

Organ and Tissue Donation in Canadian Undergraduate Medical Education

Authors:

Bing Yu Chen (McGill University)
Alexandra Fletcher (McGill University)
Ali Nazim Damji (University of Toronto)
Alon Coret (University of Toronto)
Anastasiya Muntyanu (University of Ottawa)
Arnav Agarwal (University of Toronto)
Brandon Tang (University of Toronto)
Calvin Tseng (University of Alberta)
Carlos Umberto Muzlera (Western University)
Claudia Frankfurter (University of Toronto)
Deanna Lammers (University of Ottawa)
Emily Hodgson (McGill University, CFMS Quebec Representative)
Jessica G.Y. Luc (University of Alberta)
Johnny Huang (University of Ottawa)
Mary Tong (McMaster University)
Maya Deeb (University of Toronto)
Melody Ren (McMaster University)
Nebras Warsi (McGill University, CFMS Vice-President Education)
Sheena Nandalal (McMaster University)
Teresa Li (University of Alberta)
Zachary Singer (Western University)

For adoption at the CFMS Spring General Meeting 2016

April 15-16, 2016

Montreal, Quebec



CFMS
Canadian Federation
of Medical Students

FEMC
Fédération des étudiants et des
étudiantes en médecine du Canada

Executive Summary

Organ and tissue donation is a safe and cost-effective treatment with the potential to both save and vastly improve the lives of recipients. However, over 100 Canadians die every year while waiting for organ and tissue donations and many more are left on supportive treatments that significantly compromise their quality of life. The organ and tissue shortage is a public health concern relevant to the Canadian Federation of Medical Students (CFMS) and Canadian society.

Participation in organ and tissue donation relies heavily on physicians. Doctors facilitate the process through their competency in 1) identifying and referring possible donors; 2) sensitively approaching the caregivers of the deceased; 3) providing appropriate patient education about consenting to organ donation. However, both medical students and physicians possess limited knowledge for maximizing procurement rates. Despite this, organ and tissue donation is notably absent from most Canadian medical school curricula, posing a significant risk to the safety of patients and the public.

We are recommending the integration of a standardized, evidence-based course on organ and tissue donation into undergraduate medical curricula across Canada. This course responds to relevant Medical Council of Canada (MCC) objectives for the qualifying examination, and will also develop student competence in fundamental clinical and bioethical concepts. Donation teaching helps in consolidating the understanding of brain and circulatory death. Additionally, effective counselling of patients and families regarding donation requires superior skills in breaking bad news, communication, along with cultural and religious awareness.

Background

Organ and tissue transplantation is “a life-saving treatment of last resort for individuals with organ failure, and can provide dramatic improvements in quality of life for recipients”. [1] Recognizing that the introduction of organ and tissue donation “enhanced the quality of hundreds of thousands of lives around the world” [2], the World Health Organization (WHO) endorsed the WHO Guiding Principles on Human Cell, Tissue and Organ Transplantation in 2010 [3], and the International Federation of Medical Students’ Associations (IFMSA) did the same in 2013 [4].

Organ and tissue transplantation is relatively safe and can impact many lives. On average, a single organ donor can provide organs to three patients, and save up to eight lives when all viable organs are successfully transplanted. Additionally, one tissue donor can improve the quality of life of up to 75 people [5]. In Canada, the success rate of organ transplantation one year post-transplantation ranges from 80-95% [5]. Following the adoption of modern protocols, the 5-year survival for kidney allografts was 86%, with a 92% 4-year graft survival among patients whose grafts were functioning 1 year after transplant [6]. Furthermore, organ and tissue transplantation can be of significant economic benefit. For instance, kidney transplants cost

\$23,000 per operation and \$10,000 per year for anti-rejection drugs, but hemodialysis costs \$60,000 per year, not including work days lost [7]. As well, organ and tissue donation may allow donors in the setting of end-of-life care to fulfill their wishes and give meaning to the loss felt by their families.

It is encouraging to note that between 2003 and 2012, organ donation rates in Canada increased by 17% (from 13.3 to 15.5 donors per million population, pmp). However, Canada's deceased organ donation rate is still lower than that of many developed countries. For instance, Spain's rate is 35 donors pmp, France's rate is 26 donors pmp, and the United States' rate is 26 donors pmp. [8] The shortage of organ and tissue donors poses significant burdens on patients. In 2012, there were 3400 Canadians on waiting lists for transplants and 163 died awaiting surgery. [8] Using Canadian data from 1999 to 2007, it was determined that the lifetime probabilities of receiving an organ transplant in a 60 year-old wait-listed male and female are only 65% and 62% respectively. [9]

Success in increasing organ and tissue donation rates relies greatly on physicians, who play a fundamental role in the identification and referral of possible donors. Unfortunately, a gap exists in the way that organ and tissue donation is currently being taught in the medical curriculum and in medical students' donation knowledge. Therefore, given the shortage of available organs and tissues, the lack of donation education in the medical curriculum should be addressed. Improving undergraduate medical education on organ and tissue donation can be a powerful method to improve donation rates.

Problem Description

The important role of physicians in donation

Physicians play a critical role in several steps of the donation procedure, which is often faced with major challenges. In 2012, only 17% of possible organ donors under 70 who died in a Canadian hospital became actual organ donors (520/3,088), a percentage known as the conversion rate. In response to this low rate of donor identification, the Canadian Institute for Health Information (CIHI) has identified several key areas in which there is untapped deceased organ donation potential. Among cited barriers to higher conversion rates, the CIHI has noted a lack of health professionals' willingness and ability in identifying and confirming brain death or declaring cardiocirculatory death, and a failure to refer all these possible organ donors to the provincial organ procurement organisation. The CIHI 2014 report finds that the supply of deceased donor organs can be increased by focusing on patients who die of cardiocirculatory causes, targeting older donors, and other approaches. [10]

The CIHI found that only 17% of Canadian deceased organ donors died a cardiocirculatory death, which is a recently re-established category of patients eligible for organ donation. This is in contrast to the United Kingdom where donation following cardiocirculatory death (DCD) accounted for 40% of deceased donors. [11] DCD practice varies widely across Canada;

Manitoba and Saskatchewan have not yet implemented DCD programs. [10] The CIHI reported in one study that conversion rates for patients with brain death was significantly higher (30%) than for patients with cardiocirculatory death (5%). [10] Therefore, adequate identification and referral of DCD patients are necessary to improve overall organ donation success. Across Canada, conversion rates for patients younger than 50 were much higher (30%) than for patients aged 50-59 (15%) and 60-69 (7%). There are more elderly Canadians on wait lists for organ donation than ever before and older donors represent an untapped source for donation. Moreover, about half of patients dying from brain or cardiocirculatory death were not mechanically ventilated in acute care and thus were ineligible to become organ donors, an unfortunate loss that could be minimized if timely recognition had taken place. [10] Overall, about 20% of all possible organ donation opportunities are missed every year, meaning that only 80% are identified and referred. [12] In a context where less than 1% of hospital deaths result in potential donation, accurate identification is a crucial element of donation success. [12]

Physicians have a duty to be aware of these gaps in our healthcare system and contribute to an efficient organ and tissue donation system. A 2011 report by the Canadian Blood Services identified several barriers to improving access to donor organs. [13] Of these, we have noted the under-identification and lack of referral of possible organ donors to organ procurement organizations, as mentioned previously. In addition, families lack opportunities to consent to donation because staff often find it challenging to approach them.

Physicians must be comfortable identifying and referring all possible organ and tissue donors based on medical criteria. Based on the CIHI study, this includes greater consideration of patients who suffer a cardiocirculatory death and older patients. Critical care physicians should be qualified to anticipate which patients may be eligible to become organ donors and ensure that they are mechanically ventilated in the end of life, if resources permit. Physicians must also be able to initiate difficult, culturally-sensitive conversations with next of kin regarding organ and tissue donation in suitable patients.

Physicians' knowledge of and support for donation and donation success

The lack of knowledge or support for donation among physicians can be a barrier to higher success rates. [14] A focus group conducted by the American Medical Association revealed the following barriers to physician involvement in donation: tensions between physicians and organ procurement organization staff, fear of perceived or actual conflicts of interest, unwillingness to address the issue in nonurgent settings, inadequate knowledge of regulations and protocols, discomfort with the subject, and lack of training in recognizing medical futility. This suggests that physician's attitudes and knowledge about organ and tissue donation influences their ability to fulfill critical roles such as donor identification, referral and approaching families.

A Swedish survey of anesthesiologists reached similar conclusions in regards to donation barriers. [15] 27% of the respondents were not confident with clinical neurological criteria for brain death diagnosis. 36% terminated ventilator treatment for a potential donor without waiting

for total brain death, and more than half had refrained from asking families in emotionally strained situations. 49% had a neutral approach to relatives when requesting donation while 38% had a pro-donation approach, even though it has been shown that the pro-donation approach provides the best chances for consent. [16]

Physicians who do successfully identify possible donors lack sufficient knowledge about donation to answer family members' questions or concerns, thereby squandering the opportunity for donation. [17] Another survey conducted among physicians from family practices, hospital outpatient departments and emergency departments indicates that only 17% had formal training about how to approach the families of potential donors. About 64% of doctors stated they are not sufficiently prepared to have this discussion. [18]

In Canada, a study at Queen's University has shown that 36% of students did not know that brain death meant that the patient was dead rather than in a coma, and that 50% of medical students believed that people of certain religious groups should not be approached about organ donation. It concluded that medical students possessed limited knowledge about donation topics important for maximizing procurement rates, and that a teaching intervention designed to target these shortcomings might be beneficial. [17] Research has consistently shown that medical student knowledge of donation was low. [19-21]

Both attitudes and knowledge play an important role in all the donation-related tasks of the physician. Given the lack of familiarity with donation procedures, the lack of confidence in neurological determination of death and the discomfort in approaching families, medical education in this field may help clinicians overcome these well-known challenges to successful organ procurement.

Benefits of Donation Education

There is an appreciable amount of evidence that suggests introducing fundamental clinical concepts related to organ and tissue donation to medical trainees can have profound benefits to transplant recipients. [22] The benefits for trainees include an improved understanding of laws relating to organ and tissue donation, understanding of cardiac and brain death and tissue donation eligibility criteria, comfort with approaching relatives of potential organ and tissue donors, and more supportive attitudes towards organ and tissue donation. [23] Such education can also elicit interest in the fields of transplantation and critical care among medical students. Ultimately, organ donation education would prompt reform at the level of health policy and clinical practice guidelines to optimize the donor identification, referral and consent procedures, as well as incite physicians to raise awareness among the general population and demystify donation. A curricular component to organ and tissue donation would offer high yield information, given the current lack of knowledge among physicians. [17,24] These interventions have the potential to increase eligible donor rates, enhance family satisfaction with the care received and encourage dialogue between physicians and the organ and tissue procurement organizations. [25] In addition to its inherent importance, organ donation is also part of the MCC

objectives [26], yet another reason for strengthening its inclusion in undergraduate medical curricula.

A deepened understanding of the protocols inherent to organ and tissue donation will not only make physicians better medical experts, but also competent communicators and health advocates. Beyond the technical expertise needed to properly identify organ and tissue donors in a timely fashion, donation rates also depend on the physician's ability to obtain consent. This requires competency in the delivery of bad news, cultural and religious awareness, and an understanding of the principles of the Health Care Consent Act (HCCA), which are rooted in end-of-life medical care across Canada. These competencies are explicit learning objectives of the MCC for medical graduates. [26] Additionally, curricular incorporation of medical ethics is assessed by the Committee on Accreditation of Canadian Medical School (CACMS) within their Standard and Elements for accreditation. [27] Formal teaching of the bioethical concepts relating to organ transplantation may help increase medical trainees' confidence in end-of-life care and destigmatize the consent process for donating organs and tissues. [23] Fostering widespread awareness of standardized organ and tissue transplantation practices subsequently promotes advocacy initiatives and interprofessional collaboration that can influence nation-wide participation and perception of organ and tissue donation.

Studies have shown that less than half of the families approached with the request for donation in hospital have agreed to donate. [28-29] This low rate may be explained in part by the fact that organ donation was not discussed with them prior to the death of their loved ones. In other words, they were not mentally prepared and/or lacked information about the process. Physicians are a crucial source of information as they have established trusting relationships with their patients, often over the course of multiple clinical encounters and discussions of delicate medical issues. Physicians may also be knowledgeable about the cultural and moral preferences of their patients. This allows them to better frame information about organ and tissue donation and to allow the family to make an informed decision. Furthermore, it has been previously shown that discussing organ donation during patient visits to physician offices, hospital outpatient departments, and emergency departments can greatly influence the donor rate because 35 % of deceased organ donors are over 50 [18,30] and this age group is that with the highest frequency of ambulatory visits in the United States. [30] Finally, physicians occasionally discuss end-of-life care with patients and the topic of organ donation is well suited for inclusion in such a discussion. Tierney et al. (2001) has shown that these conversations between physician and patient increase the number of patients who signed their living will, which directly increases the rate of actual donors. [31-32]

Challenges

Presently, undergraduate medical education is extremely extensive, and medical students are faced with very demanding curricular schedules. Because a vast amount of information needs to be imparted to students in the short undergraduate period, time is one of the largest barriers in integrating organ donation education into the current curriculum. [17] However, its importance and the current lack of knowledge among Canadian medical students [17] merits time and

resources dedicated to it. The proposal calls for the integration of organ and tissue donation curricula in all Canadian medical schools to address the MCC objectives. This curriculum may take the form of a set of lectures, or may be modified to fit with school's teaching style such as small group learning sessions or mandatory online modules. In order to promote uptake of the subject matter by faculty members, and to mandate its teaching, it is important for this topic, already incorporated into the national accreditation standards, to be re-emphasized by the MCC. While organ donation may raise ethical concerns amongst students and faculty, with appropriate bioethics teaching it can be communicated in a way that encourages healthy discussion, much like other areas of medicine. Going forward, it will be equally important to continue education surrounding organ donation, not only in the classroom, but also into clerkship and residency.

Principles

The following are principles that form the foundation of our recommendations. Where relevant, references to the Canadian Federation of Medical Students (CFMS) Strategic Plan 2014-2017 are included in parentheses. [33]

1. Organ shortages for transplantation are a public health concern that is relevant to the CFMS membership and Canadian society.
2. Lack of sufficient training of healthcare providers on the topic of organ donation causes missed opportunities to increase the supply of donor organs.
3. The CFMS is committed to developing partnerships with like-minded organizations and harnessing educational resources to improve the preparedness of future physicians entering the healthcare workforce (Strategic Directions 3 and 4, CFMS Strategic Plan)
4. The CFMS supports grassroots efforts undertaken by its members to improve the health and wellbeing of communities and is committed to facilitating the exchange of ideas and experiences among students, provided that these efforts do not compromise public health or patient safety (Strategic Directions 1 and 2, CFMS Strategic Plan)
5. The CFMS supports the creation of evidence-based policy to inform its efforts to build a healthier society (Strategic Direction 5, CFMS Strategic Plan)

Recommendations

1. **Canadian medical schools should incorporate education about organ and tissue donation into their respective curricula in order to meet the requirements of the MCC.** Currently, medical students do not have sufficient opportunities to gain knowledge in organ transplantation as little training is provided by medical schools. However, as physicians play a key role in the organ donation process, early education in this area of medicine may improve donor rates. Schools should offer training on key topics including identification of potential organ and tissue donors, referral to organ and tissue procurement centres, and bioethical issues in organ and tissue donation. An example three-hour curriculum satisfying MCC objectives on organ donation in Quebec is

included as an appendix. It focuses on the context of organ and tissue donation, organ and tissue donation procedure – identification of potential organ and tissue donor, referral to organ and tissue procurement centres and communication with families – and bioethical issues in organ and tissue donation. It is currently endorsed by the Quebec Medical Association, International Federation of Medical Students' Associations-Québec, Fédération médicale étudiante du Québec, the Canadian Blood Services, Transplant Québec, Héma-Québec and the Canadian National Transplant Research Program. Although the content is presented in lecture format, this information should ideally be conveyed through multiple modalities including, but not limited to lectures, small group learning, and online module learning.

2. **Canadian medical schools should equip their students with the clinical communication skills necessary for effective counseling of patients and families regarding consent to organ and tissue donation.** Given the complex and sensitive nature of organ and tissue donation, medical learners may not be adequately trained to address questions related to donation, donor registries, or the importance of donation with their patients. With greater exposure to the biomedical and bioethical issues surrounding donation, it is hoped that students will gain the necessary comfort and competence in addressing issues pertinent to organ and tissue donation with their patients. This may be achieved through “real world” examples in the clinical setting, practice simulation scenarios with standardized patients, or through integration of donation counseling tips into clinical learning.

Conclusion

Organ and tissue donation is often associated with the advancement of medical sciences, solidarity and humanity. Although available organs and tissues will continue to be scarce for the years to come, we, as future health professionals and advocates, believe in sustainable and evidence-based approaches such as medical education to reduce donation gap and give hope to patients awaiting an organ or tissues. Educational interventions are a practical solution which we invite all interested CFMS members and medical societies to consider in order to take initiative on this 21st century public health issue.

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Introduction to Organ and Tissue Donation

A course for raising knowledge of and support for organ and tissue donation among future physicians in Ontario (updated March 2016)



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2016 Edition
International Federation of Medical Students' Associations – Quebec
(IFMSA-Quebec)

ifmsa.qc.ca

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2016 Edition

Produced and distributed by IFMSA-Quebec

Editors: Bing Yu Chen^{1 2}, Alexandra Fletcher^{3 4}

Co-authors: Alissa Rutman⁵, Sam Shemie^{6 7}, Pierre Marsolais^{8 9 10}, Marc-André Leclair¹¹, Frédéric D'Aragon^{12 13 14}, Gilles Beaupré¹⁵, Philippe Robert¹⁶, Jean-François Lizé^{17 18 19}, Stéphan Langevin^{20 21}, Hugues Villeneuve²²

Contributors: Dr. Daniel Buchman, Dr. Jennifer Chandler, Dr. Christian Essman, Nathalie Thiffault, Wendy Sherry

Endorsed by: Quebec Medical Association, Quebec Society of Intensivists, IFMSA-Québec, Fédération médicale étudiante du Québec, Canadian Blood Services, Transplant Québec, Héma-Québec, Canadian National Transplant Research Program



The Canadian Medical Association supports mandatory training on organ donation for medical students and residents at all Canadian medical schools (MOTION DM 5-1, 148th GENERAL COUNCIL, CANADIAN MEDICAL ASSOCIATION).

Special thanks to McGill Centre for Medical Education, Dr. Cécile Bensimon, Dr. Marie-Josée Hébert, Dr. Denis Drouin, Dr. Fraser Moore, Dr. Colin Chalk, Dr. Stuart Lubarsky, Dr. Robert Primavesi, Dr. Donald Boudreau, Dr. Christian Bourdy, Dr Ève-Reine Gagné, Dr. Jeff Singh, Dr. Denny Laporta, Dr. Claire Touchie, Ken Lotherington, David Alexandre Galiano, Ariane Veilleux Carpentier, Camille Pelletier Vernooy, Nebraska Warsi, Jasmine Bisson, Tavis Apramian, Valéria Akim, Aline D. Khatchikian, Mathilde Côté, Raluca Poenaru, Marie-Léa Guay, Julie Côté-Leclerc, Samuel Bergeron, Félix Bégin, Anne-Lou McNeil Gauthier, Stéphanie Jospitre, Cedrik Gignac, David Alessandro Benrimoh, Matthew Danker and Julien Dallaire for their advice and continuous support.

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¹Faculty of Medicine, McGill University, Correspondence via +1.514.466.2213

²National Officer of Public Health, IFMSA-Quebec, Correspondence via npo@ifmsa.qc.ca

³MSc, Faculty of Medicine, McGill University

⁴Local Officer of Public Health, IFMSA-Quebec

⁵BSc, Founder and President, McGill Students for Organ Donation Awareness

⁶MD, Pediatric Intensivist, McGill University Health Center

⁷Medical Advisor, Deceased Donation, Canadian Blood Services

⁸MD, FRCPC, Internist and Intensivist, Centre Intégré Universitaire de Santé et des Services Sociaux (CIUSSS) du nord-de-l'île-de-Montréal

⁹Medical Coordinator of Organ Procurement Centre

¹⁰Associate Clinical Professor, Faculty of Medicine, Université de Montréal

¹¹MD, Intensivist, Centre hospitalier universitaire de Sherbrooke

¹²MD, FRCPC, MSc (epidemiology), Anesthesiologist-Intensivist, CIUSSS-CHUS

¹³Clinician Researcher, Centre de Recherche CHUS

¹⁴Assistant Professor, Faculty of Medicine and Health Sciences, Université de Sherbrooke

¹⁵CTBS, Procurement manager, Exploitation cellules souches, tissus humains et laboratoire de référence, Héma-Québec

¹⁶Faculty of Medicine and Health Sciences, Université de Sherbrooke

¹⁷Respirologist-Intensivist, CHUM

¹⁸Assistant Clinical Professor, Université de Montréal

¹⁹Assistant Medical Director, Transplant Québec

²⁰Anesthesiologist-Intensivist, MD, FRCPC, Institut de Cardiologie et de Pneumologie de Québec

²¹Associate Clinical Professor in Anesthesiology, Université Laval

²²Head of hospital development and education services, Transplant-Québec

COURSE INFORMATION

Title of course: Introduction to Organ and Tissue Donation

Program: Medicine – M.D. & M.D., C.M.

Term in which it will be offered: Preclinical years – first or second year, within the neurology unit (recommended) or in a subsequent unit

Total hours: 3 hours in total

- 1.5 hour of theory-based classroom lecture on organ donation – meeting objectives for the qualifying examination of the Medical Council of Canada (MCC)
- 0.5 hour of theory-based classroom lecture on tissue donation – recommended
- 1 hour of theory-based classroom lecture on bioethics in organ and tissue donation – recommended

Prerequisite: Previous teaching or knowledge on neurological determination of death

Course Description: This introductory course on organ and tissue donation is based on classroom lectures, and aims at raising knowledge of and support for donation among future physicians. Topics covered include context of organ and tissue donation, organ and tissue donation procedure – identification of potential organ and tissue donor, referral to organ and tissue procurement centres and communication with families – and bioethical issues in organ and tissue donation.

RATIONALE

Through transplantation, organ and tissue donation is responsible for saving thousands of lives every year worldwide. “In all countries in which deceased organ donation has been initiated, the therapeutic potential of deceased organ donation and transplantation should be maximized.” (9) Unfortunately, a discrepancy between the demand for organs and tissues and the availability of donors exists, in Canada and internationally. Success in organ and tissue donation relies highly on the knowledge of health care professionals. (1) Given this fundamental role physicians play in the identification and referral of potential donors, it comes as no surprise that the evidence supports enhanced undergraduate medical education as a powerful method to improve organ and tissue donation rates. (2) Despite this overwhelming evidence, a gap still exists in the way that organ and tissue donation is currently being taught in the medical curriculum. (3) Our objective is to implement an evidence-based, expert-supported course on organ and tissue donation into the Quebec medical curricula in order to raise knowledge of and support for donation among future physicians. If this course is adopted, we expect to ultimately improve organ donation rates in the province and we expect to quantify this change.

In addition to the inherent importance of organ donation, the topic is also part of the Medical Council of Canada (MCC) objectives, an additional reason to include it at the undergraduate medical level.

The present introductory course described in this proposal, available during the preclinical years in the forms of theory-based classroom lectures, cultivates medical students' interests early in their education in the absence of barriers to learning such as lack of time and false sense of competency and encourages them to pursue a profession in donation and transplantation or a related field. (2) We believe that the implementation of this course will be very feasible and will create a unique educational experience for medical students, who will be key players in shaping the organ and tissue donation system of tomorrow.

MCC OBJECTIVES (4)¹

Head Trauma / Brain Death / Transplant Donations

Key Objectives

Given a patient with a head/brain injury, the candidate will diagnose the cause, severity and complications. In particular, the candidate will, based on the mechanism of injury and the clinical findings, determine the appropriate management plan and select appropriate imaging and ongoing surveillance. In cases where brain death has occurred, *discuss organ donation with the next of kin.*

Enabling Objectives

Given a patient with a head/brain injury, the candidate will

1. list and interpret critical clinical findings, including those derived from
 - a. a history aimed at determining if the head injury was severe, or associated with complication (e.g., mechanism of injury, loss of consciousness);
 - b. a physical examination aimed at determining if the head injury was severe, or associated with complication (e.g., ecchymosis behind ear);
 - c. a repeat history or examination aimed at detecting evolving pathology;
 - d. clinical signs of brain death;
2. list and interpret critical investigations, including
 - a. determination as to whether the patient requires urgent brain imaging;
 - b. confirmation of brain death with appropriate investigations;
3. conduct an effective initial management plan, including
 - a. determine if the patient requires specialized or urgent care;
 - b. *in a patient whose head injury has caused brain death, but whose heart is still beating, communicate this information to the transplantation team (or equivalent) if the deceased patient or the family have indicated a desire to donate organ(s);*
 - c. *if there is no indication that organ donation has been considered, counsel the family about the possibility.*

¹ Original text from MCC

LEARNING OBJECTIVES

This course will help medical students to

- foster an interest in and awareness of organ and tissue donation;
- be acquainted with the context of organ and tissue donation;
- have a general understanding of the organ and tissue donation procedure;
- know the characteristics for identifying organ and tissue donors;
- begin to develop skills to discuss organ and tissue donation with donors' families and;
- understand major bioethical and legal issues in organ and tissue donation.

COURSE OUTLINE

Teaching Items in italics is optional. These items are considered supplemental materials.

Lecture 1 – Designed to meet MCC Objectives

Title: Organ Donation

Duration: 1.5 hour

Instructor: Intensivist, organ donation resource nurse, representative from organ procurement organisation

Learning objectives:

- Foster an interest in and awareness of organ donation
- Be acquainted with the context of organ donation
- Have a general understanding of the organ donation procedure
- Know the characteristics for identifying organ donors
- Begin to develop skills to discuss organ donation with donors' families

Topics covered:

Context of organ donation

- Basic principles of organ and tissue donation
 - Duty to serve the needs of potential transplant recipients in an ethical, legal, safe and equitable manner
 - Providing the opportunity to donate and to respect the donor's wishes without compromising the duty of care to the dying patient or living donor
 - Two types of donors: deceased and living donors
- *History of neurological determination of death and organ and tissue donation and future perspectives*

- *Patient stories*
- Benefits of organ donation and transplantation
 - Recipient: Transplantable organs, patient survival rates according to transplanted organs, number of patients benefited from donation
 - Donor's family: Overcoming grief over loss of loved one
 - Society: Cost-benefit analysis of kidney transplantation compared to dialysis
- Organ donation statistics
 - Number of organ donors, transplanted patients, patients on the waiting list, deceased patients on the waiting list, lifetime probability of receiving a transplant
 - Statistics in Canadian provinces and other countries

Organ donation procedure

- Overview of the organ donation procedure
 - Used in all healthcare institutions
 - Both organ and tissue donation are managed by TGLN
- Step 1: The Referral and Notification Process
 - Breakdown of the number of hospital deaths, potential donors and actual donors
 - Emphasis on the rarity of donors and importance of identifying all potential donors
 - Provincial law on mandatory potential donor referral
 - All designated hospitals in Ontario must call TGLN with all imminent deaths to assess the potential for organ and tissue donation.
 - Causes of death in organ donors and course of disease leading to poor prognosis
 - Basic criteria for potential organ donor
 - Non-recoverable injury, mechanically ventilated, imminent death
 - Identification in end-of-life care context [intensive care unit (ICU) and critical care unit (CCU)] and in emergency rooms (ER)
 - Referral indicators for donation
 - G.I.F.T. acronym in ventilated patients
 - Referral to TGLN
 - When: As soon as patients meet 1) criteria for Routine Notification & Request (in designated hospitals/units) or 2) clinical triggers (referral indicators) for donation
 - Must be done before setting a time to withdraw life sustaining therapy and prior to any donation discussion with the family
 - Goals: a) establish if the person has a donation consent decision in the OHIP (Ontario Health Insurance Plan) database, b) determine medical suitability to donate organs and/or tissue, and c) dispatch a coordinator onsite if there is potential for donation and initiate the donation conversation with family in collaboration with the healthcare team following neurological death or WLS discussion
 - Stats: Higher referral rate results in higher donation rate
 - Registering Consent to Become an Organ and Tissue Donor in Ontario
 - Aged 16 years or older
 - Ways to give consent
 - beadonor.ca

- Health card renewal or registration with OHIP (ServiceOntario centre)
 - Gift of Life Consent Form
 - Importance of communicating wishes with next of kin
 - Substitute decision maker will be asked to affirm those wishes
 - Common misconceptions about potential organ donors
 - Age, religion, funeral plans, quality of care for consented patients, Coroner's case
 - Summary flowchart: Clinical Trigger/Referral Indicator Algorithm for TGLN Referral
- Step 2: Determination of Death
 - Organ and/or tissue donation is possible: a) following pronouncement of death using neurological determination of death (NDD) criteria or, b) in planned situations of withdrawal of life sustaining therapy (WLS) and pronouncement of death (DCD potential).
 - Neurological determination of death (NDD)
 - Definition and concept, common medical conditions leading to NDD, clinical criteria, testing criteria including CNS-mediated motor response to pain, brainstem reflexes, apnea testing and ancillary testing for neurological death
 - Donation after cardiocirculatory death (DCD)
 - Concept and eligibility (non-recoverable injury with ventilator dependence and life sustaining therapy), WLS
 - Diagnosis of death completed by 2 physicians
- Step 3: The Donation Discussion – Communicating Registered Consent Decisions and Family Approach for Substitute Consent
 - NDD: Consent for donation
 - DCD: Family/healthcare team agree on withdrawal of life sustaining therapy (WLS), consent for donation
 - Families' attitudes
 - The majority of Ontarians would donate organs and tissues after death.
 - Donation provides meaning to the loss of their loved one and allows families to honour wishes
 - Importance of offering the option of donation and avoiding negative assumptions
 - Components of an optimal donation discussion
 - Timely referral to TGLN (as per clinical triggers and prior to setting time to withdraw life sustaining therapy)
 - Pre-approach planning with the TGLN coordinator
 - Pre-approach planning involves creating a shared communication plan between the healthcare team caring for a patient and the TGLN coordinator
 - Grave prognosis provided
 - Provide the necessary information and support to families
 - Consistent messages from team
 - Family understanding of neurological death
 - Give time to understand prognosis and opportunity to donate
 - Time of death provided
 - Separate conversation about death from donation discussion

- A decoupled approach is recommended and is defined as introducing the concept of donation only after the family has had time to absorb the reality and finality of the diagnosis.
- DCD: DCD should be offered by an experienced requester after the decision to withdraw life sustaining therapy has been made and prior to the actual withdrawal of therapy or setting of a time for withdrawal.
- Introduction of TGLN Coordinator as healthcare team member/specialist
 - TGLN coordinators have experience talking to families about donation
 - If consent to donate is registered, the TGLN coordinator will provide the consent information to the donor's family members at the appropriate time.
- The importance of experience, attitude and language
 - Discussion should be led by a healthcare team member who has good relationship with patient or substitute or who has previous experience.
 - Families are more likely to donate if the requesting person has a positive attitude about donation.
- Religious and cultural beliefs
- Information to be shared with families about donation
 - Benefits of donation and rarity of donors
 - Donation procedure basics
 - Funeral arrangements
- *Step 4: Donor Screening and Testing*
 - *Medical and social history and physical examination of donor*
 - *Diagnostic tests and serology*
- *Step 5: Donor Care/Management*
 - *NDD: Continuation of therapy to support organs*
 - *DCD: Continuation of therapy to support organs until WLS*
- *Step 6: Organ and Tissue Recovery Planning*
 - *NDD: Continuation of therapy until organ recovery*
 - *DCD: Determination of death by cardiorespiratory criteria and organ recovery*
- *Step 7: Case Closure and Follow-up*
- *Brief presentation of the transplantation waiting list*
 - *Stats: Average waiting time per organ*
- Conclusion
 - Challenges to donation availability
 - Community
 - Ethnocultural (ethnic and cultural minorities are less likely to donate), religious (e.g. some Jewish communities object to NDD), personal culture, distrust, fear, apathy
 - Healthcare system
 - Identification of potential donors (all healthcare workers in ER, ICU and CCU should contribute towards identification, especially respiratory therapists), family approach, donor management, hospital resources (access to intensive care unit and operating room) and engagement

- Physician's responsibilities
 - Identification, referral and, when appropriate, presentation of the option of organ donation
 - Awareness and advocacy

Lecture 2 – Recommended

Title: Tissue Donation

Duration: 0.5 hour

Instructor: Representative from tissue procurement organisation

Learning objectives:

- Foster an interest in and awareness of tissue donation;
- Be acquainted with the context of tissue donation;
- Have a general understanding of the tissue donation procedure
- Know the characteristics for identifying tissue donors
- Begin to develop skills to discuss tissue donation with donors' families

Topics covered:

Context of tissue donation

- *Patient stories*
- Benefits of tissue donation
- Tissue donation statistics
 - Number of tissue donors and transplanted patients
 - Projected needs

Tissue donation procedure

- Overview of the tissue donation procedure
- Routine notification legislation requirements
- Step 1: Call
 - Breakdown of the number of hospital deaths, potential donors and actual donors
 - Causes of death in tissue donors
 - Basic criteria for potential tissue donor
 - Most people can donate issue at death.
 - High risk of imminent death
 - Referral indicators for tissue donation
 - G.I.F.T. acronym in ventilated patients OR
 - Non-ventilated patients with imminent or recent death in ED/ICU
 - Non-ventilated patients aged 79 or younger with imminent or recent death in other hospital units
 - Referral to TGLN

- Each patient's eligibility to donate is evaluated on a case-by-case basis by TGLN through the initial screening process and then by each individual tissue bank prior to accepting tissue for transplant.
- TGLN can access consent decisions registered with a patient's Ontario Health Insurance Program (OHIP) health card
 - Common misconceptions about potential tissue donors – autopsies, Coroner's case
 - Summary flowchart: Clinical Trigger/Referral Indicator Algorithm for TGLN Referral
- Step 2: Screen
 - A brief medical history is required to determine preliminary eligibility and to identify what donation opportunities are available.
- Step 3: Connect
 - Arrange for TGLN to speak to family at the hospital or by telephone
 - A quiet, private location should be selected if available.
 - Exclusive tissue donation only: It is recommended that the telephone conversation with TGLN occur after the family has been notified of the patient's death, demonstrates understanding/acceptance of death and is prepared to discuss the next steps in end-of-life care. The physician may be needed to connect the family with TGLN.
- *Next steps: providing further clinical information*
 - *Donor eligibility evaluation – medical history and testing*
 - *Recovery of tissues*
 - *Bank of tissues – objective tests and processing techniques*

Lecture 3 – Recommended

Title: Bioethical issues in Organ and Tissue Donation

Duration: 1 hour

Instructors: Bioethicist

Learning objectives:

- Understand major bioethical issues in organ and tissue donation

Topics covered (8):

- Brief introduction to bioethics
- Brief overview of organ and tissue donation law and regulations in Canada
 - Accreditation Canada
- Ethical issues in defining death
 - Social, historical, cultural, religious, and spiritual considerations
 - Neurological Determination of Death (NDD)
 - Organ donation after circulatory death (DCD)
- Retrieving organs and tissues
 - Duties and obligations towards patients and conflicts of interest

- The Dead Donor Rule
- Separate medical teams
- Donation after physician-assisted suicide
- Pre-death care in DCD patients (e.g. heparin, antibiotics and corticosteroid administration, bronchoscopy) may not be in their best interests
- Family veto to donor's expressed wishes
- Presumed consent
- Allocating Organs and Tissues
 - Ethical principles in allocation
 - Criteria for recipient selection
 - Psychosocial considerations
 - Re-transplants
 - Multi-organ transplants
 - Age
 - Non-residents and uninsured patients
 - Organ donation systems
 - UK Transplant
 - Israel's priority system (2008)
- Controversial topics in organ and tissue donation
 - Transplant tourism
 - Declaration of Istanbul (2008)
 - Financial incentives for living donation
 - Public solicitations

Alternative teaching methods

Small group teaching sessions have gained popularity in medical education as they encourage self-directed learning, increase student interest and enhance retention of knowledge and skills (7). Several general themes presented in the lectures may be suitable for the small group teaching format, either as a replacement of the lecture or as a reinforcement of the content taught during the lecture. Such themes include but are not limited to: organ and tissue donation procedures, communication with donor's family and bioethical issues in organ and tissue donation.

Other teaching methods, such as mandatory online modules and simulation-based learning, could also replace conventional didactic lecture teaching format to address the learning objectives above.

STUDENT EVALUATION

Knowledge acquired during lectures will be evaluated during written examinations according to faculty regulations.

COURSE EVALUATION

Students are encouraged to provide feedbacks and suggestions to this course through formal surveys, and data collected will be used only for research purposes.

REQUIRED TEXT

PowerPoint and PDF materials are provided to students.

TEACHING RESOURCES

Lecturers may be appointed by the faculty itself. Recommended areas of expertise can be found in the Course Outline section.

IMPACT ON THE MEDICAL CURRICULUM

The content of this course complements well with the neurology unit during pre-clinical years, especially following the lecture on neurological determination of death. There should not be any conflicts with other courses.

COURSE IMPLEMENTATION AND FUTURE PROSPECTIVE

This course should be implemented prior to July 2018. As new research is being done and best practices are being shared among participating faculties, revisions to this course will be expected.

REFERENCES

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3. Nelson EW, Mone MC, Nelson ET, Hansen HJ, Gawlick U, Alder S. Evolution of trends in the live kidney transplant donor-recipient relationship. *Transplant Proc*. 2013;45(1):57-64.
4. The Medical Council of Canada & Le Conseil médical du Canada – Objectives For The Qualifying Examination

5. Standard organ donation procedure, Transplant Quebec
6. Cadre organisationnel en don d'organes et en don de tissus, Transplant Quebec
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8. Veatch, R. (2002). *Transplantation Ethics*. Washington: Georgetown University Press.
9. The Declaration of Istanbul on Organ Trafficking and Transplant Tourism