The number of potential tissue donors in Canada in both acute care settings\(^1\) and outside of hospitals\(^2\) far exceeds the number needed to meet patient demand for tissues, but the majority of potential tissue and ocular donors in Canada are not realized. In some jurisdictions they are not identified or referred to a recovery organization, while in others there is limited or non-existent capacity to surgically recover tissue from these donors.

In 2008 (the most recently available data) the current system (excluding Quebec) recovered tissue from 278 multi-tissue (potentially including ocular) and 2,679 ocular-only donors, for a total of 2,957 deceased donors.\(^3\) This equates to a rate of 15.6 tissue donors per million population (PMP) and 104 ocular donors PMP, as compared to the US rate of 99 tissue donors PMP and 176 ocular donors PMP. Data from 2010 demonstrates a small decrease in Canadian cornea distribution from 2008 levels despite significant waiting lists and increasing demand\(^4\). In 2008 eight Canadian eye banks recovered tissue from 2,670 ocular donors for an average of 334 donors per bank. In the USA corneas are recovered from approximately 55,000 ocular donors annually and currently there is a surplus which permits export of a significant number of corneas internationally.

Although there are examples of successful local or regional initiatives, Canada's overall tissue donation rate has not changed significantly in a number of years, and the gap between tissue demand and supply continues to grow. New legislation which makes potential donor referral mandatory in some jurisdictions has not resulted in an increase in corneal tissue availability, nor has it shortened waiting time in most provinces\(^5\). Paediatric cardiac surgeons indicate that in half of the surgical procedures performed, an alternate implant (not human) is used due to the lack of supply of paediatric heart valves\(^6\). Plastic surgeons have revealed that the lack of skin allografts means that allografts are used only in the most critical cases, or synthetic materials are used. The need for an emergency stock of skin to deal with sudden demand for treatment of a larger number of burn patients has been identified\(^7\). Fresh osteochondral grafts (bone and cartilage) are considered ideal for a number of surgical procedures, but the supply of these grafts is very limited. A significant proportion of the tissue needed to treat Canadian patients

\(^{3}\) Canadian Blood Services. Supply of human allograft tissue in Canada: Final report 2010
must be imported (usually from the US). In order to ensure that the Canadian supply of all types of tissue meets our demand it is estimated that tissue donor activity must, at a minimum, double and ocular-only donation activity must increase significantly.

Donation potential is estimated at 44% of all deaths within acute care (hospital) environments, with conservative estimates of 4,000 tissue donors and 9,000 ocular donors when typical donation exclusion criteria are applied. There were 335 organ donors (excluding Quebec) within the acute care environment in 2008, and of this group 135 were also identified as tissue donors (40%). However, in international jurisdictions such as Spain greater than 90% of organ donors are also tissue donors. The gap between potential and realized tissue donors within the acute care environment in Canada has been attributed to a primary hospital focus on organ donation, while tissue donation remains secondary, and to a lack of capacity to recover donated tissue.

Opportunities to support professional education strategies to increase organ and tissue donation within acute care environments include developing a full day donation training session for Intensive Care Unit (ICU) fellows from across Canada. Canadian Blood Services is partnering with the Critical Care Education Network of the Royal College of Physicians and Surgeons of Canada and the Canadian Critical Care Society to deliver a simulative donation education session as a component of the annual ICU Fellows Acute Critical Events Simulation Workshop being held in 2012.

Accreditation Canada recently incorporated organ and tissue donation requirements into hospital standards. Critical care donation performance metrics will be piloted in 2012 in several hospitals across the country. The initial tissue donation metric piloted will be the proportion of utilized NDD (neurological determination of death) and DCD (donation after circulatory death) organ donors who also donate tissue(s), expressed as a percentage. The development of these organ and tissue donation standards has been an ongoing collaboration between Accreditation Canada and Canadian Blood Services.

Unexpected deaths outside of the acute care environment represent significant potential for tissue donation; it is estimated that 50% of all deaths occurring outside the acute care environment are potential tissue donors. Medical examiners and coroners are responsible for the investigation of unexpected deaths and can serve a major role in facilitating referrals for tissue donation. In 2006, the National Association of Medical Examiners (U.S.A.) endorsed a position paper on donation which estimated that as many as 70% of potential donors may fall under medical examiner jurisdiction and “encourages the approval of organ and/or tissue procurement in virtually all cases, including cases of known or suspected child abuse or Sudden Infant Death Syndrome. With rare exceptions the procurement of organs and tissues can occur

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without jeopardizing the medical examiners medical legal responsibilities\textsuperscript{12}. The Canadian Conference of Chief Coroners and Chief Medical Examiners also endorses donation and draft guidelines for coroners and examiners will be presented and discussed at the workshop.

Within the current Canadian system only a small percentage of donor referrals originate in medical examiners and coroners offices. In the US, 12 percent of all multi-tissue donor recoveries occur in medical examiner facilities. During Canadian Blood Services consultations with a number of United States based organizations which have developed successful collaborations with medical examiner and coroners’ communities, several common features were identified:

- A distinct medical examiner and coroner leading practice strategy;
- Clearly detailed roles and responsibilities;
- A distinct paediatric donor strategy;
- A distinct funeral professional strategy;
- Dedicated liaisons between procurement organizations and medical examiner, coroner, pathologist and funeral professional communities to support relationship development and leading donation practices; and
- Educational initiatives for pathologists to support leading practices and ensure prompt communication of autopsy and pathology reports.

In 2010, Canadian Blood Services began discussions with the Canadian Conference of Chief Medical Examiners and Chief Coroners to advance leading donation practices. Two of the Conference’s members have acted as liaisons with Canadian Blood Services in support of donation initiatives including the development of donation guidelines for the Canadian medical examiner and coroner communities. Other key stakeholders have been engaged to support donation. The Canadian Association of Forensic Pathologists is receptive to the advancement of leading donation practices and forensic pathologists are expected to be key participants in future donation workshops. Additionally, the Funeral Services Association of Canada has indicated support for the advancement of leading donation practices and will be collaborating with Canadian Blood Services in the development of an online donation education (Continuing Education Unit (CEU) eligible) module targeted to their membership.

\textsuperscript{12} National Association of Medical Directors. Position paper on the Medical Examiner release of organs and tissues for transplantation. February 21, 2006.