

Introduction, history and future directions of organ and tissue donation and transplantation

One Life...Many Gifts is a curriculum resource to educate senior secondary school students about the vital importance of organ and tissue donation and transplantation. It brings to life the drama, generosity and the life-saving promise of donation and transplantation.

In June 2011, Ontarians started registering as organ and tissue donors online at

Previously, in Ontario, you could only register in person at a Service Ontario centre or by, completing and mailing a Gift of Life Consent Form. These are still valid methods of registration, but online registration is a game changer – it is the easiest and fastest way to register consent, taking just two minutes, in a secure online environment.

By logging on to beadonor.ca you are not only able to register, but you can also check your current status as an organ and tissue donor – and all you need is your Ontario health card number. Many Ontarians believe that signing a donor card means they are registered. They are mistaken. The donor card pre-dates Ontario's online registry, so you must register online at beadonor.ca. The age of consent is 16.

1 organ donor can save up to 8 lives

The Gift of 8 Movement, an extension of www.beadonor.ca, is a new way for individuals and organizations to encourage their friends, family and colleagues to register their consent to organ and tissue donation using a customized page that can be shared via Facebook, Twitter, LinkedIn and email.

Gift of 8 pages can be created in 15 minutes and are useful for sharing information about your personal connection or passion about organ and tissue donation. Sharing these pages helps to spread awareness and encourages people to make their own decisions about registration. Detailed donor registration data for communities all across Ontario is also available on the Gift of 8 homepage.

While Ontario's overall donor registration rate is 22%, registration rates in individual communities vary widely across the province – from under 10% to 50%. You can draw on this information to encourage your community to register consent to donate organs and tissue and help save more lives. Quarterly updates through the Gift of 8 scoreboard are provided to show how many new donor registrations have been recorded across Ontario and within each community. The scoreboard also shows, in real time, how many visits to the online registration site have been driven through www.beadonor.ca.

To join the Gift of 8 Movement, you are encouraged to visit www.beadonor.ca and click "Join the Movement" to set up a page, for yourself or your organization.

The easy-to-follow instructions will walk you through the process.

As part of our high schools outreach, TGLN has created a dedicated high schools page (beadonor.ca/highschools) and students are encouraged to use this Gift of 8 page to register and encourage their, friends and families to do the same. The scoreboard tracks visits to the registry by high school students in Ontario.

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- g) Write a Poem, Reflection or Scene
- h) Research and Read Aloud

Illustration © Eili-Kaija Kuusniemi/www.i2iart.com

A future is yours to give.

There is a crisis in Ontario,

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At this very moment, the sad reality is that many die before a matching organ becomes available.

The organ donation rate in Ontario is only less than half of what it should be. That means that people who could live – if they had a new heart, lung, liver, kidney, pancreas or small bowel – sit on a waiting list, hoping for a donor. That wait is often in vain.

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Every day, Ontario families experiencing heartbreaking tragedy are asked about donating the organs and tissues of their loved ones who have just died. There is no greater loss than the death of a husband, a mother, a child or other close relative. It takes great courage to reach out and help someone else when you are in deep distress yourself.

The valour and grace that are unspoken attributes of donor families are worthy of our deepest admiration. However, sometimes families choose not to donate. It may be because they don't understand the process, because they had never discussed donation, or because they did not know the wishes of their loved one.

The development of this curriculum resource – One Life...Many Gifts – has been co-sponsored by the Trillium Gift of Life Network, the Multi- Organ Transplant Program at London Health Sciences Centre, The Kidney Foundation of Canada and the provincial Ministry of Education and Ministry of Health and Long-Term Care.

One Life...Many Gifts dispels the myths that may prevent someone from considering donation, increases knowledge and understanding about donation and the success of transplantation and encourages family members to discuss this important topic and communicate their wishes to one another. Students are educated; so are their parents, siblings and friends. The experiences of living donors, donor families and transplant recipients highlighted in this curriculum resource will deepen understanding of the importance of organ and tissue donation and will assist students in making informed decisions at a crucial time in their lives, when they are reaching the legal age of consent and are making decisions about their personal wishes.

Teams of health-care professionals are ready to respond and to save more lives through transplanting more organs and tissue. Thanks to our universal health-care system, no appropriate patient is turned down for lack of money. We all need to know that within us, there is a future that is ours to give. Minutes of our time can result in 30, 40 or even 50 additional years of living for a transplant

recipient. Discussions with our families about donation wishes should be happening in every home in Ontario. By bringing to life the drama, generosity and the life-saving promise of donation and transplantation, One Life...Many Gifts can help you make a real difference in society.

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goals of one life...
many gifts

This collection of booklets is a cross-curricular resource for senior high-school students. The curriculum is designed to be used in seven subject areas – the Arts, English, Health and Physical Education, Science, Guidance and Career Education, Social Sciences and Humanities, and Canadian and World Studies. Teachers and students can use various parts of the curriculum depending on the students' interest and the course content.

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The One Life...Many Gifts curriculum aims to achieve the following goals:

- Heighten awareness, knowledge and empathic understanding of organ and tissue donation and transplantation.
- Provide information about organ and tissue donation so that students understand the impact they can have, registering to donate and talking with their families about their donation wishes.
- Inform students of how to become a potential donor and how to make their donation wishes known.
- Present accurate information to correct misunderstandings and myths about organ and tissue donation and transplantation.
- List and describe the organs and tissues that can be transplanted, and increase the understanding of lifestyle choices that support healthy organs and minimize the need for future organ and tissue transplants.
- Encourage students to make decisions when there are competing interests, by weighing medical, legal, ethical, and societal factors.
- Help students learn about career options in related fields.
- Develop communication and leadership skills and increase understanding of students' roles as citizens in a democratic society.
- Increase critical and emotional literacy competencies, and enhance the capacity to work independently and collaboratively in small and large groups, both in the school and in the community.
- Generate the desire and increase the capacity among students to respond as empathic, emotionally and intellectually literate, adaptable and productive members of various communities – familial, civic and national.

This questionnaire can be used at the beginning of the unit of study to identify areas where the students may have misconceptions about organ and tissue donation and transplantation and to provide information that may be new to them. After filling in the questionnaire individually, students can discuss the questions and answers in small groups. Then they can report back to the whole class about what each group learned through the discussion.

The students can take their questionnaire home and have their parents, siblings and friends fill it in and discuss the answers. In the Resource Guide, you will find an abbreviated questionnaire which might be useful for families who have limited free time.

Teachers may wish to have the students complete the questionnaire again at the end of the unit of study to consolidate learnings and assess increased understanding about organ and tissue donation and transplantation.

1. Approximately how many Canadians are on waiting lists for organ transplants?
- 500 - 1,000 - 4,000 - over 10,000
2. Of all Canadians who die in hospital each year, what percentage are potential organ donors?
- 1-2% - 15-20% - 30-40% - more than 50%
3. To be an organ donor, a person must be:
- older than 16 - younger than 65 - 16 to 65 years - no age limit
4. What percentage of the adults in Ontario registered to be a donor?
- less than 10% - about 20% - about 50% - more than 80%
5. Organs that can be successfully transplanted include... (check all that apply):
- the heart - the kidneys - the brain - the liver - the lungs
6. Organ transplants first became routinely successful during:
- World War I - World War II - the 1980s - the last 5 years
7. Which organ was the first to be successfully transplanted?
- heart - kidney - liver - lung - pancreas
8. A person on a transplant waiting list has a greater likelihood of receiving a transplant if that person... (check all that apply):
- has a university education
- is employed
- has worked in the health-care field

- is sicker than most of the others waiting
- is female

9. To get on a transplant waiting list, an individual must:

- have financial means to pay for the transplant
- live close to a transplant centre
- demonstrate an ability to comply with medical advice
- have never smoked cigarettes or drunk alcohol

10. Do you agree with this statement? People should not be eligible for a transplant

if they have not already signed a donor card or registered with OHIP indicating their willingness to help others if they could.

- yes - no

11. If someone dies at the scene of a car accident, can he or she donate his or her organs for transplant?

- yes -no

12. If a person donates organs after death, the family incurs additional burial expenses.

- true -false

13.To register consent to be an organ donor the person who signs must be over the age of 16 years.

- true -false

14. A person who registers at an OHIP office can direct that his or her organs only go to someone he or she specified.

- true - false

15. Is it legal in Canada for a patient on dialysis who needs a transplant to purchase a kidney over the Internet?

- yes - no

16. Do many religions oppose organ and tissue donation?

- yes - no

17. Can a person in a coma ever "wake up"?

- yes - no - don't know

18. Can a person who is brain dead ever "wake up"?

- yes - no - don't know

19. Is a person in a coma considered brain dead?

- yes - no - don't know

20. A living donor can donate a kidney to a person on dialysis only if the recipient...

(check all that apply):

- is a blood relative
- weighs more than the donor
- can pay the donor for lost time from work 0 has been on dialysis for more than 4 years 0 none of the above

21. A living donor in Ontario who donates a kidney or part of his or her liver can receive some reimbursement from the provincial government for personal costs incurred as a result of the donation (e.g., expenses for travel to the transplant centre).

- true - false

22. Have you registered at an OHIP office?

- yes - no - don't have one

23. Would you register at an OHIP office?

- yes - no

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24. If you answered YES to either of the above, indicate how important the following factors were in your decision:

Low importance (1)

High importance (5)

Desire to benefit society

1

2

3

4

5

Chance to save an individual's life

1

2

3

4

5

Past positive experience with the medical profession

1

2

3

4

5

Personal experience with donation or transplantation (family member or close friend)

1

2

3

4

5

Media exposure to donation or transplantation

1

2

3

4

5

My religion supports organ donation

1

2

3

4

5

My family supports organ donation

1

2

3

4

5

Other (please explain):

25. If you answered NO to either of the above, indicate how important the following factors were in your decision:

Low importance (1)

High importance (5)

Financial costs to society (health-care system)

1

2

3

4

5

Not a fair system in place to allocate the organs

1

2

3

4

5

Past negative experience with the medical profession

1

2

3

4

5

Some people on the waiting list are undeserving

1

2

3

4

5

My religion doesn't support donation

1
2
3
4
5

My family doesn't support donation

1
2
3
4
5

Personal experience with donation or transplantation (family member or close friend)

1
2
3
4
5

Doctors will not do everything to save my life

1
2
3
4
5

My body will be mutilated

1
2
3
4
5

My family will experience unnecessary trauma

1
2
3
4
5

My funeral will be delayed

1
2
3
4
5

Other (please explain):

26. Have you discussed organ donation with your family?

- yes - no

27. If you have discussed donation with your family, does your family support your wishes concerning donation?

- yes - no

28. When you die, who makes the final decision whether your organs will or will not be donated?

- you yourself, having registered through OHIP

- next of kin (usually your parents)

STUDENT QUESTIONNAIRE ANSWERS

1. Approximately how many Canadians are on waiting lists for organ transplants?

- 500 - 1,000 - 4,000 - over 10,000

Currently, more than 4,000 Canadians are waiting for an organ transplant. Thousands more are waiting for a tissue transplant. The success of transplantation has resulted in many more patients being referred to transplant programs.

2. Of all Canadians who die in hospital each year, what percentage are potential organ donors?

- 1-2% - 15-20% - 30-40% - more than 50%

Only people who die in a hospital and on a ventilator can become organ donors. This is necessary so that the organs are in the best possible condition and the transplant is more likely to succeed. If someone dies at home or in the community, tissues (for example, eyes) can be donated, but not organs.

3. To be an organ donor, a person must be:

- older than 16 - younger than 65 - 16 to 65 years - no age limit

There are no strict age limits. The youngest donor was a newborn and the oldest organ donor was 92 years old and the oldest tissue donor was 102. As age increases, some organs or tissue may not be suitable for transplant because the process of aging may be associated with disease. Ultimately, the ability to be an organ and tissue donor depends on several factors, including the health of the person at the time of death.

4. What percentage of the adults in Ontario registered to be a donor?

- less than 10% - about 20% - about 50% more than 80%

Fewer than 1/4 Ontarians have registered

5. Organs that can be successfully transplanted include... (check all that apply):

- the heart - the kidneys - the brain - the liver - the lungs

All these organs, except the brain, are routinely transplanted. The small bowel and pancreas can also be donated for transplant.

6. Organ transplants first became routinely successful during:

- World War I - World War II - the 1980s - the last 5 years

With the discovery of a new anti-rejection drug, cyclosporine, in the late 1970s, transplant success rates soared in the 1980s when the drug became widely used.

7. Which organ was the first to be successfully transplanted?

- heart - kidney - liver - lung - pancreas

The kidney was the first successfully transplanted organ in 1954, when a young man donated one of his kidneys to his identical twin brother. No anti-rejection drugs were needed because of the genetic identity between the twins.

8. A person on a transplant waiting list has a greater likelihood of receiving a transplant if that person... (check all that apply): 0 has a university education

- is employed
- has worked in the health-care field
- is sicker than most of the others waiting
- is female

Various factors are considered when selecting the most suitable recipient from a long list for a donated organ. They include donor- recipient matching, length of time waiting and severity of illness. Factors such as gender, employment and education are not used as criteria for recipient selection.

9. To get on a transplant waiting list, an individual must:

- have financial means to pay for the transplant
- live close to a transplant centre
- demonstrate an ability to comply with medical advice
- have never smoked cigarettes or drunk alcohol

Because transplant organs are a "limited resource" transplant specialists want to ensure that each patient is motivated to lead a healthy lifestyle after transplant, without jeopardizing the transplant. Patients need to demonstrate that they can follow medical advice, such as having regular checkups, taking medication and generally leading an active, healthy life.

10. Do you agree with this statement? People should not be eligible for a transplant if they have not already registered with OHIP indicating their willingness to help others if they could.

- yes - no

Although some people might feel this viewpoint is appropriate, no requirement exists that would make a person ineligible for a transplant unless he or she had previously registered their intentions through OHIP.

11. If someone dies at the scene of a car accident, can he or she donate his or her organs for transplant?

- yes - no

If someone dies at home or in the community, he or she may be able to donate his or her tissues, but not organs. In order for organs to be viable for transplant, they must be continually perfused with blood and oxygen up to the time they are removed from the donor. A donor must die while in a hospital and on a ventilator. The ventilator artificially maintains vital organs after a patient has died.

12. If a person donates organs after death, the family incurs additional burial expenses.

- true - false

Families should not incur any costs associated with the donation process. Donation does not interfere with funeral practices, and an open casket is possible if the family wishes.

13. To register consent to be an organ donor the person who registers must be over the age of 16 years.

- true - false

According to provincial legislation, a person who has reached the age of 16 years (the age of consent) can legally register. It is important, however, that people discuss their decision with their family so the next of kin can act on their wishes at the time of death.

14. A person who registers at an OHIP office can direct that his or her organs only go to someone he or she specified.

- true - false

Donated organs and tissues are given to the most appropriate patient, based on

need, blood type, matching and other criteria. "Directed donation" is not practised in Canada. Only a living donor can designate who the recipient will be. For example, a person may decide to donate a kidney to a family member or a friend if medical tests show that the match is compatible.

15. Is it legal in Canada for a patient on dialysis who needs a transplant to purchase a kidney over the Internet?

- yes - no

No. Legislation prohibits the buying and selling of any organs for transplant or research purposes.

16. Do many religions oppose organ and tissue donation?

- yes - no

Culture and religion play a significant role in end-of-life experiences, including how people respond to illness, how grief is demonstrated, what rituals are important at death and which members of the family are present. Most major religions support organ and tissue donation as an honoured and compassionate expression of generosity and love. If you think your religion objects to donation, consult with your faith leader.

17. Can a person in a coma ever "wake up"?

- yes - no - don't know

Yes. Coma is a state of deep unconsciousness where the person does not respond to powerful stimuli. Depending on the cause of the coma, the patient may regain consciousness. For example, a drug overdose may put a person into a coma, but if the person is treated until the drug wears off, complete recovery can occur.

18. Can a person who is brain dead ever "wake up"?

- yes - no - don't know

No. A person who is brain dead has no blood flowing through the brain. Brain function has been destroyed and there is no chance of regaining consciousness.

19. Is a person in a coma considered brain dead?

- yes - no - don't know

No. Coma and brain death (also known as neurological death) are completely separate and different diagnoses. A patient in a coma or in a persistent vegetative state continues to have some brain activity and would not be misdiagnosed or treated as neurologically dead.

20. A living donor can donate a kidney to a person on dialysis only if the recipient... (check all that apply):

- is a blood relative

- weighs more than the donor

- can pay the donor for lost time from work 0 has been on dialysis for more than 4 years 0 none of the above

A living donor has medical testing done to ensure that the donated kidney will "match" the recipient (blood and tissue match). The recipient need not be genetically related for a satisfactory match. Altruism is the basis for the donation and no money is exchanged.

21. A living donor in Ontario who donates a kidney or part of his or her liver can receive some reimbursement from the provincial government for personal costs incurred as a result of the donation (e.g., expenses for travel to the transplant centre).

- true - false

The Ontario government offers some reimbursement to living donors to help offset some of the financial costs of donating, such as time away from work, travel and

temporary accommodation near the transplant centre.

23. Would you register at an OHIP office?

- yes - no

Registration forms are available to download at www.giftoflife.on.ca If you decide to register and tell your family of your wishes, you may be able to save the lives of several people when you die.

26. Have you discussed organ donation with your family?

- yes - no

Surveys show that only approximately 60% of individuals have discussed the subject with their next of kin, even if they have registered.

If you have decided and documented your decision to become a donor, the most important next step is talking to your family about your wishes.

27. If you have discussed donation with your family, does your family support your wishes concerning donation?

- yes - no

Even if there is registration through OHIP, health-care providers still seek consent from the next of kin before organs or tissues are removed for transplant.

28. When you die, who makes the final decision whether your organs will or will not be donated?

- you yourself, having registered through OHIP

- next of kin (usually your parents)

Even if you have registered as a donor, it is important that your family know about your decision. Hospital staff will talk with the next of kin of potential donors about their feelings regarding donation and what their loved one would have wanted. Out of respect for grieving families, they are asked to provide the final consent, even if their loved one registered through OHIP.

Transplantation: WHERE WE'VE BEEN,
WHERE WE'RE GOING

Photo by K. Stuart. London Health Sciences Centre.

Dr. Bill Wall has been a transplant surgeon for more than 30 years. Dr. Wall's answers to the following important questions will help you understand what has been achieved in the field of transplantation and what is hoped for in order to save even more lives.

When were the first transplants done?

Concerted efforts at organ transplantation began in the 1950s. At that time, patients were dying from kidney failure, and newly developed dialysis machines were not

very efficient nor were they widely available. Kidney failure for many patients was a death sentence. Surgeons knew the solution – transplant a healthy kidney from someone into the sick patient. The concept was simple, but the body's immune system

quickly recognized the transplanted organs as foreign and rejected them. Exactly how the immune system was triggered by the transplanted organ was poorly understood, and how to prevent the rejection was even less understood.

In 1954, doctors at Peter Brigham Hospital in Boston were presented with a unique situation. Identical twin brothers, one in kidney failure, sought treatment. The surgeons theorized that because the twins had identical immune systems, no rejection would occur if a kidney from the healthy twin was transplanted into his brother. They were right – the transplant was a success. The brothers became famous, and the surgeon who led the team, Dr. Joseph Murray, would later receive the Nobel Prize for his contributions to transplantation. This single experience encouraged the pioneers to persist with their efforts to overcome the problem of rejection when transplants were performed between non-related individuals.

During the next 20 years, little progress was made, however. Very few kidney transplants worked. There were attempts to transplant the liver and the heart in the 1960s and 1970s, but they almost all failed. Transplantation seemed an unachievable goal. The limited drugs that were available to prevent rejection were only moderately effective, and they had many negative side effects, including death from infection. Successes were so rare that many centres that had attempted transplants discontinued their efforts.

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What changed to make transplant successful?

The early researchers and doctors kept trying. They studied rejection in the laboratory, and at the same time, refined the surgical techniques that were important to perfecting the operations. But, everything changed dramatically in the late 1970s when a new drug – cyclosporine – was discovered. It worked differently on the immune system from other drugs and it proved extremely effective in controlling rejection. Cyclosporine was a quantum leap for transplantation. The results of kidney transplants dramatically improved and transplants of other organs that had been abandoned because of poor results became routinely successful. A proliferation of transplant centres and an explosion of transplant activity occurred worldwide. Patients facing death from organ failure were restored to good health and productive lives. The discovery ushered in a new era in transplantation. Additional drugs were discovered in the 1980s and 1990s that further improved success rates, which reached 80 to 90 percent for most transplants. Today, transplant specialists have the luxury of using various drugs in different combinations, thereby maximizing their effectiveness and minimizing side effects. Transplantation is now expanding into areas that were only dreamed of years ago. It is now possible to transplant a hand or an arm for someone who has lost an extremity from a traumatic accident. Partial face transplants have also been performed for patients with large facial defects from trauma or burns. These operations are called composite transplants because they include several different tissues

- skin, fat, muscle, tendon, nerves and bone.

What is the biggest problem facing transplantation today?

Transplantation is without question one of the greatest achievements of modern medicine. The benefits to patients have been enormous. Patients facing certain death have their lives saved and transformed. However, the tragic irony today is that there has never been a worse time to be on a transplant waiting list. More people are waiting than ever before, they are waiting for a longer time, and their chances of dying while waiting have never been so high. Their needs are not being met because of the lack of donated organs. Each year, more patients are referred for transplantation, yet the number of donors has not increased. More than 4,000 Canadians are waiting for an organ transplant, and thousands more need a tissue transplant. It is a shame that each year between 200 and 300 Canadians die because there are not enough donated organs.

Regrettably, transplant specialists have to restrict the number of patients who are accepted on waiting lists. Even if someone makes it onto the list, there is no guarantee that an organ will arrive in time. Patients on kidney dialysis machines wait for several years to get a kidney transplant, if they get one at all. Patients waiting for a new heart or liver have a one in four or one in five chance of dying while waiting because no organ is available. Some potential recipients are taken off the list because they become too ill to undergo the surgery.

What are some solutions to the organ shortage?

Innovative surgical techniques have helped address the organ shortage and deaths on the waiting list. Small children require small organs, and paediatric donors are rare. Surgeons have developed a split-liver technique, whereby a small piece of an adult liver can be used for a small child. The remainder of the liver, the largest part, can be used in a suitably sized adult. Unfortunately, that is not possible for a three-year-old child who needs a heart transplant. A donor of similar age and body size is needed.

Increasingly, living donors have become a source of organs in an attempt to address the need. Almost everyone has two healthy kidneys, and one can be donated because only one kidney is necessary to sustain the life of a person. Similar to living kidney donation, a person can donate a portion of his or her liver for transplant into a recipient. Most often, it is a parent-to-child transplant, but the same technique can be used between two size-matched adults. The living donor's remaining liver segment will regenerate into a whole organ, and the donated liver segment will grow along with the recipient.

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HOWEVER, THE TRAGIC IRONY TODAY IS THAT THERE HAS NEVER BEEN A WORSE TIME TO BE ON A TRANSPLANT WAITING LIST.

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What research can help solve the shortage?

Much research is currently aimed at finding a solution to the critical need for organs – specifically, stem cells, organs from animals (xenotransplantation) and artificial organs. There has been a great deal of work on identifying and growing stem cells. Under the right conditions, they can develop into various cell types, for example, muscle cells, liver cells and pancreas insulin-producing cells. Imagine that stem cells could be injected into the muscle of a failing heart, restore muscle function and strengthen the heart to the point that heart transplantation would not be required at all. Similarly, the development of insulin-producing cells from stem cells could be used to treat diabetes. The concept is extremely exciting, but how the stem cells are controlled and regulated once in the body is not yet known.

Researchers are looking at using animal organs and tissue as one way to help solve the organ shortage. Researchers are focusing on the use of pig organs. The major challenge is overcoming the immunological barrier when transplants are performed between widely divergent species, such as pig to human. It may be solved by altering specific genes in pigs so that their organs are less likely to be rejected by humans. Some success has been demonstrated in laboratory experiments, but clinical application is not yet possible. Imagine if it was possible, however, to give diabetic patients pancreas or islet cell transplants from pigs. It would be the cure for diabetes.

Because there are not enough donated organs, researchers are trying to develop artificial organs, building on the concept of dialysis machines that support patients with kidney failure. For patients with damaged hearts, a mechanical ventricular assist device (VAD) may be inserted to take over the pumping action of the failing heart. The VAD can act as a bridge to transplantation, supporting the diseased heart until a donated organ becomes available. Ideally, a totally implantable and permanent artificial heart will be an alternative to transplantation, but it has not been perfected in spite of intense research efforts. All of these technologies and advances are hopes for the future. Today, the reality is that patients are dying on waiting lists because there are not enough donated organs.

How does Canada compare to other countries?

Although we are proud of our health-care system, our organ donation rate lags well behind other countries. A measure of the health of a nation and the compassion of its citizens is the number of transplants that are performed and the number of organs that are donated. Many European countries and the United States report donation rates ranging from 23 – 30 donors per million, about twice as many as Canada. The graph left reflects these widely discrepant organ donation rates and Canada's mediocre standing compared to other countries. Some countries have presumed consent, which assumes that a person wants to donate organs after death unless that person had specifically indicated that he or she did not wish to donate. This has been considered in Canada, but public surveys have indicated the reluctance of our society to accept this kind of legislation.

Transplantation is the only branch of medicine and surgery that depends entirely on a compassionate and altruistic society, one in which Canadians are prepared to

donate organs and tissues to help their fellow citizens. We would find it unthinkable that Canadians suffering from arthritis were denied joint replacement because there were not enough metal joints to meet the need. That would be unacceptable. Yet, that is the sad reality faced by patients with organ failure.

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Each donor can potentially give eight organs to help others, including the heart, both kidneys, liver, two lungs, pancreas and small bowel.

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What can one person do?

Each person who wants to save or improve lives through organ and tissue donation can benefit many other individuals. Each donor can potentially give eight organs to help others, including the heart, both kidneys, liver, two lungs, pancreas and small bowel. Several kinds of tissue can also be donated for transplant – bone, cornea, heart valves, islet cells and skin.

The decision to donate organs and tissues after death is a very personal one. Organ donation has been neglected in our society, and people are dying. Education is vital so that young Canadians learn about the benefits of transplantation, the importance of making their own decision, and then the importance of discussing their decision with their families. Lives will be saved as a result.

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BREAKTHROUGHS & ACCOMPLISHMENTS IN TRANSPLANTATION

1958

First successful kidney transplant from a living donor in Canada (Montreal, Quebec). Discovery of HLA genetic marker for tissue matching of donors and recipients.

1954

First successful kidney transplant in the world performed between identical twins

(Boston, USA).

1967

First heart transplant in the world (Cape Town, South Africa).

1955

World's first heart valve transplant.

The main aortic valve was removed from a 20-year-old accident victim and transplanted into a young man dying from heart failure (Toronto General Hospital, Toronto).

1963

First liver transplant in the world

(Denver, USA). First kidney transplants using deceased donors in Canada (Montreal, Quebec; London, Ontario; and Saskatoon, Saskatchewan).

1968

First heart transplant in Canada (Montreal)

1977

Cyclosporine is used for the first time in patients (Cambridge, England).

1983

World's first successful single lung transplant (Toronto General Hospital, Toronto). Canada's first heart-lung transplant (University Hospital, London Health Sciences Centre, London).

1970

First liver transplant in Canada (Montreal).

1979

Cyclosporine first used in transplant patients in Canada (University Hospital, London Health Sciences Centre, London).

1986

World's first double lung transplant (Toronto General Hospital, Toronto). Canada's first use of the Jarvik 7 mechanical heart as a bridge to transplant – this is only the 11th time it has been used in the world (Ottawa Heart Institute, Ottawa).

1989

Canada's first Artificial Heart Program is launched to develop a new implantable heart assist pump (Ottawa Heart Institute, Ottawa). A heart transplant is performed on an 11-day-old infant, the youngest recipient in Canada (Ottawa Heart Institute, Ottawa).

1995

Pig liver tissue is used as a "bridge" to transplant until a human liver is donated (Montreal, Quebec).

1988

World's first successful combined liver and bowel transplant (University Hospital, London Health Sciences Centre, London).

1993

Canada's first liver transplant using a living donor (mother- to-child) in Canada (Children's Hospital, London Health Sciences Centre, London).

1996

An infant heart transplant, using a blood group incompatible organ. The transplant was successful because the infant's immature immune system did not reject the organ (Hospital for Sick Children, Toronto).

1999

Canada's first double lung transplant using living donors (two people each donated part of a lung to the recipient) (Winnipeg).

1997

World's youngest multi-organ recipient: Read Sarah Marshall's story in her booklet (Children's Hospital, London Health Sciences Centre, London).

2000

Canada's first living donor liver transplant between adults (University Hospital, London Health Sciences Centre, London). The islet transplantation team at University of Alberta Hospital makes international news with the release of "the Edmonton Protocol," for treatment of type I diabetes (Edmonton).

2004

For the first time in Canada, a man receives a kidney from someone who found out about his need via the Internet (Toronto General Hospital, Toronto).

2005

A 38-year-old woman receives a partial face transplant, including nose, lips and chin (Amiens, France). First "paired exchange" takes place in Canada. Two living donors and their recipients who do not match trade donors so that each recipient gets a compatible kidney transplant (St. Michael's Hospital and Toronto General Hospital, Toronto).

2006

The Therien family donates their daughter's organs following declaration of cardiac death: Read the Theriens' story in the Donor Family Stories booklet (Ottawa Hospital, Ottawa).

2007

North American first: a Novalung, an external artificial lung, is used to keep a patient alive until a set of donor lungs became available for transplantation (Toronto General Hospital, Toronto).

For further information about Ontario's transplant programs, you can visit their websites:

Hamilton:

St. Joseph's Healthcare www.stjosham.on.ca

Kingston:

Kingston General Hospital www.kgh.on.ca

London:

London Health Sciences Centre www.lhsc.on.ca

Children's Hospital, LHSC [www.lhsc.on.ca/About_Us/ Childrens_Hospital](http://www.lhsc.on.ca/About_Us/Childrens_Hospital)

Ottawa:

The Ottawa Hospital www.ottawahospital.on.ca

University of Ottawa Heart Institute www.ottawaheart.ca/UOHI

Toronto:

Hospital for Sick Children www.sickkids.ca

St. Michael's Hospital www.stmichaelshospital.com

University Health Network www.uhn.ca/index.htm

Coordinating organ and tissue donation

The One Life...Many Gifts curriculum examines the lives of organ and tissue recipients and the world of donor families. In order for a person to receive an organ or tissue, there must be a family who has decided to provide the gift of new life by donating their loved one's organs and/or tissue in the middle of their own grief.

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It is important to know the backstory of organ and tissue donation and allocation. Where do the organs come from? Where do they go, and why? Who receives an organ? What are the criteria?

The Trillium Gift of Life Network (TGLN), a not-for-profit provincial government agency, is dedicated to planning, promoting, coordinating and supporting organ and tissue donation across Ontario. In 2002, the Ontario government introduced legislation, the Trillium Gift of Life Network Act, with a mandate to increase significantly organ and tissue donation in Ontario. TGLN is also responsible for establishing and managing waiting lists for organs and tissue, in addition to ensuring a system of fair allocation.

TGLN operates a call centre 24 hours a day, seven days a week. Ontario hospitals contact TGLN when a patient dies. When a phone call is received, TGLN helps determine whether a potential donor is suitable for organ and/or tissue donation.

If a deceased person is potentially suitable for organ donation, TGLN contacts one of the 20 hospital-based Organ and Tissue Donation Coordinators across the province. The coordinator supports the family, screens the potential donor, assists staff within the hospital and lets the family know their options. The coordinator will obtain consent if the family wishes to proceed with organ donation. If a patient is a potential donor for tissue, and if consent is obtained, recovery teams are organized to obtain tissue and deliver it to tissue banks.

Time is of the essence. First, two physicians at the hospital need to declare a patient brain dead. Then the coordinator starts the consent process. The coordinator, in collaboration with the intensive care team, approaches the family with the option of donation. If consent is obtained, testing is required for infectious diseases. The heart is checked. Chest x-rays are taken. Organ-specific tests are conducted. All that information is sent back immediately to TGLN, and is entered into a database by staff who are on call, around the clock.

When organs are removed from a donor, there is a limited period of time in which they can be preserved outside of the body before they are transplanted. If too much time passes, the organs are no longer usable. Different organs last different amounts of time – for example, a heart needs to be transplanted within four to six hours, while kidneys can last for as long as 24 hours. This means that a lot of cooperation and coordination needs to take place to get the transported organs to the various hospitals where the recipients wait for their transplant surgeries. There is not, however, the same time pressure for tissue. Tissues, such as bones, corneas and skin, can be recovered for as long as 24 hours after a donor has died as they don't require oxygenated blood to be usable.

In the database, all the potential organ recipients are listed. Checks for matches are conducted to determine who on the waiting list is most suitable, based on blood type, size of organ, etc. Organs are generally allocated to the sickest patient who is a compatible match and has been waiting the longest. There may also be regional considerations. If a donor is in one area of the province, sometimes it makes sense to keep the organ there because time is so important.

Staff at the TGLN Provincial Resource Centre then call various transplant programs and discuss the suitability of the available organs with physicians in the transplant hospitals. As soon as a program accepts an organ, the Provincial Resource Centre starts to coordinate the recovery process. A recovery team is sent to the hospital in which the donor is located. Once the team is in place, the donor is brought to the operating room and organs are recovered. Concurrently, recipients are prepared for transplant surgery so that the least amount of time passes between retrieval of an organ and transplantation into a waiting patient.

The provincial waiting list is updated constantly. Currently, waiting list times vary depending on the type of organ needed. In some cases, such as kidneys, the wait can be as long as eight years. It is not unusual for a person who is waiting for a corneal transplant to remain on the list for three years. Many people die while they are waiting for an organ. That is why organ donation is so important.

The Cincinnati Post
November 1976

To Remember Me...
November 1976 • The Cincinnati Post
By Robert N. Test

The day will come when my body will lie upon a white sheet neatly tucked under four corners of a mattress located in a hospital busily occupied with the living and the dying.

At a certain moment, a doctor will determine that my brain has ceased to function and that, for all intents and purposes, my life has stopped.

When that happens, do not attempt to instill artificial life into my body by the use of a machine.

And don't call this my death bed. Let it be called the Bed of Life, and let my body be taken from it to help others lead fuller lives.

Give my sight to the man who has never seen a sunrise, a baby's face or love in the eyes of a woman.

Give my heart to a person whose own heart has caused nothing but endless days of pain.

Give my blood to the teenager who was pulled from the wreckage of his car so that he might live to see his grandchildren play.

Give my kidneys to one who depends on a machine to exist from week to week.

Take my bones, every muscle, every fiber and nerve in my body and find a way to make a crippled child walk.

Explore every corner of my brain. Take my cells, if necessary, and let them grow so that someday a speechless boy will shout at the crack of a bat and a deaf girl will hear the sound of rain against her window.

Burn what is left of me and scatter the ashes to the winds to help the flowers grow.

If you must bury something, let it be my faults, my weakness and all prejudice against my fellow man...

If, by chance, you wish to remember me, do it with a kind deed or word to someone who loves you.

If you do all I have asked, I will live forever.

OVER TO YOU...

After reading this introductory section and watching the DVD, you should have a good understanding of how the donation process works, some of the impressive innovations in the field and how successful transplantation is today.

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To extend your understanding of organ and tissue donation and transplantation, undertake one of the following activities:

Research Radio Assignment

Research one aspect of organ or tissue transplantation – locate books and check online for more complete summaries of recent or historical developments. Work in a group of three or four. Choose an area in organ or tissue donation and transplantation that most interests you. For example, at burn centres in Ontario, there is a major effort to assist patients who have experienced massive burns on their faces and other parts of their body. You may want to explore the ways in which skin donation has developed for fire survivors and burn victims. Together, write and tape record a five-minute radio program to give students within your class or other senior classes the benefit of your investigations. Given the speed with which innovations emerge, discussion of these important topics will help you develop a personal response when breakthroughs are discussed publicly.

View DVD/Prepare Questions

After viewing the One Life...Many Gifts DVD, discuss with a partner five ideas or facts that struck you as the most interesting. Prepare a list of questions you would like to explore more fully. Many of these questions will be answered by the end of this unit. Return to your list of questions at the end of the unit to see if they have all been answered.

Read, Discuss and Write a Newspaper Report

Take a look at some of the firsts in the world in “Breakthroughs and Accomplishments in Transplantation” in this booklet. Count the number of times over the last 50 years that Canadian doctors, working in Canadian hospitals, have been cited. Did you know we had so many firsts, not just in Canada but also around the world? With a partner, discuss the one that most impresses you. Write a newspaper report of the “first” that impressed you the most. Don’t forget to include a headline. You may wish to work with your teacher to see how you can get your report printed in a community newspaper or school board newsletter.

Oral Presentation

Choose any of the organ or multi-organ transplants that appear in “Breakthroughs and Accomplishments in Transplantation” in this booklet. Consult with one or two of

the resource books on the human body in your classroom, in the local library or online. Working in groups of four, prepare a short oral presentation for the class in which you show pictures of the organ you chose, discuss the many functions that it performs, and explain what the implications would be for a person's health if that organ was failing.

OVER TO YOU...

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Create a Persuasive Public Service Announcement

One of the big problems we face as Canadians is that we do not have enough donors to meet the demand. Team up with a partner and construct a public service announcement (PSA) that would convince a potential organ and tissue donor – someone who is 16 or older – to become involved personally. This is a serious challenge: how can you assist someone who knows nothing about organ and tissue donation to move from a position of ignorance, through understanding, and on to participation? Remember, we are looking for action, in addition to an understanding of the benefits of organ and tissue donation and transplantation. You may use print, video, posters, billboards, 60-second public service announcements or graffiti as a vehicle for your ad. Once you have completed this assignment, think of places in your school or community to display your work to encourage a better understanding of organ and tissue donation. You may want to consider local libraries, radio stations, community newspapers, places of worship and community centres.

Develop a Survey

In Ontario, every three days a patient on a waiting list for a donated organ will die before an appropriate organ becomes available for transplant. As a citizen of Canada, do you think we have an obligation to sign a donor card or register as a donor in case there is a circumstance when you could give an organ to another person? Create a short survey you can give to friends, family and community members. Fundamentally, the questions you will need to ask on your survey deal with these issues: Am I my brother's (or sister's) keeper? Do we have obligations that extend beyond looking after our immediate family and ourselves? To what extent should we also feel an obligation to other citizens in Canada? If we do have obligations, what are they, and how much impact should they have on our lives? These questions, and others that you think are important, can become the basis of your survey. Responses from other people will help you sharpen your own thinking. Speak to at least ten people of different ages outside of your class. Family members are likely to have strong opinions. Even stopping people in a mall or on the street to ask the questions you have chosen is a good idea. Your survey should have at least five questions. Be sure to include a chance for people to give their opinion in more than "Yes/No" answers. You may wish to refer to the Myths and Misperceptions Quiz in the Resource Guide booklet for ideas. You may conduct the short survey by yourself, or team up with one or two classmates. When you have finished, come back to class, report on your findings and present your own opinion.

Write a Poem, Reflection or Scene

Included in this booklet is the poem *To Remember Me...*, by Robert N. Test. Read his poem and complete one of the following activities:

- i) Choose one stanza of the poem and use it as a starting point to write a poem, comment or dramatic scene from the point of view of someone who has become an organ or tissue recipient.
- ii) Write a poem about how you would like to be remembered, using the same title and format as *To Remember Me...*.

Research and Read Aloud

If you are interested in learning about more personal stories, you or your teacher can order a copy of the British book and DVD *Transforming Lives*. The resource book features dozens of stories of people whose lives have been changed irrevocably by the receipt of an organ. It also features interviews with donor families, with people who struggled with their own grief and, at the same time, thought of others who could use a precious gift of life.

Select the most powerful story within the book, and read it aloud to the class. You can download the book for free at: www.legacyoflife.co.uk/thebook.html

One Life...Many Gifts is a curriculum resource to educate senior secondary school students about the vital importance of organ and tissue donation and transplantation. It brings to life the drama, generosity and the life-saving promise of donation and transplantation.

Funding for this project has been provided by the provincial Ministry of Education and the Ministry of Health and Long-Term Care. This project would not have been possible without their support or the generosity of an anonymous Ontario resident whose contribution ensures that students in the province understand the life-saving promise of organ and tissue donation and transplantation. The Steering Committee sincerely thanks all of our supporters.

The development of this curriculum has been co-sponsored and coordinated by the Trillium Gift of Life Network, the Multi-Organ Transplant Program at London Health Sciences Centre and The Kidney Foundation of Canada.

Educating secondary school students and their families about the need for organ and tissue donation and the success of transplantation was originally initiated in the London region in 2000. With funding received from The Kidney Foundation of Canada, the Multi-Organ Transplant Program at London Health Sciences Centre had the vision to develop a unit of study, *One Life...Many Gifts*, working with both the Thames Valley District School Board and the London Catholic District School Board. The

original program was used in Healthy Active Living Education, Grade 11, Open (PPL30) in Ontario's curriculum. The curriculum resource before you builds on the vision and foundation provided by this original program and the Steering Committee gratefully acknowledges the dedication and pioneering effort of all those involved in the original program.

This curriculum is dedicated to the many Ontarians who have given the gift of life through the donation of organs and tissue and to the many others who will in the future.

For more information on the One Life...Many Gifts curriculum program please contact the Director of Communications, Trillium Gift of Life Network at 1-800-263-2833 or visit: www.onelifemanygifts.ca
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Every April, during National Organ and Tissue Donation Awareness Week, supporters of donation in various communities across Ontario gather together to form a living

green ribbon, the international symbol for organ donation.