusion services to find out how hospitals interpret these standards, how they measure red cell temperature and potentially how much blood is discarded as a result of this standard. We received 110 responses (response rate 73%). Forty-four percent were small hospitals (less than 100 beds), 38% were community hospitals and 18% were teaching hospitals. Figure 1 shows the variable interpretations of CSA Standard 10.10.5. Figure 2 shows the different methods used by Ontario hospital transfusion services to take the temperature of RBC units. Thirty-three hospitals reported specific numbers of RBC units discarded as a result of not meeting this standard resulting in at least 457 RBC units discarded in Ontario in 2009.

Given the impact of this standard, the next step is to contribute to an evidence base to determine the acceptable time and temperature ranges outside of the blood bank for RBC units. Dr. Sandra Ramirez-Arcos from Canadian Blood Services is conducting a study to look at changes in RBC units after prolonged room temperature exposure (longer than 30 minutes) and repeated room temperature exposures to assess bacterial growth and red cell quality indicators. These data may help give us an idea of how accurate the 30 minute rule really is and what temperatures may be acceptable. What can we do in the meantime while we await these results? Remember that 30 minutes is not a very long time: we need to prevent returns of issued RBC units by making sure the patient is ready for the transfusion with the correct transfusion order, a properly completed consent and a patent intravenous line.



- All RBC units that are returned to the blood bank more than 30 minutes after issue are discarded regardless of the temperature
- All RBC units that are returned to the blood bank at a temperature greater than 10 degree Celsius are discarded regardless of the time spent outside of the blood bank
- All RBC units that are returned to the blood bank more than 30 minutes after issued OR at a temperature greater than 10 degree Celsius are discarded
- All units that are returned to the blood bank are discarded regardless of temperature or time spent outside of the blood bank
- Other



- We do not measure the temperature of RBC units
- Tempcheck
- Infrared thermometer
- Temperature sensitive labels
- Calibrated thermometer
- Other

## “Code Omega”: A Massive Transfusion Response

*By: Lisa Merkley, Sunnybrook Health Sciences Centre*

Sunnybrook Health Sciences Centre is home to a regional trauma unit and a high risk obstetrical unit. Both patient populations have the potential to require massive transfusion support at a moment’s notice. In order to respond to such demands, “Code Omega” was

developed to facilitate a co-ordinated multi-professional team response.

Code Omega consists of 3 phases: initiation, maintenance and termination. During the initiation phase, the code is activated by the staff physician to mobilize the blood bank, the clinical pathology lab and clinical resources. The charge nurse

activates the communication strategy which includes: establishing contact with the blood bank and the lab; notifying hospital locating, who dispatches a page to a pre-determined fan out list; and security who deliver an overhead announcement. Transport is also contacted and a dedicated Porter is assigned for product and specimen delivery.

## “Code Omega”: A Massive Transfusion Response *continued*

The primary focus of the blood bank during this phase is to prepare “pack 1” which consists of 4 RBCs, 4 FP and 1 platelet pool and in the setting of an obstetrical bleed, also 1 pool (10 units) of cryoprecipitate. The goal of the maintenance phase is for the medical team, using lab guidance, to maintain blood physiology (hgb>70g/L, plts>50x10<sup>9</sup>/L, INR<2, fib>1g/L, ionized Ca>1.5 mmol/L, lactate<2mmol/L, base deficit<3mmol/L and temp>36°C). Throughout this phase the blood bank proactively prepares the next pack and this process continues until the termination phase is reached (bleeding is under control and component therapy is no longer necessary).

Mobilization of resources and effective communication are key components to a successful outcome. This was demonstrated in a recent obstetrical code omega with the delivery of one pack approximately every 28 minutes for a total of 7 packs issued, resulting in a positive patient outcome.

With every situation there are always lessons to be learned. That is why, after implementation of a massive transfusion protocol, it is paramount to review each case with the team members involved. This ensures that all gaps in the process are identified and process improvement initiatives are implemented to ensure that the next code runs as well as or better than the previous.

## Does the Age of Red Blood Cells Really Matter?

*By: Alan Tinmouth<sup>1</sup>, Jacques Lacroix<sup>2</sup>, Dean Ferguson<sup>1</sup>, Paul Hébert<sup>1</sup>.*

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Red blood cell (RBC) transfusions are a mainstay of treatment for medical and surgical patients. Surprisingly, we know little about the true effectiveness of RBC transfusions. The goal of RBC transfusions is to increase a patient’s hemoglobin, thereby improving oxygen delivery, and, ultimately, reducing morbidity and mortality. However, the TRICC trial, a large Canadian randomized controlled trial (RCT) in critically ill patients, suggested that transfusing RBCs may actually cause harm in some patients.<sup>1</sup> Subsequently, there has been a focus on the age of RBC units and the possible association with adverse outcomes. RBC “storage lesions” occur both in the supernatant (accumulation of inflammatory mediators including cytokines, iron, and microparticles containing lipids) and within the RBCs (loss of 2,3 DPG, ATP and deformability). A number of observational studies have reported an association between the

transfusion of older RBC units and death, infections or multiple-organ failure, but other studies have not demonstrated any adverse outcomes. These studies all suffer from confounding by indication (sicker patients receive more transfusions and older RBC units, and they are also more likely to have an adverse events unrelated to the transfusions). Thus, the “true” clinical consequence of transfusing older RBCs is unknown. Fortunately, large RCTs addressing this issue are currently underway. The Age of RBCs in Premature Infants (ARIPI) study has just finished enrolment. A total of 370 Canadian premature newborns were allocated to receive either fresh RBCs (stored < 8 days) or standard practice<sup>2</sup>. A second Canadian-led study, The Age of Blood Evaluation (ABLE) study is randomizing critically ill adults to receive fresh (stored < 8 days) or standard age RBCs. Over 600 (of a planned 2510) patients have been enrolled<sup>3</sup>. Two U.S. studies are randomizing cardiac surgery patients to receive younger RBCs stored for less than 14 (Red Cell

Storage Duration and Outcomes in Cardiac Surgery Study) or less than 10 days [The Red Cell Storage Duration Study (RECESS)] to RBCs stored for 21 days or longer<sup>4</sup>. The first 2 studies are examining whether transfusing fresh RBCs is beneficial while the latter 2 studies will determine if transfusing older RBCs is harmful. Together, these studies will finally provide some definitive answers about the benefits and harms of transfusing fresh RBCs as compared to older units.

<sup>1</sup>Tinmouth A, Fergusson D, Yee IC et al. Clinical consequences of red cell storage in the critically ill. *Transfusion*. 2006 Nov; 46(11): 2014-27.

<sup>2</sup>Fergusson D, Hutton B, Hogan DL et al. The age of blood cells in premature infants (ARIPI) randomized controlled trial; study design. *Transfus Med Rev*. 2009 Jan; 23(1): 55-61.

<sup>3</sup>Lacroix J, Hébert P, Fergusson D et al. The Age of Blood Evaluation (ABLE) Randomized Controlled Trial; Study Design. *Transfus Med Rev* 2011; 3: 197-205.

<sup>4</sup>Steiner ME, Assmann SF, Levy JH et al. Addressing the question of the effect of RBC storage on clinical outcomes: the Red Cell Storage Duration Study (RECESS). *Transfus Apher Sci*. 2010 Aug; 43(1): 107-16.

# A Summary of the Canadian Massive Transfusion Consensus Conference (MTCC)

By: Wendy Owens and Debbie Lauzon, ORBCoN

The conference was held in Toronto on June 9 – 11, 2011. Organized under the auspices of the National Advisory Committee on Blood and Blood Products (NAC), the conference brought experts together from around the world: “to discuss, deliberate and generate a consensus in regard to the treatment of patients experiencing massive transfusion in reflection of the availability of the supply of blood products and best treatment options for patients and overall clinical outcomes”. (Conference chair – Sandro Rizoli, MD PhD FRCSC). Consensus conferences follow a standard protocol that includes: expert speakers to present scientific evidence on the subject; a panel of experts who listen and deliberate on the evidence; a set of questions, published prior to the conference to be answered by the panel; attendees who listen to the evidence and ask questions to clarify various points of view. The panel is tasked with drafting a consensus statement based on the evidence presented and the proceedings of the conference. The proceedings of the

conference are recorded and transcribed carefully to ensure all presentations and discussions are documented.

The consensus panel, comprised of experts in the field of massive transfusion, was charged with answering six key questions and developing a consensus statement to guide the management of massive transfusion in Canada upon hearing the evidence over the course of 1.5 days.

#### Topics presented included:

- Epidemiology of trauma
- Limitations of massive transfusion protocols
- Usefulness of traditional and point of care laboratory tests for the management of massively bleeding patients
- Evidence to support laboratory directed approach for the management of massively bleeding patients
- Quality of evidence to support 1:1:1 formula driven resuscitation as the standard of care
- The role of other blood components, products and drugs
- Future studies

On the third morning of the conference, the expert panel presented a draft consensus statement along with detailed answers to the questions which were posed to them at the start of the proceedings. Attendees and speakers were given the opportunity to ask questions and make suggestions to the panel on how the statement and subsequent answers might be improved, or expanded upon.

The final report is expected to be available within a relatively short timeframe (suggested Sept 2011) and the proceedings will be published sometime in the not too distant future in a journal yet to be determined. As with other Canadian consensus conferences, it is anticipated that the recommendations derived from this process will be used to set the standard for the management of massive transfusion in many other jurisdictions worldwide.

For more information on the proceedings, program and report timelines, refer to: [www.mtcc2011.com](http://www.mtcc2011.com)

## Upcoming Educational Events Calendar

Event	Where	When
CBS Research and Development Symposium	Toronto, ON	September 10, 2011
GHEST Annual Transfusion Seminar	Burlington, ON	September 17, 2011
Annual ORBCoN Provincial Transfusion Committee Forum	Delta Chelsea Hotel Toronto, ON	September 23, 2011
London Laboratory Services Group - Annual Transfusion Medicine symposium	Four Points Sheraton London, ON	November 5, 2011

For a complete list of upcoming events please visit [www.transfusionontario.org](http://www.transfusionontario.org)

### Quote

Blood is that fragile scarlet tree  
we carry within us.  
~ Osbert Sitwell

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