The Perfusionist

December 2014 decembre Volume XXIV, Number III
Tempora mutantur nos et mutamur in illis

The Official Publication of
Canadian Society of Clinical Perfusion

La publication officielle de la
Société Canadienne de Perfusion Clinique

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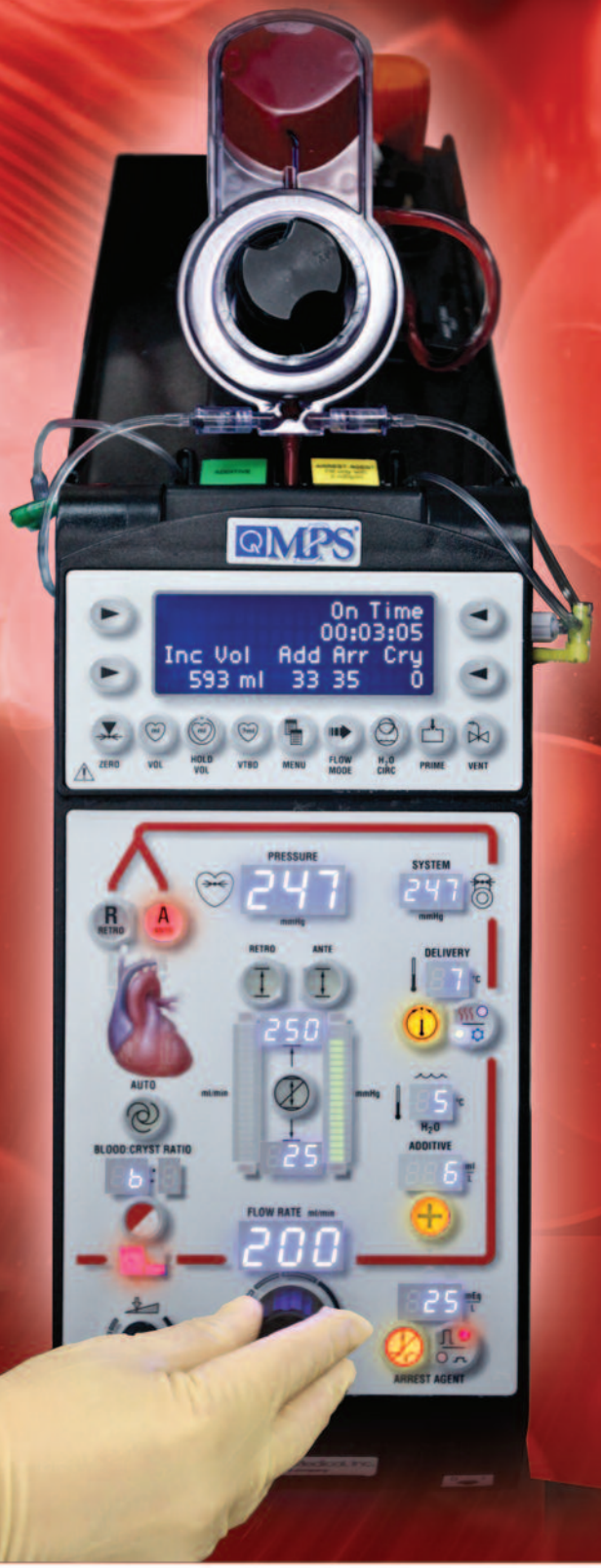

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Mission Statement ❧ Rôle de la Société

The mission statement of the Canadian Society of Clinical Perfusion is to encourage and foster the development of clinical perfusion through education and certification so as to provide optimum patient care.

La mission de la société canadienne de perfusion clinique est d'encourager et de promouvoir le développement de la perfusion clinique à travers l'éducation et la certificatin, de manière à assurer des soins de qualité.

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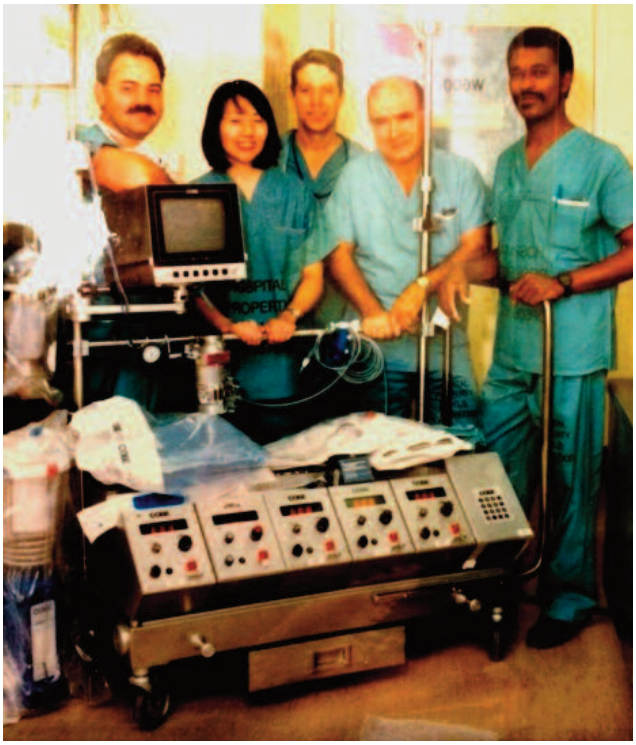
In This Issue... Dans cette publication...

Gus Fabrikis

It is with a heavy heart for me to inform you of the passing of my first Chief and one of our Pioneers of Perfusion. Gus(Constantine) Fabrikis. Gus passed away peacefully in his sleep with his family at his side on Wednesday September 17th 2014.

He was born in Drosato Greece, October 1932, to Anastasios and Tarsi Fabrikis. He graduated from high school in 1950 and then three years later he completed his accounting diploma. He came to Canada in 1956 to marry his wife Soula after corresponding for over two years.

After completing a heart technician program in Toronto, he was hired by Victoria Hospital in London, Ontario where he dedicated his entire career of over 35 years to this new profession. He was one of the first Perfusionists in Ontario to pioneer perfusion for open heart surgery and was respected by everyone in his field for his knowledge and expertise.



Over the years Gus worked alongside with Maurice Martin, and mentored Judy Won, Richard Low, Peter Allen and Steve Ditmore in their perfusion careers and worked with Dr. John Coles , Dr. Martin Goldbach, Dr. ML Myers , Dr. Byung Moon and Dr John Lee.

He was very involved in the Greek Community and the church volunteering for over 35 years as a treasurer and Vice President for the church and treasurer and President for AHEPA. He was also a volunteer treasurer for the London District Youth Soccer Association and for the Olympians of the Western Ontario Soccer Association for approximately 20 years. A bursary has been created in his name to assist young children to be able to participate in the sport.

Gus is survived by his wife of 58 years Soula, his three children and their spouses Taso and Lorraine Fabrikis, Helen and Michael Mandal and Jim and Aristea Fabrikis and his seven grandchildren, Dean and Erika Fabrikis, Stephanie and Rebecca Mandal, and Costa, Tiana and Yianni Fabrikis. He is also survived by his four siblings Evanthia, Afrodite, Hercules and Pagona whom are all in Greece.

Gus is will always be remembered by the Team by the London Health Science Centre for his contributions to this profession.

Passing of an Era.
Peter Allen CPC CCP

C'est avec le coeur lourd que je vous apprend le décès de mon premier chef et de l'un des pionniers de la perfusion, Gus(Constantine)Fabrikis. Gus s'est éteint doucement dans son sommeil aux côtés de sa famille le mercredi 17 septembre 2014.

Il est né à Drosato en Grèce, en octobre 1932, issu d'Anastasios et Tarsi Fabrikis. Il a gradué de l'école secondaire en 1950 et a complété son diplôme de comptabilité trois ans plus tard. Il a immigré au Canada en 1956 et a épousé Soula après une correspondance de plus de deux ans.

Après avoir complété une formation de technicien cardiaque à Toronto, il fût engagé par l'hôpital Victoria à London, Ontario, où il a dédié sa carrière de plus de 35 ans à sa nouvelle profession. Il a été un pionnier de la perfusion pour les chirurgies à coeur ouvert en Ontario et était respecté de tous pour son savoir et son expertise dans ce domaine.

Au fil des ans, Gus a travaillé aux côtés de Maurice Martin, et a été le mentor de Judy Won, Richard Low, Peter Allen et Steve Ditmore au cours de leurs carrières en perfusion. Il a aussi travaillé avec Dr. John Coles , Dr. Martin Goldbach, Dr. ML Myers , Dr. Byung Moon et Dr John Lee.

Il s'est toujours beaucoup impliqué auprès de la communauté grecque et a fait du bénévolat pour l'église pendant plus de 35 ans en tant que trésorier et vice-président de l'église, et comme trésorier et président de l'AHEPA. Il a aussi été trésorier bénévole de l'Association de Soccer pour les jeunes du district de London, et pour les Olympians de l'Association de Soccer de l'Ouest de l'Ontario pendant environ 20 ans. Une bourse a été créée en son nom pour venir en aide aux jeunes enfants qui veulent participer à ce sport.

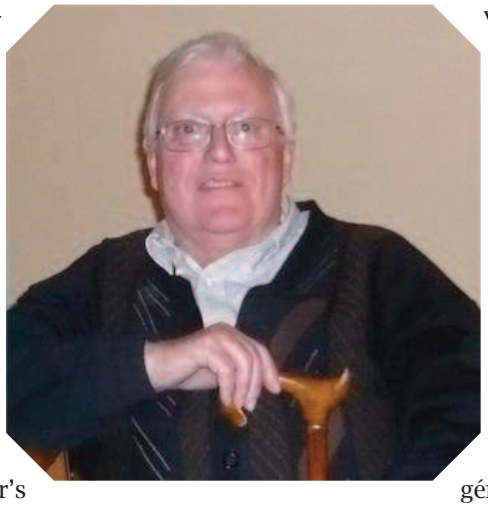
Gus laisse dans le deuil son épouse depuis 58 ans, Soula, ses trois enfants et leurs époux Taso et Lorraine Fabrikis, Helen et Michael Mandal, et Jim et Aristea Fabrikis, ainsi que ses sept petits-enfants, Dean et Erika Fabrikis, Stephanie et Rebecca Mandal, et Costa, Tiana et Yianni Fabrikis. Il laisse aussi dans le deuil ses frères et soeurs Evanthia, Afrodite, Hercules et Pagona qui se trouvent toujours en Grèce.

Gus sera toujours présent dans les souvenirs de l'équipe du London Health Science Center grâce à ses contributions à cette profession.

Au passage d'une époque,
Peter Allen CPC CCP

Peter Burrows

The first Perfusionist I met and had the privilege to work with was Peter Burrows. He was my introduction to the profession. He was my mentor on my first pump run, a circuit with a Rygg-Kyvsgaard bubble oxygenator and Travenol pump used on a canine based research project. We talked for hours on every corner of clinical and research perfusion practice. I can still see him now, greens and lab coat on, tea mug balanced on his right thigh.



Peter had an encyclopedic historical knowledge of perfusion that could be called on at any time to provide a solution to every situation faced. We shared many hours of challenge in our chosen profession of which he was a skilled craftsman. Peter came from the generation of Perfusionists that did not have the benefit of a formal program to prepare them for the critical care and open heart surgery environment. Many of the techniques and practices we perform daily were hard lessons learned by Peter's generation.

We worked together through the last years of his career and the first few years on mine. As we worked at a small heart program this exposed us, several times, of working short staffed. This produced in Peter, a work ethic of independence and confidence; no one was coming to help, better sort it out yourself.

He was a passionate professional in our field.

After he retired he would call around the Christmas season. We would talk of family, recent experiences and the good ole days. I could tell he missed those days, all 37 years of them.

I have been told that we are a little bit of all who we have met. I hope that I carry a little bit of Peter through my working days.

I was very sorry to learn of Peter's passing.

Mark Rosin
Saskatoon

Le premier perfusionniste que j'ai rencontré et avec qui j'ai eu le privilège de travailler, a été Peter Burrows. Il m'a introduit à la profession. Il a été mon mentor lors de ma première pompe, avec un circuit comprenant un oxygénateur à bulles Rygg-Kyvsgaard et une pompe Travenol, pendant un projet de recherche sur des chiens. Nous avons parlé pendant des heures sur tous les aspects de la pratique de la perfusion pour la clinique et la recherche. Je le vois encore, en uniforme vert et en sarrau, sa tasse de thé en équilibre sur sa cuisse droite.

Peter possédait une connaissance de l'histoire de la perfusion digne d'une encyclopédie, dans laquelle on pouvait puiser en tout temps une solution pour n'importe quel problème rencontré. Nous avons partagé plusieurs défis dans la profession que nous avons choisie, dans laquelle il était un artisan talentueux. Peter faisait partie de la génération de perfusionnistes qui n'a pas profité d'une programme de formation formel pour les préparer à l'environnement des soins critiques et de la chirurgie cardiaque. Plusieurs des techniques et pratiques que nous utilisons quotidiennement viennent de dures leçons apprises en cours de route par la génération de Peter.

Nous avons travaillé ensemble pendant les dernières années de sa carrière et les premières années de la mienne. Étant donné que nous travaillions au sein d'un petit programme de chirurgie cardiaque, nous avons été exposés plusieurs fois à la réalité d'effectifs réduits. Cela a produit chez Peter une éthique de travail basée sur l'indépendance et la confiance; comme personne n'était là pour aider, valait mieux s'en sortir tout seul.

Il était un professionnel passionné de son domaine.

Après sa retraite, il appelait toujours à l'approche de Noël. Nous parlions de famille, d'expériences récentes et du bon vieux temps. Je me rendais compte qu'il s'ennuyait de ce bon vieux temps, qui pour lui a duré 37 ans.

On m'a dit que nous gardons tous un petit quelque chose des gens que nous avons côtoyés. J'espère que je porte un peu de Peter à travers mon travail.

J'ai été très attristé d'apprendre le décès de Peter.

Mark Rosin
Saskatoon

It is with great sadness we announce the passing of Peter John Burrows, the loving, caring husband of Frances Rose Miller of Calgary, Alberta who passed away peacefully with his wife and family at his side on Sunday, November 2, 2014, at the age of 76 years. Peter was born in South Battersea, England on May 7, 1938 and immigrated to Canada. He spent many years as a committed health care professional at the Royal University Hospital in Saskatoon, Saskatchewan, a profession in which he took great pride. He had a passionate interest in books, music and loved to express himself through his joy of acting. Peter is survived by his wife, Frances, and a large extended family of loved ones.

C'est avec grande tristesse que nous annonçons le décès de Peter John Burrows, l'époux aimant et attentionné de Frances Rose Miller de Calgary, Alberta. Il nous a quitté paisiblement aux côtés de sa femme et de sa famille le dimanche 2 novembre 2014, à l'âge de 76 ans. Peter est né à South Battersea, Angleterre le 7 mai 1938 et a immigré au Canada. Il a travaillé plusieurs années en tant que professionnel de la santé engagé au Royal University Hospital, profession qui lui a toujours apporté beaucoup de fierté. Il était passioné de littérature, de musique et adorait s'exprimer par le biais du théâtre. Peter laisse dans le deuil son épouse, Frances, et une famille nombreuse.

Ask Kathy! ❧ Kathy vous répond

Kathy Currado
info@cscp.ca

Welcome to "Ask Kathy", where my purpose is to help keep our membership informed about National Office issues and matters of interest to our members.

The official F'2015 membership dues receipts will already have been received by our members when making your online dues payment back in June. The receipt is your e-mail confirmation of successful online payment of any kind. If you have trouble finding it in your inbox please look in your junk or spam folder and search for *noreply@cscp.ca*. While you're in there, add *noreply@cscp.ca* to your safe senders list. Please remember that duplicate copies of these receipts come with an added administration fee of $25 so please keep them in a safe place until needed.

The National Office would like request that every member kindly log into the website at your convenience and visit "Your Profile" section to ensure all your information is up-to-date. As a gentle reminder, if you have a change of address, you can simply log into the website and change your address on your own. It seems some members have overlooked choosing an employing hospital in your profile. Please keep this information up to date as well. Having the most up to date demographic information on our members is essential.

Get involved with our social networking community. The CSCP is on twitter (*@cscp_online*), Facebook (*CSCP—Online*), and Instagram (*cscp_online*). It's a great way to stay informed all year around. If you are concerned about privacy, don't be. You can follow us but WE won't follow you.

Twitter is more than just a collection of fleeting observations about everyday life.
Twitter can connect people to events, information and each other in ways that have never been experienced before.

~Ian Lamont

Twitter In 30 Minutes: How to connect with interesting people, write great tweets, and find information that's relevant to you.

Bienvenue à ¨Demandez à Kathy, où le but est de tenir les membres informés sur les enjeux et les questions d'intérêts relatifs au bureau national.

Les reçus officiels F2015 pour les cotisations sont maintenant disponibles pour les membres qui ont fait leur paiement en ligne en juin dernier. Le reçu est votre confirmation par e-mail que votre paiement en ligne a été effectué avec succès. Si vous avez du mal à le trouver dans votre boite de réception, s.v.p. regardez dans votre dossier de courrier indésirable et recherchez noreplay@cscp.ca. Pendant que vous y êtes, profitez-en pour ajouter noreplay@cscp.ca à votre liste d'expéditeurs désirables. De plus, rappelez-vous que des frais administratifs de 25$ accompagnent toutes demandes de copies de ces reçus. Donc, veuillez garder vos reçus en lieu sûr jusqu'à ce que vous en ayez besoin.

Le bureau national demande à chaque membre d'aller sur le site web et de bien vouloir mettre à jour son profil. Pour votre information, si vous avez un changement d'adresse, vous pouvez simplement le faire par vous-même en allant sur le site web. Il semble que certains membres ont oublié de mettre le nom de l'hôpital où ils travaillent dans leur profil. SVP n'oubliez pas de mettre aussi cette information. Il est essentiel d'avoir à jour les informations démographiques de nos membres.

SVP soyez actifs dans notre réseau social communautaire. Le CSCP est sur twitter (*@cscp_online*) et sur facebook (*CSCP—Online*). C'est un excellent moyen de demeurer informé toute l'année. Si la confidentialité vous préoccupe, vous n'avez pas à vous inquiéter. Vous pouvez nous suivre mais Nous ne vous suivrons pas.

Twitter est plus que juste une collecte d'observations anodines de la vie de tous les jours.
Twitter peut mettre les gens en contact avec des évènements, des informations et les uns avec les autres et ce, d'une façon nouvelle et innovatrice.

~Ian Lamont

Twitter en 30 minutes: Comment se connecter avec des gens intéressants, écrire d'excellents tweets et trouver des informations pertinentes à chacun.

President's Message

John Miller
cscp@cscp.ca

The CSCP 25th Anniversary AGM and Scientific Sessions in Vancouver were nothing short of an outstanding success. I cannot recall an AGM that was better organized, more professional, more educational and informative, or just plain fun!

The academic agenda of our Scientific Sessions was packed with a full lineup of excellent presentations covering a wide variety of pertinent topics. I think I can speak for most of us present when I say that we were very impressed with the quality of the student presentations from the BCIT, Michener Institute, and University of Montreal programs. Outstanding work, students, and our congratulations to all of you. We are lucky to have you joining our profession!

One highlight of the academic program was a panel discussion on ECMO Program management, with presenters from across Canada, Germany, and our Keynote speaker, Dr. Giles Peek from Leicester, UK. It was a privilege to hear his opinions and recommendations on organization and delivery of ECMO services based on his years of experience and dedication to this field.

The social events of this year's national conference were just as successful as the scientific presentations. The Corporate Wine and Cheese event at the Steamworks Brewery gave the group from Vancouver General Hospital the opportunity to display some of the pumps, oxygenators, and equipment from generations past from their archives. Very impressive to see how far back some of our more seasoned members can remember the older technology! The Vancouver Aquarium proved to be the ideal venue for our annual Banquet and Awards Ceremony. This being the 25th anniversary banquet, we enjoyed the company of Scott McTeer, and Ted and Carla Flegel, along with video presentations from other Founding Directors of the CSCP. And a Beluga whale show to top it all off! Hats off to our Site Coordinators, Annie Bedard and KL Ta for organizing such spectacular events for us. And a very sincere thanks to all of our Corporate sponsors for their continued support in making such wonderful events possible, and for all your support of our clinical activities throughout the year. We couldn't do what we do every day without you!

The CSCP Annual Business Meeting saw the approval of our updated By-Laws for submission to Corporations Canada, thereby securing our continued existence as a not-for-profit professional society. Discussion around definitions of clinical case activity and streamlining the Foreign Applicants process also ensued, with these items being identified for the January Board of Directors Meeting Agenda. Further discussion also took place regarding major operational changes to the Canadian Cardiovascular Congress, and therefore our continued association with it. There will be some serious financial implications for the CSCP, and some important decisions to be made in determining whether we continue to hold our AGM as an organization within the CCC. Any recommendations from the Board of Directors and AGM Coordinator will, of course, be put to the membership for a vote.

And as a final parting note, this year's President's award went to, who else? — Mr. Bill O'Reilly for the exceptional work he has done as our AGM Coordinator for the last several years, but also for his numerous contributions to the CSCP over the course of his career. Thank you so much, Bill, for everything!

Another tremendously successful AGM brought to a close, and already looking forward to seeing many of you in Toronto in 2015. Just imagine what the next 25 years have in store for us!

Message du président

John Miller
cscp@cscp.ca

La réunion générale et scientifique annuelle 25ième Anniversaire de la SCPC à Vancouver n'a été rien de moins qu'un succès retentissant. Je ne me souviens pas d'une RGA qui ait été mieux organisée, plus professionnelle, plus éducative ou tout simplement plus divertisssante !

L'agenda des sessions scientifiques était rempli d'excellentes présentations couvrant une variété de sujets pertinents. Je crois que je peux parler au nom de tous ceux qui étaient présents en disant que j'ai été très impressionné par la qualité des présentations des étudiants des programmes du BCIT, de l'Institut Michener et de l'Université de Montréal. De l'excellent travail, et félicitations de la part de nous tous. Nous sommes chanceux de bientôt vous accueillir dans notre profession !

Le panel de discussion sur la conduite de l'ECMO était sans doute un des grands moments du programme scientifique, avec des participants de partout au Canada, de l'Allemagne et notre présentateur invité, Dr. Giles Peek de Leicester, Royaume-Uni. C'était un vrai privilège que d'entendre ses opinions et recommandations sur l'organisation et la conduite des services d'ECMO, basées sur ses années d'expérience et son implication dans ce domaine.

Les événements sociaux de notre congrès ont été tout aussi réussis que les présentations scientifiques. Le vin et fromage des membres corporatifs au Steamworks Brewery a donné au groupe du Vancouver General Hospital l'occasion d'exposer quelques pompes, oxygénateurs et appareils du passé qu'ils ont tirés de leurs archives. C'était impressionant de voir à quel point nos membres les plus chevronnés se souvenaient de la technologie ancienne! L'Aquarium de Vancouver était l'endroit idéal pour notre Banquet et Soirée de remise de prix. Comme c'était le 25ième anniversaire, nous avons eu la chance d'avoir la compagnie de Scott McTeer, de Ted and Carla Flegel, et de voir des présentations vidéo d'autres membres fondateurs de la SCPC. Et un spectacle de bélugas pour couronner le tout ! Chapeau à nos coordonnateurs locaux, Annie Bédard et KL Ta pour l'organisation d'événements si spectaculaires. Et je tiens à remercier sincèrement nos commanditaires pour leur support continu, qui rend de tels événements possibles, et qui nous suivent dans nos activités cliniques durant toute l'année. Nous ne pourrions faire ce que nous faisons tous les jours sans vous !

Durant l'assemblée des membres de la SCPC, les Règlements révisés ont été adoptés afin de les soumettre à Industrie Canada, confirmant ainsi le maintien de notre statut de société professionnelle à but non-lucratif. Une discussion sur les définitions de cas clinique a eu lieu, ainsi que sur la possibilité de restructurer le processus d'application pour candidat étranger. Ces deux items seront étudiés à la réunion du conseil d'administration de janvier. Les changements opérationnels majeurs du Congrès Cardiovasculaire Canadien ont aussi été abordés, ainsi que notre association future avec le Congrès. Il y aura des implications financières majeures pour la SCPC, et nous devrons prendre des décisions importantes pour déterminer si notre organisme continuera de tenir sa conférence annuelle au sein du CCC. Toute recommendation du conseil d'administration sera, bien sûr, soumise au vote des membres.

Sur une note finale, le prix du Président de cette année a été remis à – qui d'autre? – M. Bill O'Reilly pour le travail exceptionnel qu'il a effectué en tant qu'organisateur de la RGA au cours des dernières années, mais aussi pour ses nombreuses contributions à la SCPC tout au fil de sa carrière. Merci beaucoup pour tout, Bill !

Une autre Réunion Générale Annuelle couronnée de succès s'est conclue, et nous avons déjà hâte de voir plusieurs d'entre vous à Toronto en 2015. Essayez d'imaginer ce que les prochains 25 ans nous réservent !

Vice President's Message ❧ Message du président

Marie–France Raymond
info@cscp.ca

As this year is coming to an end, so is the 25th anniversary of the Society. I would like to salute the work of everyone who has made the Society what it is today. From the founding members who spent time and energy into creating the foundations of the CSCP, to the past Boards who dedicated themselves to its smooth operation and continous improvement. But I also want to recognize all the members who endlessly participate in all aspects of fulfilling our common mission, whether it be by organizing or presenting great quality scientific content to our meetings, getting involved in the education of our future colleagues, making our profession better known to the public in a variety of ways, or simply by striving to improve the high quality of care we deliver in each of our respective centers. We may be a small group in comparison to other professional bodies, but what we lack in numbers we make up for in involvement and generosity. The Society truly is a reflection of our members, and it is something we can all be proud of.

As usual, this year's AGM was a great success. The simulation sessions offered by Terumo were available again this year and were a great opportunity for the attendees to practice emergency situations in a high fidelity setting. In the future, simulation will probably increase its presence amongst the tools we have to educate ourselves but also to maintain our competencies. We all have recognized for a long time the usefulness of practice sessions and wetlabs, especially for situations that are not encountered often in the clinical setting. As a professional Society, maybe it's time to start reflecting on how to make room for simulation in our clinical requirements. The goal of our recertification requirements is to ensure we maintain our competencies by practice. Maintaining our proficiency in high stress, critical situations should probably be a part of that too. What do you think? Let's get the discussion rolling! If you would like to share your thoughts, you can use the message board on the website and participate in the debate.

Unfortunately, because of personal circumstances, I must resign from my position on the Board. The Board of Directors has appointed John Miller to continue in the position of President. I would like to thank John who has gracefully accepted to extend his service on the Board. We are still looking for someone to serve on the Nomination committee, for a term of five years. This is a great way to get involved in the Society, and to get to know your fellow perfusionists from across the country. Also, I would like to encourage each and everyone of you to bring your questions, concerns or ideas to the Board. All requests receive the Directors' attention and are discussed. This is how we shape the future direction of our Society!

I wish everyone a happy holiday,

Tout comme l'année 2014, le 25ième anniversaire de la Société tire à sa fin. J'aimerais souligner le travail de tous ceux qui ont fait de la Société ce qu'elle est aujourd'hui; les membres fondateurs qui ont investi temps et énergie à créer les fondations de la SCPC, ainsi que les conseils d'administration qui se sont dévoués à son roulement et à son amélioration continue. Mais je voudrais aussi reconnaître tous les membres qui participent sans relâche à tous les aspects de notre mission commune, que ce soit en organisant des congrès intéressants ou en y présentant du contenu scientifique de haute qualité, en s'impliquant dans l'éducation de nos futurs collègues, en faisant connaître notre profession au grand public de toutes sortes de façons, ou simplement en cherchant toujours à améliorer la qualité des soins que nous prodiguons dans nos centres respectifs. Nous sommes peut-être un petit groupe comparativement à d'autres organisations professionnelles, mais ce qu'il nous manque en nombre nous compensons en engagement et en générosité. La Société est réellement une réflection de ses membres, et il y a de quoi en être fier.

Comme toujours, la RGA de cette année a été un grand succès. Les sessions de simulation offertes par Terumo étaient de retour cette année, et offraient un belle opportunité aux conférenciers qui voulaient pratiquer des situations d'urgence dans un environnement haute-fidélité. Dans le futur, la simulation prendra probablement plus de place dans notre arsenal d'outils, non seulement d'éducation mais aussi de maintien de nos compétences. Nous reconnaissons tous depuis longtemps l'utilité des sessions de pratique et des laboratoires, spécialement pour des situations que l'on ne rencontre pas souvent dans la pratique clinique. En tant que Société professionelle, peut-être est-il temps de réfléchir à la place que nous voulons accorder à la simulation dans nos exigences cliniques. Le but de notre processus de recertification est de s'assurer de maintenir nos compétences par la pratique. De savoir garder notre efficacité en situation critique, avec un haut niveau de stress, devrait probablement faire aussi partie de nos exigences de recertification. Qu'en pensez-vous ? Discutons-en ! Si vous voulez partager votre opinion sur le sujet, vous pouvez nous en faire part sur le babillard du site web et alimenter le débat.

Malheureusement, à cause de circonstances personnelles, c'est avec tristesse que je dois quitter mon poste au sein du Conseil d'administration. Le CA a désigné John Miller pour continuer à présider le conseil. J'aimerais sincèrement remercier John d'avoir accepté de prolonger son service. Nous sommes toujours à la recherche d'un candidat pour le comité des Nominations, pour un mandat de 5 ans. C'est un excellent moyen de s'impliquer dans la Société et d'apprendre à connaître vos compagnons perfusionnistes de partout au pays. Aussi, j'aimerais encourager tous et chacun à faire parvenir vos questions, inquiétudes et suggestions au conseil d'administration de la SCPC. Toutes les requêtes reçues sont étudiées et discutées, et reçoivent l'attention des directeurs concernés. C'est de cette façon que tous ensemble nous déterminons la future direction de notre Société !

Je souhaite à tous de très Joyeuses Fêtes !

Central Region ❧ Région central

Chris McKay
info@cscp.ca

I am so pleased to express my congratulations to Bill O'Reilly, for yet another incredibly successful Annual General Meeting, this past October in Vancouver. I am equally proud to report that the Central Region was well represented. Congratulations to Cyril Serrick and Valerie Cunningham from University Health Network and Graham Walsh, as well as yours truly, from London Health Sciences Centre for offering up eight presentations in total. They all offered up their own versions of acquired knowledge and entertainment as well. The Michener was not to be left out. Five of the nine students participating at the meeting were from our region. Job well done by all!

The Central Region may also be proud, that the Perfusion Team Award went to the group at University Health Network. A tremendous amount of hard work, collaboration and sharing of information has come from this department over the past year.

At last count, 10 of the 13 cardiac centres in Ontario have been listed as Ebola receiving centers. Here in London, every employee has had to go through mandatory physical testing of donning and doffing our personal protective equipment (PPE). This included proper hand washing, gowning, N95 respirators, eye protection and of course gloving. A little intimidating for those of us who usually only mask and wear gloves, in addition to our usual scrubs. Best of luck to these centres this season, with all of the newly emerging viruses and hoping that it does not increase your ECMO workload.

On a final note, I would like to invite everyone to consider contributing to our provincial and/or national societies. The OSCP will be holding a general meeting prior to the next National Meeting, details to follow, where we will have to fill several key positions. The OSCP will require a new board of directors and a new Regional Representative to the CSCP will have to be elected. Don't be tentative, this has been an extraordinary experience and it has provided invaluable exposure to how our society functions. You will never regret giving back to the Societies that serve us all well. If you have any questions or concerns about these positions, please feel free to contact me through the National Office at: *info@cscp.ca*

Je suis heureux d'exprimer mes félicitations à Bill O'Reilley pour avoir, encore une fois, réussi à organiser un extraordinaire congrès à Vancouver en octobre 2014. Je suis aussi très fier de rapporter que la région centrale était très bien représentée. Félicitation à Cyril Serrick et Valerie Cunningham de l'Université Health Network, à Graham Walsh ainsi qu'à moi-même du London Health Center pour avoir réussi à faire 8 présentations en tout. Ils ont tous offerts, à leur façon, une présentation divertissante de leurs connaissances cliniques. Michener n'a pas été laissé pour compte. 5 des 9 étudiants qui ont participé au congrès étaient de notre région. Chapeau à tous.

La région centrale peut aussi être fière du trophée pour la meilleure équipe de perfusion qu'a remporté l'équipe de l'Université Health Network. Tout au long de cette année, il y a eu un effort extraordinaire de collaboration, de partage d'informations et de travail assidu de ce département.

Au dernier compte, 10 des 13 centres de chirurgie cardiaque de l'Ontario ont été nommés centres pour le traitement de l'Ebola. Ici, à London, tous les membres du personnel ont dû obligatoirement participer à l'essayage de l'équipement personnel de protection (EPP). Cet exercice incluait la bonne technique du lavage des mains, l'essayage du vêtement protecteur, le masque N95, la protection des yeux et bien sur les gants. Ceci a été un peu intimidant pour ceux qui habituellement ne mettent qu'un masque et des gants en plus de leur habit habituel de bloc. Meilleures des chances à ces centres pour la prochaine saison, à cause de tous les nouveaux virus émergeants, nous espérons que tout ceci n'augmentera pas votre charge de travail en ECMO.

Finalement j'aimerais inviter tout le monde à participer à notre Société Provinciale ou Nationale. Le congrès annuel de l'OSCP se tiendra avant le prochain congrès National (les détails suivront) et il y aura plusieurs postes importants à combler. L'OSCP aura besoin d'un nouveau CA et un nouveau représentant national pour le CSCP sera élu. N'hésitez pas : c'est une expérience extraordinaire qui nous permet d'avoir une nouvelle compréhension des rouages de notre Société. Vous ne regretterez jamais d'avoir donné du temps à cette Société qui est présente pour nous tous. Si vous avez des questions ou des interrogations concernant ces positions, sentez-vous libre de me contacter par l'entremise du Bureau National à *info@cscp.ca.*

Western Region Région ouest

John Miller
info@cscp.ca

As I write this report from the Western Region, I must apologize that I am a little remiss in soliciting information from our centres in Western Canada — mostly because I have been on a medical mission in China for the last ten days. Many members of our Canadian perfusion community have been very active in contributing to international cardiac surgery missions, and my hat goes off to all of you.

These truly are life-changing experiences, and the adventure of a lifetime. The people you meet and the friends you make turn all the hard work into nothing but reward. I would encourage anyone who has even the slightest interest in participating in a mission trip to seize the opportunity — you will never regret it!

In any case, reining in my thoughts from the Far East back to the Western Region… remember everyone, hot on the heels of the 2014 CSCP AGM and Scientific Sessions in Vancouver comes the CSCP Western Region Meeting in beautiful, sunny Kelowna BC! François Perron and Savy Spada are putting together a combination of academic and social activities that you won't want to miss! So mark your calendars for mid-to late June, pack your golf clubs and swimsuits, and brush up on your wine–tasting, because it promises to be an all-around enjoyable conference. Looking forward to seeing you there!

Comme j'écris ce rapport à partir de la région de l'Ouest, je dois m'excuser d'avoir été un peu négligent à solliciter des informations de nos centres de l'Ouest du Canada, étant donné que j'ai été en Chine pour une mission médicale pendant les 10 derniers jours. Plusieurs membres de notre communauté de perfusion canadienne ont été très actifs en participant à des missions internationales de chirurgie cardiaque, et je désire lever mon chapeau à vous tous!!!

Ce sont vraiment des expériences qui changent la vie, et qui sont l'aventure d'une vie. Les gens que vous rencontrez et les amis que vous vous faites rendent la charge de travail en récompense. Je voudrais encourager tous ceux qui ont le moindre intérêt à participer à un voyage de mission à l'étranger de sauter sur l'occasion - vous ne le regretterez jamais!

Dans tous les cas, ramenant mes pensées de l'Extrême-Orient à la région de l'Ouest ... Je veux rappeler à tout le monde, que succédant à l'AGA de la SCPC et des sessions scientifiques de Vancouver vient la Réunion de la région Ouest de la SCPC dans la belle ville ensoleillée de Kelowna en Colombie-Britannique! François Perron et SavySpada travaillent ensemble pour préparer une combinaison d'activités scientifiques et sociales que vous ne voudrez pas manquer! Alors marquez vos calendriers pour la fin de juin, emballez sacs de golf et maillots de bain, et préparez vos papilles, car cela promet d'être un rendez-vous agréable du début à la fin. Au plaisir de vous y voir!

Message from Secretary ~ Message du Secrétaire

Chris McKay
info@cscp.ca

The first year of re-certification, with a new CEU system, has progressed fairly well. Thanks to everyone who filed on time. A few suggestions have surfaced and will be addressed for next year.

The new website was a first for everyone. A phase two will be introduced to make the processing end of things easier for the Executive Secretary. The system was not without its glitches, but they are being worked through. Another suggestion has come forward, to more clearly define what a "primary case" may be. This is going to be on the agenda for our January Board of Director's Meeting and will appear on the website when complete. Hopefully this will clarify some workload that may be utilized by members that may be just shy of the 80 cases in a two year period.

If you are sponsoring a meeting or symposium, please feel free to submit the content of the meeting to the Board of Directors for assessment and designation of either Class I or Class II credits. There is no cost involved and it will definitely make your meeting more attractive to CSCP members trying to earn Class I credits.

If you are claiming credits, and you are unsure of whether it qualifies as Class I CEU's (ie. ABCP or CSCP certified), please call and inquire via the National Office. Discrepancies between ABCP and CSCP CEU's may occur, but are usually minor. As long as you have your attendance certificate issued by the meeting itself, you will be covered in the event of an audit.

Any further questions or concerns may be directed to me, via the National Office at: *info@cscp.ca*

La première année de recertification sous le nouveau système s'est quand même bien déroulée. Merci à tous ceux qui ont remis leur formulaire à temps. Quelques suggestions ont été apportées et seront considérées pour l'an prochain.

Le nouveau site web était une grande première pour tous. Une deuxième phase sera développée afin de rendre le traitement des formulaires plus convivial pour le Secrétaire. Le système a eu son lot de petits problèmes, mais ils ont été surmontés. Il a aussi été suggéré de mieux définir ce qui constitue un «cas clinique primaire». Ce sujet sera à l'agenda de la réunion du conseil d'administration de janvier, et la définition complétée sera ensuite affichée sur le site web. Nous espérons que cette clarification des activités qui peuvent être utilisées aidera les membres qui sont juste en deçà des 80 cas cliniques requies par période de deux ans.

Si vous organisez une conférence ou un symposium, n'hésitez pas à en envoyer le contenu au conseil afin qu'il assigne des crédits d'éducation de Classe I ou Classe II. Il n'y a aucun coût associé et cela rendra certainement votre conférence plus attrayante pour les membres de la SCPC qui veulent obtenir suffisament de crédits de Classe I.

Lorsque vous réclamez vos crédits et que vous n'êtes pas sûr s'il s'agit de crédits de Classe I (par ex. Approuvé par l'ABCP ou la SCPC), communiquez avec le Bureau national pour vérifier. Il y a parfois une différence entre les crédits accordés par la SCPC et l'ABCP, mais elle est généralement mineure. En autant que vous avez un certificat de participation délivré par l'organisation de la conférence même, vous serez couvert en cas de vérification.

Vous pouvez me faire parvenir toutes questions ou préoccupations via le Bureau national au: *info@cscp.ca*

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May 8 & 9, 2014

ECLS PROGRAM
UNIVERSITY HEALTH NETWORK

Cyril.Serrick@uhn.ca

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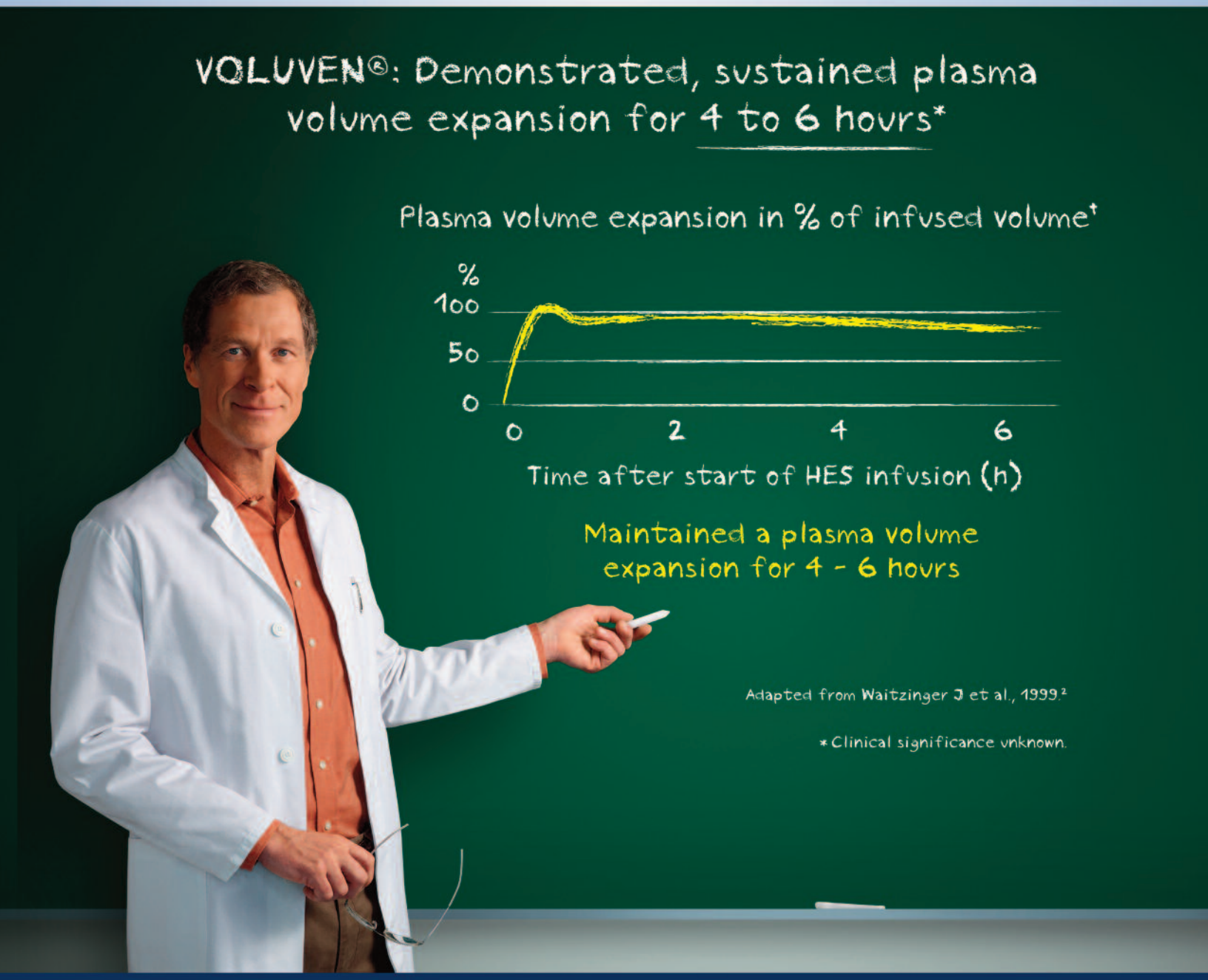

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†Based on a study of 12 healthy male volunteers. Subjects received 500mL VOLUVEN® following a 500 mL bleed.

REFERENCES: 1. VOLUVEN® Product Monograph, Fresenius Kabi, June 28, 2011. **2.** Waitzinger J, et al. Pharmacokinetics and Tolerability of a New Hydroxyethyl Starch (HES) Specification (HES (130/0.4)) After Single Dose Infusion of 6% or 10% Solutions in Healthy Volunteers. Clin Drug Invest 1998; Aug 18 (2): 151-160.

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See Prescribing summary on page 120

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Message from ACE ⚜ Message du ACE

Jackie Archibald
info@cscp.ca

The ACE Committee met in Vancouver this past week for our annual meeting. We had 11 candidates challenge the National exam. After marking and validating the exam, the committee met with Dr. David Cane of Catalyst Consulting. Dr. Cane is assisting us in updating and validating the Competency Profile and Blueprint. Our profession is dynamic and constantly evolving so our Competency Profile and Blueprint needs to reflect this. The ACE Committee wishes to thank Steven Fang and Annie Bedard for invigilating the exam, and Doug Isreal for organizing the location for the exam and our meeting.

In early 2015, we will have an electronic survey sent to every member via e-mail. So please take a few minutes to complete the survey and help guide us in the process. Your input is invaluable. The validity of our documents is only as strong as our membership and stakeholder involvement.

The upcoming year will be very busy with a lot of transition. Manon Caouette has completed her term as ACE Committee Chairman. The members of the committee cannot thank Manon enough for all her hard work and leadership. She organized the exam databank and improved our statistical reporting with the new software that houses the exam bank. I also personally wish to thank Manon for her guidance and support in helping me prepare for my tenure as ACE Committee Chairperson. I am excited about my new role. Manon has set the bar very high and I am looking forward to the challenge.

La semaine dernière, le comité ACE s'est réuni à Vancouver pour le congrès annuel. Il y avait 11 candidats pour l'examen national. Après avoir noté et validé les résultats des examens, le comité a rencontré le Dr David Cane de la compagnie « Catalyst Consulting ». Le Dr Cane nous assiste dans la mise à jour et dans la validation du Profil des Compétences et des blueprints (plan de travail détaillé). Notre profession est très active et en constante évolution, nos Profils de Compétences et blueprints doivent donc refléter cet état. Le comité ACE veut exprimer ses remerciements à Steven Fang et Annie Bédard pour avoir surveillé l'examen ainsi qu'à Doug Isreal pour avoir trouvé les locaux pour l'examen et pour notre réunion annuelle.

Au début de 2015 tous les membres recevront un sondage électronique par e-mail/e-blast. SVP prenez quelques minutes pour compléter ce sondage qui nous guidera dans ce processus. Votre participation est essentielle. La portée et la validité de nos documents sont supportées par la participation des membres.

L'année prochaine sera bien occupée avec une série de transitions. Manon Caouette a terminé son mandat comme présidente du comité ACE. Les membres du comité ne pourront jamais assez remercier Manon pour tout l'excellent travail accompli et pour son leadership. Elle a organisé la banque de données de l'examen et amélioré les statistiques avec le nouveau logiciel associé à la banque de données. J'aimerais aussi la remercier personnellement pour m'avoir guidé dans la transition comme prochaine présidente du comité ACE. Je suis emballée par ce nouveau rôle. Manon a mis la barre très haute et je ferai tout pour être à la hauteur.

Awards Prix

Recipient of the 2014 President's Award

Bill O'Reilly

Récipiendaire du prix du Président 2014

This award is at the discretion of the President, and is presented to the individual who has contributed to the development of the CSCP by his/her participation and/or by his/her services.
This award is presented by the President.

Ce prix est à la discrétion du Président et est décerné à la personne qui a contribué au développement de la SCPC par sa participation et/ou par son implication.
Ce prix est remis par le Président.

Recipient of the 2013 Alec D Thorpe Academic Achievement Award

Kyle O'Scienny & Keegan Rowe

Récipiendaire du prix Alec D Thorpe pour la réussite académique 2013

This award is presented to the person achieving the highest passing mark on the National Certification Exam in a given group
at the discretion of the board of directors

Ce prix est décerné à la personne dans un groupe donné, qui a obtenu le meilleur résultat à l'examen de certification Nationale de la SCPC.

Recipient of the 2014 Scott McTeer Award for Outstanding CSCP Student Presentation

May Angela Nguyen~Vu

Récipiendaire du prix Scott McTeer 2014

Awards Prix

Recipient of the 2014 Team Award

University Health Network, Toronto

Gagnant 2014 de l'équipe de perfusion de l'année

This award is given to acknowledge the achievement of a perfusion department or a group of individuals, involved toward the betterment of our profession. This award is presented by the Vice President.

Ce prix est remis en reconnaissance de leur implication dans la promotion et/ou l'amélioration de notre profession à un département de perfusion ou à un groupe de personnes . Ce prix est présenté par le Vice Président.

Career Achievement Award 2014

Richard Michael Morrison

Frank Van Staalduinen

Prix de l'accomplissement de las carrière

This award is presented to individuals with 20 years of service in the field of Perfusion. This award is distributed every two years to deserving individuals whose eligibility (seniority) has been brought forth to the Award Committee and upon confirmation of attendance by the recipient to the Annual General Meeting.

Ce prix est présenté aux individus cumulant 20 ans de service dans le domaine de la perfusion. Ce prix est remis à tous les deux ans aux individus méritants dont l'égilibité (la séniorité) a été portée à l'attention du Comité des prix, et dont la présence à la Réunion Générale Annuelle a été confirmée.

Awards Prix

Past President's Awards Récipiendaires précédents du Prix du Président

1989 — Barre Hall
1990 — Kathy Deemar
1991 — Graham Walsh
1992 — Elaine Gordon
1993 — David Nash
1994 — Brian McClosky
1995 — David Edgell
1996 — Mark Henderson
1997 — Chris McCudden
1998 — Andrew Cleland
1999 — Bill O'Reilly
2000 — Todd Koga
2001 — Ron Mac Leod
2002 — Steve Ditmore
2003 — Dwayne Jones
2004 — David Edgell
2005 — Andrew Beney
2006 — Todd Koga
2007 — Manon Caouette
2008 — Steve Chanyi
2009 — Jim MacDonald
2010 — Dustin Spratt
2011 — Eric Laliberte
2012 — Kathy Currado
2013 — Annie Bedard

Lifetime Achievement and Director Emeritus Prix pour l'accomplisssement de la carrière

2009 — Scott McTeer

Professional Achievement Award Prix pour l'accomplisssement de la carrière

2005 — Scott McTeer

Past Alec D Thorpe Academic Achievement Awards
Récipiendaires précédents du Prix Alec Thorpe pour le meilleur résultat académique

1991 — Craig Armstrong
1992 — Andree Marceau
1993 — Michael Courtney
1994 — Karen Henry
1995 — Zbignien Wiericki
1996 — Daniel Herbst
1997 — Ann-Marie Wynnyk
1998 — Dwayne Jones
1999 — Bio Dai
2000 — Eric Laliberté
2001 — Cheryl Armstrong
2002 — Christos Calaritis
2003 — Armindo Fernandes
2004 — Natalie Barlow
2005 — Justin Hawkins
2006 — Lynn E Crawford Lean and Saverio Spada
2007 — Jane Barrington
2008 — Richard Saczkowski
2009 — Julie Trembley
2010 — Andrée—Anne Langevin
2011 — Diana Galley
2012 — Myriam Burns

Past Perfusion Team Awards Récipiendaires précédents de l'Équipe de perfusion de l'année

1993 — University Hospital, London
1994 — The Hospital For Sick Children, Toronto
1995 — Winnipeg Health Sciences Centre, Winnipeg
1996 — Royal Victoria Hospital, Montreal
1997 — Winnipeg Health Sciences Centre, Winnepeg
1998 — Michener Institute, Toronto
1999 — QE II Hospital, Halifax
2000 — CSCP ACE Committee
2001 — B.C. Children's Hospital, Vancouver
2002 — Montreal Children's Hospital, Montreal
2003 — Trillium Health Centre, Mississauga
2004 — Foothills Hospital, Calgary
2005 — Kingston General Hospital
2006 — New Brunswick Heart Centre, Saint John
2007 — Hôpital Laval, Laval, Québec
2008 — London Health Sciences Centre
2009 — Mazankowski Alberta Heart Institute, Edmonton
2010 — Accreditation, Competency, Examination (ACE)
2011 — Université de Montréal
2012 — BCIT Program and Clinical Coordinators and Liaison
2013 — Kelowna General Hospital, British Columbia

Past Career Achievement Award Récipiendaires précédents du Prix de l'accomplissement de la carrière

1985
John Basaraba
Gus Fabrikis
Peter Fortini
Danny Johnston
Dietrich Kemna
Henry Kronhardt
Richard Leadon
Jaques Matte
Winston Offord
Remi Rodrique
Marcel Roy
Roger Samson
Alec Thorpe

1987
Leonard Doiron
James MacDonald
Maurice Martin

1989
Peter Burrows
Ted Flegel
Wallace MacDonald

1991
Lothar Broker
Dennis Nugent
Clarence Powers
Ralph Ricketts
Jamie Villamater

1993
Jennifer McDonough
Rodrique Morel

1994
Brian Brown

1995
Louise Gauthier
Richard Mayer
Henry Wood

1997
Kathy Deemar
David White

1999
Marcel Bouchard
Hugette Clement
Jacques Matte

2001
Andrew Cleland
Carole Hamilton
Bill O'Reilley
Jackie Stokoe

2003
Rosemary Brinkema
Jolene Carbonneau
Ginette Cote
France Denis
Yvan Gevry
Colleen Gruenwald
Graham Walsh
Zahir Young

2005
Grant Mamchur

2006
David Edgell
Harry Mickelson

2010
Steve Chanyi
Tony Maas
Judy Won

2012
Roy Romanowicz
Stephanie Walsh

Toronto AGM RGA

October 2015 octobre

Message from AGM

Bill O'Reilly
info@cscp.ca

The 25th Anniversary CSCP AGM was a great success. The attendance at the sessions was outstanding. As a meeting organizer it makes all the work worthwhile when you see a great turn out, fantastic speakers and a great deal of good discussion and questions from the audience.

The ECMO panel discussion and patient interview were an exciting highlight of the conference. Thanks to Dustin Spratt from Vancouver for the great idea and thanks for getting Dr. Peek to attend.

There are many to thank. Starting with all the attendees this year. No point in having a meeting if no one shows up. There were 94 registrations at this years meeting including guests, speakers and students.

Speaking of students there were nine student presenters this year from all three of our Canadian perfusion schools. This was a first that was celebrated with the awarding of the Scott McTeer Student Presentation Award. Scott himself presented it. All of the student sessions were very well attended, as the talks were all outstanding. Congratulations to May Nguyen–Vu for winning the award.

It was certainly a highlight of the 25th Anniversary meeting to have Scott McTeer and his wife Ilyne join us in Vancouver. I think those who know him would agree we would probably not have had a 25th year of the CSCP if not for Scott.

A last minute surprise happened at the banquet dinner as Ted and Carla Flegel joined us. Ted was the first president of the CSCP and his wife Carla was our first office manager. Great to see that they are enjoying retirement on Vancouver island.

I have to say a great thanks to the moderators this year. While I am running around doing various things at the meeting they keep it going and on time. Thanks to Steve Chanyi, David Nash, Graham Walsh, François Perron , John Miller and Kim Long Ta.

Could not have done it without you guys. Thanks.

Of course the background work any year is always worth remembering the efforts of those who prepare for the meeting. This year I had the help of two very dedicated individuals. Thanks to Annie Bedard for finding the best venue ever for the banquet. We did not know when we booked it but we were at the Vancouver Aquarium almost 25 years to the day. Great work Annie.

A special thanks to KL Ta and the guys at VGH for organizing a great display of old devices at the corporate wine and cheese reception.

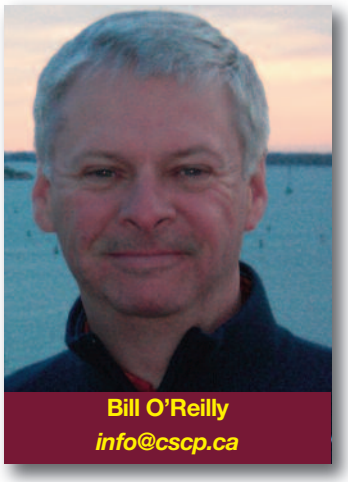
Of course a special thanks as always to our nine corporate sponsors who invited us to the reception this year. A special thanks to Alere, IL, and Teleflex sponsors of this year's breakfast sessions. Always a great treat at the meeting.

The Terumo/Ryan Medical sponsored simulator sessions were well attended and enjoyed by all. Thanks to a great job from the Terumo staff and those at Ryan Medical.

I really don't know if we can top the level of this meeting next year but it will be fun trying. See you in Toronto, next year the dates are October 24th to the 27th 2015.

Thanks again to all those who attended and helped out it is always a pleasure to serve our society.

Message du RGA



Bill O'Reilly
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La RGA 25ième Anniversaire de la SCPC a été un grand succès. L'assistance aux sessions scientifiques a été extraordinaire. Pour un organisateur, ça vaut tout le travail lorsqu'on voit une aussi bonne participation, des présentateurs fantastiques et de très bonnes discussions et questions de la part de l'auditoire.

Le panel de discussion sur l'ECMO et l'entrevue avec un patient était sans contredit un point fort de la conférence. Merci à Dustin Spratt de Vancouver d'avoir eu cette bonne idée et d'avoir obtenu la participation de Dr. Peek.

Je dois remercier plusieurs personnes, en commençant par les participants. Il ne sert à rien d'organiser un congrès si personne ne vient. Nous avons eu 94 inscriptions cette année incluant les invités, les conférenciers et les étudiants.

En parlant des étudiants, nous avons entendu 9 présentateurs cette année provenant des trois écoles de perfusion canadiennes. Cette première a été soulignée par la remise du prix Scott McTeer de la meilleure présentation étudiante. Scott a remis ce prix en personne. Toutes les présentations étudiantes ont attiré un bon auditoire, et était de très grande qualité. Félicitations à May Nguyen-Vu qui s'est merité le prix.

Ce fût certainement un honneur de recevoir Scott McTeer et son épouse Ilyne à Vancouver pour le congrès 25ième Anniversaire. Je crois que tous ceux qui le connaissent seraient d'accord pour dire que sans Scott, ce ne serait sans doute pas la 25ième année d'existence de la SCPC.

Nous avons eu une surprise de dernière minute au banquet alors que Ted et Carla Flegel se sont joints à nous. Ted a été le premier président de la SCPC et sa femme Carla a été la première à s'occuper de la gestion du bureau. C'était bien de voir qu'ils profitent de leur retraite sur l'île de Vancouver.

Je dois aussi remercier tous les modérateurs de cette année. Pendant que je m'occupe de mille et une chose pour le congrès, ils prennent les présentations en main et s'assurent de les garder à l'heure. Merci à Steve Chanyi, David Nash, Graham Walsh, Francois Perron , John Miller et Kim Long Ta. Je ne pourrais y arriver sans vous. Merci.

Bien sûr, il est important de souligner les efforts de tous ceux qui travaillent en coulisse pour le congrès chaque année. Cette année, j'ai eu l'aide de deux individus très dévoués. Merci à Annie Bédard pour avoir trouvé le meilleur emplacement qui soit pour le banquet. Nous ne le savions pas quand nous avons réservé, mais nous étions à l'Aquarium de Vancouver il y a presque exactement 25 ans. Excellent travail Annie.

Un merci tout spécial à KL Ta et toute l'équipe du VGH pour l'exposition d'appareils anciens à la réception vin et fromage des membres corporatifs.

Et bien sûr, un merci spécial à nos 9 commaditaires qui nous ont invité à la réception cette année encore. Merci à Alere, IL et Teleflex, les commanditaires des sessions du déjeûner de cette année. C'est toujours très apprécié.

Les sessions de simulation commanditées par Terumo/Ryan Medical ont connu un grand succès et ont été très aimées de tous. Merci pour l'excellent travail fait par l'équipe de Terumo et celle de Ryan Medical.

Je ne sais vraiment pas si nous pourrons surpasser le niveau d'excellence de ce congrès l'an prochain, mais ce sera intéressant d'essayer. Nous nous reverrons à Toronto l'an prochain, du 24 au 27 octobre 2015.

Merci encore une fois à tous les participants et tous ceux qui ont offert leur aide, c'est toujours un plaisir que de servir notre société.

Reprint Article ❧ Article Reprint

Potential Role of Oxygen Delivery as an Indicator of Adequacy of Perfusion During Cardiopulmonary Bypass

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Abstract

Purpose: Assessment of adequacy of perfusion during cardiopulmonary bypass is commonly achieved by monitoring PvO_2, SvO_2, and by providing a normothermic cardiac index of at least 2.4 L/min/m^2. This review considers the use of oxygen delivery, and the concept of a critical oxygen delivery value to help dictate adequacy of perfusion while on cardiopulmonary bypass.

Source: Systematic review of indexed articles retrieved through keyword searches in PUBMED databases.

Principle Finding: There is data that suggests oxygen delivery less than 260 mL O_2/min/m^2 in an adult patient results in anaerobic tissue metabolism. Poor or no correlation of SvO_2 and PvO_2 with mortality and oxygen delivery question their ability to function as an adequacy of perfusion parameter. Oxygen delivery is easily monitored while on cardiopulmonary bypass, and is primarily controlled by modulating pump flow and hemoglobin.

Conclusion: Much of the literature describes oxygen delivery and critical oxygen delivery in a wide spectrum of intensive care patients. As such, there is an opportunity to further define oxygen delivery and critical oxygen delivery specific to adult and pediatric patients. This data supports maintaining an oxygen delivery in excess of 260 mL O_2/min/m^2 to minimize detrimental effects of inadequate tissue perfusion while on cardiopulmonary bypass.

Sommaire

Objet: L'évaluation de l'adéquacité de la circulation extra-corporelle est très souvent monitorisée par la PvO_2, la SvO_2, en paralèlle à une mesure d'index cardiaque normothermique d'au moins 2.4 L/min/m^2. Cette revue prends en considération la libération d'oxygène, et le concept de valeur de libération d'oxygène critique,afin d'aider à définir la perfusion adéquate pendant la circulation extra-corporelle.

Source: Revue systématique d'articles indexés à partir de mots clés dans la base de données PUBMED.

Découverte: Les données suggère qu'une libération d'oxygène de moins de 260 mL O_2/min/m^2 chez l'adulte résulterait en un métabolisme anaérobique. Le manque de corrélation entre la SvO_2 et la PvO_2 par rapport à la mortalité et la libération d'oxygène, porte à remettre en question la fiabilité de ces paramètres en tant que paramètre de perfusionl. L'apport d'oxygène est facilement monitoré pendant la CEC et est primairement contrôlé par la modulation du débit de pompe et le taux d'hémoglobine.

Conclusion: Beaucoup de litthératures décrivent l'apport d'oxygène et le niveau critique de ce dernier à travers un large spectre de patients de soins intensifs. Ainsi, il y a une opportunité de définir l'apport d'oxygène et le niveau critique de celui-ci spécifiquement pour les patients adultes et pédiatriques qui subissent la CEC. Cette valeur supporte le fait qu'un apport d'oxygène supérieur à 260 mL O_2/min/m^2 minimalise la possibilité de créer des accidents de perfusion tissulaire lors de la CEC.

Disclosure · Information

The author of this manuscript is the editor for *The Perfusionist.* This manuscript was blinded and submitted to the peer-review process, as are all other submissions to *The Perfusionist.* Decision to accept/revise/reject the submission was deferred to the Associate Editor, who was blinded to the identity of the author.

L'auteur de ce manuscript est l'édituer en chef. Ce manuscript a été évalué sans que le nom de l'auteur ne soit divulgué et soumis à un processus de revue par les pairs, tout comme le sont les sousmissions au *The Perfusionist.* La décision d,accepter/de refuser/de rejetter la soumission a été attribuéeà l'assistant-Éditeur, tout en gardant le nom de l'auteur confidentie

Introduction

A fundamental responsibility perfusionists have when a patient is placed on cardiopulmonary bypass is to provide adequate tissue perfusion and maintain adequate tissue metabolism. Routine parameters of perfusion that indicate adequate tissue perfusion include a normothermic cardiac index flow of 2.4 L/min/m^2, PaO_2 of between 150 mmHg and 200 mmHg, PvO_2 >40 mmHg, and a venous saturation of approximately 80%; if the oxygen tension coming out of the oxygenator is *normal*, and if the cardiac index is *normal*, then chances are that the patient will also be fairly close to clinical *normal*. This is further supported when a venous saturation between 70% and 80% and a PvO_2 of more than 40 mmHg is obtained. Having these routine parameters close to *normal* appear to indicate good perfusion, and many a perfusionist would be content if presented with such a state. It is suggested that the theory of oxygen delivery and the concept of a critical level of oxygen delivery can identify periods of inadequate tissue perfusion, even when the routine parameters indicate acceptable tissue perfusion.

Methods

Journal articles were systematically retrieved from the PUBMED database using keywords *oxygen delivery, extracorporeal support, cardiopulmonary bypass* and *critical oxygen delivery*. These papers were reviewed, and further support references were obtained from the retrieved papers' citations list.

Results

Aerobic and Anaerobic Metabolism

Through various pathways, aerobic cellular metabolism can theoretically generate 36 molecules of adenosine–5'–triphosphate (ATP), the fundamental energy unit in tissue metabolism, from one molecule of glucose; two ATP molecules from the tricarboxylic acid cycle, and 34 from the electron transport chain. That same molecule of glucose results in a scant two ATP molecules when processed through the anaerobic pathway; from anaerobic glycolysis. This makes aerobic metabolism 18 times more efficient than anaerobic metabolism. The acid waste molecules formed per ATP molecule is 1:6 in aerobic metabolism, compared to 1:1 in anaerobic metabolism. Further, the acid waste formed from aerobic metabolism is carbon dioxide, easily removed via the lungs. The acid waste formed from anaerobic metabolism is lactic acid, which is converted into pyruvate, then back to glucose, through the Cori cycle in the liver and kidneys; a bit more laborious.

Tissues are normally in a state of aerobic metabolism; utilizing oxygen to drive their metabolic pathways. When the tissue oxygen supply is reduced to below a certain critical level, anaerobic metabolism starts; inefficiently driving their metabolic pathways without oxygen. As such, the transitory state between aerobic and anaerobic metabolism can be considered a marker of inadequate tissue perfusion.

Oxygen Delivery

The concept of delivering oxygen to the tissues is the *raison d'etre* of the cardiovascular perfusionist. The single parameter that measures this, oxygen delivery, is poorly cited in the literature specific to cardiopulmonary bypass, and regardless, is not commonly monitored as a standard of practice. The majority of perfusion protocols rely upon the routine parameters, especially the 2.4 L/min/m^2 index flow and venous saturation, as the gold standard for adequate tissue perfusion (1—7). There is mounting evidence that suggests the use of these parameters may not be optimal to fully assess adequate tissue perfusion (3, 5, 6). With point–of–care blood gas analyzers becoming standard in the cardiac operating room, it is now easier to measure oxygen delivery while on cardiopulmonary bypass.

Oxygen delivery is defined as the amount of oxygen made available to the body per minute. Oxygen is distributed through the blood, and at the tissue level there are two mechanisms of oxygen delivery: Convective oxygen delivery, and diffusive oxygen delivery (8). Convective oxygen delivery is proportional to cardiac output, arterial oxygen content, and blood flow distribution within the tissues. Diffusive oxygen delivery is proportional to the oxygen tension gradients between the red blood cell and the mitochondria, and is inversely proportional to hemoglobin's affinity for oxygen. These two components can be seen in equations 1 and 2 (9):

$$\underset{\text{Arterial Content}}{\underset{[mL\ O_2/dL]}{CaO_2}} = \underset{\text{Convective Oxygen Delivery}}{(Hb \cdot 1.31 \cdot SaO_2)} + \underset{\text{Diffusive Oxygen Delivery}}{(0.00314 \cdot PaO_2)} \quad ①$$

$$= ([g/dL] \cdot [mL\ O_2/g]) + ([mL\ O_2/mmHg/dL] \cdot [mmHg])$$

Where;
1.31 mL O_2/g is the oxygen dissociation curve constant
0.00314 mL O_2/mmHg/dL is the concentrational solubility coefficient
Hb is the hemoglobin in [g/dL]
SaO_2 is the fractional saturation
PaO_2 is the arterial oxygen tension [mmHg]

$$\underset{[mL\ O_2/min]}{DO_2} = 10 \cdot Q \cdot CaO_2 \quad ②$$

$$= [dL/L] \cdot [L/min] \cdot [mL\ O_2/dL]$$

Where;
Q is the cardiac output [L/min]
CaO_2 is Oxygen Content [mL O_2/dL], from equation 1
10 is the conversion factor from L to dL

Critical Oxygen Delivery

Oxygen delivery is a parameter that primarily integrates both cardiac output and hemoglobin. In isolation, oxygen delivery does not tell us anything significant about the metabolic status of the patient, and to properly interpret this value some reference point is needed. To find that reference point we need to understand what happens to oxygen at the tissue level.

Tissues require oxygen for their metabolic requirements, called oxygen consumption. The source of this oxygen is from tissue perfusion, called oxygen delivery. There is a complicated, and classically biphasic, relationship between these two parameters, shown in figure 1.

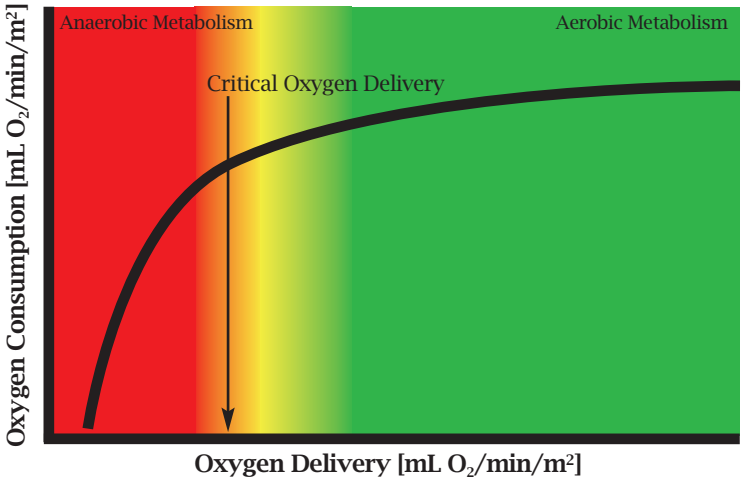

Figure 1: Classical biphasic relationship between oxygen consumption and oxygen delivery, illustrating critical oxygen delivery at the flexion point of the curve.

The plateau of this curve represents aerobic metabolism, where there is an excess of oxygen being delivered to the tissues; the tissues have an unlimited supply of oxygen. As the oxygen delivery decreases, there exists a point where there is no longer enough oxygen being delivered to the tissues to meet their requirements. At this point, oxygen consumption becomes directly proportional to, and dependant upon, oxygen delivery; the independence between oxygen delivery and consumption is disconnected. This is delineated by the angled slope of this curve.

The flexion point of this curve represents a critical oxygen delivery value (8, 10—14). This is where tissues are no longer being provided with enough oxygen to function properly, and this point represents a switch from aerobic to anaerobic metabolism. With decreasing oxygen delivery below this critical level, oxygen consumption is further reduced leading to tissue injury, increased cellular membrane permeability, and ultimately cell death (15). This point identifies when the metabolic requirements of the patient are not being met at the tissue level (8—10, 13).

This critical oxygen delivery point appears to be a relatively simple calculable value. Regardless of the model used to induce anaerobic metabolism, whether it be anemia, hypoxemia, or hypovolemia, all models provide relatively consistent values for the critical oxygen delivery (8, 11, 15—17).

Normal oxygen delivery in the conscious adult patient is on the order of 500 and 600 mL O_2/min/m^2 or 20 to 25 mL O_2/min/kg (49). Critical oxygen delivery has been reported to be between 250 to 330 mL O_2/min/m^2 (6, 14, 18—20) and 6.6 and 10 mL O_2/min/kg (15, 21). For the purposes of this review, the modally reported value of 260 mL O_2/min/m^2 will be used. With that, we must provide adult patients with an oxygen delivery of at least 260 mL O_2/min/m^2 to preserve normal aerobic tissue metabolism. If oxygen delivery falls below this point, then the tissues are no longer receiving an adequate supply of oxygen, and they start to switch to anaerobic metabolism (18, 19, 22).

Heterogeneity of Critical Oxygen Delivery

This relatively simple calculable critical oxygen delivery value does vary. Representing when tissues transition to anaerobic metabolism, this value is dependant upon many factors including disease process, tissue type, anesthesia, age, and temperature.

Disease processes can alter critical oxygen delivery. Sepsis and shock can significantly raise the critical oxygen delivery level (9, 13, 20, 22, 23) to as high as 15 mL O_2/min/kg, equivalent to 600 mL O_2/min/m^2. Variations are also observed between tissues (11). The gut has been reported to have elevated critical oxygen delivery values (11, 15, 24, 25), and a higher incidence of acute renal failure when oxygen delivery falls below 272 mL O_2/min/m^2 has been reported, implying an elevated critical oxygen delivery value in the kidneys (22). The gut and kidneys appear to be among the most sensitive tissues to oxygen delivery, with their critical oxygen delivery values higher than the modal 260 mL O_2/min/m^2 value. A whole body approach does not necessarily preclude the possibility of a specific tissue bed falling below the critical value (6).

It can be expected that the critical oxygen delivery levels decrease with elderly patients and with anesthesia. Practically, the reductions caused by these conditions do not sanction accepting a decreased critical value, given that there are known tissues that have elevated critical values (22).

Critical oxygen delivery in children has not been sufficiently studied; this value appears similar to that found in the adult patient, however, limited and conflicting literature indicate that further work is needed (20, 26) before using this parameter to help dictate clinical practice in children.

There is data that demonstrates the critical oxygen delivery value decreases with tissue cooling. Therefore patients undergoing hypothermic cardiopulmonary bypass can benefit from an increase in oxygen delivery relative to decreased critical oxygen delivery. Even a mild cooling to 35 ºC can result in a significant decrease in critical oxygen delivery. A temperature correction coefficient, equation 3, must be applied to the normothermic critical oxygen delivery value (1, 27, 28).

$$\text{③} \qquad \lambda = \frac{e^{(0.08329 \cdot T + 1.5234)}}{100}$$

Where;
λ is a unitless temperature correction coefficient
T is the patient's body temperature [ºC]

The Problem with Critical Oxygen Delivery

Although there is a considerable amount of literature expounding the benefits of managing patients with oxygen delivery in excess of the critical value, there are some studies that challenge this treatment modality (26, 29—31).

The majority of study patients found in the literature are those presenting to the Intensive Care Unit (ICU) for various medical and surgical interventions. Within this setting, there are confounding factors that reduce the fidelity of the data.

Two primary mechanisms of altering oxygen delivery are to change either the hemoglobin or the cardiac output. Changing the cardiac output in the ICU patient is achieved through the use of inotropic and vasoactive drugs. Paradoxically, several studies have demonstrated poorer outcomes when oxygen delivery has been increased through the use of inotropes and vasoactive support. Incidences of tachy-arrythmias, decreased tissue blood flow, and myocardial ischemia have all been associated with high levels of inotropes, despite the enhanced oxygen delivery (29, 32, 33). Unfortunately, there are complex interrelationships between oxygen delivery and fluid management, inotropic support, and blood pressure; all treatment modalities found within the ICU setting.

This confounding data does not sanction indiscriminate treatment based upon critical oxygen delivery for all critical care patients (32), however, there is the existence of a subgroup that may yet benefit from this treatment modality (29). If a patient is tightly controlled, *vis a vis* volume and cardiac output, then treatment based upon critical oxygen delivery still has merit (26, 32, 34).

Critical Oxygen Delivery and Cardiopulmonary Bypass

The critical care patient presenting for cardiopulmonary bypass is unique in that they generally come from a homogenous patient group (usually excluding lung disease, trauma, and septicemia), the two major oxygen delivery parameters are directly controlled by the perfusionist (cardiac output and hemoglobin), and the patient's volume status is directly controlled by the perfusionist. Increasing cardiac output to enhance oxygen delivery does not rely upon inotrope support and all of the associated problems, but by simply dialing up the pump revolutions.

There is contradictory work that has demonstrated the classical biphasic relationship between oxygen consumption and oxygen delivery may not exist in patients undergoing cardiac surgery, whether it be on–pump or off–pump. This biphasic relationship has been occasionally reported to transform into a linear relationship, and may persist for several hours post–operative. It is not known if this is the result of autoregulation dysfunction removing the biphasic curve's plateau (oxygen consumption continues to increase with increased oxygen delivery) or if there is a change in the oxygen extraction ratios in the tissues, called a pathologic oxygen supply dependency (35—37). A similar transformation (biphasic to linear) has also been reported in some septic patients. There has been suggestion that this transformation may be artefactually related to the model used to determine oxygen delivery and consumption, the Fick thermodilution or spirometry and gas fractions, rather than the underlying disease process itself (31). What the actual value of this critical oxygen delivery value is and the curve relationship in the patient undergoing cardiopulmonary bypass still need to be fully clarified (6).

Should Oxygen Delivery be Monitored?

A prime benefit with modern cardiopulmonary bypass technology is that it is relatively safe; the steep learning curve that existed during the 1950's is over. Cardiopulmonary bypass is now routinely performed with relatively low mortality rates, with approximately 448,000 surgeries reported in the U.S. alone for 2006 (38). This successful use of cardiopulmonary bypass has been attained with the use of the routinely measured parameters, hence there is no perceived need to explore new and novel parameters (6). Although suboptimal tissue oxygenation by perfusing below the critical oxygen delivery value is not likely going to develop into any overt clinical signs (organ failure or death), it is important to note that when oxygen delivery falls below this critical value, even transiently, lasting and measurable physiological damage is done (11, 19, 22, 39, 40). In already compromised patients, it is empirically not in their best interests to continue to add to their list of insults, especially if one can avoid it. Retrospective studies have been able to identify patients with significant mortalities that exhibited what was considered relatively normal indices (20, 41).

Even though PvO_2 (and SvO_2) has been suggested to be a good predictor of oxygen delivery and mortality (42), this conflicts with work that has demonstrated no (or poor) such correlations (14, 19, 21). There appears to be no correlation between PvO_2 and lactate (another indicator of inadequate perfusion), and correlation between PvO_2 and mortality is not achieved until PvO_2 falls below 28 to 30 mmHg, well below values normally seen during cardiopulmonary bypass (20, 42). This is equivalent to a venous saturation of between 35% and 50% (20). This is particularly unsettling as PvO_2 (and SvO_2) are considered part of our routine parameters of adequacy of perfusion. This casts significant doubt upon the tenet that by having normal targets for routine parameters is the goal of optimal patient support.

Controlling Oxygen Delivery

Consider a typical adult patient on normothermic cardiopulmonary bypass with seemingly acceptable routine parameters,

Patient weight = 80 kg
Patient height = 180 cm
Patient BSA = 2.00 m^2
Q = 4.8 L/min

PaO_2 = 150 mmHg
PvO_2 = 40 mmHg
SaO_2 = 99%
SvO_2 = 78%
Hb = 72 g/L (7.2 g/dL)

$$\text{Calculated } DO_{2(crit} = 260 \text{ mL } O_2/\text{min}/m^2 \cdot 2.00\ m^2 = \mathbf{520 \text{ mL } O_2/\text{min}}$$

after calculating patient DO_2 from equations 1 and 2,

$$DO_2 = 10 \cdot 4.8 \cdot ((7.2 \cdot 1.31 \cdot 0.99) + (0.00314 \cdot 150)) = \mathbf{470 \text{ mL } O_2/\text{min}}$$

therefore, despite relatively normal routine indices of adequacy of perfusion extracorporeal support appears to be below the critical value of oxygen delivery, and anaerobic metabolism is probably occurring in the tissue beds, especially the gut and renal systems. The herein described concept of critical oxygen delivery dictates an intervention to increase oxygen delivery. Referring to equations 1 and 2 we can see four ways of modifying oxygen delivery, and one method of changing the critical oxygen delivery value itself, with equation 3.

Changing Hemoglobin Affinity (1.31 constant)

Changing the oxygen dissociation curve constant (1.31) can result in changes in oxygen delivery. Right shifting the oxygen dissociation curve, or increasing p_{50}, will result in a decrease in affinity allowing more oxygen to be released at the tissue level thus increasing the oxygen delivery (43, 44). Classically, such a shift can be accomplished by increasing tissue temperature, increasing 2,3–diphosphoglycerate (2,3–DPG) levels, or by decreasing pH. Pharmacologically, an allosteric modification of the hemoglobin–oxygen affinity relationship can be used to increase p_{50} (45). Such a modifier, RSR13, has been clinically trialed to improve tissue oxygenation, however RSR13 has only been able to academically improve oxygen delivery (8). In a practical sense, modulating the hemoglobin–oxygen relationship is not an effective way to clinically affect oxygen delivery.

Increasing PaO_2 (0.00314 · PaO_2)

Given the minimal contribution of PaO_2 to the oxygen delivery equation due to the small concentrational solubility coefficient, PaO_2 is not a significant factor in managing oxygen delivery, so long as the oxygen saturation is near 100%. With the given example, increasing the PaO_2 100% from 150 mmHg to 300 mmHg, oxygen delivery only increases a mere 4.9% to 493 mL O_2/min, still well below the critical oxygen delivery value of 520 mL O_2/min.

Increasing Hemoglobin (Hb)

With the given example, after adding one unit of packed red cells the Hb increases by 11% to 80 g/L, the oxygen delivery also modestly increases 11%, to 521 mL O_2/min. This maneuver has only raised the oxygen delivery to just at the critical oxygen delivery value of 520 mL O_2/min, suggesting that further intervention should still be considered.

Adding hemoglobin requires further understanding on how it relates to oxygen delivery. Acute increases in hemoglobin through hemoconcentration or banked blood addition do not necessarily elevate *physiological* oxygen delivery at a uniform rate at the tissue level. Such increases can cause regional areas of hyperviscous blood, resulting in areas of heterogenic tissue perfusion (20, 46). Further, aged homologous blood demonstrates significant 2,3–DPG depletion, which results in a left shift of the oxygen dissociation curve (decreasing p_{50}) and hence, reduced release of oxygen from the hemoglobin (16, 44, 47, 48). This results in hemoglobin that is unable to efficiently release oxygen at the tissue level. This variable effect has been reported to exist for between 15 minutes (48), and up to six hours (49).

Standard transfusion guidelines range between 60 to 80 g/L in patients with no known risk factors. These same guidelines also disapprove of transfusions when the hemoglobin is greater than 100 g/L and encourage accepting lower transfusion limits (50, 51). As these guidelines conflict with care based upon oxygen delivery, and are in part derived upon a trial that was performed when the Canadian blood supply was not leukocyte depleted (50), they stand to be reevaluated. One subgroup of critical care patients that was identified as an exception to this restricted transfusion policy is the patient presenting with acute myocardial infarction and unstable angina (48). There are suggestions that homologous blood transfusion are currently underused (6, 15, 24, 52—54), and is clinically supported, for example, by demonstrated increases in acute renal failure in extracorporeal support patients with hemoglobin less than approximately 83 g/L (22, 47). Using the patient's clinical status to dictate when a transfusion is required, as compared to relying upon a set hemoglobin value for all patients, is gaining favour (55).

Since homologous blood transfusions have the potential for adverse reactions or infections, and also carries a significant social cost, elevating the hemoglobin through such a transfusion should not be the first intervention used to increase oxygen delivery. These concerns do not contraindicate a transfusion to improve oxygen delivery, but does lend significant credence to the conservation of native hemoglobin during cardiopulmonary bypass through prime reduction modalities in the first place. Using the concept of critical oxygen delivery moves away from patient management with a fixed value for transfusion, and towards one that is specific to the metabolic needs of the patient (37, 48).

Increasing Cardiac Output (Q)

Using a cardiac index flow of 2.4 L/min/m^2 is reasonable to provide an approximate starting value for cardiopulmonary bypass. It is not reasonable to solely rely upon this value to dictate perfusion practice (3, 5, 6, 56). This flow should be upregulated (or downregulated) based upon physiological interpretations from the patient to maintain a physiological balance. Increasing cardiac output is the most predictable and effective modality to manage oxygen delivery, especially in the realm of reasonable hemoglobin (6, 16, 22, 51).

With the given patient example, simply increasing Q to 6.4 L/min, a 33% increase, results in oxygen delivery similarly increasing 33% to 628 mL O_2/min. Simply by dialing up the pump speed, oxygen delivery is substantially increased, and is now well above the critical oxygen delivery value.

Hypothermic Correction

Hypothermia does not significantly affect oxygen delivery, but it does reduce the critical oxygen delivery value itself. If this patient example was cooled to a moderate hypothermic temperature of 28 ºC, then the revised critical oxygen delivery value described in equations 1 through 3 becomes,

$$\text{corrected } DO_{2(crit)} = \frac{DO_{2(crit)} \cdot e^{(0.08329 \cdot T + 1.5234)}}{100}$$

$$= \frac{520 \text{ mL } O_2/\text{min} \cdot e^{(0.08329 \cdot 28 + 1.5234)}}{100}$$

$$= \mathbf{246 \text{ mL } O_2/\text{min}}$$

and now oxygen delivery is in excess of the revised critical oxygen delivery value. Even with very mild drifting to 35 ºC, the critical oxygen delivery value can be significantly reduced to an acceptable 440 mL O_2/min. However, given that many extracorporeal support procedures are now performed at normothermic temperatures, cooling is not necessarily a first line defense for critical oxygen delivery management, albeit a very effective one.

Discussion

Oxygen delivery interpretations show us that the routine parameters of adequacy of perfusion alone do not sufficiently demarcate when physiological damage is likely to be occurring. The routine targets of cardiac index (2.4 L/min/m^2), tissue oxygenation (PvO_2 >40 mmHg) and transfusion (60 g/L) do not necessarily provide satisfactory oxygen delivery in all tissues, and should be reassessed.

Poor correlations between PvO_2 and SvO_2 with mortality diminish their reliability as a marker for adequate tissue perfusion. Positive correlation between insufficient oxygen delivery and mortality increases oxygen delivery's reliability as a marker for adequate tissue perfusion. Inadequate oxygen delivery, hence inadequate tissue perfusion, can occur during cardiopulmonary bypass coupled with seemingly normal routine parameters of adequacy of perfusion.

Providing tissue oxygen delivery above the calculated critical oxygen delivery value helps to avoid the patient from developing summative deficits caused by cardiopulmonary bypass and inadequate tissue perfusion. As such, interventions should be made to correct deficient oxygen delivery values. Increasing cardiac output is a primary modality of increasing oxygen delivery in the extracorporeal support patient. If after increasing the cardiac output the oxygen delivery remains close to the critical value, or if the physical limits of the extracorporeal circuit or patient physiology are approached, then hemoglobin must be improved. Raising hemoglobin does not necessarily improve *physiological* oxygen delivery, and the importance of preserving native hemoglobin during cardiopulmonary bypass to preserve physiological oxygen delivery must be stressed.

Altering the oxygen–hemoglobin affinity relationship is not a practical method for increasing oxygen delivery, and increasing PaO_2 has a similar, non–practical effect on oxygen delivery. Tissue cooling is a very effective mode of altering the critical value of oxygen delivery itself, however the realm of normothermic perfusion makes this technique not too practical.

It is essential to remember that any one parameter should never be looked at in isolation; all parameters should be assessed in a collective to obtain an overall picture of adequacy of perfusion. There is no data found to discount this monitoring technique for cardiopulmonary bypass management. This review supports the monitoring of oxygen delivery and the use of the critical oxygen delivery value during normothermic adult cardiopulmonary bypass procedures. Further investigations should be performed to further define oxygen delivery and critical oxygen delivery values in both adult and children during cardiopulmonary bypass

Limitations

The quality of the data in the literature is reflective of a heterogeneous mix of study subjects. With studies ranging from laboratory to clinical, and subjects from animals to humans, adult and child, there is still some question to exactly what the critical oxygen delivery specifically is in the cardiac patient, and if this value shifts significantly during cardiac disease processes. Some disease processes, especially shock, can significantly alter the critical oxygen delivery values making clear discrimination in the literature difficult.

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Perfusion Week Winners

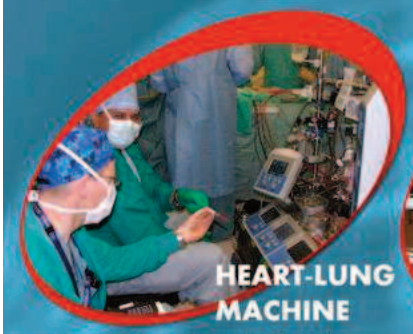
Mazankowski Alberta Heart Institute

Thanks also to University Health Network, Toronto, and
London Health Sciences Centre, London.
See our website for all the details!

CLINICAL PERFUSION

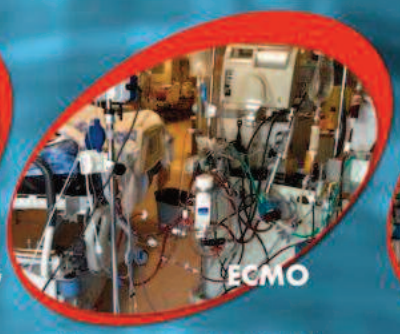
ALBERTA HEART INSTITUTE

Perfusionist – a vital member of a cardiac surgery team, who is responsible for operating the heart-lung machine to keep blood circulating and oxygen flowing to vital organs such as the brain, kidneys, liver and intestines. They are clinicians who carefully monitor circulatory and metabolic parameters such as blood pressure, heart rate, respiratory rate and blood gases.



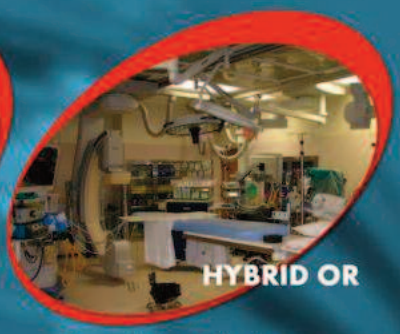
HEART-LUNG MACHINE

Support for major cardiothoracic, vascular and transplant surgeries
Cardiac Operating Room
- Adult
- Pediatric



ECMO

Life support for the critically-ill patient
- Transport from other hospitals
- CVICU • OR
- CATH LAB



HYBRID OR

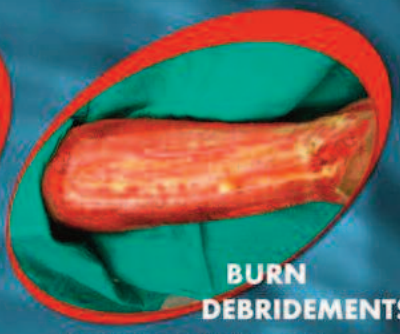
Transcatheter aortic valve implantation (TAVI) standby

VADs

Mechanical pumps used to support weak or failing hearts
- Heartware
- Heartmate
- Berlin Heart

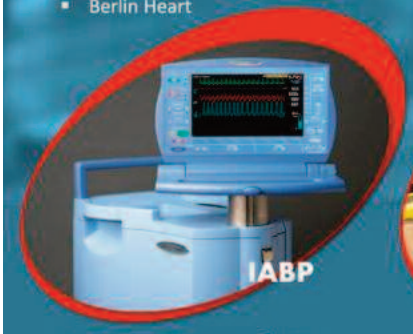
LIFEPORTS

To preserve, transport, treat, and assessing kidney organs for transplant
- General Operating Room
- Greater Edmonton Area hospitals



BURN DEBRIDEMENTS

To remove necrotic tissue and prevent infection
- Plastics Operating Room



IABP

Augments coronary perfusion, increases cardiac output and decreases left ventricular stroke work
- OR • Cardiac units
- May involve transport

TEG

Thromboelastogram
- Comprehensive whole blood hemostasis testing
- Assess bleeding and thrombotic risks
- Monitor antithrombotic therapies

DATABASE MANAGEMENT

Store, modify, and extract information for surgeons and research groups
- Pump database
- National Pediatric database – CardioAccess

EDUCATION

BCIT®

2 years, part-time distance learning and full-time clinical rotations

- English proficiency
  - English 12 (73%) or
  - 3 credits of post-secondary English, Humanities or Social Sciences (73%)

OPTION A	OPTION B
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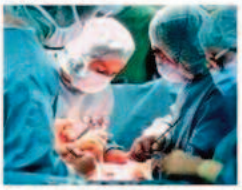
THE Michener INSTITUTE For Applied Health Sciences®

16 months Full-time

OPTION A	OPTION B
▪ Bachelor's degree AND ▪ Respiratory Therapist (RRT) or Registered Nurse (RN) AND ▪ Critical care experience within the last 5 years ▪ Minimum required CGPA is 70%	▪ Bachelor's degree (Minimum CGPA is 70%) AND ▪ Successful completion of university courses (minimum grade of 60%): • Human Anatomy • Human Physiology • Algebra or Calculus • General Physics • Physical Chemistry

WORK ENVIRONMENT

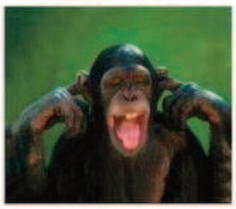
- Cardiac surgery centres across Canada and the USA
- Education
- Commercial sales
- Research management
- Philanthropic cardiac surgery missions



What my mom thinks I do

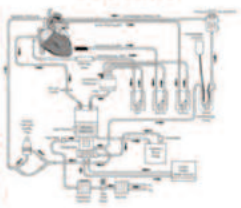
What society thinks I do

What I think I do



What anesthesiologist thinks I do

What surgeons think I do



What I actually do

CHARACTERISTICS OF A PERFUSIONIST

- Strong knowledge base in cardiothoracic anatomy, physiology and pathophysiology, pharmacology, fetal and neonatal cardiac development and perfusion science
- Works well in stressful situations "GRACE UNDER PRESSURE"
- Physical ability to lift and pull equipment, and bend low to make connections
- Able to work independently and as part of a team
- Outspoken with excellent communication skills
- Able to work at any time of day or night
- Ambidextrous
- Problem solver
- Critical thinker
- Strong bladder

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VOLUVEN®

6% HydroxyEthylStarch 130/0.4

Prescribing Summary

Patient Selection Criteria

THERAPEUTIC CLASSIFICATION: Plasma Volume Expander.
VOLUVEN®, 6% hydroxyethyl starch (HES 130/0.4), tetrastarch, is an artificial colloid, third generation starch, for plasma volume expansion.

INDICATIONS AND CLINICAL USE
VOLUVEN® is indicated for the treatment of hypovolemia when plasma volume expansion is required.
It is not a substitute for red blood cells or coagulation factors in plasma.

CONTRAINDICATIONS
VOLUVEN® is contraindicated in patients:
- with fluid overload (hyperhydration), especially in cases of pulmonary edema and congestive cardiac failure.
- with renal failure with oliguria or anuria not related to hypovolemia.
- receiving dialysis treatment.
- with severe hypernatremia or severe hyperchloremia.
- with known hypersensitivity to hydroxyethyl starch.
- with intracranial bleeding.

Special Populations
Pregnant Women:
There are no adequate and well-controlled studies using VOLUVEN® in pregnant women. However, animal studies do not indicate harmful effects with respect to embryo/fetal development, pregnancy, parturition or postnatal development. There were no post-marketing reports of harm when VOLUVEN® was used in pregnant women.

Embryotoxic effects were observed in rabbits when 10% HES 130/0.4 in 0.9% sodium chloride solution is given at 50 mL/kg BW/day. No evidence of teratogenicity was observed.

VOLUVEN® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Women:
It is not known whether HES 130/0.4 is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when VOLUVEN® is administered to a nursing mother.

A decision on whether to continue/discontinue breast-feeding or to discontinue/continue therapy with VOLUVEN® should be made taking into account the benefit of breast-feeding to the child and the benefit of VOLUVEN® therapy to the nursing mother.

Pediatrics:
There is limited experience on the use of VOLUVEN® in children available. In non-cardiac surgery in 41 children including newborns to infants (< 2 years), a mean dose of 16 ± 9 mL/kg was administered safely and was well tolerated for stabilisation of hemodynamics. The tolerability of this product administered perioperatively was comparable to 5% albumin.

VOLUVEN® may be given to premature infants and newborns only after careful risk/benefit evaluation.

Geriatrics:
Of the total number of patients in clinical trials of VOLUVEN® (N= 471), 25% were 65-75 years old, while 7% were 75 and older. No overall differences in safety or effectiveness were observed between these subjects and younger subjects. Other reported experience has not identified specific risks for the application of VOLUVEN® in this patient group.

Safety Information

WARNINGS AND PRECAUTIONS

General:
Fluid overload caused by overdose should be avoided in general. Particularly, for patients with cardiac insufficiency or severe kidney dysfunctions the increased risk of hyperhydration must be taken into consideration; posology must be adapted.
In case of severe dehydration a crystalloid should be given first.

Carcinogenesis and Mutagenesis:
No mutagenic effects were observed with HES 130/0.4 10% solution according to the following tests on mutagenic activity: Salmonella typhimurium reverse mutation assay (in vitro), mammalian cells in the in vitro gene mutation assay (HPRT), assessment of the clastogenic activity in cultured human peripheral lymphocytes (in vitro), bone marrow cytogenetic test in Sprague-Dawley rats.

Hematologic:
Caution should be observed before administering VOLUVEN® to patients with severe liver disease or severe bleeding disorders (e.g. severe cases of von Willebrand´s disease).
Administration of large volumes of hydroxyethyl starch may transiently alter the coagulation mechanism and decrease hematocrit and plasma proteins due to hemodilution.

Hepatic/Biliary/Pancreatic:
Caution should be observed before administering VOLUVEN® to patients with severe liver disease.
Serum amylase can rise during administration of VOLUVEN® and can interfere with the diagnosis of pancreatitis. The elevated amylase is due to the formation of an enzyme-substrate complex of amylase and hydroxyethyl starch subject to slow elimination and must not be considered diagnostic of pancreatitis.

Immune:
If a hypersensitivity reaction occurs, administration of the drug should be discontinued immediately and the appropriate treatment and supportive measures should be undertaken until symptoms have resolved (please refer to section ADVERSE REACTIONS).

Renal:
It is important to supply sufficient fluid and to regularly monitor kidney function and fluid balance.
Serum electrolytes should be monitored.

Skin:
Pruritus is a known complication of administration of hydroxyethyl starches, though is typically more common with prolonged use of high doses.
HES-induced pruritus may be delayed in onset, typically one to six weeks after exposure, may be severe and may be of protracted (weeks and months) persistence. It is generally unresponsive to therapy. However, the decreased molecular weight, lower degree of substitution, decreased tissue storage and intra-vascular persistence in conjunction with a shorter plasma half-life of HES 130/0.4 may result in a lower incidence of pruritus related to its use.

ADVERSE REACTIONS
Adverse reactions with VOLUVEN® reported spontaneously, from clinical trials and in the literature include:

Immune system disorders
Rare: Anaphylactoid reactions (hypersensitivity, mild influenza-like symptoms, bradycardia, tachycardia, bronchospasm, non-cardiac pulmonary edema) have been reported with solutions containing hydroxyethyl starch (see WARNINGS AND PRECAUTIONS).

Abnormal Hematologic and Clinical Chemistry Findings (Investigations)
Common (dose dependent): Increase in serum amylase (see WARNINGS AND PRECAUTIONS).

Common (dose dependent): At high dosages the dilution effects may result in a corresponding dilution of blood components such as coagulation factors and other plasma proteins and in a decrease of hematocrit.

Skin and subcutaneous tissue disorders
Common (dose dependent): Pruritus, itching (see WARNINGS AND PRECAUTIONS).

Blood and lymphatic system disorders
Rare (in high dose): Blood coagulation disturbances beyond dilution effects can occur depending on the dosage.
For frequency of occurrence of ADRs see Supplemental Product Information.

DRUG INTERACTIONS
No interactions of VOLUVEN® with other drugs or nutritional products are known or have been reported to date.
However, mixing VOLUVEN® with other drugs should be avoided.
To report an adverse event, contact Health Canada's Canada Vigilance Program at 1-866-234-2345 or contact Fresenius-Kabi at 1-877-953-9002.

Administration

DOSAGE AND ADMINISTRATION
VOLUVEN® (6% HES 130/0.4 in 0.9% sodium chloride injection) is **administered by intravenous infusion only.**

Total volume and rate of infusion are dependent on the clinical situation and the individual patient. As with any intravenous fluid, VOLUVEN® should be administered in accordance with accepted clinical practices for fluid and electrolyte management.
In clinical trials, infusions up to 33 mL/kg/day were most commonly used. There is limited experience with infusions between 33 mL/kg/day and 50 mL/kg/day.
The initial 10-20 mL is to be infused slowly, keeping the patient under close observation for possible anaphylactoid reactions.
VOLUVEN® can be administered repetitively over several days according to the patient's needs. The dosage and duration of treatment depends on the duration and extent of hypovolemia, the hemodynamics and on the hemodilution.

Children:
There is limited clinical data on the use of VOLUVEN® in children. In 41 children including newborns to infants (< 2 years), a mean dose of 16±9 mL/kg was administered safely and well tolerated for stabilization of hemodynamics.
The dosage in children should be adapted to the individual patient colloid needs, taking into account the disease state, as well as the hemodynamic and hydration status.

SUPPLEMENTAL PRODUCT INFORMATION

Adverse Reactions

Table: Frequency of Occurrence of Adverse Drug Reactions

System Organ Class	Adverse Drug Reaction	Frequency of Occurrence
Blood and lymphatic system disorders	Coagulation disorders beyond dilution effects	Rare (in high doses) (> 0.01% – ≤ 0.1%)
Immune system disorders	Anaphylactoid reactions	Rare (> 0.01% – ≤ 0.1%)
Skin and subcutaneous tissue disorders	Pruritus	Common (dose dependent) (≥ 1% – < 10%)
Abnormal hematologic and clinical chemistry findings (Investigations)	Increase of serum amylase	Common (dose dependent) (≥ 1% – < 10%)
	Decrease of hematocrit	Common (dose dependent) (≥ 1% – < 10%)
	Decrease of plasma proteins	Common (dose dependent) (≥ 1% – < 10%)

Overdosage
As with all volume substitutes, overdose with VOLUVEN® can lead to overloading of the circulatory system (e.g. pulmonary edema). In this case the infusion should be stopped immediately and if necessary, a diuretic should be administered.

For further information on the management of a suspected drug overdose, contact your regional Poison Control Centre.

Storage and Stability
To be used immediately after the bag is opened. The solution is intended for intravenous administration using sterile equipment. Use only clear solutions and undamaged containers.

Parenteral drug products should be inspected visually for clarity, particulate matter, precipitate, discoloration and leakage prior to administration. Solutions showing haziness, particulate matter, precipitate, discoloration or leakage should not be used. Discard unused portion.

Do not use VOLUVEN® after expiry date.
free*flex*® bag storage: at 15° - 25°C for 3 years.

Do not freeze.

This document plus the full product monograph, prepared for health professionals can be found at:
http://www.fresenius-kabi.ca
or by contacting Fresenius Kabi Canada at:
1-877-953-9002 (toll-free-telephone)

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Corporate Full

Enjoys full advertising within the CSCP, including full Website (both healthcare professional and public content options), all publications, and all CSCP meetings. Receives three banquet tickets for the Annual General Meeting, and enjoys two annual mail outs. This level provides the most substantial support for the Canadian Perfusion community.

Corporate Plus

Enjoys comprehensive advertising within the CSCP Website
(both healthcare professional and public content options), and the Annual General Meeting.
Receives one banquet ticket for the Annual General Meeting, and enjoys one annual mail out. This level provides significant support for the Canadian Perfusion community.

Corporate Basic

Designed for those who want to show their support for the Canadian Perfusion community. The Corporate Basic supporter enjoys comprehensive advertising within the CSCP Website (healthcare professional option), and the Annual General Meeting. Receives one banquet ticket for the Annual General Meeting.

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This list is a compilation of telephone numbers for the Perfusion Departments across Canada. **Recent changes are listed in *RED*.** Please let us know if your information changes and needs to be updated, by contacting us at:

Cette liste est un registre des numéros de téléphone des départments de perfusion à travers le Canada. Si ces informations doivent être mises à jour, veuillez nous en aviser par messagerie électronique aux adresses suivantes:

editors@warp.nfld.net

East

Eastern Health, St. John's, Newfoundland	(709) 777-7329
New Brunswick Heart Centre, Saint John, New Brunswick	(506) 648-6396
Queen Elizabeth II Health Sciences Centre, Halifax, Nova Scotia	(902) 473-4050
Centre Hospitalier de la Sagamie, Ville de Saguenay, Québec	(418) 541-1234 ext 2531
Centre Universitaire de Santé de Sherbrooke, Sherbrooke, Québec	(819) 346-1110 ext 14241
Hôpital Laval, Sainte-Foy, Québec	(418) 656-8711 ext 5883
CHUM, Campus Sainte-Luc, Montréal, Québec	(514) 890-8000 ext 34024
CHUM, Campus Hôtel-Dieu, Montréal, Québec	(514) 890-8000 ext 15388
CHUM, Campus Notre-Dame, Montréal, Québec	(514) 890-8000 ext 27403
Hôpital Sacré-Coeur, Montréal, Québec	(514) 338-2222 ext 2140
Hôpital Sainte-Justine, Montréal, Québec	(514) 345-4931 ext 5633
CUSM, Hôpital Royal Victoria, Montréal, Québec	(514) 934-1934 ext 35863
CUSM, Hôpital Général de Montréal, Montréal, Québec	(514) 934-1934 ext 35863
CUSM, Hôpital de Montréal pour Enfants, Montréal, Québec	(514) 412-4400 ext 22399
Hôpital Général Juif , Montréal, Québec	(514) 340-8222 ext 3565
Institut de Cardiologie de Montréal, Montréal, Québec	(514) 376-3330 ext 3734

Central

Ottawa Heart Institute, Ottawa, Ontario	(613) 761-5000 ext 4656
Children's Hospital of Eastern Ontario, Ottawa, Ontario	(613) 737-7600
Kingston General Hospital, Kingston, Ontario	(613) 549-6666 ext 3524
Sunnybrook, Toronto, Ontario	(416) 480-4218
St. Michael's Hospital, Toronto, Ontario	(416) 864-5753
The Hospital For Sick Children, Toronto, Ontario	(416) 813-6870
Toronto Hospital, Toronto, Ontario	(416) 340-4800 ext 4703
Trillium Health Centre, Mississauga, Ontario	(905) 848-7580 ext 3515
SouthLake, Newmarket, Ontario	(905) 895-4521 ext 2566
Hamilton, Hamilton, Ontario	(905) 527-0271 ext 46684
St. Mary's General Hospital, Kitchner, Ontario	(519) 749-6578 ext 1949
London Health Sciences Centre, London, Ontario	(519) 663-3804
Health Sciences North, Sudbury, Ontario	(705) 523-7100 ext 8375

West

Health Sciences Centre, Winnipeg, Manitoba	(204) 787-7524
St. Boniface General Hospital, Winnipeg, Manitoba	(204) 235-3888
Royal University Hospital, Saskatoon, Saskatchewan	(306) 655-2128
Regina General Hospital, Regina, Saskatchewan	(306) 766-3846
Foothills Medical Centre, Calgary, Alberta	(403) 944-1092
University of Alberta, Edmonton, Alberta	(780) 407-6969
Vancouver Acute Hospital, Vancouver, British Columbia	(604) 875-4111 ext 63634
St. Paul's Hospital, Vancouver, British Columbia	(604) 682-2344 ext 62271
British Columbia Children's Hospital, Vancouver, British Columbia	(604) 875-2345 ext 7935
Royal Columbian Hospital, New Westminister, British Columbia	(604) 520-4363
Royal Jubilee Hospital, Victoria, British Columbia	(250) 370-8449

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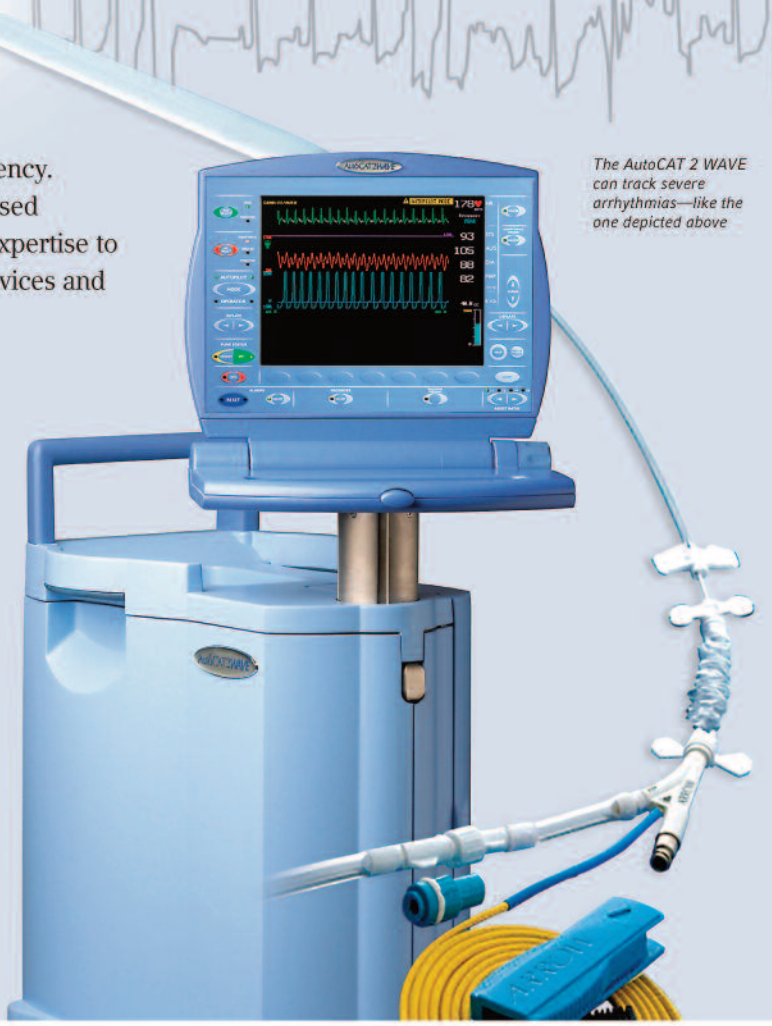

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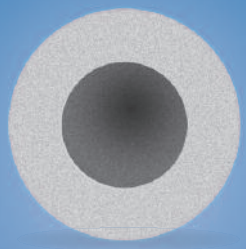

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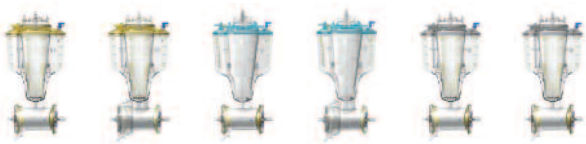

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