

## REVIEW ARTICLES

### Donation of body for Anatomical Dissection in Sri Lanka: A Review

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#### Abstract

Anatomy remains central for Medical Education which forms the basis of efficient and safe medical practice. Dissection of a cadaver is deliberated as an essential and valuable tool in teaching macroscopic anatomy for medical students. Apart from gaining knowledge and skills, the anatomical dissection aids in cultivating humanistic values, behaviors, and attitudes which are essential assets for an empathetic future medical practitioner. This manuscript highlights the dynamic history of acquiring human bodies for anatomical dissection, with a particular emphasis on Sri Lanka. Knowledge on the source of cadavers, and the manner by which they have been obtained, is fundamental for medical students to realize the ethical and legal challenges associated with procurement of cadavers. This knowledge will help to further students' understanding of the evolving mindset of society, both past and present, regarding anatomical dissection and voluntary body donation. Through the study of the history of procuring cadavers, students are better positioned to appreciate the determination, generosity, and altruism of donors who have bequeathed their bodies for the educational needs of others. This, in turn, enables the students to consider the cadaver as their teacher, first patient or at best body of a fellow human being; not only to ensure that the body is treated in an ethically acceptable

manner, but also to provide an empathetic foundation in students to provide the utmost care to their patients with kindness and due respect in their future medical practice. Thus the willed body donation plays a significant role in producing not only a competent but also a compassionate medical practitioner. In this manuscript, the body donation practices of Sri Lanka are reviewed along with the Taiwanese-originated silent mentor programme.

**Running title:** Body donation in Sri Lanka

### Donation of body for Anatomical Dissection in Sri Lanka: A Review

Anatomy remains central for medical education; ample knowledge in this discipline is fundamental for an efficient and safe medical practice. The macroscopic anatomy is an integral part of the anatomy curriculum in the allopathic medical study programme. Dissection of a cadaver is regarded as an essential and valuable tool in teaching macroscopic anatomy for medical students. Evidence of the practice of dissection has its roots in the school of Alexandria ~ 300 B C where dissection was used as the main tool to learn anatomy through a regular and systematic approach (1).

Cadavers are regarded as “great teachers” (2) and / or “first patients” (3) on different perspectives, and dissection of which enable students to comprehend the complex, three - dimensional human anatomy which is mandatory for their future role as a medical practitioner. In addition, cadavers also contribute to clinical training, for example in surgical simulation training (4).

Knowledge on the source of cadavers and the manner by which they were obtained for anatomical studies in the past is fundamental for medical students to appreciate the evolutionary changes that occurred through many centuries in the scientific, ethical and legal perspectives of society towards procurement of bodies for dissection. Understanding the history of body procurement helps the present medical students to appreciate the determination, generosity, and altruism of donors who have bequeathed their bodies to medical institutions for educational purposes and scientific advancement.

The earliest records of the dissection of human bodies indicate that they were performed in public, including the ones that were performed in the Middle Ages. Later in the 17<sup>th</sup> and 18<sup>th</sup> centuries, anatomy theatres were established in many cities of Europe (5) to perform dissections for which the dead bodies of executed persons was the only legal source of cadavers, as at the time, society viewed dissection as a great dishonor for the person being dissected (6) both in terms of loss of personhood and the social identity.

As the procurement of bodies from executions alone was unable to fulfil the requirement of medical schools, body snatching (the “digging up of newly buried bodies” illegally) became the additional source of bodies in the United States (6, 7) and in Britain during the 18<sup>th</sup> and early 19<sup>th</sup> centuries (8). The grave robbers were given specific names by the public such as “body snatchers”, “sack-em-up men”, and / or “night doctors” whereas anatomy professors referred to them as “resurrectionists” (6, 7, 8). In order to prevent grave robbing, new devices like iron cages (“mortsafes”) were erected over new graves and / or guards were assigned to watch over the burial ground for a certain period of time after the burial of a fresh corpse (often family members took on the responsibility of being a guard)(7). The watch houses and watch towers, built to guard new graves, still exist in Scotland (8). Legislation preventing grave robbing was passed in 1789 in the United States in response to a mob riot referred to as the “Doctors’ Riot” held in New York in the previous year (6, 7).

Use of unclaimed bodies was deliberated as an alternate source of cadavers for anatomy teaching. The laws that permit usage of unclaimed bodies for dissection were first enacted in the United States in Massachusetts in 1830 and 1833 (6), and in the United Kingdom in 1832 (Anatomy Act of 1832) (8).

In the 19<sup>th</sup> and 20<sup>th</sup> centuries, body donation programmes were developed and capital punishment was eliminated in many countries in view of the rights and dignity of human beings (9). Body donation can be described as an act of providing one’s own intact body for

medical education and / or research upon demise by his/her informed consent given prior to death. At the turn of the 20<sup>th</sup> century, though opinion of most citizens of the United States disapproved of dissection, a few exceptional Americans were in view of donating their bodies to the science upon death; this was noteworthy and peculiar enough that it was mentioned in newspapers. As such, in 1889, newspapers highlighted that a wealthy Maryland horse dealer, Thomas Orne, had made the decision to bequeath his body. In addition, in 1912, two hundred physicians in New York pledged in public to bequeath their bodies upon death for dissection with the intension of overcoming the stigma against this teaching tool (10).

Gosh (11) indicated that body donation serves as the sole source of cadavers for dissection purposes in the medical institutions located in most parts of the globe. Among the 68 countries where cadavers were used for anatomy education, body donation (obtained through bequest made by the “deceased person during his or her lifetime”) was the exclusive source of cadavers in 22 countries (12).

The allopathic medical education system in Sri Lanka has its roots in the 19<sup>th</sup> Century in Jaffna where the training of doctors was carried out by American Missionary practitioners (13). Establishment of the Colombo Medical School in 1870 can be considered as a milestone in the path of allopathic medical education of the country (14). Subasinghe and Jones (15) highlighted that the practice of donating bodies for medical education commenced in the early 20<sup>th</sup> century or early post-colonial days. However it

is not known when the cadavers were first utilized for dissection purposes in the country. Available information indicates that preserved cadavers from Colombo were brought to the University of Peradeniya to commence its first batch of medical education in 1962. Subsequently, unclaimed bodies obtained from a hospital and those resulting from execution were used for dissection (16). However, from the 1970’s onwards, body donation became the sole source of cadavers for medical education in Sri Lanka (15).

In Sri Lanka, the Transplantation of Human Tissues Act (No. 48 of 1987) governs the donation of human bodies and tissues for educational, scientific, therapeutic, and research purposes (17). This legislation permits the procurement of cadavers for dissection with the consent of the donor which was given prior to his or her demise in the presence of competent witnesses. In the absence of such consent, the next of kin is legally empowered to donate the body if no contrary intention had been expressed by the deceased during his or her life time. Donation of the body of a child (child is defined as someone who is “under twenty-one years of age”) for anatomical dissection can be made by the parents, or guardian (in the absence of parents). As it stands, Sri Lankan law permits the usage of unclaimed bodies for anatomical research.

In general, body donation should be governed by highly transparent, non-commercial, professionally supervised ‘willed body programmes’ (5). The International Federation of Associations of Anatomists (IFAA) in 2012 provided “recommendations of good practice

for the donation and study of human bodies and tissues for anatomical examination” (18). Medical institutions in Sri Lanka have their own criteria for body donation (referred to as “body donation programme”) in accordance with the legislation of the country.

The body donation programme in Sri Lanka encompasses fundamental information regarding body donation including, but not limited to; Essential documentation (e.g. application / consent form, identification proof of next - of - kin, Certificate of Death or Notice of Death); Institutional policies and practices (e.g. prior registration, embalming method, age of the deceased, time of acceptance, transportation arrangements, handling of remains subsequent to dissection, maintaining the dignity and anonymity of the donors); Rejection criteria (e.g. unsuitability of a dead body due to medical reasons [e.g. history of certain infectious diseases] and scientific reasons (e.g. poor physical condition, having had postmortem examination); and Legal rights of the body upon it’s transfer to a medical institution (19, 20, 21, 22). Medical institutions typically accept both unpreserved and embalmed bodies for medical education and research.

Subasinghe and Jones (15) reported that most medical institutions in Sri Lanka obtain more donated bodies than their requirements. However, when an institution has no or limited cadaver resources (making it impossible to conduct the dissection session according to the stipulated curriculum) dead bodies can be obtained from another institution (19) through legal procedures.

The scarcity of cadavers for dissection is one of the major challenges faced by many medical schools in the world, especially the ones located amongst the more developed countries. Procurement of human bodies and body parts through importation has also been adversely affected due to restrictions and prohibitions made by the countries that permit exportation of cadaveric materials (23). Inadequacy of cadavers leads medical institutions to consider the incorporation of alternate methods such as pro-section, human body models prepared using plastination technology, 3-dimensional computer programmes, body painting, interactive tables that can be used to learn full-body anatomy, etc. A medical school in the United Kingdom has introduced a curriculum which requires no cadavers for teaching anatomy (24, 25) due to disadvantages in, and surrounding the usage of, cadavers.

A novel approach (referred to as “silent mentor programme”), that was successful in overcoming the deficit of cadavers, was introduced in Taiwan at Tzu Chi University in 1996. The body donation system and the educational approach of this programme were successful in generating excess of donations (26). Since then, this program has expanded to Malaysia (2012); it was commenced by a collaboration between the University of Malaya and Tzu Chi University (23, 27). In addition, the model of the silent mentor programme has been followed in the development of body bequest programmes of some educational institutions located in Hong Kong, Myanmar, and Singapore (23). A successful implementation of this approach was at the Yong Loo Lin School of Medicine,

National University of Singapore. Before the introduction of the silent mentors programme in 2012, dissections were paused for almost a decade due to a shortage of cadavers; after the development of the program, dissections could once again be carried out (28).

This approach differs from traditional body donation programmes, both in Sri Lanka and Western countries, where anonymity of the donor (name, family background, etc.) is usually preserved. Conversely, in the newer approach, the students perform home visits and meet the other members of the family of the donor to learn about the donor's life (e.g. personal, medical, social history, etc.) prior to the official commencement of the course (4, 23, 26, 27). Occasionally, the students may even have the opportunity to meet living donors who are at a terminally ill stage (26).

Historically, many medical institutions in Sri Lanka have had the practice of organizing religious memorial blessings to the donors in the presence of staff, students, and relatives of the donor, albeit in the absence of the cadaver (15). Conversely, in the novel body donation programme, the religious ceremony occurs in the presence of cadavers, with the students, and donor's family members in attendance (26).

Traditionally in Sri Lanka, arrangement for disposal of cadaveric remains, upon completion of dissection, is made by the relevant institution without the involvement of relatives or students; no remains, including ashes, are provided to relatives. In contrast, the students and relatives of the donor participate in the cremation ceremony and serve as coffin

bearers in the newer approach (26). In this approach, ashes are either kept in urns and placed in the institution (26), or are returned to the family members (27, 28).

In Thailand, the cadavers attain the status of *ajarn yai* (great teacher) and treated accordingly. Anonymity is not preserved, and students participate in both the dedication as well as cremation ceremonies (2).

It is rational and logical to consider that an ideal body donation programme should incorporate sufficient information regarding the handling of cadavers upon its acceptance by the institutions, particularly in the procedures related, including but not limited, to; Storage (e.g. whether a separate space is provided for each cadaver); Teaching (e.g. importance of cadavers/cadaveric dissection in teaching anatomy, how cadavers are presented to students [i.e. exposure of required region only]); Research (e.g. what is the role of cadavers or body parts in research, whether/how images could be published in research papers); Maintaining the anonymity and dignity of the donor (e.g. whether cadavers/body parts are transferred to other institutions, display of cadavers/body parts in public exhibitions, restricting access to dissection halls); and the Fate of the remains (e.g. retention of body parts to be used as museum-mounted specimens or for other purposes, how/when cadavers are disposed of). In order to protect and preserve trust from the general public, there needs to be transparency regarding the policies and procedures of body donation programs, especially ones that address the issues mentioned above.

## Reflective Remarks

The first exposure to a cadaver may trigger many questions to medical students concerning the purpose of the cadaver in teaching anatomy and how it was obtained by the medical institution. Answering the latter question, along with historical context, enables medical students to understand the evolution and importance of body donation, as well as recognize the generosity of donors and their family members. In addition, this guides medical students to handle cadavers in a moral, ethical, and legal manner, with respect and graciousness throughout their learning period.

By bequeathing their bodies (upon death) donors set an example for altruism and establish a social bond with the medical students dissecting them; it reminds students of the privilege of their profession, and it encourages them to provide the utmost care to their patients, with kindness and due respect, in their future medical practice.

Both body donation programmes and silent mentor programmes have inherent similarities and differences. Regardless, in order to support anatomical education and protect public support, a vivid transparency of all procedures must be maintained in the donation process from the moment of acceptance of a dead body, up until the respectful disposal of its remains.

The selfless gift of donors significantly contributes in producing a competent and compassionate medical practitioner and is viewed as an invaluable contribution to society.

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## Conflict of interest

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