Focus on Canadian research continues while Society introduces new projects

As the summer winds to a close and the academic year begins, I would like to update you on some of the exciting initiatives underway at the Canadian Hematology Society (CHS).

Drs. Tom Nevill and Gail Rock will leave shortly for the International Society Hematology (ISH) meeting where they will make a formal bid to host the 2018 ISH meeting in Vancouver. Hosting ISH would be an outstanding opportunity to highlight all of the great hematology achievements in Canada. I would like to thank Tom and Gail for all of their hard work in preparing this presentation. I am hopeful we will have positive news to share with you in the near future.

Along those lines, please let us know of other hematology-related meetings that you are organizing in Canada. We would be delighted to bring the conference announcements to the membership.

A priority of the CHS is to support research among its trainees and junior staff. To that end, I am delighted to announce Drs. Geerte Sluis and Paul Spagnuolo as the recipients of the 2014 RK Smiley grant competition. You can read about their exciting research on page 5 in this issue. We received many high quality proposals spanning the broad disciplines in hematology, and the caliber of these proposals is a testament to the highly creative hematology research being conducted in this country.

We will again be offering the RK Smiley grant competition in 2015 and I encourage our junior faculty members to consider applying for these awards.

In addition, abstracts for ASH have been submitted and the decisions on presentations will be available shortly. I would like to encourage all of our trainees to submit their abstracts for consideration of CHS merit awards. Details of how to submit your abstract and the deadlines will be available on our website and flyers that will be distributed.

We look forward to showcasing your work and recognizing your achievements at our annual business meeting and gala that will be held on Sunday December 7, 2014 at ASH.

This year, we will also be establishing a new award to recognize the best paper in Canadian hematology.

We are requesting nominations from all CHS members to identify the best manuscript published this past year.
the field of hematology. (See details next page.) Both clinical and lab-based papers spanning benign and malignant hematology will be considered. I think this award is an important mechanism to highlight the tremendous hematology research being conducted in Canada and recognize our CHS members who are international leaders in their field. Please see the CHS website and flyers for nomination details and deadlines.

In June 2014, CHS held a special symposium in parallel with the CBMTG transplant meeting in Halifax. With topics ranging from the diagnosis and treatment of aplastic anemia to thrombosis in malignant hematology, the symposium addressed new and complicated issues in hematology. A special thank you to our past president, Dr. Stephen Couban, for his hard work in organizing this symposium.

You may have noticed a larger than usual number of surveys to our members over the last several months. We have had several requests to help facilitate research being conducted by hematology trainees through the distribution of surveys. These surveys are an important step to understand the practice landscape in the country and form the basis for prospective research studies.

We appreciate the problem of “survey fatigue” and don’t want to burden our members with excessive emails. However, we hope you will appreciate the importance of assisting our junior colleagues in their academic pursuits and consider taking the time to complete these occasional surveys.

Finally, we continue to work hard to bring on-going initiatives such as brining the Choosing Wisely Canada campaign to our members and are embarking on new activities such as revamping our website and the features it offers our members.

In closing, I would like to thank the executive members and staff for their hard work and time they devote to the CHS. I would also like to thank you for your support of the CHS and your continued membership in the Society.
The Canadian Hematology Society is accepting nominations for the “best hematology paper in Canada”. Individuals may nominate themselves or may nominate others.

Please include:
- A PDF of the paper
- A one-paragraph description of the work and its significance to hematology

Eligibility requirements:
- Papers must have been published (not in press) between August 1, 2013 to August 31, 2014.
- Nominated individuals must be CHS members in good standing.
- The recipient or designate must be available to accept the award at the CHS awards gala at ASH, December 7, 2014 in San Francisco, CA.
- Papers addressing clinical or lab-based research relevant to the field of hematology will be considered.
- Applicants of all levels are encouraged to apply.

Nominations:
- Are now open
- Please submit material to: The Canadian Hematology Society office by email to chs@uniserve.com by September 15, 2014.
Do you know the diagnosis?

A 52-year-old woman presented with a complaint of persistent bruising and pain in her lower leg two weeks after striking it on the corner of a coffee table (see photograph).

- She had undergone blood stem cell transplantation (SCT) from her HLA-identical sister for acute myeloid leukemia two years previously.
- Her post-SCT course was complicated by chronic graft-versus-host disease (GVHD) involving her eyes, mouth, liver and skin.
- She remained on Prednisone 10 mg daily and Cyclosporine 50 mg twice daily as well as antimicrobial prophylaxis with Valacyclovir and Sulfatrim DS; she was not on an antiplatelet agent.
- A CBC showed a hemoglobin of 105 g/L, WBC count of 10.5 x 10^9/L (with a neutrophilia of 9.0) and platelets of 260 x 10^9/L.

Do you know the diagnosis? … SEE PAGE 9

![Lower limb ecchymosis](image)

Upcoming Events

Canadian Hematology Society (CHS)
Annual Reception, Dinner & Awards Evening
Sunday, December 7, 2014
San Francisco
Contact: chs@uniserve.com

International Society of Thrombosis and Haemostasis (ISTH)
25th World Congress
July 11—17, 2015, Toronto, Ontario
Contact: https://www.isth.org

American Association of Blood Banks (AABB)
Annual Meeting
Philadelphia, USA
October 25—28, 2014
http://www.aabb.org/annual-meeting

Canadian Blood and Marrow Transplant Group (CBMTG)
Annual Conference
May 13-16, 2015, Montreal, Quebec
http://www.cbmtg.org
The Canadian Hematology Society established a research award in honour of our founding President, Dr. R. Kennedy Smiley, to mark our 40th Anniversary in 2011.

This Research Grant offers start-up funds of $10,000 aimed at pilot projects which are expected to lead to larger follow-up studies funded by CIHR or other grant funding agencies.

The critical phase in this study will be the subsequent “knockdown” of p62 and NIX in the two model cell lines in an attempt to reproduce the LSC mitochondrial phenotype.

The proposed research study involves measuring mitochondrial metabolic activity (oxygen consumption, ATP production, fatty acid oxidation) on a Seahorse Bioanalyzer and mitochondrial mass with qPCR in two model cell lines that lack the LSC mitochondrial phenotype.

The TEX cell line, widely considered to be a surrogate LSC population, will be used as a positive control. Mitophagy will be measured with Western blotting of autophagy proteins including p62 (which “shuttles” mitochondria to autophagosomes) and NIX (a mitochondrial protein whose ubiquitination signals mitochondrial degradation).

The primary outcome will be the ability to achieve a ≥50% reduction in anti-Xa levels with secondary outcomes to include the incidence of VTE and bleeding as well as plasma levels of fXai achieved.

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Bruce Chown was born in Winnipeg, Manitoba on October 10, 1893, the son of a pioneer surgeon, Dr. Henry H. Chown. Young Bruce received a B.A. from McGill University in 1914 and became one of many Canadians who patriotically enlisted in the military when Great Britain declared war on Germany and the Austrian Empire in August 1914 – precisely 100 years ago.

He went on to serve in the Canadian Field Artillery during the Great War for which he was awarded the Military Cross.

Following his return to Winnipeg, he graduated from the University of Manitoba Medical School in 1922. He married Gladys Webb that same year with whom he had four children before her untimely death in 1948.

After receiving his M.D., Dr. Chown relocated to the United States and trained in pediatrics at Columbia University (1922-1923), Johns Hopkins University and Cornell University (1925-1926).

In 1927, he returned to Winnipeg once again in 1927 as the only trained pediatrician in the province of Manitoba. He took a position as a pathologist at Children’s Hospital and had an appointment at the University of Manitoba which he held for the next 50 years. He was also the Chairman of Pediatrics from 1949 to 1959.

In the early 20th century in Canada, Rhesus (Rh) factor incompatibility resulting in hemolytic disease of the newborn (“Erythroblastosis fetalis”), was associated with a 50% mortality rate although its etiology was not well understood. During this time period, Rh disease was thought to be responsible for 10% of all neonatal deaths in Canada.

In 1939, Philip Levine and Rufus Stetson published the first case report of hemolytic disease in a newborn despite ABO compatibility and proposed that the mother must have been sensitized to one of the father’s red cell antigens.

In 1940, Karl Landensteiner and Alexander Weiner discovered that serum from rabbits reacted with 85% of human red blood cells. The rabbits had been immunized with red cells from Rhesus macaque and the antibody produced was therefore designated as being directed against Rhesus factor.

Dr. Chown took great interest in this discovery and, in 1944, founded the Rh Laboratory in the basement of Winnipeg Children’s Hospital to study the cause and to develop treatments for Rh disease.

In 1945, he performed the first exchange transfusion for Rh disease (a procedure that was pioneered by Alexander Weiner himself) and ultimately developed Rh immune globulin which could be used to prevent antibody formation in an Rh-negative mother exposed to an Rh-positive fetus/newborn.

Dr. Chown partnered with Connaught Laboratories to manufacture commercial quantities of Rh gamma globulin which was subsequently licensed for use in Canada in 1968. The Winnipeg Rh Institute, under the guidance of Dr. Chown, John Bowman and Albert Friesen, went on to develop a vaccine (WinRho) which was licensed for use in 1980 and is now sold in 35 countries world-wide.

For his work with Rh disease and its treatment, Dr. Chown was made an Officer of the Order of Canada in 1967 and received the Gairdner Foundation International Award in 1968.

He died at the age of 92 in Victoria, British Columbia on July 3, 1986.

In 1995, he was posthumously inducted into the Canadian Medical Hall of Fame.

By Dr. Tom Nevill, Editor
The Microenvironment
Reduced intensity conditioning transplants (RICTs) are a type of blood stem cell transplant (SCT) in which lower doses of chemo/radiotherapy are given pre-transplant than in a conventional high-dose (“myeloablative”) SCT.

RICTs rely on the preparative regimen (conditioning) being able to suppress the patient’s immune system to facilitate adequate engraftment of the donor’s stem cells.

Once engraftment has occurred, it is hoped that the donor’s immune system will control the residual cancer cells through a graft-versus-tumour effect. This type of transplant was designed to allow for older patients and patients with pre-existing health problems to be considered for SCT.

This summer project was designed to collect and analyze data on the outcomes of patients who have received a RICT in Vancouver.

Data was collected on a cohort of 232 patients who had received a RICT in Vancouver between May 2001 and December 2013; the annual distribution of RICTs over the 12-year study period is shown in Figure 1. The median age of the recipients was 58 years (range: 18-68) and the male:female ratio was 2.1:1.

Hematologic diagnoses are shown in Figure 2, with the most common being CLL (36% of patients) followed by AML and NHL (18% and 16%, respectively). The majority of patients (221) had only one RICT although 10 patients had 2 transplants -- 9 due to graft failure and 1 due to disease relapse.

One patient had 3 RICTs due to 2 episodes of graft failure. Analysis of the entire cohort shows that half of RICT recipients remain alive and well with ~20% experiencing a TRM and ~30% of patients having a relapse following transplant.

Data on donor type, conditioning regimen and development of graft-versus-host disease (GVHD) was also collected. Matched related donor transplants, which were performed more commonly than unrelated transplants, used Busulfan and Fludarabine (BuFlu) or Fludarabine and Cyclophosphamide (FluCy) and resulted in 42% of patients being alive and well. The conditioning regimen used for unrelated donor RICTs was either BuFlu plus Campath or BuFlu plus ATG.

The latter resulted in the best results with 73% of patients remaining alive and well post-SCT with a median follow-up of 33 months (range 9-49 months).

Campath-containing conditioning led to less successful outcomes with 39% of recipients alive and well although median follow-up was longer at 57 months (range 26-81 months).

The vast majority of the patients in our cohort who remain alive and well post-SCT developed GVHD, clearly critical to a successful outcome following RICT.
The occurrence of acute and/or chronic GVHD amongst the 232 patients is shown in Figure 3. Notably, of the 53 patients who never developed acute or chronic GVHD, only 1 patient remains alive without relapse or graft-failure. In this subset of patients, over 50% relapsed and 15% had graft-failure.

Patients who developed only chronic GVHD (an indolent illness usually occurring 3-18 months post-SCT) had the best outcome with over 50% of patients still being alive and well. Those who develop only acute GVHD (a more severe illness usually occurring in the first 3 months post-SCT) have intermediate outcomes with an equal proportion of the patients (~1/3) ending up alive, in relapse or dying of a treatment-related mortality (TRM).

Patients who developed both acute and chronic GVHD also had a good outcome with 50% of patients alive and well although a larger proportion (23%) experienced a TRM.

The development of GVHD was examined according to the donor type and the conditioning regimen used, with the outcomes as shown in Figure 4 and Figure 5. There was less acute and chronic GVHD with Campath-containing conditioning compared to ATG conditioning. However, as noted previously, this was not necessarily beneficial to a favourable overall outcome.

Paradoxically, chronic GVHD was more common following related donor transplant than after an unrelated donor transplant. This was probably explained by the routine addition of an antibody-containing product in the GVHD prophylaxis used with unrelated RICTs.

The Microenvironment will be happy to consider for publication, articles submitted by members who have sponsored student summer projects.

Queries should be directed to:
- Dr. Tom Nevill, The Editor, The Microenvironment
- Email: chs@uniserve.com

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Coagulation studies showed an INR of 1.0 and a PTT of 122 seconds (normal of 20-38 seconds).

A 50:50 mixing study only reduced the PTT to 47 seconds and this increased to 82 seconds post-incubation.

Factor assays revealed a Factor VIII level of 0.01 consistent with a specific Factor VIII inhibitor which was measured at 18 Bethesda units.

Her Prednisone was increased to 60 mg daily and her Cyclosporine was increased to 100 mg twice daily.

Within 24 hours, the PTT began to fall and over the next 10 days, her PTT normalized as did her Factor VIII levels; factor concentrates were not required.

Specific Factor VIII inhibitors have been described in the context of acute and chronic GVHD, albeit rarely.

They typically respond well to increased doses of immunosuppression and may not recur on subsequent tapering.
Aplastic anemia (AA) is an immune-mediated reaction with the best evidence for this being the 70% response rates seen when AA is treated with immunosuppression (IST). Dr. Neal Young (NIH, Bethesda, MD) provided this and other interesting new insights into the immune etiology of and potential genetic predisposition to this disorder. The abnormal persistence of T-cell clones in AA appears to be due to inadequate numbers and functional deficiencies of T-regulatory cells (TREGs). Dr. Young’s group has demonstrated that TREG populations are reduced at diagnosis of AA and reappear with successful IST. T-cell clones in large granular lymphocytosis, a condition that is part of the spectrum of marrow failure, and also in some cases of AA, show evidence of acquired STAT3 mutations that result in activation of the STAT3 pathway. Dr. Young feels that there may be a role for genomics in trying to establish the reason for the rare persistence of the inappropriate immune response that leads to AA. The ongoing high rates of AA in Asia – where AA is a more common reason for hospitalization than AML – suggests that this region may be a fertile base for genomic analysis.

Telomeropathies are of considerable interest to Dr. Young and his group at NIH although their description has clearly blurred the distinction between constitutional and acquired marrow failure. Numerous studies have found mutations in the telomere repair complex in adults with otherwise “typical” AA without associated physical anomalies or family history of marrow failure. When mutations in the TERT or TERC genes are found in such patients, Dr. Young advises caution regarding the use of “late-onset dyskeratosis congenita” as a diagnosis. The telomeropathy disease spectrum includes any of: macrocytic anemia, thrombocytopenia, frank AA, MDS/AML, pulmonary fibrosis, cirrhosis, premature gray hair and even a normal phenotype. All of the clinical manifestations may be influenced by environmental factors such as occupational toxin exposures, smoking, alcohol consumption and viral infections.

The recent discovery that a small thrombopoietin (TPO) mimetic, Eltrombopag, can produce responses in AA was a
Venous thromboembolism (VTE) may be the first manifestation of a malignancy, a relationship that was first noted by Armand Trousseau in the 1860s. More importantly, patients with cancer have a 4-5 fold incidence of VTE than non-cancer patients and the incidence increases further (to 6.5 fold) when patients are started on chemotherapy. The reasons for the high incidence of VTE in malignancy are many – decreased mobility, post-surgical situations, tumour infiltration, medications, DIC and mucin/procoagulant substances produced by cancer cells.

Dr. Shivakumar discussed two specific management situations pertaining to anticoagulation in malignancy. Firstly, he presented a case of a patient with an upper extremity VTE related to a central venous access device (CVAD). He indicated that LMW Heparin (for a minimum of 3 months) was better at preventing recurrent VTE in these patients although no survival benefit has been shown compared to Warfarin.

Although some controversy still exists, in most cases, the CVAD can be left in place with a low likelihood of recurrent VTE although anticoagulation should be continued as long as the CVAD is in situ.

The second clinical scenario discussed was a patient with multiple myeloma who developed a VTE despite already being on once daily therapeutic LMW Heparin. Dr. Shivakumar highlighted that survival in this patient subgroup is unfavourable with a 1-year survival of ~40%.

Management of the recurrent VTE would include assessing compliance with LMW Heparin injections, ensuring adequate dosing for the patient’s current weight and ruling out heparin-induced thrombocytopenia. If these factors are ruled out as a cause of the recurrent VTE, increasing the total dose to 120% and delivering it in a twice daily schedule has, anecdotally, been successful.

Dr. Marc Carrier (University of Ottawa, Ottawa, ON) addressed the issue of anticoagulation in thrombocytopenic cancer patients. He suggested that the etiology of the reduced platelets should be taken into consideration when deciding upon appropriate anticoagulation as transient chemotherapy-induced thrombocytopenia may be approached differently than disease-related thrombocytopenia.

~40% of refractory AA patients have responded, many with bilineage or even trilineage improvement. This effect indicates that this molecule acts on an early hematopoietic/stem cell although Dr. Young expressed concern that Eltrombopag may be a double-edged sword in refractory AA. He reported that a significant number of AA patients treated with this agent have gone on to develop clonal hematologic disorders, with the development of monosomy 7 being particularly notable.

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The severity of the thrombocytopenia is critical in guiding anticoagulant doses with $50 \times 10^9/L$ being the general threshold for full-dose LMW Heparin, $20 \times 10^9/L$ being the point at which LMW Heparin should usually be held. Patients with counts of 20-50 $\times 10^9/L$ may receive 50% of the therapeutic dose of LMW Heparin. Finally, the presence of co-morbidities enters into the decision regarding anticoagulation as some patients will be at greater risk of bleeding complications, for example, patients who are post-surgical procedure. In these individuals, IVC filters may be of benefit in an acute VTE situation although Dr. Carrier emphasized that the filter should be removed when therapeutic anticoagulation can be restarted. The incidental finding of a pulmonary embolism (PE) on CT scan of the chest in cancer patients was also addressed by Dr. Carrier. In reviewing the available literature, it has been shown that the risk of recurrent VTE in these patients is the same as those that have had a symptomatic PE -- although patients with a subsegmental PE may be at somewhat lower risk. Dr. Carrier also suggested that anticoagulation in incidental PE patients has been shown to be associated with a more favourable outcome than those not given anticoagulants.
Hemophilia A and B are X-linked recessive disorders that primarily affect multiple male members of one family although carrier females may be symptomatic and new mutations can occur in a patient without a family history.

Bleeding complications in patients with hemophilia are dependent upon their Factor VIII/IX levels – excessive trauma-related bleeding and delayed/recurrent bleeding in those with factor levels ≥1% (mild-moderate disease) and spontaneous joint/intramuscular/intracranial bleeding in severely affected (levels <1%) and occasional moderately affected (levels 1-5%) individuals.

The efficacy of prophylactic factor concentrates is good provided patients have access to these treatments – which the majority of haemophiliacs in developing countries do not have. With the introduction of recombinant factor concentrates, the key complication experienced by 25% of hemophilia A and up to 3% of hemophilia B patients is the development of inhibitors which can be difficult to treat.

Fortunately, new treatments are on the horizon for hemophilia emphasized Dr. Moorehead. Products have been developed that are fusions of coagulation factor and either albumin, PEG or the Fc region of IgG. These fusions result in a longer half-life for the factor although this has been more easily achieved with factor IX than factor VIII (whose half-life continues to be largely influenced by
its interaction with vWF). Bispecific antibodies which bind factor VIII/IX to factor X, the obligatory next step in fibrin clot formation, show promise. These antibodies have the advantage of being given subcutaneously and are less immunogenic.

Novel concentrates will allow patients to decrease the frequency of prophylactic infusions and increase trough factor levels. However, these products are not a cure and may create a false sense of security, interfering with a patient’s ability to deal with a bleeding crisis.

Hemophilia should be fertile ground for gene therapy -- hemophilia is a monogenic disease and a single allele should provide a normal phenotype. In fact, factor IX has been packaged into an adenovirus-associated virus 8 vector with tropism for liver cells.

A single IV infusion has been shown to increase factor IX levels to 2-4% in patients with severe hemophilia B. Immune hepatitis was a complication seen in patients infused with the vector which responded to corticosteroid therapy.

However, Dr. Moorehead cautions that hemophilia A will be more problematic to treat with this approach – factor VIII is a large gene that is more immunogenic than factor IX and will be more difficult to deliver to the endothelial cell, the site of factor VIII production.

Can a web-tool improve the care and health outcomes for patients with atrial fibrillation?

The IMPACT-AF Study
Jenn Dixon, Research Associate & Joanna Nemis-White, Project Manager, for the IMPACT-AF Investigators

Atrial fibrillation (AF), the most common abnormality of cardiac rhythm, affects 1-2% of the population, and is associated with increased stroke-risk, increased morbidity, and decreased quality of life.1-5.

Caring for patients with AF can be challenging for primary care physicians when there is uncertainty or lack of clarity about AF diagnosis, treatment and management. Results from a 2013 Nova Scotia (NS) needs assessment validated existing care gap research, highlighting opportunities for improvement, such as: estimation of stroke versus bleeding risk, confidence with oral anticoagulant use in special circumstances, and rate versus rhythm management.6-7. In addition to gaps across the care continuum, AF also places increased strain on the health care system, and is an important public health issue.8

Integrated Management Program Advancing Community Treatment of Atrial Fibrillation (IMPACT-AF) is a community-based research study designed to address challenges documented with AF patient care. This cluster-randomized study will test a novel clinical decision support system that computerizes Canadian AF guidelines and best-practice approaches into interactive web-based tools for providers and patients. During the 12-month clinical trial, up to 200 Nova Scotia primary care providers and 4,000 of their patients will participate.

The ‘intervention’ tool will interpret patient profiles (past medical history/current health status) in order to provide proactive, personalized, and evidence-based recommendations, auto-calculate risk scores and prioritize patient care needs. Intervention arm patients will also have access to their own tool designed to engage and empower them to actively participate in their own care. Anticipated study outcomes include a reduction in cardiovascular hospitalization and enhanced quality of life for patients with AF.

The research team, lead by Dr. Jafna Cox (Capital Health, Division of Cardiology), includes clinical research and IT experts from Capital Health (NS), and Dalhousie and McMaster Universities. The team also receives expert guidance and support from a broad range of stakeholders, including Dr. Sudeep Shivakumar (Capital Health, Division of Hematology), the Heart and Stroke Foundation of NS, Cardiovascular Health NS, Doctors NS and the provincial government among others.

Once proven effective, this technology has the potential to be applied to a range of chronic conditions and be portable to other provincial health systems to address the increasing prevalence of chronic conditions within our aging Canadian population.

NCT01927367. For more information, please visit: www.impact-af.ca

References


**Thrombosis Fellowship 2014-2015 Jewish General Hospital, McGill University**

The JGH Thrombosis Program is currently accepting applications for a one year fellowship (July 1, 2014—June 30, 2015) to acquire and consolidate expertise in Thrombosis. Specific areas of clinical activity include the Thrombosis Clinic, Anticoagulation Clinic and In-patient Thrombosis Consultation Service. Our Thrombosis Program also encompasses a broad range of research activities that relate to diagnosis, risk factors and treatment of venous and arterial thromboembolic disease.

For information, please contact:
Dr. Susan Kahn
514-340-7587
susan.kahn@mcgill.ca

**Thrombosis Clinical & Research Fellowships - Up to 3 positions**

Applications are encouraged from MDs who have completed or who will complete General Internal Medicine, Respirology and/or Hematology training. Foreign medical graduates with equivalent qualifications are eligible.

Applicants may apply to one of three training streams:

1.) **Clinical Fellowship**, one-year—To consolidate expertise in thrombosis.
2.) **Clinical and Research Fellowship**, 2-3 years (to become a clinician investigator in thrombosis (Fellows enroll in the Master’s of Clinical Epidemiology Program at the University of Ottawa).
3.) **Clinical and Education Fellowship**, 2-3 years (to become a clinician educator in Thrombosis. (Fellows enroll in a Master’s in Education).

To apply, please contact:

nlanglois@ohri.ca

Details are also available on the CHS website.

**LEUKEMIA/BONE MARROW TRANSPLANTATION FELLOWSHIP VANCOUVER**

The Leukemia/Bone Marrow Transplantation Program of British Columbia offers 1 or 2 Year fellowships to provide advanced training in the management of adults with hematological malignancies including all aspects of allogeneic and autologous hematopoietic stem cell transplantation (HSCT). Candidates should be registered in, or completed a recognized hematology or oncology training program.

For more information: leukemiabmtprogram.org

Interested candidates should submit
a CV and names of three references to:

**Dr. Donna Forrest, Fellowship Director,**
Leukemia/BMT Program
BC Cancer Agency & Vancouver General Hospital

Phone: (604) 875-4089
FAX: (604) 875-4763
Email: dforrest@bccancer.bc.ca
Membership Matters

The Canadian Hematology Society has represented all physicians and scientists with an interest in the discipline in Canada since it was founded in 1971, and currently has over 400 members.

Active Membership
- Physicians in the practice of clinical or laboratory hematology in Canada
- Scientists with PhD degrees making continuing contributions to research related to hematology in Canada
- Allied Health Professionals with university degrees making sustained contributions to clinical or laboratory hematology practice or hematology research in Canada.

Only active members shall:
- vote
- hold office
- receive CHS grants, and
- pay dues.

Associate Members
- Residents and fellows engaged in hematology training
- Masters and PhD graduate students
- Post-doctoral fellows engaged in hematology research

Associate members will not be required to pay dues until completion of their training.

Emeritus Members
- All individuals who have retired from full time hematology practice or research, or those who were active members and request a transfer of status with adequate reason.

Honorary Membership
- Non-members may be invited to become Honorary Members of the corporation by virtue of their outstanding contributions to any discipline which is of importance to hematology.

CHS members are reminded ... that dues for the year 2014, were due on January 1, 2014.

Your $75. annual dues payment may be made online at the CHS website: www.canadianhematologysociety.org

Or by mail to: Canadian Hematology Society, 199-435 St. Laurent Blvd., Ottawa, Ontario K1K 2Z8
Please provide the following information with your payment:

2014 Membership Renewal: Canadian Hematology Society

Membership Status
Active ☐
Associate ☐
Emeritus ☐

Has your status changed?
Yes ☐
No ☐

Name: _____________________________
Title: _____________________________
Email: _____________________________
Work Address: _____________________________

Work Phone: _____________________________
Work Fax: _____________________________