



Teacher's Reference

• Background Information about Organ Donation

◇ The need for organ donation

Although there are a lot of medical breakthroughs in recent years, many diseases are still incurable, among which organ failure is one of them. When the function of an organ has deteriorated to a stage of organ failure where normal treatment methods are no longer effective, organ transplant would be the only hope for the patients. Organ transplant does not only help them regain their lives, it will greatly improve their quality of life. Without a suitable organ, patients can only struggle with the disease and rely on medical equipment and medicine to extend their life. Some patients will even pass away very soon.

◇ Organs suitable for donation

Organs suitable for transplantation include heart, lung, liver and kidney. Some tissues can also be donated, including cornea, skin and long bone.

◇ Sources for donation

Organs donated are coming from two sources, living donation and cadaveric donation. The organs suitable for donation are different under the two sources.

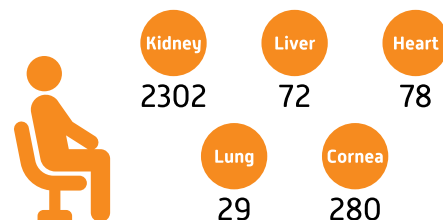
- Living Donation: Kidney and liver are suitable for living donation.
- According to the Human Organ Transplant Ordinance, living donors must be 18 years of age or above.
- The Human Organ Transplant Board was established under the Human Organ Transplant Ordinance to handle applications for living organ transplants, including cases where the donor and recipient are not blood-related, or a couple has been married for less than three years, or a blood relation which cannot be proved. The purpose is to prevent organ trading.

- Living donors have to bear the pain, the risk of complications and even death associated with the surgery. Therefore, the best way of organ donation is always cadaveric donation.
- Cadaveric Donation: Kidney, liver, heart, lung, cornea, bone and skin are suitable for cadaveric donation.
- Brain-dead patients donate their healthy organs or tissues to those with organ failure without compensation, so that the later can regain their lives. In such cases, the cadaveric donor was not subject to any risk.
- There is no strict age limit for cadaveric donation. In general, organs may be donated by someone as young as a newborn or as old as 75. As for tissue donation, the age limits are between 16 and 60 for long bones, below 80 for corneas, and 10 or above for skin.

◇ Current situation in Hong Kong

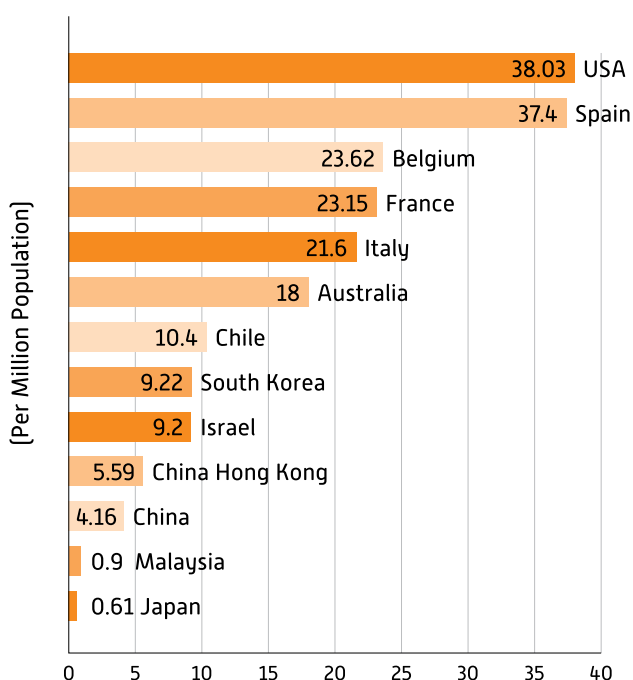
Everyday, there are more than 2,000 patients with organ failure in Hong Kong waiting desperately for organ transplants (figure below shows the waiting list for individual organ). Unfortunately, the cadaveric donation rate in Hong Kong remains low. There were only 42 deceased donors and 33 living donors in 2020. Quite a number of patients suffering from organ failure died while waiting for suitable transplants.

**No. of Patient Waiting for Transplantation
(As at 31.12.2020)**



Despite the advancement of medical technology in Hong Kong, there is a serious short of suitable organs for transplantation. According to the International Registry in Organ Donation and Transplantation, Hong Kong is one of those regions with the lowest donation rates in the world, with only 5.59 donors per million population in 2020. There is a huge gap between Hong Kong and countries with high donation rates, such as Spain where the donation rate is 37.40 donors per million population.

No. of Actual Deceased Donors Per Million Population in 2020



◇ **Current system and procedures in Hong Kong**

▪ **Opt-in system**

The opt-in system is currently adopted in Hong Kong, which means that people who wish to donate their organs after death would need to proactively register as an organ donor when alive. However, even if a deceased person has registered as an organ donor, donation can only be done with the family’s consent. Therefore, people should tell their family about their wish to donate after they have done the registration.

▪ **Registration**

The Department of Health set up the Centralised Organ Donation Register (CODR) in 2008 to facilitate voluntary registration of prospective donors. The register can record the donor’s wish reliably and securely, and enables medical personnel concerned and the donor’s family to be informed of the deceased’s wish, so that the organs can be arranged for transplant efficiently. If you wish to become an organ donor, you may register through the methods below:

1. Register at the CODR website: www.codr.gov.hk, or
2. Complete the registration form in the the organ donation leaflet, then submit by post or fax.

▪ There is no age limit for registration as an organ donor at the CODR, but it is important to inform your family of your wish.



◇ Organ Donation procedures

- “Brain death” is the medical criterion for organ donation in Hong Kong. When a patient is suspected to be brain death, the following procedures will be carried out:
 1. Two independent senior doctors who have no relationship with organ transplant matters are required to conduct two separate tests to confirm the diagnosis of brain death;
 2. Medical personnel inform an Organ Transplant Coordinator (OTC) and initiate communication with the patient’s family, providing support and counselling service;
 3. Medical team assess and maintain the functions of the deceased’s organs;
 4. Consent of the deceased’s family to donate organs is obtained;
 5. Conduct relevant checks and matches to confirm the organs’ suitability for donation;
 6. Arrange for organ/tissue harvesting and transplantation;
 7. Return the body to the ward;
 8. The OTC accompanies the donor’s family to bid the last farewell.

◇ Allocation mechanism

- Each organ has its own waiting list and scoring system. After verifying the state of illness, the patient will first register at the Centralised Organ Transplantation Register of the respective organ. The organ distribution order will then be determined by an established mechanism based on the patient’s score. Those with higher score will have higher priority. The scoring items include:
 1. Seriousness of the illness (higher score for more serious illness)
 2. Age (higher score for younger patients)
 3. Waiting time on the register (higher score for those who waited longer)
 4. Compatibility (higher score for higher compatibility)
 5. Health condition (lower score for poor general health condition)
 6. Comorbidity (lower score for those with complication of diseases)

◇ Common misconceptions

- The public have some misconceptions on organ donation due to a lack of understanding. For example:

1. There is an age limit for organ donation. We may be too old to donate organs.
 - ▲ There is no strict age limit for cadaveric donation. In general, everyone below the age of 75 are suitable organ donors, including newborn babies. As for tissue donation, the age limits are between 16 and 60 for long bones, below 80 for corneas, and 10 or above for skin.
 - ▲ For living donation, donors must be aged 18 or above under the Human Organ Transplant Ordinance of Hong Kong.
2. We cannot donate our organs or tissues as a patient.

Only very few people are refrained from donating their organs, such as those suffering from serious infectious disease and most cancer patients. Although cancer patients are in general not suitable for organ donation, they can still donate corneas after death (with the exception of lymphoma, blood cancer, bone marrow cancer and malignancies that involve the eye). In any case, the medical team responsible for transplantation will conduct assessment on each donor before deciding whether the organs are suitable for transplantation.

3. My religion does not support organ donation.

Most religions encourage sharing or giving. In fact, many religions such as Buddhism, Taoism, Catholicism and Christianity agree with the spirit of organ donation.

4. The appearance of the donor’s body will be affected by the removal of the organ.

In the process of organ transplant, the body will be treated with full respect by medical personnel and the incisions will be sutured properly. The incision will normally be covered by the shroud so as not to affect the appearance of the body.

• Advanced Organ Donation Knowledge

◇ Opt-in and opt-out systems

▪ Opt-in

- ▲ Under the “opt-in” system, people who wish to donate their organs after death would need to register proactively as an organ donor when alive. Many countries/regions adopt the “opt-in” system, including Hong Kong, Taiwan, the United States and Australia, etc.
- ▲ In Hong Kong, anyone who wish to become an organ donor can register at the Centralised Organ Donation Register (CODR) or carry an organ donation card. As the system takes a voluntary approach, some potential donors have not registered because they are too busy and do not feel an urgency to do so. As of 13 September 2021, 338,357 people had registered on the CODR, accounting for only about 4.5 percent of the total population.
- ▲ Even if the deceased has registered as an organ donor, family members would still have the final decision to donate or not. The medical personnel will respect the decision of the family. Organ donation will not take place without the family’s consent. The Department of Health has pointed out that over 90% of people are willing to donate the organs of their deceased family member if they are aware of such wish. Therefore, people should tell their family about their wish to donate after making registration.

▪ Opt-out

- ▲ The “opt-out” system is adopted in other countries, including Singapore, Spain, France, Italy and the United Kingdom.
 - ▲ Under this system, it is assumed that people agree to be organ donors after death, unless they have registered their wish not to donate when alive. There are “soft” and “hard” approaches under the “opt-out” system. The difference is whether the family can make the final decision.
 - ▲ In the “soft” approach, the family has the final say. Consent of the deceased’s family has to be sought irrespective of whether the deceased person has raised objection to donate when alive. This approach is adopted by Spain, the United Kingdom and Croatia.
- ▲ In the “hard” approach, the decision made by the deceased will be followed and the bereaved families do not have the legal right to oppose. In this case, if someone has not registered his/her objection to donate when alive, the organs will be donated after death and there is no need to consult the deceased’s family. This approach is adopted in Singapore and Austria.

▪ The Spanish experience

- ▲ The donation system is only one of the factors affecting the organ donation rate. The donation rate can be very different in places where the “opt-out” system is adopted. Using Spain and Singapore as an example, both adopt the “opt-out” system but Spain has the highest donation rate in recent years, with 37.4 cadaveric donors per million population in 2020. While in Singapore, the “opt-out” system was introduced many years ago but there were only 5.1 cadaveric donors per million population in 2010 [latest data available].
- ▲ In the 10 years since Spain introduced the “opt-out” system through legislation, the donation rate did not rise. Later in 1989, Spain established the National Transplant Organization to organise and promote organ donation matters, which then started pushing up the organ donation rate every year.
- ▲ According to the data released by the International Registry in Organ Donation and Transplantation (IRODaT), the rate of organ donation in Spain has increased sharply since the establishment of the National Transplant Organization, with the number of donors per million population rising from 14.0 in 1989 to 37.4 in 2020.

▪ “opt-in” and “opt-out”

- ▲ Both systems are being used in many different countries, having different organ donation rates. In fact, no matter which system is adopted, we should try to promote and educate the public so that they can avoid the misconceptions, understand the need and meaning of organ donation. People will only be willing to become organ donors when they are convinced of the importance of organ donation.

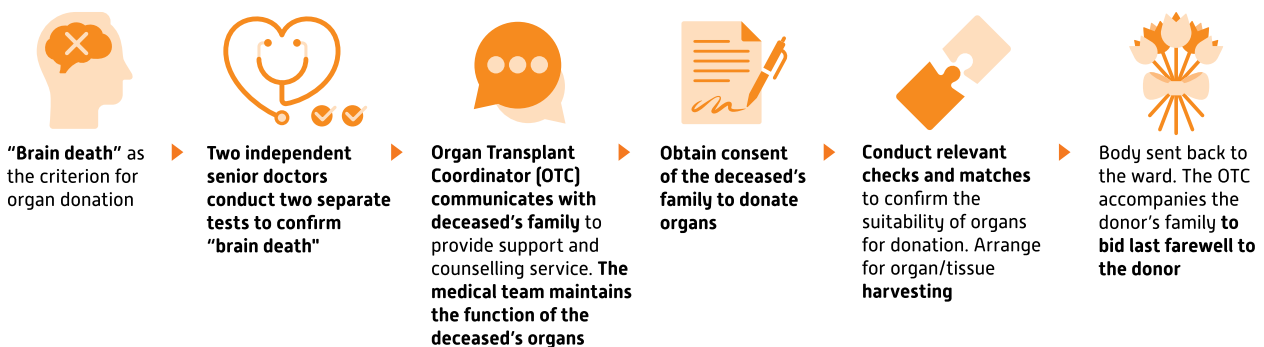


◇ **Organ donation procedures**

- Currently, “brain death” is the criterion for cadaveric donation in most cases in Hong Kong. Only tissues such as corneas, sclera and skin are accepted from donors of cardiac death.
- Brain death refers to a condition where there is a complete and irreversible loss of a patient's brain stem function. The patient can only rely on medical equipment to maintain breathing and heartbeat. That is equivalent to death of the patient.
- When a patient shows signs of brain death, medical personnel such as doctor and Organ Transplant Coordinator (OTC) will make a preliminary assessment of the patient and contact the family to learn about the situation. If the patient's condition is likely to deteriorate, or if the patient has fallen into a deep coma, the hospital will send two senior doctors to conduct a brain death test.
- There are clear and strict rules for determining brain death, and two tests have to be conducted independently by two senior doctors who are not involved in organ transplant matters. The purpose of the test is to confirm that the patient's brain stem reflexes are completely lost and irreversible. There are two prerequisites for conducting a brain death test. Firstly, it should be confirmed that the cause of the coma is irreversible. Secondly, when the patient stops breathing on his own, other factors that might cause temporarily coma or loss of brain stem reflexes must be excluded. Only then, the 7 clinical tests of brain death shall be performed.

- When the doctors confirm that the diagnosis of brain death, the medical personnel will inform the patient's family and give them time to accept the fact. The OTC will take into consideration the emotions of the family and accompany them patiently to ease their grief. OTC will only introduce the idea of organ donation to the family when appropriate, and will respect their decision.
- If the deceased has already agreed to donate organs when alive, the medical personnel will explain the whole procedure to the family in detail. After they have a clear understanding, they will be asked to sign the “Organ Donation Consent Form” and confirm the organs or tissues that will be harvested. At this time, the medical personnel will maintain the operation of medical equipment such as the ventilator so as to ensure that the function of the organs can be kept.
- The transplant team will conduct a detailed examination of the condition and function of each organ. If the organ is suitable for transplant, it will be harvested in the operating theatre as soon as possible, and transported to the hospital where the transplantation is conducted. At the same time, the medical personnel will identify suitable patients in the Centralised Organ Transplantation Register and arrange examination for them at the hospital with a view to selecting the most suitable recipient for the transplant.
- The body of the deceased will be treated with full respect in the process and the incision will be sutured properly after the operation. The incision will normally be covered by the shroud so as not to affect the appearance of the body. The body will be returned to the ward after the operation. The OTC will then accompany the donor's family to bid the last farewell.

Organ Donation Flow Chart



◇ **Organ Transplant Coordinator (OTC)**

- The Hospital Authority currently operates four major organ transplantation centres at Queen Mary Hospital, Queen Elizabeth Hospital, Prince of Wales Hospital and Princess Margaret Hospital respectively. There are OTC at each centre to coordinate organ donation matters. The Hospital Authority Eye Bank also has Eye Donation Coordinator who is responsible for cornea donor identification.
- OTCs are senior medical personnel who are responsible for matters relating to organ donation. They play a very important role in organ donation and transplant. Brain death, which can be caused by stroke, traffic or other accidents, usually occurs all in a sudden. Therefore, the family of the deceased will likely be emotional. The OTC will help ease their grief, provide support and counselling service, give them time to accept the fact, and accompany the deceased's family to bid the last farewell. At present, there are 9 OTCs, responsible for 43 hospitals in 7 clusters of the Hospital Authority in Hong Kong.

◇ **Compensated donation**

- Apart from organ donation registration systems, other schemes employed to encourage organ donation are also worth exploring, such as compensated donation. Compensated organ donation means that people who are willing to be a living donor can receive some symbolic rewards.
- For example, in 2009, Singapore established the Kidney Live Donor Support Fund which provides kidney donors who have financial difficulties with a lump sum compensation and medical insurance related to kidneys.

- The Australian government also runs a live donor support program to help reduce the financial burden on donors. Noting that donors need time to recover after transplant operation and cannot work to earn their living, the government would reimburse donors for the costs involved in organ donation and pay a minimum wage of up to 342 hours to donors who are at work. This serves as a support to living donors, help relieve their financial burden in the recovery period, and at the same time an appeal to employers for their support.
- However, some people consider that compensated organ donation may obscure the genuine intention of helping others. It is controversial and may fall into a grey area morally. Hong Kong has all along adopted a donation system without compensation. People generally believe that donating organs is a spirit of love, and "compensated donation" may give people a wrong impression of organ trading. The medical care community in Hong Kong generally does not support such approach.
- In recent years, however, the Government has made some breakthroughs in paying tribute to deceased donors, which is more acceptable to the general public. In 2017, the Board of Management of The Chinese Permanent Cemeteries set up the "Endless Love - Healing Act" area at the Garden of Remembrance at Junk Bay Chinese Permanent Cemetery, where ashes of cadaveric donors can be scattered. Moreover, they put the donors' name onto a memorial wall to openly recognise their contributions to the end-stage organ failure patients and the society at large.
- In addition, the government built the "Garden of Life" at Kowloon Park to recognise the good deeds of organ donors and to pay tribute to them and their families. The garden has a distinctive landscape and architecture design. The pillars there are carved with the thoughts of donors' families, recipients and medical personnel, highlighting the theme of "lighting up your lives".