

# The ORBCoN Report

Ontario Regional Blood Coordinating Network

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## Welcome to the Eighth Edition of the ORBCoN Report

This edition is structured around Intravenous Immune Globulin (IVIG). In this edition you will find an update on the IVIG Utilization project, information on the IVIG dose calculator and a case study on hemolysis due to the administration of IVIG.

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

- Online audit tool for transfusion processes at the bedside
- IVIG toolkit including infusion practice recommendations
- IVIG utilization management guidelines, pocket card version
- Frozen Plasma toolkit and algorithm
- New Q& A section available on our website [www.transfusionontario.org](http://www.transfusionontario.org).
- 2010 Tech Competency Assessment questions

### Coming soon:

- Bloody Easy 3
- Tracking tool for the on-line Bloody Easy for Nurses Program
- Training orientation package including training checklists for Transfusion Medicine Laboratory
- Contingency Planning Updates

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## Intravenous Immune Globulin (IVIG) Utilization Project

*By: Kate Gagliardi, Regional Blood Coordinator, ORBCoN Southwestern Ontario*

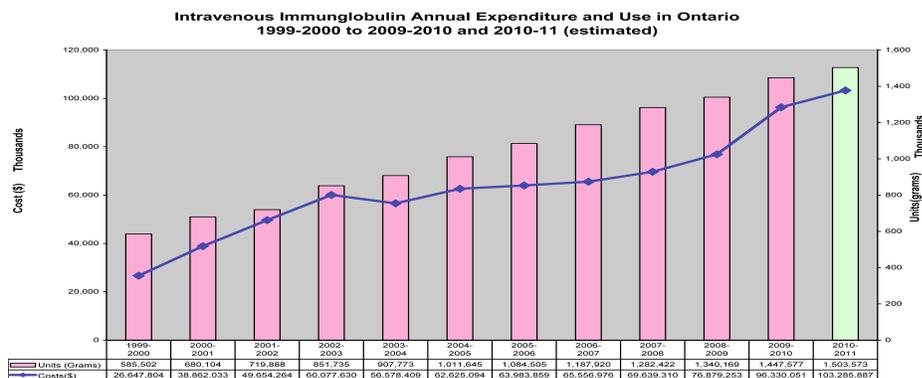
IVIG is a product prepared by commercial manufacturers who use plasma derived from donors to extract immunoglobulin subclass gamma (IgG). IVIG works via several mechanisms of action including the modulation of the Fc receptors of phagocytic cells, complement activation, inhibition of cytokine release and interaction with B and T-cell receptors.<sup>1</sup> IVIG is used to treat patients for a large number of clinical indications, while the products themselves are only licensed for a few of those indications (e.g. Primary Immune Deficiency). One of the projects undertaken by ORBCoN is an IVIG utilization management initiative. From September 1, 2007 to November 30, 2007 staff at 25 hospitals and at ORBCoN collected data on clinical indications for which patients received IVIG. This baseline data will be used in the future to compare practice in Ontario, post implementation of Ontario IVIG Utilization Management guidelines. Guidelines were circulated in November 2009, and are available at [www.transfusionontario.org](http://www.transfusionontario.org). Pocket guides and poster versions are available from the ORBCoN regional offices (See contact information on newsletter at the end of this newsletter).

## Intravenous Immune Globulin (IVIG) Utilization Project *continued*

Of utmost concern is maintaining an adequate supply of IVIG, so that all patients, whose proper care relies upon it, continue to have access to the product. Governments and informed taxpayers alike are also concerned whether covering the cost of IVIG is sustainable in the future. A graph showing the increasing use in Ontario is shown in Figure A.

Reasons for increased use may include:

- Emerging new indications for use of IVIG
- Blood components and blood products including IVIG are considered 'free'
- Clinicians who order IVIG are unaware of the risk factors and the increasing costs of the product.
- Lack of awareness of alternate therapies
- Guidelines are circulated, however do not reach the physicians who need them



**Figure A IVIG Utilization in Ontario fy1999/00 to fy 2010/11 in Units and Costs (2010-2011 estimated)**

A repeat audit at hospitals with the highest IVIG utilization in Ontario is scheduled to take place in 2012-13. The Ontario IVIG working group has suggested this be a mandatory audit for the top user hospitals, in order to ensure the capture of increasing use that may be inappropriate. This is critical, in light of the increasing concern about treatment of Alzheimer's disease patients with IVIG. As of 2008, statistics produced by the Alzheimer Society of Canada noted that 103,700 new cases per year would appear in Canada. That is one case every 5 minutes, and approximately half of those would be people living and being treated in Ontario. Two clinical trials run by manufacturers are under way to evaluate the effectiveness of IVIG as a treatment; if only one percent of those new cases (1% or approximately 1000 patients) were treated with the lowest dose being evaluated, it would add another 30 million dollars to the plasma proteins budget for Canada.<sup>2</sup>

1. Crow A, Lazarus A. The mechanisms of action of intravenous immunoglobulin and polyclonal anti-D immunoglobulin in the amelioration of immune thrombocytopenic purpura: what do we really know? *Transfusion Med Rev.* 2008; 22(2):103-116.
2. Alzheimer's Society of Canada <http://www.alzheimer.ca> (accessed November 30 2010).

## Subcutaneous Immune Globulin for Immunodeficiency

*By: Brenda Reid, Clinical Nurse Specialist, The Hospital for Sick Children, Toronto, Ontario.*

Subcutaneous infusion of gammaglobulin (SCIG) is an option for antibody replacement in immunodeficiency.<sup>1</sup> The approved Canadian SCIG products are Vivaglobin® and Gamunex®.<sup>2</sup> SCIG is as effective as IVIG in preventing infections. It has been

reported to have a low frequency of systemic adverse effects. Local site reactions are frequent and include swelling, erythema and burning or itching at the injection sites.<sup>1</sup>

SCIG therapy gives smaller doses of immunoglobulin more frequently than IVIG. SCIG may be infused using infusion pumps and multi-site infusion sets weekly

or via the push method daily.<sup>1</sup> Patients who benefit from SCIG include those with significant adverse reactions to IVIG and poor vascular access. Social benefits include a desire for independence and the convenience of home based infusion.<sup>1</sup>

SCIG is not ideal for everyone and care should be taken to ensure

## Subcutaneous Immune Globulin for Immunodeficiency *continued*

that patients are adequately assessed for compliance and ability to follow treatment regimes prior to initiating therapy. A teaching program should be established to train patients for independent administration. Ideally, both a patient and infusion partner should participate. All aspects of the infusion procedures required to maintain SCIG therapy need to be taught. To assess readiness for independent home therapy, patients and/or caregivers need to be able to independently infuse in hospital. Written material should be supplied for home use.<sup>1</sup>

The decision to initiate or switch to SCIG treatment is one that should be made jointly between the patient and their health care professional. While not every patient is a candidate for SCIG treatment, it may enhance quality of life for the ideal candidate.<sup>1</sup>

### References:

1. Berger, M. Subcutaneous IgG therapy in immune deficiency diseases, IDF clinical focus on primary immunodeficiencies <http://www.primaryimmune.org/publications> (accessed 11.24.10)
2. Canadian Blood Services. Plasma protein products. November 2010 <http://www.blood.ca/plasmaproducts> (accessed 12/3/10)

## Visit Transfusion Ontario and try out the Ideal Body Weight/IVIG Dose Calculator

*By: Kate Gagliardi, Regional Blood Coordinator, Southwestern Ontario and Jeannie L Callum, Medical Director Blood and Tissue bank, Sunnybrook Health Sciences Centre*

### What is the intent of this tool?

The dose of IVIG administered varies depending on the clinical indication. In the case of obese patients, the appropriate dosing regimen is unclear. There is some agreement in the literature that IVIG should be dosed using actual body weight in patients weighing up to 100 kg, with a body mass index less than 30 kg/m<sup>2</sup>. In contrast, obese patients should have IVIG dosing calculated using an ideal or adjusted body weight to account for the increase in volume of distribution (body fluids) without accounting for the increase in fat.<sup>1,2</sup>

### Where can I find this tool?

There is an explanation of the dose calculator in the IVIG toolkit (launched September 2010), however, in order to test it out on line, follow these steps:

1. Go to [www.transfusionontario.org](http://www.transfusionontario.org) and click your language of choice

2. Log into the Member's section
3. Click on Utilization (in top frame of screen)
4. Click on IVIG Utilization (left side of screen)
5. Click IVIG Dose Calculator (appears in html in centre of screen)

### How does it work?

Perhaps you would like to try out the calculator using our mock patient.

Name: Pleasant Patty

Gender: Female

Height: 200 cm

Weight: 110 kg

Dose ordered: 1 g/kg

1. Enter the sex of the patient.
2. Enter the height of the patient.
3. Enter the weight of the patient.
4. Push "Calculate" and the weight re-calculation will appear.
5. On right of screen, select from drop down menu the dosing ordered.
6. Push "Calculate" on this box and the dosage and a rounded dose will appear.
7. Push the "Clear the form" button when finished.

### How do I implement the dose calculator at my hospital?

There is a lot of ground work to be done at any institution implementing this tool. The link can be incorporated into your ordering form for IVIG if you use one through your intranet. Education of physicians who order IVIG would need to take place.

This tool is available by contacting the website administrator at [www.transfusionontario.org](http://www.transfusionontario.org) to obtain the link. Click on 'Administration' on the right hand side of the IVIG screen and select 'help' and request information to obtain the link to the tool.

1. Siegel J. Intravenous immune globulins: therapeutic, pharmaceutical, administration, and cost considerations. Pharmacy Practice News Special Edition. 2009:20-27.
2. Privenge Immune Globulin Intravenous (Human) 10% Liquid [package insert]. Ottawa Ontario CSL Behring Canada; [www.cslbehring.ca](http://www.cslbehring.ca); Approval October 15 2010

## Case Report

*By: Melanie Tokessy, Charge Technologist and Doris Neurath, Manager, Transfusion Medicine, The Ottawa Hospital*

**Setting:** A 61-year old male with primary diagnosis of Myelodysplastic Syndrome (MDS) presented with Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) symptoms.

### Background information:

CIDP is characterised by progressive weakness and impaired sensory function in the legs and arms. IVIG may be used as first line therapy for short-term management of new-onset CIDP or used in combination with immunosuppressive therapy for long-term care. The recommended total dose is 2 g/kg given over 2 to 5 days. IVIG was ordered for 1 g/kg/day (patient weight = 79 kg) for 2 days to be given in the out patient clinic. The patient was group A positive.

### Description of event:

On day 1 the pre-infusion hgb was 93 g/L. Patient received 80 g IVIG. On day 2 the hgb was 88 g/L and type and screen for 2 units on hold was ordered. After 40 g IVIG the patient experienced fever (temp = 38C) and chills. The patient was admitted and transfusion of red cells was started. At the same time, a transfusion reaction workup to IVIG was ordered: hgb = 69 g/L, LD = 1506 U/L and TBIL = 30 umol/L, anti-A in the plasma, DAT = 1+ and anti-A eluted from the patient's RBCs. The workup indicated hemolysis due to anti-A in IVIG. The group A red cell transfusion was stopped to prevent additional hemolysis. A single group O red cell unit was issued and transfused with no complication. A directive to issue group O red cells was placed in the patient's record. Two subsequent group O red cell units were transfused and the patient was discharged on day 4.

### Conclusion:

Hemolysis is a well documented adverse effect of IVIG therapy. It is important to review the dosage and monitor the patient's lab values to identify possible complications. In cases that transfusion is required, group A patients should receive group O red cells to prevent further hemolysis.

### Questions to Ponder:

1. How should patients that receive IVIG in out patient clinic be monitored for post IVIG hemolysis?
2. Should group A patients receiving IVIG automatically receive group O red cells when a red cell transfusion is required?
3. What tests could be performed in the laboratory to help identify post IVIG complications?

## Upcoming Educational Events Calendar

Event	Where	When
Annual Northern and Eastern CBS/ORBCoN Spring Symposium and videoconference	Videoconference (host site Kingston General Hospital, Kingston, ON)	April 13, 2011
Canadian Society for Transfusion Medicine Annual Conference	Toronto, ON	May 12-15, 2011
London Laboratory Services Group Annual Seminar	London, ON	November 5, 2011

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

## Contact Us

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