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CMBES/SCGB Monthly e-Bulletin

January 2017

Message From the President

From the desk of the CMBES President, Martin Poulin

Happy New Year and Happy Chinese New Year (恭禧發財 新年快樂),

We're now only 5 months from the Winnipeg CMBEC 40 conference and the organizing team is doing a great job of putting together a great program for biomedical engineering researchers and clinical engineers. Now is the time to start pestering your manager to get approval to come to the conference to learn what's new in your profession. The time is now to finish your analysis and submit your paper for presentation at the conference.

Something to be aware of is that Andrew Ibey, Professional Affairs Chair, has submitted trademark applications to legally secure our CMBES logo and the FCMBES designation. The granting of a trademark will ensure no one can use our logo or the FCMBES designation without permission, which in turn helps to secure our national identity.

Best wishes for achieving your goals this year and I look forward to seeing you in Winnipeg.

Message du président

Du bureau du président de SCGB, Martin Poulin

Bonne Année et Heureux Nouvel An chinois (恭禧發財 新年快樂),

Nous sommes maintenant à seulement 5 mois de la conférence de Winnipeg CMBEC 40 et l'équipe organisatrice fait un excellent travail pour mettre sur pied un excellent programme pour les chercheurs en génie biomédical et les ingénieurs cliniques. Il est maintenant temps de commencer à harceler votre gestionnaire pour obtenir l'approbation de venir à la conférence pour apprendre ce qu'il y a de nouveau dans votre profession. Le moment est venu également de terminer votre analyse et de soumettre votre article pour être présenté à la conférence.

Notez également que Andrew Ibey, président du comité des affaires professionnelles, a déposé des demandes de marque officielle pour légalement sécuriser notre logo CMBES et la désignation Fellow CMBES. L'octroi d'une marque de commerce garantira que personne ne peut utiliser notre logo ou la désignation Fellow CMBES sans autorisation, ce qui contribue à sécuriser notre identité nationale.

Meilleurs vœux pour la réalisation de vos objectifs cette année et j'ai hâte de vous voir à Winnipeg.

À votre santé,

Cheers,

Martin

Martin

Message from the Vice President

From the Desk of the CMBES Vice President, Mike Capuano

I would like to wish our members and all of those in the biomedical engineering community all the best for the New Year. I hope those, who were able to take some vacation, had a restful and enjoyable time off.

At this time we have received well over 200 responses to the CMBES Survey on the Supportability of Medical Devices. This looks to be unprecedented and could be one of the most important of its kind for those involved in clinical engineering. We hope to report on this at CMBEC40. The deadline has been extended to **Friday, January 13th** so there is still time to complete it and be eligible for free registration to CMBEC40 in Winnipeg. A big Thank You to all of the those who have completed it so far! [Click Here](#) to complete the survey before January 13th.

The newly formed CMBES Webinars Subcommittee has convened and is in the midst of preparing a schedule for 2017. We thank Michael Barton of Nova Scotia Health Authority (Halifax) and Jody Lavery of Health Association of Nova Scotia (HANS – Cape Breton) for participating. We wish to expand this group and to include members from the West and Central Canada as well. Please send me e-mail if you are interested in participating. There is still time to share your thoughts on what we should focus on. We are looking for the webinar ideas related to both academic and clinical engineering areas of interest. You can contact me directly at CapuaMik@hhsc.ca to share your ideas.

Also, those of you who have an interest and /or skills in the Web development department, I urge you to [contact Kelly Kobe](#), CMBES Secretary and IT Chair to help with the CMBES website redevelopment project. He is looking for more input and expertise on that as well.

You might have been unable to access www.cmbes.ca in late December early January, our service provider experienced technical difficulties, which have now been rectified. We apologize for the limited accessibility.

Attention Retired and Student Members!

From the desk of the Membership Committee Chair, Sarah Kelso

Attention Retired Members: **Join Us at CMBEC40!**

We all value the contributions our retired members continue to make to our field, and we all benefit when retired members choose to stay engaged in our network and Society events. An excellent way to stay connected is to participate in the conference.

As such, the CMBEC40 Organizing Committee will extend greatly discounted Student

Member conference registration pricing to all Retired Members (including Retired Fellows).

If you are a Retired Member, there is no better time to join us at the annual conference!

Membership Publications Spotlight

If you or your organization has published and it would be of interest to our CMBES membership, we'd like to know about it. Please contact [the Secretariat](#) with a copy of your work so we can showcase in Membership Publications Spotlight!

Update on the CMBEC40 Conference

From the desk of the CMBEC40 Committee Chair, Kyle Eckhardt

Dear Colleagues,

Happy New Year!

The Conference Organizing Committee is going into high gear until May when the CMBEC40 opens on May 23rd, 2017. To get you excited about your visit, Winnipeg was voted one the [Top 20 Destinations of 2016](#) by National Geographic. Just because it is 2017, doesn't mean you have missed your chance to take in all that this marvellous and diverse city has to share.

"Planted midway between [Canada's](#) Atlantic and Pacific coasts, Winnipeg is a whistle-stop on rail and road trips across Canada; polar bear and beluga whale enthusiasts know it as the starting point for their journey north to Churchill. But this unpretentious prairie city proves itself worthy of more than a glance from a train window." - National Geographic

We are excited to announce the location of our Awards Gala at the [Historic Fort Gibraltar](#). Be prepared for an evening of entertainment and fun while you learn about Indigenous culture, the Fur Trade and life on the prairies from locals.

Before you read on, please take a minute to watch this [fun clip](#) about the many things you can expect to see and experience when you come to town.

Finally, a friendly reminder that the paper submission deadline is **February 17th, 2017**. Visit the [CMBES website](#) for more information and see the [call for papers](#).

Awards Committee Updates

From the Desk of the Awards Committee Chair, Evelyn Morin

Congratulations to Tony Easty!

Congratulations to Tony Easty who has been recently selected as a Fellow of the Engineering

Institute of Canada (EIC). He was nominated by the CMBES, which is a member society of the EIC, and was named an EIC Fellow for his “excellence in engineering and services to the profession and to society”. Tony has had a distinguished career in Clinical Engineering, and has been an active member of the CMBES. This is a well–deserved honour.

Call for Nominations – CMBES 2017 Awards

This is the first call for nominations for the 2017 CMBES Awards and Special Memberships to recognize members of the Society who are making or have made significant contributions to Biomedical Engineering and technology in Canada. Awards include the Outstanding Canadian Biomedical Engineer, Outstanding Canadian BMET, Early Career Achievement Award, and special memberships include Fellow, Emeritus, and Honorary member. Criteria for the awards and special memberships, and information on how to submit a nomination, can be found on the [Awards page](#) on the Society website. If you know a CMBES member who is deserving of an award or special membership, please consider submitting a [nomination](#). The deadline for receiving nominations is **February 28th, 2017**.

CMBES 2016 Accomplishments

From the Desk of the Publications Committee Chair, Tidimogo Gaamangwe

It is with great pleasure that we announce the release of the CMBES electronic proceedings of the CMBEC conference held in Calgary in May 2016 (CMBEC 39). The eProceedings are hosted by PKP and enable easy access and structured web searches to the papers. This was a collective effort between multiple committees and volunteers and we extend our sincere gratitude to Mr. Raymundo Cassani who took the lead on this effort. The eProceedings can be found here: <https://proceedings.cmbes.ca>. Your feedback is highly appreciated!

On a related note, a selected number of extended papers from CMBEC 39 were also submitted to the Journal of Medical and Biological Engineering, as part of a Special Issue on Recent Advances in Biomedical Engineering. Papers are currently under review and the Special Issue should be published in early 2017. We'll keep you posted!

CMBES 2017 New Year Resolutions

From the Desk of the Academic Affairs Committee Chair, Tiago Falk

With the CMBES eProceedings site up–and–running, we are initiating an effort to upload the papers from previous CMBES conferences into the PKP system. For this particular effort, we are calling on to the CMBES membership for help. First, if you have a copy of the proceedings from previous conferences and would be willing to share these CDs/USB sticks with us, please let us know.

So far, we have been able to secure the proceedings from CMBEC 37 and have already initiated the upload process. For older conferences, the plan will be to search for the paper proceedings at libraries and scan the documents. If you come across any such paper

proceedings at your local libraries, please let us know!

Lastly, it takes roughly 2 minutes per paper to upload the PDF and prepare the metadata on the PKP site. Given the number of papers per conference and conference proceedings to be uploaded, this will need the effort of several volunteers. If you would like to help out, please do not hesitate to [get in touch with us](#). We have developed a tutorial describing the procedure step-by-step and will go over the procedure with you. Your help cataloguing these historical conference proceedings online will be invaluable for the CMBES community as a whole and is deeply appreciated!

CMBES Positions Statements

From the desk of the Professional Affairs Committee Chair, Andrew Ibey

For Information: The Joint Commission's (TJC) New Maintenance Standards

While our Canadian institutions are not bound by TJC, an understanding of our southerly neighbours do, can be highly influential to decisions we make. The CMBES thought it was important to inform our members of this change:

“Starting in January, The Joint Commission (TJC) will expect hospital healthcare technology management (HTM) departments to complete all planned maintenance activities in line with manufacturer recommendations or the policy set by their organization 100% of the time. This change to the Environment of Care (EoC) standards found in the Comprehensive Accreditation Manual for Hospitals is part of TJC’s project REFRESH, which George Mills, the commission’s director of engineering, described during a presentation at the AAMI 2016 Conference & Expo in June. A main goal of this project is to develop a single, comprehensive method of categorizing the risk associated with TJC standards. As a result, the “A” and “C” scoring categories previously applied to the elements of performance (EP) for each standard were eliminated.” – AAMI

(<http://www.aami.org/newsviews/newsdetail.aspx?ItemNumber=4041>)

There is a webinar if you are a ECRI member to become better informed:

ECRI – Clarity to Avoid Confusion: Updates to the Joint Commission’s Requirements for Equipment Maintenance Programs Tuesday, January 17 1:00 to 2:00 PM (ET)

Member Spotlight from the Archives

This month’s member spotlights is a throwback to the CMBEC archives, taken randomly from the Digest of the 1st Canadian Medical and Biological Conference, Sept 8 and 9, 1966, Ottawa, CANADA. The article is by F.H. Siemonsen, P.Eng, Kingmed Limited, Kingston Ontario and is titled “A Canadian Approach to the Problem of Haemodialysis Machinery”. The article describes the challenges and advantages of the Kolff and Kiil systems of the day. Some of the highlights include the inadequate safety of the devices, and dialysis time of 12 to 16 hours per patient! The author goes on to advocate for their design and it’s benefits.

A CANADIAN APPROACH TO THE PROBLEM OF HAEMODIALYSIS MACHINERY.

F.H. SIEMOUSEN, P.ENG.

KINGMED LIMITED, KINGSTON, ONTARIO.

More than four hundred Canadians under the age of forty die annually of uremia. Of these, many could be maintained and live a useful existence on a program of haemodialysis.

Several machines are available to carry out haemodialysis, all of which use the same basic principle, and each of which seems to have its own peculiar advantages and attendant disadvantages. The two most prevalent types of machinery are the Kolff system and the Kill system. In each method, the costs run presently between \$7,000 and \$10,000 per patient per year.

Other systems such as peritoneal dialysis, dialysis of lymph fluid, blood filters, and resin exchange systems, have all undergone extensive investigation without evidence that these offer any significant advantage over haemodialysis techniques.

With the increasing load of uremic patients, a mechanical system seems to be the most effective to use, in terms of efficiency and safety of operation.

We propose to review the problem, the major deficiencies of the above mentioned two types of machinery and to combine their outstanding features into an optimal artificial kidney. Our approach will be from the engineering point of view, and our solution is substantiated from records kept during the operation of one such machine at the Kingston General Hospital, in Kingston, Ontario, under Doctors C.F.D. Ackman, R.A.F. Morrin, P. Honda, and A.S. Bruce, of the Departments of Medicine and Urology of Queen's University.

The Problem:

In simple terms, the kidney is a washing machine for blood. The problem is to replace this function mechanically with maximum safety, efficiency, patient comfort, and minimum cost and labour effort.

The major deficiencies of the Kolff system

- Cost:
- (1) The cost of the disposable parts (approximately \$60.00 per dialysis).
 - (2) Inadequate safety devices requiring close supervision.
 - (3) Cumbersome equipment.

The major deficiencies of the Kill system

- Cost:
- (1) High labour and assembly of membrane.
 - (2) Machine is not efficient in handling of acute renal failure.
 - (3) Dialysis time of twelve to sixteen hour per patient is too high.

The Optimal Machine features:

- (1) The use of disposable coils
- (2) Significant reduction of the bath volume required.

- (3) Simplicity of machinery in operation and maintenance.
- (4) Reliable fail safe devices.
- (5) Simple hot water cleaning and storage.
- (6) Competitive capital and operating costs.
- (7) Availability of efficient ultrafiltration.
- (8) Permits a favourable staff to patient ratio within a complete eight hour shift cycle.

The Kingmed Artificial Kidney machine approaches the optimal machine as follows:

(1) Disposable coils. Although currently using the regular Baxter disposable twin coil at \$60.00 per unit, the system is designed to function with a disposable coil and tubing which will cost \$20.00 or less. Work is underway, on the development of a coil to meet these stated requirements and it is expected that similar coils will be available on the American market this fall.

(2) Bath. The dialysis coil is mounted in a ten litre heated tank and bath is pumped through the coil at a rate of 20 litres per minute. Cold fresh bath fluid is added at a variable rate and the excess allowed to flow freely into the drain. In this manner, we have -
(a) reduced the total volume of bath required for a complete haemodialysis to about 1/3rd of the previous requirements.

(b) Accomplished adequate removal of waste products, such as urea and creatinine.
(c) Controlled the bacterial count since the bath is stored at room temperature and bacterial counts for six hours are usually well below 10,000 per millilitre, as compared to warm bath counts of one to two million.

(5) Simple Machinery. The system is designed to function as a series of small independent dialysis units connected to a central tank, which feeds the cold bath to the entire system. The use of a bath concentrate in preparation of the bath obviates the risk of mixing errors and a simple test will confirm the correctness of bath concentrate. Blood is pumped by a roller pump with a variable speed control. As the blood requirements per patient have been similar to, or less than that of the Kill system, our concern about potential haemolysis has largely been unfounded. The roller blood pump offers an additional safety factor as it seals the arterial circuit whenever it is stopped, thus preventing a lethal haemorrhage. The bath circulating pump is a standard unit which can be replaced in minutes. The in-flow of cold bath is individually controlled at each dialysis station and all heating is done at each station. Piping and fittings are standard items which can be repaired on the scene by routine hospital maintenance staff.

(4) Reliable fail-safe devices. Our major concern has been the monitoring of the pressure within the coil and we have so arranged our high and low pressure fail systems so that should the

IFMBE Teamwork Award

From the Desk of the International Outreach Committee Chair, Bill Gentles

CMBES-Ghana Health Service Collaboration wins IFMBE Teamwork award

[The IFMBE / Clinical Engineering Division](#) Awards Committee has announced that the Ghana Health Service Clinical Engineering – Canadian Medical and Biological Engineering Society Collaboration has been chosen by an international panel of reviewers to receive the 2016 IFMBE–CED Clinical Engineering Outstanding Teamwork Award. This award recognizes an individual or a group that has fostered and facilitated cooperation between healthcare technology managers to successfully achieve outstanding impact on the Clinical Engineering field.

This collaboration began at two Advanced Clinical Engineering Workshop in Ghana in March and June 2009. At these workshops the Ghanaian clinical engineers were introduced to the activities of the CMBES, including the development of the Clinical Engineering Standards of Practice for Canada.

The team leader for these workshops was Bill Gentles, past President of CMBES and current Chair of the CMBES International Outreach Committee. Nicholas Adjabu was and still is the deputy Director of Clinical Engineering in the Ghana Health Service. The workshops led to the formation of the Ghana Biomedical Engineering society in March 2009.

The two groups developed further collaboration when the CMBES International Outreach Committee obtained a research grant in 2013 to study the donation of medical devices to developing countries. The grant included funds to support a Clinical Engineer in Ghana who would interview recipients and compile data on Medical Equipment donations in Ghana Health facilities. The grant also included funds for members of the Ghana Health Service to travel to conferences in Toronto, Vancouver, and London England.

In 2014, Dr Adjabu and Bill Gentles attended the Appropriate Healthcare Technologies for Low Resource Settings Conference in London, England, and presented a paper entitled “A study of medical equipment donations from Canada to developing countries: progress and challenges.”

In 2015, John Zienaa and Yolanda Adusei–Poku (Ghanaian Clinical Engineers) attended the CMBES conference in Vancouver and participated in a roundtable discussion on Medical Equipment Donations.

In 2015, Yolanda Adusei–Poku, visited 28 health facilities in Ghana to interview recipients of medical equipment donations. This data was used as the basis of a paper presented by Bill Gentles at the CMBES conference in Calgary, Alberta, Canada in 2016. This paper won the award for best research paper award at the conference.

A video addressing the issues of medical equipment donations to developing countries has been produced by CMBES and is published on YouTube and can be viewed here:

<https://www.youtube.com/watch?v=R27CPPAwL1Y&feature=youtu.be>

Team collaboration has led to many mutual benefits and increased mutual understanding. The team continues to maintain contact and seek new opportunities for interaction.

Interested in publishing your story in the monthly e-Bulletin or the quarterly Newsletter? [Contact us](#) to discuss your topic!