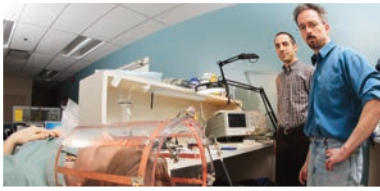
CMBES/SCGB

The Canadian Medical and Biological Engineering Society

cmbes.ca







WELCOME

What is the Canadian Medical and Biological Engineering Society?
The Canadian Medical and Biological Engineering Society (CMBES) is Canada's principal society for engineering in medicine and biology. CMBES is a member of the Engineering Institute of Canada (EIC) and is affiliated with the International Federation for Medical and Biological Engineering (IFMBE).

The Society aims are scientific and educational. They include the advancement of the theory and practice of medical device technology and the advancement of all individuals in Canada who are engaged in interdisciplinary work involving engineering, the life sciences, and medicine.

The CMBES publishes guidelines (the Clinical Engineering Standards of Practice) that outline criteria for health care institutions on the management of medical devices; administers a peer-review process designed to evaluate these practices; promotes the professional development of its members; and outlines the education and certification requirements for clinical engineers and biomedical engineering technologists and technicians.

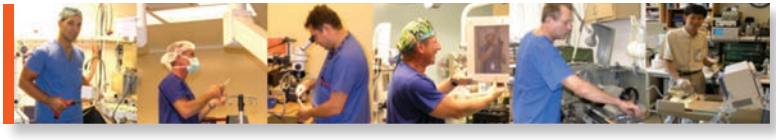
Dr. John (Jack) Hopps
CMBES Founder and inventor of the heart pacemaker
In 1965, Dr. Hopps founded the Canadian Medical and Biological Engineering Society and became its first president. He was also President of the International Federation for Medical and Biological Engineering in 1971 and served as Secretary General for the Federation from 1976 to 1985. From 1985 to 1988, Dr. Hopps was Secretary General of the prestigious International Union for Physical and Engineering Science in Medicine. He dedicated most of his career to working for the Medical Engineering Group of the National Research Council of Canada, which he joined shortly after graduating from the University of Manitoba in 1941.

Who do we represent?

The Society represents the interests of biomedical and clinical engineering by providing advice, submitting briefs, and reviewing documents for various agencies. These include

- Accreditation Canada
- Health Canada
- Medical Devices Regulatory Committee
- Ministries of Health
- HealthCareCAN
- CSA Health Technology Program

The CMBES facilitates communication among its membership and other agencies by regularly publishing a newsletter and the proceedings of all conferences and seminars.



What is our role?

We work to achieve the safety, well-being, and effective care of all patients across Canada through quality support and management of medical devices and systems. Biomedical engineers, clinical engineers, biomedical technicians, and biomedical technologists; all make valuable contributions to Canadian health care institutions.

Who benefits?

These professionals help to control the cost of health care and improve the safety of our patients and staff. As medical technology advances, individuals responsible for care, safety, and accuracy of the equipment and technology used in our health care facilities are becoming increasingly valuable to Canadians.

Conferences and Events

The CMBES organizes national medical and biological engineering conferences in various cities across Canada and also conducts the CMBES Webinar Series. The conferences provide keynote addresses; seminars; technical, scientific, and technology management papers; presentations; exhibits of current medical devices; a continuing education program; workshops; symposia; and networking opportunities.

CAREER PATHS

Biomedical Engineers (BME) are involved in applying engineering principles to the design and development of medical devices. They are linked academically with engineering programs at universities and frequently work for or collaborate with government, manufacturers, and teaching hospitals.

Clinical Engineers (CE) work in large hospitals and are involved in health care technology management activities such as management of biomedical or clinical engineering departments, systems integration, capital acquisition and implementation, patient safety, compliance to standards and regulations, and risk management.

Biomedical Technicians and Technologists (BMET) work in large health care facilities providing comprehensive service and support of medical devices and equipment. Activities include inspection, installation, repair, and preventive maintenance of medical devices and complex medical systems. They also provide advice and training on the safe and effective use of medical devices and systems.

Where do we work?

Biomedical/clinical engineers, technologists and technicians work in offices, laboratories, workshops, manufacturing plants, clinics, and hospitals. Some travel to various clinics or hospitals. Longer hours may be required to meet research deadlines. They might need to work on medical equipment that is in use on patients. Those who work in hospitals may participate in 24/7 coverage and may work in patient rooms, operating rooms, and critical care areas.

REQUIREMENTS

Biomedical/clinical engineers and BMETs need the following characteristics:

- a strong interest in engineering and medicine
- the ability to think analytically and solve problems
- an aptitude for science and mathematics
- the ability to visualize complex processes and equipment
- good oral and written communication skills
- creativity and persistence
- a willingness to improve their knowledge and skills on an ongoing basis
- the ability to work effectively with people from various disciplines and educational backgrounds

They should enjoy

- synthesizing information to conduct research and develop new instruments, equipment, and systems
- performing tasks that require precision
- consulting with and supervising others

What are the educational requirements?

Entry-level positions in industry (medical device or pharmaceutical companies) or clinical engineering positions in hospitals generally require a bachelor's degree in engineering with a major in biomedical engineering or a bachelor's degree in chemical engineering, electrical engineering or mechanical engineering with a specialty in biomedical engineering. A working understanding of life sciences and medical terminology is required.

There are 3-year community college programs in biomedical engineering technology designed to provide practical knowlege and skill for the support of medical device technologies. Anatomy and physiology, biomedical instrumentation, electronics, computers, and information technology are the primary topics of study.

Engineering program graduates may continue their education in medicine or dentistry, or graduate (master's or doctoral) degree programs in other fields. A graduate degree is required for research and development positions in biomedical engineering.

EDUCATION

Biomedical Engineering Education in Canada

The following are some of the typical curricula members have engaged with in Canada. Programs such as bioengineering, clinical engineering, biophysics, medical physics, mechanical and materials engineering, computer and electrical engineering cover some or all of these topics:

- Biomaterials
- Biomechanics
- Biomedical Engineering Education
- Clinical Engineering
- Health Sciences
- Information Technology
- Medical Device Technology
- Medical Imaging
- Medical Telerobotics
- Microelectronics
- Optoelectronics
- Rehabilitation Engineering
- Signal Processing
- Telemedicine

There is a continuous evolution of programs in the biomedical field, particularly with regard to research topics being actively pursued. Prospective students are advised to contact the institutions directly for detailed program information.

CMBES MEMBERSHIP

Benefits of Membership

Membership provides interaction with peers and a forum for national initiatives and professional advancement. Benefits include:

- Reduced conference rates
- Reduced rates for courses and webinars
- Membership in the IFMBE
- Preferred subscription rates to the IFMBE *Medical and Biological Engineering and Computing Journal*
- Access to the website, which includes by-laws, newsletter, membership directory, list of fellows, emeritus, other award winners, and more
- Access to CMBES Forum for discussions and expert commentary
- Discounted rate on job postings
- The *Society Newsletter* highlights issues of importance in health care technology, upcoming events, items of interest to our members, etc.
- Special rates for Workshop Proceedings, Conference Digests, and the Clinical Engineering Standards of Practice

MEMBERSHIP CATEGORIES

Full Membership

Membership is open to all persons who are graduates of a university or technical program relating to some aspect of biomedical engineering in its broadest sense.

Associate Membership

Associate Membership is open to individuals who are in non-managerial and non-supervisory roles in healthcare or the medical device industry and are users or repairers of medical equipment or IT professionals. This membership category is also open to individuals living outside of Canada or those members who are unemployed or who are on unpaid leave from their regular employment or studies (e.g. family leave).

Retired Membership

Individuals who have retired from active participation in the work force may apply for the status of Retired Member.

Student Membership

A student member must carry at least 50% of a full-time academic program as a registered undergraduate or graduate student in a course of study in a discipline related to biomedical engineering. *Benefits of student membership include:*

- Student rates for the CMBES national conference, as well as reduced rates for some international conferences
- Eligible for Student Paper Competition held during CMBES Conferences
- Complimentary registration to CMBES hosted Webinars

GROUP MEMBERSHIP

Corporate Membership
The Corporate Membership Plan is available to any organization in the public or private sector. This plan is designed to assist employers provide membership in the Society for their employees. Members listed under a corporate membership shall have the same privileges and responsibilities as full members. Hospital groups and company groups may obtain a corporate membership by paying for two or more members at a pre-determined discount.

Student Institutional Membership
Universities may apply to have an Institutional Membership to cover their biomedical engineering students. They must pay for at least 2 students to receive the discounted rate. The institution may apply the member rate for registrations to the annual conference for their students.

ANNUAL MEMBERSHIP FEES

- Full member: $130
- Associate member: $45
- Retired member: $35
- Student member: $35
- Corporate membership: variable rate based on number of individuals in the group
- Student Institutional membership: $30 per student, minimum of 2 students required

Membership Information
For more information on membership categories and to apply for membership please visit our website at www.cmbes.ca

CERTIFICATION

*Note: Certification is not administered by CMBES.

Go to www.cmbes.ca and click on Certification for more information on the following certification programs:

- Certified Clinical Engineer (CCE)
- Certified Biomedical Engineering Technician/Technologist (CBET)
- Certified Laboratory Equipment Specialist (CLES)
- Certified Radiology Equipment Specialist (CRES)

SEE YOU AT THE NEXT CONFERENCE

World Congress, Toronto, June 2015
CMBEC 39, Calgary, May 2016
CMBEC 40, Winnipeg, 2017

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CONTACT CMBES Secretariat
1485 Laperriere Ave., Ottawa ON K1Z 7S8
Tel: (613) 728-1759, Fax: (613) 729-6206
secretariat@cmbes.ca | www.cmbs.ca

The Canadian Medical and Biological Engineering Society is a member of the **International Federation for Medical and Biological Engineering** (IFMBE).

Cover photos courtesy McMaster University and University Health Network