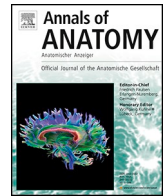


Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Annals of Anatomy

journal homepage: www.elsevier.com/locate/aaanat

The legal and ethical framework governing body donation in Europe – 2nd update on current practice

Erich Brenner^{a,u,*}, Ronald L.A.W. Bleys^b, Raffaele de Caro^{c,u}, Iliia Catereniuc^d,
 Andy R.M. Chirculescu^{e,u}, Christophe Destrieux^f, Elisabeth Eppler^g, Luis Filgueira^h,
 David Kachlikⁱ, Péter Kiss^j, Clive Lee^k, Niki Matveeva^l, Konstantinos Natsis^m, Diogo Pais^{n,u},
 Friedrich Paulsen^o, Maria Piagkou^p, Fabio Quondamatteo^k, Dóra Reglódi^j,
 Erdoğan Şendemir^{q,u}, Jørgen Tranum-Jensen^r, Janina Tutkuvienė^s,
 María Teresa Vázquez Osorio^t

^a Institute of Clinical and Functional Anatomy, Medical University of Innsbruck, Austria

^b Department of Anatomy, University Medical Centre Utrecht, Utrecht, the Netherlands

^c Section of Anatomy, Department of Human Anatomy and Physiology, University of Padova, Italy

^d Department of Anatomy and Clinical Anatomy, Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

^e Department of Anatomy and Embryology, Faculty of Medicine, C Davila University, Bucharest, Romania

^f Laboratoire d'Anatomie, Faculté de Médecine de Tours, France

^g Institute of Anatomy, University of Bern, Switzerland

^h Anatomy, Faculty of Science and Medicine, University of Fribourg, Switzerland

ⁱ Department of Anatomy, Second Faculty of Medicine, Charles University, Prague, Czech Republic

^j Department of Anatomy, University of Pécs, Hungary

^k Department of Anatomy and Regenerative Medicine, Royal College of Surgeons in Ireland, Dublin, Ireland

^l Department of Anatomy, Faculty of Medicine, Ss. Cyril and Methodius University, Skopje, North Macedonia

^m Laboratory of Anatomy and Anatomy of Surgery, Aristotele University School of Medicine, Thessaloniki, Greece

ⁿ Departamento de Deontologia, Bioética e Direito Médico, Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Portugal

^o Institute for Functional and Clinical Anatomy, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

^p Department of Anatomy and Surgical Anatomy, National and Kapodistrian University of Athens, Greece

^q Anatomy Department, Medical Faculty, Uludağ University, Bursa, Turkey

^r Department of Cellular and Molecular Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, Denmark

^s Department of Anatomy, Histology and Anthropology, Faculty of Medicine, Vilnius University, Lithuania

^t Centro de donación de cuerpos y salas de disección, Universidad Complutense, Madrid, Spain

^u Trans-European Pedagogic Anatomical Research Group (TEPARG)

ARTICLE INFO

Keywords:

Body donation
 Body procurement
 Teaching of anatomy
 Anatomical research

ABSTRACT

Background: In 2008, members of the TEPARG provided first insights into the legal and ethical framework governing body donation in Europe. In 2012, a first update followed. This paper is now the second update on this topic and tries to extend the available information to many more European countries.

Methods: For this second update, we have asked authors from all European countries to contribute their national perspectives. By this enquiry, we got many contributions compiled in this paper. When we did not get a personal contribution, one of us (EB) searched the internet for relevant information.

Results: Perspectives on the legal and ethical framework governing body donation in Europe.

Conclusions: We still see that a clear and rigorous legal framework is still unavailable in several countries. We found national regulations in 18 out of 39 countries; two others have at least federal laws. Several countries accept not only donated bodies but also utilise unclaimed bodies. These findings can guide policymakers in reviewing and updating existing laws and regulations related to body donation and anatomical studies.

* Corresponding author at: Institute of Clinical and Functional Anatomy, Medical University of Innsbruck, Austria.

E-mail address: erich.brenner@i-med.ac.at (E. Brenner).

<https://doi.org/10.1016/j.aaanat.2023.152195>

Received 14 November 2023; Accepted 28 November 2023

Available online 30 November 2023

0940-9602/© 2023 The Author(s).

Published by Elsevier GmbH. This is an open access article under the CC BY license

(<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Pre-mortem body offer and post-mortem body donation, i.e., the free act of donation of the body before death, after a signed informed consent and the cadaver's transfer to an Anatomy Department, is an important source of cadavers and provide an opportunity to carry out research or educational activities in medicine. This altruistic choice is of high moral value (Ciliberti et al., 2018). "The dead teach the living" is the motto reflecting the fundamental role of cadavers' dissection in anatomy teaching, surgical training, and practising novel techniques (Pawlina and Lachman, 2004; McHanwell et al., 2008; Riederer et al., 2012; Biasutto et al., 2014a, 2014b). Traditional dissection courses (Dyer and Thorndike, 2000; Garment et al., 2007; Pawlina et al., 2011) have been an integral part of medical education since the 1800 s (Korf et al., 2008; Papa and Vaccarezza, 2013). Despite the development of new technologies, dissection remains the highlight of anatomy education, as it provides students with an explicit aspect of the anatomical structures and their spatial orientation within the body, as well as the understanding of anatomical variants within the same or different populations (Older, 2004; McHanwell et al., 2008; Papa and Vaccarezza, 2013). Research has shown that body donation for the science of anatomy is a unique and irreplaceable learning tool for undergraduate medical education (Older, 2004). Culture, society, and spirituality contribute to the variable characteristics of body donors worldwide. Body donation programmes are still relatively rare, and in attempts to increase the offer of the body after death, many countries have instituted programmes and regulations surrounding cadavers' donation.

In 2008, the Trans-European Pedagogic Anatomical Research Group (TEPARG) published its first report on the legal and ethical framework governing body donation in Europe (McHanwell et al., 2008). The group recognised that while some information concerning the legal framework and practical concerns surrounding body bequests has been published concerning some countries, information about the situation Europe-wide was fragmentary. Because of that survey, TEPARG was positioned to propose a series of good practice recommendations concerning the acceptance, storage, handling and subsequent disposal of donated bodies for anatomical examination.

Four years later, TEPARG published its first update (Riederer et al., 2012). As stated therein, "since then, several legal and ethical laws and directives regarding body donation and the use of human bodies for teaching and research have been published". Again, it is true that an update is needed.

For this second update, we have asked authors from all European countries to contribute their national perspectives. By this enquiry, we got many contributions compiled in this paper. When we did not get a personal contribution, one of us (EB) searched the internet for relevant information. These perspectives are presented only briefly and may not reflect the full spectrum of this country.

2. Perspective from Austria

(Prof. Erich Brenner).

In the first article, we described the basic situation of body donation in Austria (McHanwell et al., 2008). The second article discussed the body's legal status (Riederer et al., 2012). This basic situation has stayed the same since then. There is still no specific national law regulating body donation. Only the post-mortem right of personality allows a living person to dispose of their body after death. Post-mortem personality rights refer to the continuation of these rights after a person's death. The duration and extent of these rights after death can vary. In some jurisdictions, these rights can be inherited or transferred, providing control over the deceased's image, name, etc., for a certain period. This makes it possible to bequeath one's body to an anatomical institute for research and teaching. The laws of the individual federal provinces regulate burial.

In this respect, the Vorarlberg burial law is a particular case (Land

Vorarlberg, 1969). Vorarlberg is the westernmost federal state (Bundesland) of Austria. This law allows the relatives, instead of burial, to give the body to an institution for scientific or medical research and education, to determine the causes of illness, or for medical treatment, unless the deceased has given instructions to the contrary. In addition, the law obliges the relatives to hand over the body to such an institution if the deceased has expressly requested it and if it is possible and reasonable to comply with the request. The transfer of a corpse for profit or other improper motives, as well as the transfer and use of a corpse for purposes other than those specified, is not permitted.

This regulation poses an ethical dilemma. In principle, it is considered ethically acceptable to follow the law. On the other hand, body donation should also follow the "informed consent" principle. However, this would not apply in the case of relatives donating. However, the cited law provides for the possibility of objection. In the sense of the common good, i.e., the well-being of society, such a body donation by relatives is quite ethically correct. However, many might regard compliance with this law as immoral.

The landscape of medical education in Austria has changed since the first update. At that time, there were three public universities (Medical Universities of Vienna, Graz, and Innsbruck) and one private medical university (Paracelsus Medizinische Privatuniversität Salzburg). Since then, another medical university has been organised under private law (Karl Landsteiner Private University Krems, founded in 2012), a state medical school (Medical Faculty of Johannes Kepler University Linz, founded in 2014), and a private medical school (Medical Faculty of Sigmund Freud Private University Vienna, founded in 2015) have been added. However, the latter two have not established their own body donation programme. Except for the Medical University of Innsbruck, prospective body donors are required to contribute to the costs of the subsequent funeral.

3. Perspective from Belgium

The University of Antwerp describes its body donation programme in a frequently asked questions document to be found on its website (ANON, 2023a).

In Antwerp, anyone over the age of 18 can donate their body. Such a donation can be revoked. There is no upper age limit. There are no additional costs for donating your body to the University of Antwerp, apart from the usual funeral director's expenses, including the morgue, coffin and funeral/cremation services. These are to be paid by the donor's heirs. The University may also refuse a donation for several reasons, including delay in transfer, autopsy, accidents preventing proper embalming, organ explantation, and certain infectious diseases. The cadavers are mainly used for educational purposes, for teaching students in the Faculty of Medicine and Health Sciences and the Faculty of Biomedical Sciences. They are also used for learning new surgical techniques and for scientific research.

Ghent University also has a body donation programme. In 2022, they received 133 donor bodies for use in teaching and research, a slight increase compared to 2021 but at the same level as before the COVID-19 pandemic (ANON, 2023a). The donors are mostly older people, 45% male and 55% female, whose bodies end up in the anatomy department and are used to teach students or as study subjects for junior doctors. Sometimes, they are also used for scientific research.

4. Perspective from Cyprus

Cyprus has a centralised body donation registry at the Nicosia General Hospital. The database was established per Law 127/2012 of the Republic of Cyprus and is the only authorised registry for registering personal wishes to donate organs for transplantation or to donate bodies for research and education.

5. Perspective from the Czech Republic

(Prof. David Kachlik).

The Czech Republic, a small country in the heart of Europe with a population of 10.8 million, offers medical studies to future doctors at eight medical schools, which train around 13,000 students.

Josef Tadeáš Klinkoš (1734–1778) was the first person in the Czech lands to advocate the introduction of an official procedure for the transfer of corpses to anatomical departments to teach anatomy (Čornejová, 1995). In modern legislation, body donation was first mentioned in the Public Health Act No. 20/1966 Coll. (§ 26, subsection 5, letters a-d). According to this law, it was possible to use the body of a deceased person for medical purposes, but only if the deceased person had given their verifiable written consent during their lifetime. If the deceased had not demonstrably expressed their wishes during life, a person close to the deceased could have given demonstrable written consent to the use of the body of the deceased (i.e. the cadaver) for educational or scientific purposes. The body could not be used for medical purposes if the medical institution did not obtain consent. Paragraph 6 then stated that it was possible either to use a part of the patient's body or to preserve and use the whole body of the deceased and made it clear that the corpse had to be in a condition that would not endanger the health of others.

The issue of body donation was also enshrined in the Decree of the Ministry of Health No. 47/1966 Coll., "On Funerals" dealt with the donation of a body for scientific purposes in § 10 (1), where it was stated that burial could be dispensed with if the deceased's body was to be used permanently for scientific or educational purposes. Bodies of deceased persons who had given their consent before death, as well as those whose identity could not be established, could be used. For such purposes, the body of a deceased person could also be used if no one had claimed the body within 96 hours of death, even though the relatives had been notified in time if the deceased had not made funeral arrangements before death. Paragraph 2 of the same decree also stated that before the body could be used for scientific or educational purposes, it had to be proved that an examination, possibly including an autopsy, had been carried out and that a report of the results had been submitted to the local, national committee responsible for the administration of the register (Section 4, paragraph 2). Similar wording can be found in the 1988 Decree No. 19/1988 Coll. of the Ministry of Health of the Czechoslovak Socialist Republic, "On procedures in the event of death and on funeral services", which was in force until 2012. In that year, it was entirely replaced by Act No. 372/2011 Coll. "On health services" and Act No. 256/2011 Coll. "On funeral services", which was later amended by Act No. 193/2017 Coll.

Currently, Section 113 of Act No. 89/2012 Coll., the Civil Code, gives people the right to decide what happens to their body after death. The performance of an autopsy or the use of a body after the death of a person without their written consent may be performed only in cases specified by law. Section 493 states that the human body or its parts are not things. This concept expresses the principle of human inviolability, followed by the dignified treatment of the deceased's body in Article 92 of the Civil Code. Act No. 285/2002 Coll follows the Civil Code., the "Transplantation Act", as amended, which stipulates in § 28 that the human body and its parts cannot be a source of financial or other benefits (Kotrlý, 2013). Donating one's body in the Czech Republic is possible if the person has lived here for a long time or is considering it. This is made possible by Directive 2010/53/EU of the European Parliament and of the Council on quality and safety standards for human organs intended for transplantation.

The term "anatomical dissection" (autopsy) has been enshrined in Czech law since 2012, in Section 88, Paragraph 1, Letter d) of Act No. 372/2011 Coll. "On Health Services" (previously, it appeared in Decree No. 19/1988 Coll. "On Death and Funeral Procedures", which implemented the Act on the Protection of the Health of the Population). Accordingly, anatomical dissections are performed for educational

purposes or the purposes of science and research in health care. Under Section 88(6) of the above Act, anatomical dissection may be performed only in universities and colleges that have an accredited bachelor's or master's degree programme, the completion of which confers professional competence for the exercise of medical professions, and in designated workplaces; it may be performed if the conditions for the use of the body of the deceased in accordance with this Act are met. The transport of the cadaver to the anatomical dissection and back, the performance of this dissection and the storage of the corpse are provided, and the costs are covered by the institution (Vojtšek and Prudil, 2006).

The transport of a deceased donor's body to a department of anatomy is carried out exclusively by contracted funeral directors. The bodies are either frozen and used as fresh cadavers for workshops and courses organised by the departments/centres for postgraduate training of surgeons, or they are embalmed for pre-graduate training of medical, dental and paramedical students (nurses, laboratory assistants, nutritionists, midwives, etc.).

The medical school will pay for the transport of the deceased donor's body to the department, its embalming and storage, and its transportation from the department to a crematorium, including the cremation itself.

There is no national programme for body donors in the Czech Republic, so each of the eight medical schools runs its own donor system. About 9100 registered donors are in separate registries (Frishons et al., 2022).

6. Perspective from Denmark

(Prof. Jørgen Tranum-Jensen).

The rules for body donation are laid down in the Danish Health Act of December 2010. The law states that only people over 17 can bequeath their bodies to science and education. The donor and two non-family witnesses or the donor's doctor must sign the will. The donor may declare that the institute may investigate the donor's medical history, which practically all donors do. This is particularly important if the donation is for scientific purposes. The institute will maintain the donor's complete anonymity. It is implicit in the above-mentioned legal provisions that unclaimed bodies cannot be accepted and that parents cannot donate the body of a deceased child under 18.

Three Danish universities have body donation programmes (the University of Copenhagen, the University of Aarhus, and the University of Southern Denmark). They operate independently but according to the same principles.

The three universities pay the costs of transporting the body to the institute and from the institute to a crematory or directly to a cemetery for burial in a coffin. According to Danish rules, bodies must be enclosed in a coffin during transport.

The bodies are embalmed by vascular perfusion with a fluid containing formaldehyde. The procedure differs slightly between the three universities. Un-embalmed bodies for surgical courses are frozen on arrival and thawed for use. Some frozen cadavers are divided up for use in different surgical disciplines. For neurosurgical courses, corpses are preserved by vascular perfusion with an ethanol-glycerol mixture to maintain near-normal tactile qualities of the brain tissue. Bodies used for scientific purposes may be frozen and thawed or used immediately on arrival, depending on the goal.

Embalmed cadavers are used to teach dissection to medical and dental students and prepare prosected specimens of various body regions for demonstration in lectures. In addition, all three universities have permanent study collections of necropsy specimens in display cases.

The deceased donor's relatives should contact a funeral director of their choice and agree with them on the donor's destination after the Institute has released the body. In this way, the Institute need only contact the funeral director who brought the body to the Institute. The

institute may keep body parts for many years for use in the study collections. Worn specimens will be collected in a coffin and cremated, and the urn will be buried in a common grave in a cemetery at the Institute's expense.

7. Perspective from France

(Prof. Christophe Destrieux).

France has a new law that will apply from the end of April 2022 (*République Française, 2022*). However, the Ministry must still provide the primary documents (official information leaflet, registration form, etc.). France is, therefore, in a transitional period. In any case, all body donation programmes must follow the same organisation and regulations (in the past, there was almost nothing).

Body donation is organised at the university level, i.e., regionally in France (27 centres total).

Unclaimed bodies are not accepted; in France, body donation is a voluntary process: donors have to write a kind of testament; this means that the process has to be done *in vivo*, of course, and donors under the age of 18 or with cognitive deficiency (i.e., with legal protection decided by a judge) are not allowed to register. One can assume that it just prevents some families from using body donation as a cheap funeral.

With the new legislation, the universities must cover the costs; there is no cost to the families or the donors. This was not the case before 4/2022. The problem is that the financial compensation from the Ministry (if any.) will not cover the costs. So, it will be a big problem for the universities' budgets.

Embalming procedures vary from university to university so no general statement can be made.

Bodies are used for undergraduate and postgraduate medical education. Most centres use corpses for training MD Cycle 1 (1–3 years), C2, and C3, and more specific training (DU/DIU) in anatomy or usually surgical specialities. Paramedics also use the bodies for educational purposes. The regulation introduced in 4/2022 restricts the educational use of bodies to paramedics (including odontologists and midwives) and paramedics working in operating theatres. There is no restriction for physiotherapists, for example.

8. Perspective from Germany

(Prof. Friedrich Paulsen).

In Germany, the law on funerals (*Gesetz über das Leichen- und Bestattungswesen*) applies. It states that human dignity is inviolable and should be preserved even after death. The Funeral Act ensures that the deceased are treated with dignity and safety. It was initially enacted for religious and hygienic reasons and served to prevent the spread of epidemics, especially in past centuries. The Burial Act has been amended several times and today contains central regulations on the deceased's coffering, burial and reburial, deadlines for transfer and burial, and ordinances on responsibilities in the event of death.

Burials in Germany are regulated by state law, not federal law. As a result, each of the 16 German states has its own burial law. Many points are similar in all states, but there are also differences. For example, different burial periods often apply. A "coffin obligation" does not exist everywhere. For example, some states allow exceptions for Muslim burials, while others do not.

The burial law regulates the mortuary/burial system and the cemetery system. It handles burial and resting periods, who must organise a funeral and who bears the burial costs. It also regulates repatriation and burial periods. According to the burial law, there is a coffin obligation in Germany. According to this, deceased persons (including body donors after a dissection course) may only be transported and buried or cremated in a coffin. In the meantime, however, most federal states now make an exception for Muslims. Finally, there is a cemetery obligation in Germany. According to this, deceased persons must be buried in a cemetery or specially designated burial areas. Urns containing the

deceased's ashes may not be taken home but must be buried in a gravesite. The only exception is burial at sea on the Baltic or North Sea. (In Bremen (one of the German states), moreover, the ashes of the dead may be scattered on private land outside a cemetery under certain conditions.)

A second postmortem examination is mandatory in all German states except for Bavaria. This serves to ensure that the cause of death was natural.

In addition to periods of rest and the design of the gravesite, the Burial Act also regulates body donation at the state level. In Germany, anyone who decides to donate their body after death makes it available for medical training.

A last will is required for a body donation, which is made in writing between the future body donor and an anatomical institute. The testamentary disposition can only be made by the body donor, not relatives or other persons. It can, therefore, only be made during the lifetime of the potential body donor. It can also be revoked at any time without giving reasons. Surviving relatives cannot subsequently revoke a testamentary disposition made regarding body donation. The wishes of the deceased must be respected and accepted. In the testamentary disposition, which is equivalent to a will, the potential body donor stipulates that their body can be used for teaching and research after death by the respective anatomical institute with which they have made the disposition. The anatomical institutes in Germany advise potential body donors in detail about this legal step. A sale of the own body by the body donor or of a body donor by an anatomical institute is not possible.

Each anatomical institute in Germany sets criteria for who is accepted as a body donor.

- For example, a certain age must often already have been reached when the testamentary disposition is concluded. Potential organ donors (younger age) are usually rejected, and reference is made to a later disposal date.
- The body donor must usually live within a certain radius of the anatomical institute (50–100 km). If the body donor dies away from their residence (e.g., while travelling abroad), body donation is usually no longer possible.
- Notifiable diseases regulated by the Federal Epidemic Diseases Act, amputations or physical abnormalities such as severe obesity may cause the anatomical institute to refuse to accept the body donor. Severe injury sustained in an accident may also result in rejection of the body donor.

Some anatomical institutes (nearly half of the anatomical institutes) require a financial contribution (between 500 € and 1200 €) from their body donors in the event of death, but this is much lower compared to the costs incurred in a "normal" funeral. All other costs (or all costs) are otherwise borne by the respective university, including transfer costs, fixation, cremation and burial. The only exceptions here are special requests from body donors, such as burial in a particular cemetery, burial in a family vault or, for example, burial at sea.

After completion of the testamentary disposition, the body donor receives a donor card, and it is up to them whether they inform their relatives (if any) about the body donation. Typically, nothing further happens until the death of the body donor occurs.

As soon as the anatomical institute is informed of the death of a body donor by bereaved relatives, care facility employees, clinical staff, or other means, a mortician is commissioned to transfer the body to the respective responsible anatomical institute. Here, the corpse is either chemically preserved and thus preserved (duration for this approx. 4–6 months) or frozen.

Preservation or freezing depends on what is to be done with the corpse. For dissection courses with students, preservation is usually chosen. Afterwards, dissection courses are carried out on such cadavers. Between death and burial, 2–3 years can pass quickly. In some anatomical institutes, body donors remain as "permanent specimens", e.

g. in the anatomical collection or are prepared by preparators and are used for education and training in courses. Frozen body donors are often used to conduct surgical courses in continuing education centres at anatomical institutes. Sometimes, organs and tissues from body donors are also removed immediately after death for scientific studies if body donors have agreed to this during their lifetime.

Various embalming methods are used throughout Germany, in most cases a traditional method based on a formalin solution or mainly with alcohol or phenol. In addition, the Thiel technique for fixation is used at some universities for clinicians' surgical courses and some particular fixation protocols and plastination methods.

After completion of the dissection course, the remains must be cremated and the ashes interred in a local cemetery (or according to the donor's wishes). In most cases, universities have a particular burial plot in the local cemetery where urns containing the donor's ashes are interred anonymously. Usually, one or two services are held at each university each year, organised by the anatomical institutes with the help of clergy from the two major Christian denominations (Lutheran and Roman Catholic). The students who dissected the bodies are involved in these services (e.g., by contributing words or music or by transferring the urns from the place of the ceremony to the burial site) (Pabst et al., 2017). At several universities, the donors' relatives are also invited to these services.

Riederer et al. (2012) described that unclaimed bodies are not accepted in Germany. The statement written by the Anatomische Gesellschaft in this regard is still valid (Riederer et al., 2012): The Anatomische Gesellschaft asks scientists, anatomy teachers, students and the interested public to disapprove of the trade in anatomical specimens. The principle must apply that specimens are only taken from body donors who have committed themselves in a written special bequest to benefit anatomical research and teaching.

In summary, there is an active programme for body donation on a large scale in Germany. The states and responsible university administrations at the various locations see the great benefit of training medical and dental students in dissection courses and continuing students' education in other associated degree programmes, medical-associated professions, and physicians' continuous medical education in surgical classes directly on the body donor. In contrast to the situation ten years ago, the body donation system in Germany is well financed (at some universities with the participation of body donors (see above)) and runs very smoothly. After a short bend during the coronavirus pandemic, there is currently no shortage of testamentary dispositions and incoming body donors at the anatomical institutes in Germany.

9. Perspective from Greece

(Prof. Konstantinos Natsis and Maria Piagkou).

In Greece, body donation for medical science and education is a topic of interest, but it faces challenges and limited willingness among the population. Historically, Greeks have had a tradition of dissection for scientific and educational purposes (Ghosh, 2015). Recent studies suggest Greece's body donation willingness is relatively low (Halou et al., 2013).

According to Greek law, prospective body donation is a voluntary and anonymous practice based on the donor's explicit consent. In the case of body donation, the remains are returned to the relatives, if they so wish, so that the remains can decompose completely if the family happens to have a grave. The remains are buried in a public cemetery if the family has no grave (Papagaroufali, 1999).

Among the ten anatomy departments in Greece today, only the two Departments in Athens (National and Kapodistrian University of Athens - NKUA) and Thessaloniki (Aristotle University of Thessaloniki - AUTH) have well-organised cadaver donation programmes. At the same time, the other universities train their students in anatomy by using prosected or formalin-embalmed or fresh frozen cadaveric specimens derived from imports from other countries. The AUTH also receives unclaimed

cadavers after a special royal decree that allows the co-capital to receive such corpses for dissection. The NKUA uses exclusively donated corpses. The following data are derived from the collaboration between the two Anatomy Departments of the Medical Schools of the NKUA and the AUTH on the procurement of cadavers based on the body donation programmes and the sources of cadavers before the body donation period. It provides data on the distribution of cadavers over the last 70 years (1946–2015) and the establishment of body donation programmes during the previous 35 years (1981–2015).

The first dissection occurred in the Descriptive Anatomy Department of the NKUA in the academic year 1840–1841, 182 years ago; the Descriptive Anatomy Department of the AUTH followed 104 years later in 1945. Today, almost two centuries later, both departments continue to use dissection as a significant educational tool for teaching anatomy to undergraduate and postgraduate medical students. Initially, the primary sources of (unclaimed) bodies were the nearby hospitals, charities and prisons. After the introduction of the Body Donation Act of Michigan in 1981, donors could donate their bodies before their death after signing an informed consent form. After the 1981 academic year, the body donation programme was the sole source of cadaver procurement for the Department of Descriptive Anatomy of the NKUA, while the Department of AUTH, due to the relatively more minor number of donated cadavers, continues to receive both unclaimed and donated cadavers under a relevant legislative act issued by the Greek government. Based on the available records of the departments' archives, no unidentified bodies have ever been used for educational or research purposes due to legal issues.

The first documented report on the use of cadavers in the NKUA Department dates from 1934, and the first for the AUTH from 1946. A cadaver donation programme was established in both departments at the same time. The COVID-19 pandemic affected the distribution of cadavers and body donation forms in both departments due to the Greek government's restrictive measures against the pandemic in 2020.

Three thousand three hundred twenty bodies were dissected between 1934 and 2015 (2214 male, 1106 female). Regarding age distribution, 265 bodies were under 20 years old, 1212 were 21–40, 754 were 41–60, and 877 were over 61. One hundred and twelve bodies were unclaimed (until the introduction of body donation). Two hundred and forty bodies were from Athens, 2069 from the province, 591 from abroad and 415 were of unknown origin. One hundred and two cadavers came from their home, 31 from prisons, 2876 from hospitals and 311 from charitable institutions. From 1934–1959, tuberculosis was the leading cause of death, unlike today, when cancer and heart disease are the leading causes. Regarding the body donation programme from 1981 to 2015, 227 bodies were donated (118 male and 109 female). There has been a significant decrease in dissected bodies over time. The dramatic decline was mainly observed after the establishment of the body donation programmes. The financial crisis has significantly increased body donation in the last eight years. The need to find cadavers remains timeless because the human body is an irreplaceable teaching tool for the basic science of anatomy and its contribution to medical education. There is a clear need for well-organised and informative body donation programmes.

10. Perspective from Hungary

(Prof. Dóra Reglődi and Prof. Péter Kiss).

There are four medical schools in Hungary, all of which have a body donation programme. These programmes provide enough cadaveric specimens to enable dissection laboratory courses for general medicine students. Students of dentistry and other professions with anatomy courses (e.g. nursery school, pharmacy) can also study prosected specimens, including whole bodies, but do not dissect themselves.

Body donation is organised at the university level. State legislation does not cover body donation for educational and scientific purposes.

Only voluntary donations are accepted, which can be made by the

person themselves; family members can also donate the bodies of their deceased relatives. Unclaimed bodies were used in the past but have not been used since the 1990 s. As post-mortem examinations are mandatory in Hungary, only donations where the cause of death was natural and known (diagnosed illness) can be accepted.

Some universities have exclusion criteria: the donor's medical records are checked to assess the general condition of the body, as amputations, massive tumours, previous illnesses, and some primary medical procedures can compromise the situation so that the normal anatomical site cannot be studied. If the donation is accepted, the bodies are embalmed with a formaldehyde solution and used for teaching for 3–5 years. After this period, the remains are cremated and buried. The university pays for all transport, embalming and cremation/burial costs. One of the four universities has a designated burial plot in the city cemetery where the urns containing the ashes are placed. A funeral service is held each year, to which families are invited and attended by staff and students.

11. Perspective from Ireland

(Prof. Fabio Quondamatteo, Prof. Clive Lee).

There is a legal framework at the national level under the Anatomy Act 1832 ([Government of Ireland, 1832](#)). In modern times, the Anatomical Examination in the Republic of Ireland is carried out in five medical schools. This includes accessing donors for both research and teaching. The Irish Medical Council has regulated it since 2007, when the Medical Practitioners Act was introduced ([Government of Ireland, 2007](#)). The Irish Medical Council appoints an Inspector of Anatomy who ensures compliance with the law and the Code of Practice. This Code of Practice was written by the Inspector of Anatomy for Ireland to ensure adherence to best practices reflecting society, science, medicine, education and ethics norms of the 21st Century. The Government recently introduced a new Human Tissue (Transplantation, Post-Mortem, Anatomical Examination and Public Display) Bill 2022, and it is now being discussed in the Irish Parliament, the Oireachtas. This will bring a change in legislation that will align with modern practice. Heads of Anatomy Departments in the Republic of Ireland meet as the Anatomical Committee of the Irish Medical Schools to discuss common matters related to donation and anatomical examination at the national level. The Inspector of Anatomy also attends these meetings.

Within the national legal framework and using the model consent form published as an appendix to the Code of Practice for Anatomical Examination, each University has its body donation programme that differs slightly according to the University's requirements. Still, there is a provision on the consent form for transferring a donor from one University to another with the appropriate consent. The Inspector of Anatomy inspects Each University every two years to ensure the required standards are met.

Since the 1960 s, only voluntary donations are accepted. While permitted under the Anatomy Act 1832, acceptance of unclaimed bodies is no longer considered ethical and has not been practised for over 70 years.

Usually, the institution carries the funeral costs, but the extent of this may vary from University to University. RCSI University of Medicine and Health Sciences bears all the expenses related to the funeral, transportation, and burial/cremation in the Dublin Medical Schools' plot of Glasnevin Cemetery. In the case of private family interments outside of the Dublin area, the donor's family pays costs related to transportation and opening of the grave. Some institutions have a limit on transportation costs. All institutions organise a ceremony to commemorate the gift the donors have given, to which the donors' families, students and staff are invited.

Throughout the Anatomical Departments of the Republic of Ireland, bodies are predominantly embalmed using traditional mixtures, and the practice of working on fresh frozen cadavers is not widespread. In the Royal College of Surgeons in Ireland, embalming is done via femoral

artery /carotid artery cannulation and pump-aided /gravity-fed perfusion of the cadaver with approximately 20 L of embalming solution, typically containing formaldehyde, phenol, methanol, and glycerol. A venous drain is put in place to avoid building up pressure. Afterwards, the injected fluid is allowed to permeate the body, and if necessary, spot injections may be performed. The bodies are stored in a refrigerator at the end of the process.

With the outbreak of the COVID-19 pandemic, the intake of bodies was suspended in line with many other institutions worldwide ([Brassett et al., 2020](#)). Donation intake was resumed in the Royal College of Surgeons in Ireland at the end of 2021 after about a year and a half of suspension. Most Irish Anatomical Departments resumed regular intake around the same time. During the height of the COVID pandemic, several Irish institutions participated in a multi-centre international study that assessed the effects of various embalming fluids regularly used in anatomical practice on the viability of SARS-CoV-2 virus ([Quondamatteo et al., 2021](#)).

12. Perspective from Italy

(Prof. Raffaele de Caro).

A new law was recently introduced after the matter had been addressed several times for over a decade ([Repubblica Italiana, 2020](#)). This legislation has tuned regulations concerning the donation of one's post-mortem body and tissues for study, training, and scientific research purposes ([Bolcato et al., 2021](#); [Ciliberti et al., 2021](#); [Orsini et al., 2021](#)). For the first time in Italy, the law establishes compulsory requirements and minimum characteristics—in terms of logistics, safety, availability of staff, space, and equipment—for institutions to be recognised as reference centres for the conservation and use of bodies and tissues donated post-mortem for study, training and scientific research purposes. This makes it possible to standardise the features of such reference centres nationwide and coordinate their activities and potential future development while ensuring essential operational efficiency and workplace safety, adequate facilities, buildings and equipment, and staff training ([Boscolo-Berto et al., 2023](#)). Critical issues arise concerning the learners, the type of training and teaching activities that can be planned, the position of academic anatomy institutes, the role of family members in the donation process, the time frame of the donation process, the eligibility of partial donation, or the simultaneous donation of organs and tissues to patients awaiting transplantation. In particular, a universal time limit for donations (i.e., one year) makes it impossible to plan the long-term use of specific body parts, which could be effectively preserved for the advanced teaching and training of medical students and surgeons. The abovementioned conditions lead to the limited use of corpses, thus resulting in the inefficiency of the whole-body donation system. ([De Caro et al., 2021](#)).

Body donation will be organised in National Centers for the Future; hitherto, it was organised at the local level of the universities themselves.

Unclaimed bodies are not accepted, and the active donation process is essential.

The costs for the body donation programmes are partially paid by the ministry, with the remaining costs to be paid by the National centres.

According to the National Centre's procedures, bodies are frozen or chemically embalmed.

The donated bodies are used for educational and research activities to benefit medical and health professions students, physicians, health professionals, and surgeons.

The national centres of reference, which have received a person's body for study, training and scientific research, must return the body to the family in decent condition within twelve months of delivery.

13. Perspective from Latvia

Every person able to act has the right to express their desire to ban or

allow the use of their body, tissues and organs after death by marking in the national eHealth Information System (Supreme Council of the Republic of Latvia, 1992). According to this law, the “use of [...] the body of a deceased human being for medical studies and in professional development programmes of medical practitioners is permitted when implementing an accredited medical study programme or a professional development programme of medical practitioners in a higher education institution which has the authorisation to use tissues or organs issued by the State Agency of Medicines”.

14. Perspective from Lithuania: the experience of the Faculty of Medicine, Vilnius University

(Prof. Janina Tutkuvienė).

In Lithuania, also at the Faculty of Medicine, Vilnius University, until 1998, unclaimed bodies were used for medical studies (mainly brought from hospitals or nursing homes; on average, about 10–20 bodies were obtained annually).

In December 2007, the Law on the Burial of Human Remains came into force, thus changing the legal basis for managing remains (Lietuvos Respublikos Seimas, 2007). Since then, we have only used bodies donated by a person’s will for anatomical studies. The Law prohibits the use of unidentified or unclaimed bodies.

In Lithuania, only the organ donation programme is active nationally. The issue of body donation for anatomy studies is the prerogative of the Faculty of Medicine at Vilnius University.

The Department of Anatomy, Histology and Anthropology at the Faculty of Medicine, Vilnius University, spreads information about body donation in various ways. We prepare information about the possibility of donating the body after death and publicise it via different mass media. Interested persons register in multiple ways – usually, they enquire by phone, regular mail or e-mail, and often come to our Department by themselves. A person can get acquainted with body donation procedures in advance (a form of will declaration, embalming and handling of the remains after death, etc.).

The legal community of Lithuania is becoming better and better informed on this issue. However, not all notaries agree to advise and approve a document of a person’s will to donate the body for anatomical studies after death. In 2008, together with lawyers, we prepared a particular form for personal will declaration. In this form, the main text is the same for all persons; however, additional terms are also provided (depending on the person’s will). We plan to prepare a special body donor card for a person who has declared to donate a body for anatomical studies after death.

We want to emphasise that correct and ethical media is very important in society’s decision regarding body donation. Our practice shows that media articles with a negative tone, unethical reporting on this issue or provoking hype and inappropriate comments prevent people from deciding to donate their bodies for studies. On the other hand, ethical articles in the media, appropriate comments and messages online, and various forums organised by Vilnius University encourage people to donate their bodies for anatomical studies.

Human remains are not always used for educational purposes, even with the person’s consent. In the form prepared by our Department, together with notaries, the permission of the relatives and the promise to report the death is not indicated. Still, during the conversation with the person who has decided to donate remains, it is advised to inform the relatives about this. Unfortunately, even in this case, we do not always or in time know about the fact of a person’s death because very often, we are not informed by the relatives of the deceased. The Department is responsible for the safe storage of the body, ethical studies, and the disposal of the remains after the examinations. After death, bodies are transported to the Department by funeral companies. Anatomists of our Department manage the delivery of bodies to the Department, examine the body, decide on the body’s suitability for studies, embalm the body, and handle various documents related to this fact. A body donated for

studies must reach the department within 24–72 hours.

Usually, we do not refuse to accept the body. However, we reserve the right not to accept a body due to certain circumstances, and this is discussed with the individual a priori. The University will not usually accept a body in the following cases: The body was found late, already decomposed (there were such cases); the body severely damaged (i.e. a massive car accident – has not happened yet); death occurs abroad and bringing the body to Lithuania takes a very long time (it has never happened till yet). During the pandemic, acting by a particular order of the Lithuanian Ministry of Health, we did not accept those who died from the COVID-19 virus - unfortunately, there were several cases.

Recently, the number of persons willing to become body donors at Vilnius University has increased from one person in 1999 to 337 in 2023. We have received an average of 6–9 bodies annually for anatomical studies from deceased donors. Women predominate, accounting for nearly two-thirds of all body donors: Male/Female ratio is 38/62% (respectively). Most of the persons who donated their bodies for studies did so with a declaration of will be certified by a notary (up till 2011, three persons expressed their wish to donate their bodies for anatomy studies in a testament; however, recently, notaries certified only the statement of personal will).

The average age of persons at the moment of body donation is 65 years (min-max=19–98 y.). The average age at death is 77 years for males and 78 years for females. About 30% of persons who decided to donate their body died one year from the moment of donation – this can be attributed to the changing attitude towards body donation and the changing social and economic situation. In addition, relatives (this is allowed by Lithuanian law) donated three dead bodies. It is worth mentioning that the people currently in the register of our Department are intelligent, educated, interested, modest, selfless, and committed to a noble goal – to help train Lithuanian doctors in a high-quality manner. So far, only ten persons have reversed their decisions.

After examining currently available declarations of the will of body donors, we found such trends: Until 2010, individuals usually wanted their body to be traditionally buried in a specially designated cemetery after being used for educational purposes (only a couple of individuals wanted their body to be cremated; a few individuals expressed a desire to bury their body in a family cemetery after the studies); those who have made up their mind do not hide their identity and often prefer their name to be mentioned at mass, inscribed on a tombstone or honoured in some other way. Since 2011, deceased body donors’ remains have been only cremated, already recorded in the declaration of will.

In Lithuania, any payment (bonus) for body donation is prohibited. However, Vilnius University compensates for the costs of body donation (notary services, etc.). It also covers the cost of body usage and disposal after death – embalming, storage, use, and handling (cremation, burial, etc.).

Remains that will be used for educational purposes are embalmed in various ways: Classical, using formaldehyde (4%), alcohol, phenol, or new, more organ and tissue-sparing methods (“deep freezing” technique). This depends on the intended use of the body; for example, the “deep freezing” method is particularly suitable for bodies that will be used for clinical studies. We currently have two regular refrigerators where embalmed bodies (at present – 18 bodies) are stored (these refrigerators maintain a temperature of plus 2–4 °C). In addition, we dispose of a “deep-freezer”, which maintains a temperature of minus 20–25 °C. We also use the equipment of the plastination laboratory for “deep freezing” (in total – 4 frozen bodies). For “deep freezing”, we usually use either bodies donated for a short period (for one year) or bodies that are post-autopsy. These bodies are not embalmed; they are frozen fresh. We use them to organise special courses for surgeons and other doctors – the thawed body is soft, close to the tissues of a living person.

A few years ago, the position of an anatomy prosector was introduced in our Department to ensure the quality of dissection to produce preserved specimens of different organs, structures, and body parts. This

significantly improved the quality of anatomy studies.

Bodies are mainly used for students' practical works and seminars (for demonstration dissection) and in courses, training, and workshops for resident doctors and practising clinicians to improve their knowledge and skills. Some bodies are also used for scientific research in basic and clinical sciences. Our Department is responsible for ensuring that the body is used as the person indicated in the declaration of will. Bodies, their parts and organs are usually kept at the Department for approximately three years (unless otherwise specified by the body donor). Anatomy studies of the whole body, its parts and organs can be supervised by a licensed anatomist and another designated suitable person (prosector, anatomy technician).

Until 2009, three ways of body disposal were possible: Burial in the cemetery indicated at the declaration of will by the body donor (only one case), cremation, and preparation of wet anatomical specimens (if the person agreed to it in the declaration of will). Since 2010, all bodies have been cremated after anatomical studies (the person is informed about this before deciding on body donation). The urns are stored in a place specifically designated for this purpose within the premises of our Department. Recently, we have worked hard to demonstrate the importance of the acts of such individuals. We are happy to say that a few months ago, we received a letter from Vilnius municipality regarding allocating a special place in a historic cemetery in the city centre to bury the cremated remains of the persons who donated their bodies for anatomy studies.

Vilnius University has already established a beautiful tradition of honouring the people who have donated their bodies for educational purposes: Ceremonies honouring those who have donated their bodies for studies are held, as well as annual masses to honour the deceased persons who have contributed their bodies. These events are attended by the academic community, professors, students and relatives if the individual so requests. We plan to build a monument in the historical cemetery to the people who donated their bodies.

Summarising the experience of body donation for anatomical studies at the Faculty of Medicine, Vilnius University, the following conclusions can be drawn:

1. From the end of 2007, the national Law on Burial of Human Remains and use for anatomical studies came into force ([Lietuvos Respublikos Seimas, 2007](#));
2. The body donor's written, notarised consent (handwritten, printed, signed and witnessed) is mandatory at the Faculty of Medicine, Vilnius University.

However, several important issues remain very relevant:

1. Our society is not yet fully ready for such a step – body donation remains unpopular in Lithuania. However, positive trends have been observed in the last decade. Unfortunately, relatives do not always give the donor's body (even if it was stated in a will) for anatomical studies. For example, we learned about the death of one body donor half a year after death. Even in the case that relatives of the deceased body donor agree to hand over the body for studies, they usually ask to dispose of the body and organise the funeral as soon as possible (in less than a year), even though a more extended period of the body usage for studies was specified when providing information to the body donor.
2. Unfortunately, due to the lack of bodies in the Faculty of Medicine of Vilnius University, dissection for 1st and 2nd year students in anatomy courses still cannot be mandatory. Now, students are offered an optional dissection course, with the suggestion to conduct scientific research on anatomical structures. We solve the issue of anatomy studies in different ways: By demonstrating already prepared bodies, using wet specimens, video material, computer programmes, etc. We recognise that basic anatomical knowledge is essential for all doctors, but especially for surgeons, so sometimes, due to the lack of

cadaveric material, surgeons must train in other European countries or the United States. Recently, we have also been dealing with the problem of the "import" of bodies donated for studies; however, this has not been resolved at the state level.

A few issues for the discussion:

- It is imperative to prepare clear, comprehensible and detailed information about the possibility of donating bodies for anatomical studies, considering the region's ethical, cultural and other aspects.
- Publication and spread of information must be professional and ethical.
- Commercialisation of bodies donated for studies should be prohibited.
- Honouring of deceased body donors, thanksgiving days, and masses should be encouraged.
- The possibility of exchanging and sharing anatomical material between medical universities is debatable.
- An international agreement on transporting anatomical material between countries may also be discussed.

15. Perspective from Malta

The perspective from Malta was described by Isabel Stabile previously ([Riederer et al., 2012](#)).

16. Perspective from Moldova

(Prof. Ilia Catereniuc).

Unfortunately, in the Republic of Moldova, there is no normative basis, no legislative act governing Body Donation for medical education and anatomical dissection. That is why we have no donation organisation or programme (no local or national).

Within The Department of Anatomy and Clinical Anatomy of Nicolae Testemitanu SUMPh, the only Medical University in the country, unclaimed bodies are accepted, as they are the only source of bodies for the teaching process. There are no costs; the unclaimed bodies are provided free of charge.

A solution proposed by us embalm the bodies that includes glycerine 2 L, ethanol (70%) 2.5 L, benzoic acid (C₆H₅COOH) or salicylic acid [C₆H₄(OH)COOH] 200 mL, formalin (40% formaldehyde) 300 mL, hydrogen peroxide 200 mL, sodium chloride 600 g, potassium nitrate 300 g, potassium acetate 600 g, acetic acid 300 mL, and distilled water up to 10 L. The corpses are perfused via the femoral artery with this solution, and then they are stored in the immersion solution (with the same formula) for approximately six months.

The muscles, blood vessels and nerves are highlighted through anatomical dissection of the bodies, and the prosected bodies are used for demonstration during practical lessons. Some of the bodies are also used for scientific purposes.

The bodies, the body fragments, and the organs used in the teaching process are buried in the cemetery. Nicolae Testemitanu SUMPh has a contract with the Funeral Services Combine from the municipality of Chisinau.

In the situation of the shortage of bodies, we strive to enrich the Anatomy Museum (within the Department of Anatomy and Clinical Anatomy of Nicolae Testemitanu SUMPh)¹ with exhibits as much as possible.

In the Republic of Moldova, adopting a clear legal framework governing the body donations for medical education and research is necessary.

¹ URL: <https://anatomiaomului.usmf.md/ro/muzeul-de-anatomie-omului>

17. Perspective from Montenegro

The perspective from Montenegro was described by Gordana Teofilovski-Parapid previously (McHanwell et al., 2008).

18. Perspective from the Netherlands

(Prof. Ronald L.A.W. Bleys, MD, PhD).

The way body donation in The Netherlands is governed has stayed the same since the previous update. Nevertheless, there have been developments during the last decade which have influenced the situation and the procedures.

The National Law on the Disposal of the Dead allows body donation as an alternative to burial and cremation (Hopstaken et al., 2020). Consent has to be given by the donor during life or by close family members after death. The latter may happen if relatives want the last wish of the donor to be fulfilled without pre-existing registration.

18.1. The practice of body donation

The organisation of body donation is local. A deceased will be taken to the university medical centre (UMC), where the donor has been registered beforehand. The seven Dutch UMCs are in Amsterdam, Groningen, Leiden, Maastricht, Nijmegen, Rotterdam and Utrecht. Amsterdam UMC has three locations. The UMCs of Free University (VUmc) and University of Amsterdam (AMC) fused in 2018 but kept their original sites. The third location is Amsterdam Skills Centre, which opened in 2019.

Because of the local organisation, internal rules and formal procedures may vary between the institutes. Some only register persons from the region based on postal codes. Apart from general exclusion criteria such as passing away abroad, certain infectious diseases and heavy mutilation, some institutes have additional ones. These include an age limit, a limit on body mass index and a lack of need if there is already a surplus of bodies. The anatomical institutes in the Netherlands will only accept donated bodies.

All anatomical institutes require the arrival of the bodies within 24 hours. Though not all institutes test the bodies for HIV and Hepatitis B and C. Bodies are either embalmed or frozen, the latter in parts or entirely. A formaldehyde solution is often used for embalming, but alternatives are also used. The institute in Groningen has been using the Thiel-embalming method for part of their bodies, and some institutes use the newly developed Fix for Life method, which decreases exposure to formaldehyde. Like the Thiel-embalming method, the Fix for Life method offers more flexibility and life-like colours than formaldehyde fixed bodies.

The bodies are used to educate students of medicine and related teachings, for postgraduate training of residents and medical specialists, and research. The head of the department and scientific staff make decisions about the distribution of bodies or body parts. In principle, bodies are only used for the purposes they are donated for, i.e., education of (para)medical students, training medical specialists, and biomedical scientific research. In cases of doubt regarding a particular request for the use of human tissues, institutional lawyers and the ethical committee are asked for advice.

It can take two years until all parts of a particular body have been used. Used bodies and body parts are cremated in a crematorium. Ashes from most institutes are scattered in the North Sea. Costs related to body donation are taken care of by the UMCs. These include the costs for transportation to the UMC, body handling and disposal of the remains.

Ethical standards among anatomists, medical students and medical specialists are high. Students receive an extensive introduction and explanation before entering a dissecting room for the first time. Throughout their studies, they can talk to staff about their experiences. Most institutes have a way of expressing gratefulness and respect for donors and their relatives. In many cases, there is a monument;

sometimes, institutes organise a memorial service. Many relatives use the opportunity to come to such a memorial service to receive information and talk to employees of the UMC and medical students.

18.2. Latest developments

Four developments since the last update should be mentioned.

1. The willingness for body donation in The Netherlands has increased enormously. It was mentioned in the previous update, and the increase has continued since then. For most institutes, it is necessary to limit registration by temporary registration stops to prevent a surplus of bodies and ensure that the bodies received are used efficiently. The Dutch institutes have a common website (lichaamsdonatie.info) where information about temporary stops is published. The reason for the increase is thought to be twofold. First, the possibility of body donation has become more familiar to the public through media attention (television, radio, newspapers, magazines). Second, people get older and as a result, the percentage of people considering body donation increases.
2. Many embalming cocktails contain formaldehyde, a substance categorised as carcinogenic since 2016. This prompted all institutions to monitor the exposure to formaldehyde in the respiratory zone. Since the law requires an exposure markedly below the permitted level (10% when one measurement is taken), exposure had to be decreased considerably. A reduction of the embalming concentration, intensive post-embalming rinsing, alternatives such as the Fix for Life embalming cocktail, extensive renovation of dissecting rooms with improvement of ventilation and the use of flow tables have taken place in several institutes, often in combination. Furthermore, written information about formaldehyde for students has been improved and standardised according to requirements by the law. It can be said that the situation in The Netherlands is under control now, but monitoring should continue.
3. Commercial body donation has found its way into The Netherlands. A particular company, initially only an intermediate for a company from the USA, has started recruiting its donors. The Nederlandse Anatomen Vereniging (NAV; Dutch Anatomical Society) is in touch with them, and information has been exchanged. However, there is no intention or need to obtain body parts from this company among the Dutch anatomical institutes.
4. In The Netherlands, new legislation is being made concerning all acts with tissues: Wet zeggenschap lichaamsmateriaal (WzI; Control over Human Biomaterials Act). While mainly developed for tissues derived from living patients (e.g. biobanks), there will also be amendments to the Law on the Disposal of the Dead. According to these amendments, comprehensible information and total transparency regarding the destination of body parts are required. Furthermore, commercial benefit from dead bodies is not permitted, nor is pretending that body donation leads to financial benefits for body donors or relatives. Representatives of the Ministry of Health, Welfare and Sports have intensively discussed the current standard practice at the UMCs and the intended amendments in the law with representatives of the NAV.

19. Perspective from North Macedonia

(Prof. Niki Matveeva).

Almost two million people live in the Republic of North Macedonia, although the number of permanent residents has been significantly lower in recent years due to continuous economic migration. The country has three state universities, including the Faculty of Medicine and the Faculty of Dentistry, which recruit more than 800 students annually.

For many years, unclaimed bodies from psychiatric and state hospitals have been the country's primary source of cadavers. Although

there is an increasing need for cadavers, the current situation is characterised by a sharp decline in the supply of corpses. There is a lack of legislation and regulations governing the donation of human bodies for educational purposes. Only the transplantation of human organs and tissues has an adequate legal framework. Organ and tissue transplantation is a part of medicine that has developed rapidly in recent years and is already common practice among the population. The continuous campaign over the last few years has made it possible to confirm the citizens' willingness to donate organs for transplantation. Campaigns to increase organ donation for medical education have not been successful enough to reach sufficient corpses. As funeral services have become very expensive, the current situation may contribute to more people being willing to donate their bodies to anatomical institutes. Public attitudes towards cadaver donation are primarily negative, mainly because of cultural background and the widespread belief that leaving a body for educational purposes hides the family's lack of care for the deceased. In the last five years, we have had only one cadaver donation and two persons willing to donate their bodies for educational purposes, who visited the Department of Anatomy at the Medical Faculty in Skopje, where their written statement was taken, in which they also requested certain obligations from the Faculty (the place they wish to be buried, the desired religious service, etc.). Therefore, Potential donors are advised to inform relatives, friends and doctors of their decision. Some reasons for refusal, which are determined locally, include death abroad, serious injury to the body (accidents), severe obesity, contamination with an infectious disease, or severe burns.

The Department of Anatomy has developed its embalming method, which involves using a chemical cocktail containing the compound formaldehyde. Embalmed cadavers are mainly used for teaching anatomy to students and residents. In recent years, the Medical Faculty in Skopje has invested in supplying body parts prepared using plastination techniques. Well-prepared specimens using plastination techniques will last much longer and are ideal for teaching human anatomy. Plastinated body parts are dry and odourless, making them suitable for display. One disadvantage is that these plastinated cadavers have already been dissected. Dissection of cadavers remains an integral part of anatomy education for students, especially for residents. This situation could lead to inadequate anatomy training for medical students and residents. Therefore, certain activities in terms of a more effective campaign for body donation for educational purposes among the population and the inclusion of certain financial benefits for body donors, which the government could support, would significantly improve the current situation.

20. Perspective from Norway

Tromsø, Trondheim, Bergen and Oslo universities can accept body donations. Donors can also change their minds at any time and terminate the donation agreement. The departments usually use the donated body for two years, sometimes longer. After use, it is recommended that the body be cremated. ([ScienceNorway, 2021](#)).

At the Norwegian University of Science and Technology in Trondheim, the Anatomical Laboratory - part of NTNU's Department of Clinical and Molecular Medicine - was established in 1993 ([ScienceNorway, 2021](#)). Since its establishment, more than 900 people have given their consent for their bodies to be used for research and teaching when they die. The lab needs about 25 prosected samples a year. Previously, only medical students and doctors used dissected cadavers to teach anatomy and surgical techniques. Now, radiography and physiotherapy students have lessons examining muscles, tendons and nerves.

21. Perspective from Poland

In Poland, the issue of body donation for scientific purposes was first regulated by the Circular of the Minister of Public Health on 29 January 1923 on the transfer of human corpses to university institutions for

scientific purposes. It stated, among other things, that corpses from hospitals, anatomical laboratories, prisons, old people's homes, foundlings' homes or "other similar institutions" could be given to anatomical institutions of state universities for scientific purposes if the family of the deceased did not request a burial within 48 hours of the death ([Siuta et al., 2020](#)). The subsequent law that further regulated the rules of donation was the Act of 17 March 1932 on burials and determining the cause of death (Journal of Laws of 1932, No 53, item 359). The law states that "powiat authorities of general administration may hand over bodies not buried by the family to university units for scientific purposes". Nowadays, the rules of handling human corpses, including the possibilities and conditions of donating bodies for scientific purposes, are strictly defined by legal acts. The essential act is the Act on Cemeteries and Burials (Journal of Laws of 1959, No. 11, item 62, as amended), which defines, among other things, the operation of cemeteries, the rules for transporting and storing corpses, the rules for issuing a death certificate, the rules for exhumation and, most notably for this article, the principles of donation for scientific purposes and the persons entitled to bury corpses. Following Art. 10.2 of the law mentioned above, only bodies that relatives or institutions have not buried may be donated for scientific purposes to a "public medical university or a public university that carries out teaching and research activities in the field of medical sciences". The list of people potentially having the right to burial is very long. The situation is much simpler if the deceased has made a written declaration before their death that they wish to donate their body to an appropriate university (art. 10.6 of the law as mentioned above) - as the will of the deceased is more important than the right or choice of other people. The universities must bear the cost of transporting the body. Finally, a decree of the Minister of Health of 30 July 2009 regulates the procedure and conditions for donating bodies for scientific purposes (Journal of Laws of 2009, No. 129, item 1067). The regulations do not specify the period for which the body is donated to a university before death unless otherwise specified; the body is donated to the university "in perpetuity". The purpose of the university's use of the body must be "scientific". Only a public university can be involved in the process of donating a body (which follows from Art. 10.2 of the Act on Cemeteries and Funerals (Journal of Laws - Dz.U. 1959, nr 11, poz. 62 as amended art. 2)). This provision completely marginalises the ability of private medical universities to practise anatomy.

According to articles in the popular press, the issue is controversial for potential body donors and their families - but these controversies are primarily due to a lack of information in society.

In 2003, a Conscious Body Donation Programme at the Department of Human Anatomy, Medical University of Silesia in Katowice, was the first innovative project to obtain informed donors' bodies to teach anatomy in Poland ([Bajor et al., 2015](#)). Unlike in the USA, for example, Polish law does not allow private companies to run such programmes. Only medical universities are permitted to run them. The programme has received over 1250 donor declarations so far, and the number is increasing yearly. In 2004, the Medical University of Silesia in Katowice carried out the first burial in Poland of people who had served science for many years and trained the next generation of doctors. Because the donors had declared different religions, the ceremony is usually accompanied by at least two priests: Catholic and Protestant. The university and faculty authorities attend the ceremony. Local television and the press are generally invited to the ceremony. After the first part of the ceremony, which takes place at the Medical University of Silesia, the ashes of the cremated bodies and the remains of the deceased are placed in the Park of Remembrance in one of the local cemeteries. The first-year students of all Medical University of Silesia faculties are cordially invited to attend the ceremony.

At present, many other medical universities or universities with medical faculties also run programmes for the donation of young boys, such as Jan Kochanowski University in Kielce, Jagiellonian University Medical School in Krakow, University of Warmia and Mazury in Olsztyn, Medical University of Lublin, Medical University of Białystok, Wrocław

Medical University and others (Siuta et al., 2020). Each university has its rules for the donation programme, but their differences are slight.

22. Perspective from Portugal

(Prof. Diogo Pais).

The use of bodies for teaching and research and body donation programmes are regulated by Portuguese Decree-Law No. 274/99 of 22 July 1999 (República Portuguesa, 1999). This is an opt-out legal situation: every citizen living in Portugal is a potential donor unless they register with RENNDA (the National Register of Non-Donors).

Each institution (according to the law, university medical schools, forensic medicine institutes, medico-legal offices, and hospital pathology services) can have its body donation programme as long as it complies with the law. Although the institutions mentioned above can have a body donation programme, only medical schools have one.

Unclaimed bodies are accepted, and the law provides for the situation (art. 3.2 of the Decree-Law). The institutions mentioned above may dissect or otherwise use the bodies for teaching and research purposes as long as the body is not claimed in any way within twenty-four hours of the knowledge of the death by the persons referred to in Art. 4 of the Decree-Law).

The Institutions cover the costs as long as the death occurs in continental Portugal. In some institutions, when the donor dies in Madeira or the Azores islands, or a very long distance from the Institution and the costs for transportation are very high, the family is invited to collaborate with the transport of the body to the Institution.

The body is embalmed using aliphatic alcohol perfused through an artery, usually one of the femoral arteries (Goyri-O'Neill et al., 2013). After embalming, the body is kept cold (freezing and conservation units). If the body has been previously autopsied, an arteriocavitary technique is used (where each limb and the head/neck are perfused individually, and the embalming fluid is injected into the thoracic and abdominopelvic cavities).

The embalmed cadavers are used for teaching in undergraduate medical courses, particularly anatomy and surgery, and in several postgraduate courses, particularly in surgical specialities. The specimens are also used for medical and anatomical research.

After anatomical use, the bodies are usually cremated, with or without the presence of relatives, who may take the ashes with them.

23. Perspective from Romania

(Prof. Andy R.M. Chirculescu).

There still needs to be a new special law concerning body donation for anatomical education purposes in Romania. During the last decade, the legislative priority focused on transplants and tissue manipulation. The most recent is Law 95/2006, updated in 2017, 2019 and 2023, establishing better rules and standards of quality and safety, post-mortem donation of human organs, tissues, and cells to avoid commercial traffic and any material profit.

There is no national or legal situation of body donation for either purpose of teaching anatomy or research. So, there still needs to be a legal rule for it.

The unclaimed bodies are accepted if they are not visibly damaged, if they have no severe body or limb deformities (congenital, due to the wrong position the rigour has been installed or storage), if evident signs of infection, signs of recent, uncured surgical procedures, large bandages, draining devices in place, etc.

The University bears the costs, providing the car to transport the corpses.

The corpses are embalmed by perfusion of a water solution of 10% formaldehyde, 5% saline and 1% phenol through the femoral artery (usually the right one) at constant pressure. After that, they are immersed in the same solution in large containers, where they are removed from at the beginning of the term and transferred to the

dissecting room.

There, the bodies are exposed on the unique marble tables, where the teaching staff show the students the region's elements according to the day's topic.

After fixation, some corpses (usually one or two per term) are frozen and cut in serial transversal slices from top to bottom. The selected slices corresponding to the region studied (either trunk or limbs) are displayed in the dissecting room, where students can identify the anatomical elements. At the end of the teaching year (usually mid-July), the dissected corpses and other human remnants are collected and sent to the City Crematorium to be buried. The University also covers these expenses. The transversal slices of the trunk and limbs, which are still in good condition, are stored in individual small containers filled with 10% formalin solution to be used during the following year. But most of them are damaged on both sides, as they are examined frequently.

Anatomical specimens may be retained as long as needed. As there is no legal time limit, the storage and use of corpses or parts of them will largely depend on their condition. The material may be retained and re-used for one to two years or more if well preserved.

24. Perspective from Serbia

The perspective from Serbia has already been described by Gordana Teofilovski-Parapid (McHanwell et al., 2008). At the University of Novi Sad, most students (51.26%) would support the body donation of a stranger. In comparison, a much smaller proportion of respondents would become donors (19.51%) or support their family members (21.67%) to bequeath their bodies (Srdić Galić et al., 2016).

25. Perspective from Slovakia

At least the Department of Anatomy at the Pavol Jozef Šafárik University in Košice runs a programme of body donation after receiving a signed consent form from the donors themselves (Vecanova et al., 2023; Vrzgula et al., 2023). The cadavers are embalmed soon after death and preserved by injection of formalin-based preservative solutions.

26. Perspective from Spain

(Prof. María Teresa Vázquez Osorio).

There is no legal framework for body donation in Spain. The only reference to it is contained in the Decree of 1974 (Ministerio de la Gobernación, 1974), which has been slightly modified in some Autonomous Communities, taking into account some general aspects such as transport or the destination of the remains. However, issues concerning the use, the facilities' requirements or the procedure's technical conditions still need to be addressed.

Most Spanish universities have a donated body depository with dissection rooms for students linked to their anatomy department. However, not all of them have their cadaver donation programme. These donation protocols are mainly developed in the public university sector. The Body Donation Centre of the Complutense University of Madrid is an exception, as it is independent of the UCM Anatomy Department. This makes it possible to meet the needs of different health sciences schools.

Due to the lack of regulation, the Spanish Anatomical Society has made some attempts at legal adaptation, considering some historically well-regulated processes, such as those in England. These recommendations have been summarised in two documents: Acta de Barcelona (Sociedad Anatómica Española, 1996) and Acta de Madrid (Sociedad Anatómica Española, 2015). Unfortunately, only a few universities decided to comply with these recommendations voluntarily.

Nowadays, five public universities (Alcalá de Henares University, Salamanca University, Castilla La Mancha University, Valencia University, and Complutense University of Madrid) have signed a commitment to maintain adequate facilities and good practices along with the processes concerning the use of donated bodies in teaching and research

activities. These universities have joined the National Programme for Body Donation (PRONADOCU), which is open to all universities once they are qualified according to the requirements included in the Acta de Madrid (*Sociedad Anatómica Española, 2015*).

The procedure for donors is similar throughout the country. In most cases, a form containing personal data must be completed and signed in the presence of two witnesses. This document contains a specific reference to a donated body's possible use and destination. Once the donor has died, a funeral director will transport the donor's body to the body donation centre or university within 48 hours of the donor's death, as required by law. This process is free of charge to the donor's relatives, to whom the remains may be returned, depending on the operating practices of the receiving institution.

Some people include their wish to be a donor in their living will. This is a problem for the donation process because universities do not know about this until after the donor's death. Some universities will accept donations from relatives to fulfil the donor's wishes even if there is no previous donation document.

Undergraduate students in the health sciences use most donated bodies, although use for undergraduate medical education has increased over the past decade.

During COVID-19, the lack of regulation became apparent. This encouraged the Spanish Anatomical Society to lobby the national authorities to adopt a specific law. After the initial concern, significant progress has yet to be made in regulating the use of donated bodies for teaching and research activities.

27. Perspective from Sweden

In Sweden, an accepted system for receiving bodies for anatomical dissection was introduced in 1973, and an old order to various public institutions to supply bodies for dissection was abolished (*Grant, 2008*). Since the introduction of the donation system in Sweden, every single specimen for anatomical dissection has come exclusively from voluntary donations from people who have decided during their lifetime to donate themselves for the benefit of medical education. The donated bodies are embalmed with an alcohol-glycerol-phenol solution without formaldehyde. After embalming, the bodies are usually kept in a refrigerator at around +4°C.

In Sweden, approximately eighty whole-body donations are made yearly to support medical education and development. The recipients are the anatomical teaching departments at Umeå, Uppsala, Linköping and Gothenburg universities and the Karolinska Institutet (KI) in Stockholm (*ANON, 2023b*). The donation rate in Sweden is relatively low. If more people decided to become donors, it would contribute to better medical education, research and health care. The vast majority of people in Sweden between 18 and 95 can donate their bodies to medical education and development. Some illnesses, injuries, being overweight or other changes to the body may prevent the body from being suitable for donation or being processed by the anatomy department.

The university's financial commitments apply within Sweden and include:

- Transport costs for the deceased body from the morgue to the anatomy unit and from the anatomy unit to the crematorium or burial ground in Sweden.
- Fees to the funeral contractor
- Costs for coffin and burial urn of a basic model
- Costs of cremating and finally depositing ash/remains at a cemetery in Sweden

28. Perspective from Switzerland

(PD Elisabeth Eppler and Prof. Luis Filgueira).

Since the last contribution by *Riederer et al. (2012)*, new relevant Swiss Federal laws and regulations have been issued. These include The Federal Act on Research Involving Human Beings (810.30: Human Research Act, HRA) of 30 September 2011, the Ordinance on Human Research except Clinical Trials (810.301: Human Research Ordinance, HRO, Humanforschungsverordnung) of 20 September 2013, and the Ordinance of 20 September 2013 on Organisational Aspects of the Human Research Act (810.308: Organisation Ordinance, OrgO-HRA, Organisationsverordnung) about the organisation of the Swiss ethics committees of 20 September 2013, all available at [Federal Chancellery \(2023\)](#).

The new legal changes have not substantially changed the procedure for the body donation programmes of the six Swiss universities, which have always required signed informed consent from body donors, including whether their body could be used for undergraduate and postgraduate teaching, training and research purposes. However, the use of cadavers and body parts for research purposes has been regulated more clearly and stringently, with the establishment of human research ethics committees to provide external ethical oversight of research projects. The Swiss Association of Research Ethics Committees (<https://swissethics.ch/en>) acts as an umbrella organisation for the cantonal ethics committees to harmonise and coordinate the working procedures of the ethics committees and to promote high ethical standards in research (*Swiss Association of Research Ethics Commissions, 2023*).

Furthermore, since the last article by *Riederer et al. (2012)*, legal and medical-ethical guidelines have been published by the Swiss Academy of Medical Sciences (SAMS), including the SAMS Recommendation on the Use of Dead Bodies and Body Parts ("Empfehlung der SAMW: Verwendung von Leichen und Leichenteilen in der medizinischen Forschung, sowie Aus-, Weiter- und Fortbildung" (2008, updated in 2014), the SAMS Guideline 'Ethics Support in Medicine' (2012), the SAMS Guideline 'Management of Dying and Death' (2018, adapted in 2021), the SAMS Guideline 'Ethics Training for Health Professionals' (2019) and the SAMS Guideline 'Collaboration between Medical Professionals and Industry' (2022), all available on the SAMS website (*Swiss Academy of Medical Sciences, 2023*).

Overall, the demand for cadavers and body parts has increased over the years for all purposes. These purposes also include postgraduate teaching, continuing education and research projects. The supply relies mainly on the body donation programmes of the six established Swiss medical faculties, which work closely together in the Swiss Clinical Anatomy Network, a subsection of the Swiss Society of Anatomy, Histology and Embryology (*SSAHE/SGAHE, 2023*), for example through regular meetings on ethical, legal and medical issues.

For undergraduate teaching, the demand for cadavers has also increased due to the growing number of medical students, as promoted by the Swiss Federal Council and Parliament since 2017, both at the established medical faculties in Basel, Bern, Fribourg, Geneva, Lausanne and Zurich, and in newly introduced medical programmes, such as at ETH Zurich (*Swiss University Conference, 2016*). The Swiss Anatomical Institutes honour body donors by inviting their families to annual memorial services organised by medical students and staff and by memorial graves maintained by the universities.

29. Perspective from Turkey

(Prof. Erdoğan Şendemir).

Following our first contribution on this topic (*Riederer et al., 2012*), Turkey now has a population of 85 million with 118 medical schools by the end of 2022, which will educate 112,058 medical students (*Odabaşı, 2023*) and 106 dental schools with 46,078 students (<https://istatistik.yok.gov.tr/>).

The first permission for the use of human bodies in the teaching of anatomy was granted by Sultan Abdulmecit to the newly founded Military Medical Faculty in 1841 (*Kahya, 1979; Akkin and Dinc, 2014*). This permission only included using unclaimed bodies of non-Muslim

prisoners who died or were executed in the Naval Arsenal in Istanbul (Kahya, 1979; Sehirli et al., 2004).

In Turkey, body donation has been regulated since 1979 by Law 2238, its subsequent amendment numbered 2594 of May 1982, and the related Regulation on Performing Scientific Research on Human Corpses published in the Official Gazette numbered 17727 of 17 June 1982 (Turkish Government - Ministry of Health and Social Assistance, 1979, 1982). This amendment to Law 2238 and subsequent regulations allowed individuals to donate their bodies and families to donate the body of a deceased relative. Law 2238 prohibits the importation of bodies of victims of genocide and crimes against humanity but does not specify the source as donated or unclaimed.

An amendment was introduced in 2014, allowing the import of human bodies and body parts for teaching, training, and research if domestic sources become insufficient (ANON, 2012; Turkish Government - Ministry of Health and Social Assistance, 2014). As the difficulties in finding bodies continued, an Autopsy Directive allowed the use of unclaimed bodies at the Forensic Medicine Institutes (under the Ministry of Justice) under the authority and permission of the Public Prosecutor after a forensic autopsy had been performed (Republic of Turkey, Ministry of Justice, 2015). The embalming of these bodies can be carried out after a mandatory 15-day judicial period following the autopsy. Anatomy departments are usually the last to hear about an unclaimed body. If a person dies in a hospital, the hospital informs the municipality and buries the body; if the District Attorney (DA) is involved, an autopsy is carried out, and the city again carries out the burial. At this stage, anatomy departments need social and official relationships with hospitals and DAs to receive unclaimed bodies.

Apart from these legal provisions, the Turkish Society of Anatomy and Clinical Anatomy (TSACA) launched a National Body Donation Campaign (NBDC) in 2012 to raise public awareness about body donation with the motto "Donate, May Your Body Live On in Medical Education" (Turkish Society of Anatomy and Clinical Anatomy, 2012, 2013). However, unclaimed cadavers are still the primary source (84.8%), which is not surprising for a country whose legislation on body procurement is no older than 35 years and which has had a national donation campaign for only ten years (Gürses et al., 2018).

Turkey has no regional or national body donation programme, but a well-functioning organ donation programme is active nationwide. Only twelve (12%) of 102 anatomy departments provided information and documents on body donation (Ok and Gürses, 2021).

Although a fatwa has been issued by the Presidency of Religious Affairs in Turkey stating that whole-body donation does not conflict with Islamic beliefs (Hürriyet, 2006), it has yet to be adequately publicised. Şahin et al. (2023) found that contrary to popular belief, more than half of the participants did not consider a whole-body donation to conflict with moral values. This was also the case for those who said they had religious beliefs (51.8%, 129/249). The stronger the religious belief, the less likely the respondent was to approve body donation based on moral values. Of those who said they were religious, only 8.1% would consider donating their whole body. Among non-believers, 35.7% expressed a positive attitude towards whole-body donation. An interesting finding of this study is that while none of the participants whose mothers were illiterate would consider donating their body, the proportion of respondents who were in favour of whole-body donation increased significantly among those whose mothers had completed primary, secondary or tertiary education.

The transport of an unclaimed or bequeathed body to the anatomy departments is mainly carried out by municipal funeral vehicles. The second choice is the vehicles of the university hospitals. Embalming solutions are ordered from the budgets of the medical schools. Almost all anatomy departments have technicians paid from the medical school's budget as government employees or on contract. The government covers transport, embalming, maintenance and burial costs. Many private and some government medical schools may import cadavers for their students and are paid from their budgets.

Almost all anatomy departments use 4% formaldehyde solution, chloral hydrate and glycerine for embalming, usually from the carotid artery, with the help of the cadaver technician and research assistants, with a professor supervising the procedure.

The cadavers are mainly used as prosections for medical and dental students. Unfortunately, the students cannot dissect, as the number of corpses is insufficient to train assistant doctors or doctoral students. Rarely residents from clinics are allowed to practice on cadavers to improve their surgical skills. Most medical schools do not use cadavers for nursing, physiotherapy or vocational students. Some corpses are kept for a long time (about 8–10 years) because the departments have no choice. The shortage of cadavers also leads to inadequacy for PhD students or anatomy residents; they have less chance to dissect enough (or none) corpses. Also, the importation of embalmed cadavers leads to these future anatomy professionals being unable to embalm a body.

Some institutions and anatomy departments organise clinical skills courses. They usually use imported corpses or body parts. A few brokers carry out the import procedures to import a body or body parts. Money is provided by the organising medical society (e.g. neurosurgery, plastic surgery, etc.) and collected from the participants. The participation of an anatomy department is mandatory for such an import, and the remaining body parts become the department's property after the course.

If the body is unclaimed, the remains are taken to a cemetery with the municipality's help and buried with a small religious ceremony reserved for the bereaved. If the body has been left behind, it is either given to the family or buried according to the person's wishes. There are no crematoria in Turkey.

Body donation registrations have increased significantly since 2012 (Gürses et al., 2019). Anatomy departments should promote donation programmes through their websites and use media with every possibility to educate the public to achieve the goal of increased body donation. Public awareness is much stronger than government laws or religious beliefs for positive motivation.

30. Perspective from the Ukraine

At least until 2018, Ukraine has no legislation regulating post-mortem human body donation for research and education. The country's only legal act regulating cadaveric tissue and organ donation is the Law of Ukraine on Transplantation of Human Organs and Other Anatomical Materials of 16 July 1999. According to Article 16 of the Law, "an individual has the right to make arrangements for the post-mortem transfer of his or her organs and other anatomical materials to research, medical or educational institutions". The issues related to the procedure of such transfer or disposal of the above-mentioned human organs, tissues or body are not yet regulated by law in Ukraine. (Pakhlevanzade, 2018).

31. Perspective from the United Kingdom

The perspective from the United Kingdom was published previously by Bernhard J. Moxham, Stephen McHanwell (McHanwell et al., 2008; Riederer et al., 2012) and D Ceri Davies (Riederer et al., 2012).

32. Discussion

This second update on the legal and ethical framework governing body donation in Europe substantially extends active or – at least passive – contributions. This results in a more detailed picture of this sensible topic (Table 1).

We still see that a clear and rigorous legal framework is still unavailable in several countries. We found national regulations in 18 out of 39 countries; two others have at least federal laws.

Several countries accept not only donated bodies but also utilise unclaimed bodies. This is likely due to a lack of legal regulations or too

Table 1
Legal regulations, body procurement, and body donation programmes in European countries.

Country	Legal regulation	Body procurement	Body Donation Programme
Albania			
Austria	Federal	EBD	Local
Belarus		EUB	
Belgium		EBD	Local
Bosnia and Herzegovina			
Bulgaria		MUB	
Croatia			
Cyprus	National		National
Czech Republic	National	EBD	Local
Denmark	National	EBD	Local
Estonia			
Finland			
France	National	EBD	Local
Germany	Federal	EBD	Local
Greece	National	MUB; IB	Local
Hungary	None	EBD	Local
Iceland			
Ireland	National	EBD	Local
Italy	National	EBD	Local → regional
Latvia	National		
Lithuania	National	EBD	Local
Malta	None	EBD	Local
Moldova	None	EUB	None
Montenegro	National	MUB	Local
Netherlands	National	EBD	Local
North Macedonia	None	MUB	Local
Norway			Local
Poland	National	EBD	Local
Portugal	National	MBD	Local
Romania	None	EUB	Local
Serbia	National	MUB	Local
Slovakia			Local
Slovenia			
Spain	None	EBD	Local
Sweden	National	EBD	Local
Switzerland	National	EBD	Local
Turkey	National	MUB; IB	Local
Ukraine			
United Kingdom	National	EBD	Local

EBD: exclusively body donation; MBD: mostly body donation; MUB: mostly unclaimed bodies; EUB: exclusively unclaimed bodies (according to [Habicht et al., 2018](#)); IB: imported bodies.

few pre-mortem explicit donations. This might be due to cultural or even religious concerns, but often by a lack of information about this possibility. Establishing a successful body donation programme does not take place within a short time but takes decades. Even when a body donation programme acquires – even in its first years – a sufficient number of potential donors, these donors are still living, and they might live for many years. In Austria at Innsbruck, there is an average difference of 15 years between the active donation and the donor's death.

This is also an issue in anatomical research. Some journals may take an overly strict approach to the evaluation of articles based on unclaimed cadavers. However, this rigorous approach cannot be considered fair, as it fails to consider the dire circumstances faced by many anatomical departments that are sadly deprived of donated remains. As a result, unclaimed bodies are the only way for these anatomical institutes to conduct research.

The number of body donations can only be increased through an active and open information policy. The information must address the legal, cultural and - where necessary - religious framework conditions. It must also include possible reasons for exclusion, potential costs, the planned uses of the bodies, and the procedure after the completion of the anatomical use.

The instructions should enable the future body donor to explicitly exclude some possible uses, e.g., stating that anatomical research may be

carried out on their body, but not student teaching. At the same time, permission should be obtained to take pictures or films and use them for teaching or scientific publications.

In addition, we recommend Services of Thanksgiving or Commemoration for those who have donated their bodies for medical education and research to which invited relatives of the deceased, staff and students ([Kooloos et al., 2010](#); [Pawlina et al., 2011](#); [Jones et al., 2014](#); [Pabst et al., 2017](#); [Guo et al., 2020](#)). Introductory courses on the ethical treatment of body donors are recommended for students ([Hildebrandt, 2016](#)).

There are, of course, several limitations to this paper. The perspectives presented in the article may not reflect the full spectrum of each country, as they were obtained through personal contributions and internet research by one of the authors. The paper does not provide an in-depth analysis of the specific legal and ethical challenges faced by each European country about body donation. It gives only a brief overview of current practice. The paper does not comprehensively compare European countries' legal and ethical frameworks for body donation. It focuses primarily on providing an update on current practice. Finally, the paper does not discuss the possible cultural, social or religious factors influencing body donation's legal and ethical considerations in different European countries.

32.1. Practical implications

- The paper provides an update on the current practice of body donation in Europe, which can inform policymakers and organisations involved in body donation programmes.
- It highlights the need for a legal and ethical framework to govern body donation, ensuring transparency, consent, and respect for the donors' wishes.
- The discussion on commercialising bodies donated for studies raises whether it should be prohibited, which can influence future regulations and policies in European countries.
- These findings can guide policymakers in reviewing and updating existing laws and regulations related to body donation and anatomical studies.

Ethical statement

This work did not use human or animal bodies or parts of them.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

The authors would like to thank the European Federation for Experimental Morphology (EFEM) for its support in developing the Trans-European Pedagogic Research Group for the Anatomical Sciences (TEPARG).

References

- Akkin, S.M., Dinc, G., 2014. A glimpse into the process of gaining permission for the educational dissection of human cadavers in the Ottoman Empire. *Clin. Anat.* 27, 964–971. <https://doi.org/10.1002/ca.22421>.
- Anon 2012. Türkiye “kadavra” ithal edecek. *Radikal*, last update: June 5, 2012. *Hürriyet Gazetecilik ve Matbaacılık A.Ş.* <http://www.radikal.com.tr/saglik/turkiye-kadavra-ithal-edecek-1090185>. (visited: March 21, 2017).
- Anon 2023a. Body donation. In: Website, Medicine and Health Sciences | University of Antwerp, last update: 2023/10/02/. <https://www.uantwerpen.be/en/about-uantwerp/faculties/faculty-medicine-health-sciences/healthcare-services/body-donation>. (visited: October 2nd, 2023).

- Anon 2023b. Organ and body donations. In: Department of Neuroscience, last update: 2023/10/03/. Karolinska Institutet. <https://ki.se/en/neuro/organ-and-body-donations>.
- Bajor, G., Likus, W., Kuszewski, P., Kostro, K., Los, A., Klakus, P., 2015. "Mortui vivos docent" or who gives his body to science? The analysis of the personal questionnaires of Polish donors in the Conscious Body Donation Program. *PLoS One* 10, e0121061. <https://doi.org/10.1371/journal.pone.0121061>.
- Biasutto, S.N., Sharma, N., Weiglein, A.H., Benia, F.M., McBride, J.M., Bueno-Lopez, J.L., Kramer, B., Blyth, P., Barros, M.D., Ashiru, O., Ballesteros, L.E., Moxham, B.J., Krishnan, S., 2014a. Human bodies to teach anatomy: importance and procurement - experience with cadaver donation. *Rev. Arg. Anat. Clin.* 6, 72–86.
- Biasutto, S.N., Sharma, N.A., McBride, J., Krishnan, S., Vatsalaswamy, P., Garud, R.S., Kharat, V.S., du Toit, D.F., Redwood, C., Fisk, W., 2014b. Part II - human bodies to teach anatomy: importance and procurement—experience with cadaver donation. *Rev. Arg. Anat. Clin.* 6, 162–175.
- Bolcato, V., Braga, P., Bini, G., Belli, G., Quaiotti, J., Tronconi, L.P., Osculati, A.M.M., 2021. Corpses against science death: new Italian law titled 'Rules relating to the directives of one's body and tissues *post-mortem* for study, training, and scientific research purposes. *Ann. Anat.* 233, 151595 <https://doi.org/10.1016/j.aanat.2020.151595>.
- Boscolo-Berto, R., Porzionato, A., Stecco, C., Macchi, V., De Caro, R., 2023. Reference centers for tissue and body donations: compulsory requirements in Italy. *Clin. Anat.* 36, 465–470. <https://doi.org/10.1002/ca.23990>.
- Brasset, C., Cosker, T., Davies, D.C., Dockery, P., Gillingwater, T.H., Lee, T.C., Milz, S., Parson, S.H., Quondamatteo, F., Wilkinson, T., 2020. COVID-19 and anatomy: stimulus and initial response. *J. Anat.* 237, 393–403. <https://doi.org/10.1111/joa.13274>.
- Ciliberti, R., Gulino, M., Gazzaniga, V., Gallo, F., Vellone, V.G., De Stefano, F., Santi, P., Baldelli, I., 2018. A survey on the knowledge and attitudes of Italian medical students toward body donation: ethical and scientific considerations. *J. Clin. Med.* 7 <https://doi.org/10.3390/jcm7070168>.
- Ciliberti, R., Bonsignore, A., Bonzano, C., Ventura, F., Licata, M., 2021. Taking care of life: the new Italian law on post-mortem donation for study purposes, training and scientific research. *Ann. Anat.* 236, 151712 <https://doi.org/10.1016/j.aanat.2021.151712>.
- Čornejová, I., 1995. Dějiny Univerzity Karlovy. Praha: Univerzita Karlova.
- De Caro, R., Boscolo-Berto, R., Artico, M., Bertelli, E., Cannas, M., Cappello, F., Carpino, G., Castorina, S., Cataldi, A., Cavalletti, G.A., Cinti, S., Cocco, L.I., Cremona, O., Crivellato, E., De Luca, A., Falconi, M., Familiari, G., Ferri, G.L., Fornai, F., Gesi, M., Geuna, S., Gibelli, D.M., Giordano, A., Gobbi, P., Guerra, G., Gulisano, M., Macchi, V., Macchiarelli, G., Manzoli, L., Michetti, F., Miscia, S., Montagnani, S., Montella, A.C.M., Morini, S., Onori, P., Palumbo, C., Papa, M., Porzionato, A., Quacci, D.E., Raspani, M., Rende, M., Rezzani, R., Ribatti, D., Ripani, M., Rodella, L.F., Rossi, P., Sbarbati, A., Secchiero, P., Sforza, C., Stecco, C., Toni, R., Vercelli, A., Vitale, M., Zancanaro, C., Zauli, G., Zecchi, S., Anastasi, G.P., Gaudio, E., 2021. The Italian law on body donation: a position paper of the Italian College of Anatomists. *Ann. Anat. Anat. Anz.* 238, 151761 <https://doi.org/10.1016/j.aanat.2021.151761>.
- Dyer, G.S., Thorndike, M.E., 2000. Quidne mortui vivos docent? The evolving purpose of human dissection in medical education. *Acad. Med.* 75, 969–979. <https://doi.org/10.1097/00001888-200010000-00008>.
- Federal Chancellery, 2023. Fedlex - The publication platform for federal law. last update: 2023/08/04/. <https://www.fedlex.admin.ch/en/>. (visited: 2023/10/13/7).
- Fršhones, J., Joukal, M., Vojtšek, T., Hájek, P., Miklošová, M., Ferda, J., Naňka, O., Mrzilková, J., Kachlík, D., 2022. Current issues of body donation for teaching and research purposes and their use in the Czech Republic. *Cas. Lek. Ceskych* 161, 153–158.
- Garment, A., Lederer, S., Rogers, N., Boulton, L., 2007. Let the dead teach the living: the rise of body bequeathal in 20th-century America. *Acad. Med.* 82, 1000–1005. <https://doi.org/10.1097/ACM.0b013e318149e986>.
- Ghosh, S.K., 2015. Human cadaveric dissection: a historical account from ancient Greece to the modern era. *Anat. Cell Biol.* 48, 153–169. <https://doi.org/10.5115/acb.2015.48.3.153>.
- Government of Ireland, 2007. Medical Practitioners Act 2007. (Act No. 25/2007) <https://www.irishstatutebook.ie/eli/2007/act/25/enacted/en/html>.
- Government of Ireland, 1832. Anatomy Act 1832. (C.A.P. LXXV) <https://www.irishstatutebook.ie/eli/1832/act/75/enacted/en/print.html>.
- Goyri-O'Neill, J., Pais, D., de Andrade, F.F., Ribeiro, P., Belo, A., O'Neill, A., Ramos, S., Marques, C.N., 2013. Improvement of the embalming perfusion method: the innovation and the results by light and scanning electron microscopy. *Acta Méd. Port.* 26, 188–194.
- Grant, G., 2008. The donation system of bodies for use in medical education in Sweden. *Anatomy* 2, 16–21. <https://doi.org/10.2399/ana.08.016>.
- Guo, K., Luo, T., Zhou, L.H., Xu, D., Zhong, G., Wang, H., Xu, J., Chu, G., 2020. Cultivation of humanistic values in medical education through anatomy pedagogy and gratitude ceremony for body donors. *BMC Med. Educ.* 20, 440 <https://doi.org/10.1186/s12909-020-02292-1>.
- Gürses, İ.A., Coşkun, O., Öztürk, A., 2018. Current status of cadaver sources in Turkey and a wake-up call for Turkish anatomists. *Anat. Sci. Educ.* 11, 155–165. <https://doi.org/10.1002/ase.1713>.
- Gürses, İ.A., Ertaş, A., Gürtekin, B., Coşkun, O., Üzel, M., Gayretli, Ö., Demirci, M.S., 2019. Profile and motivations of registered whole-body donors in Turkey: Istanbul University experience. *Anat. Sci. Educ.* 12, 370–385.
- Habicht, J.L., Kiessling, C., Winkelmann, A., 2018. Bodies for anatomy education in medical schools: an overview of the sources of cadavers worldwide. *Acad. Med.* 93, 1293–1300. <https://doi.org/10.1097/ACM.0000000000000227>.
- Halou, H., Chalkias, A., Mysterioti, D., Iacovidou, N., Vasileiou, P.V.S., Xanthos, T., 2013. Evaluation of the willingness for cadaveric donation in Greece: a population-based study. *Anat. Sci. Educ.* 6, 48–55. <https://doi.org/10.1002/ase.1304>.
- Hildebrandt, S., 2016. Thoughts on practical core elements of an ethical anatomical education. *Clin. Anat.* 29, 37–45. <https://doi.org/10.1002/ca.22645>.
- Hopstaken, J.S., Widdershoven, G.A.M., Ploem, M.C., 2020. Whole-body donation in the Netherlands: current regulations and suggestions for improvement. *Ned. Tijdschr. Geneesk.* 164.
- Hürriyet (Konuralp, O.), issued June 20th, 2006. Kadavra 'caiz' dir. <http://www.hurriyet.com.tr/kadavra-caiz-dir-4610909>.
- Jones, T.W., Lachman, N., Pawlina, W., 2014. Honoring our donors: a survey of memorial ceremonies in United States anatomy programs. *Anat. Sci. Educ.* 7, 219–223. <https://doi.org/10.1002/ase.1413>.
- Kahya, E., 1979. Bizde disseksiyon ne zaman ve nasıl başladı. *Belleten* 43, 739–760.
- Kooloos, J.G., Bolt, S., van der Straaten, J., Ruiters, D.J., 2010. An altar in honor of the anatomical gift. *Anat. Sci. Educ.* 3, 323–325. <https://doi.org/10.1002/ase.171>.
- Korf, H.W., Wicht, H., Snipes, R.L., Timmermans, J.P., Paulsen, F., Rune, G., Baumgart-Vogt, E., 2008. The dissection course - necessary and indispensable for teaching anatomy to medical students. *Ann. Anat.* 190, 16–22. <https://doi.org/10.1016/j.aanat.2007.10.001>.
- Kotrly, T., 2013. Pohřebnictví: právní zajištění piety a důstojnosti lidských pozůstatků a ostatků. Praha: Linde.
- Land Vorarlberg, 1969. Gesetz über das Leichen- und Bestattungswesen. (LGBL.Nr. 58/1969 zuletzt geändert durch LGBL.Nr. 4/2022) <https://www.ris.bka.gv.at/eli/lgb/VO/1969/58/PO/LVB40005448>.
- Lietuvos Respublikos Seimas, 2007. Žmonių Palaikų Laidojimo. (X-1404) <https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.312055/uAulcQqIXb>.
- McHanwell, S., Brenner, E., Chirculescu, A.R.M., Drukker, J., van Mameren, H., Mazzotti, G., Pais, D., Paulsen, F., Plaisant, O., Caillaud, M., Laforêt, E., Riederer, B.M., Sanudo, J.R., Bueno-Lopez, J.L., Donate, F., Sprumont, P., Teofilovski-Parapid, G., Moxham, B.J., 2008. The legal and ethical framework governing Body Donation in Europe - a review of current practice and recommendations for good practice. *Eur. J. Anat.* 12, 1–24.
- Ministerio de la Gobernación, 1974. Decreto 2263/1974, de 20 de julio, por el que se aprueba el Reglamento de Policía Sanitaria Mortuoria. (BOE-A-1974-1358) <https://www.boe.es/eli/es/d/1974/07/20/2263>.
- Odabaşı, O., 2023. Türkiye Tıp Fakülteleri 2023. *Sürekli Tıp Eğitimi Dergisi* 32:37-61.
- Ok, F., Gürses, İ.A., 2021. Evaluation of information on body donation promotion at official websites of Turkish Anatomy Departments. *Anat. Sci. Educ.* 14, 816–827. <https://doi.org/10.1002/ase.2021>.
- Older, J., 2004. Anatomy: a must for teaching the next generation. *Surgeon* 2, 79–90. [https://doi.org/10.1016/s1479-666x\(04\)80050-7](https://doi.org/10.1016/s1479-666x(04)80050-7).
- Orsini, E., Quaranta, M., Ratti, S., Mariani, G.A., Mongiorgi, S., Billi, A.M., Manzoli, L., 2021. The whole body donation program at the University of Bologna: a report based on the experience of one of the oldest universities in Western world. *Ann. Anat.* 234, 151660 <https://doi.org/10.1016/j.aanat.2020.151660>.
- Pabst, R., Schmiedl, A., Schrieber, S., Tschernig, T., Pabst, V.C., 2017. Ceremonies of gratitude following the dissection course: a report on procedures in departments of anatomy in German speaking countries. *Ann. Anat.* 210, 18–24. <https://doi.org/10.1016/j.aanat.2016.10.009>.
- Pakhlevanzade, A., 2018. Human body donation in foreign legislation. *Journal of Ophthalmology (Ukraine)* 485:76-79.
- Papa, V., Vaccarezza, M., 2013. Teaching anatomy in the XXI century: new aspects and pitfalls. *ScientificWorldJournal* 2013, 310348. <https://doi.org/10.1155/2013/310348>.
- Papagaroufali, E., 1999. Donation of human organs or bodies after death: A cultural phenomenon of "flesh" in the Greek context. *Ethos* 27:283-314. <https://doi.org/10.1525/eth.1999.27.3.283>.
- Pawlina, W., Lachman, N., 2004. Dissection in learning and teaching gross anatomy: rebuttal to McLachlan. *Anat. Rec. B New Anat.* 281, 9–11. <https://doi.org/10.1002/ar.b.20038>.
- Pawlina, W., Hammer, R.R., Strauss, J.D., Heath, S.G., Zhao, K.D., Sahota, S., Regnier, T.D., Freshwater, D.R., Feeley, M.A., 2011. The hand that gives the rose. *Mayo Clin. Proc.* 86, 139–144. <https://doi.org/10.4065/mcp.2010.0625>.
- Quondamatteo, F., Corzo-Leon, D.E., Brasset, C., Colquhoun, I., Davies, D.C., Dockery, P., Grenham, S., Guild, S., Hunter, A., Jones, J., Lee, T.C., Tracey, C., Wilkinson, T., Munro, C.A., Gillingwater, T.H., Parson, S.H., 2021. Neutralisation of SARS-CoV-2 by anatomical embalming solutions. *J. Anat.* 239, 1221–1225. <https://doi.org/10.1111/joa.13549>.
- Repubblica Italiana, 2020. Norme in materia di disposizione del proprio corpo e dei tessuti post mortem a fini di studio, di formazione e di ricerca scientifica. (20G00024) *Gazzetta Ufficiale della Repubblica Italiana* 161:1-5.
- República Portuguesa, 1999. Decreto-Lei n.º 274/99, de 22 de julho regula a dissecação de cadáveres e extração de peças, tecidos ou órgãos para fins de ensino e de investigação científica. *Diário da República Série I-A de 1999-07-27:4522-4527*.
- République Française, 2022. Décret n.º 2022-719 du 27 avril 2022 relatif au don de corps à des fins d'enseignement médical et de recherche (ESRS2204519D). *Journal Officiel de la République Française* 0099:41.
- Riederer, B.M., Bolt, S., Brenner, E., Bueno-Lopez, J.L., Chirculescu, A.R.M., Davies, D.C., De Caro, R., Gerrits, P.O., McHanwell, S., Pais, D., Paulsen, F., Plaisant, O., Sendemir, E., Stabile, I., Moxham, B.J., 2012. The legal and ethical framework governing Body Donation in Europe – 1st update on current practice. *Eur. J. Anat.* 16:1-21.
- Şahin, Z.A., Üzel, M., Marur, T., Eren, F., Yıldırım, F.G., 2023. Knowledge levels and attitudes of medical faculty students related to whole body donation in Türkiye. *Ann. Anat. Anat. Anz.* 247, 152047.

- ScienceNorway (Aakervik, A.-L.), issued March 27th, 2021. Nine hundred people from one Norwegian county donated their bodies to research when they die. Why? <https://partner.sciencenorway.no/health-medicine-ntnu/nine-hundred-people-from-one-norwegian-county-donated-their-bodies-to-research-when-they-die-why/1829353>.
- Sehirli, U.S., Saka, E., Sarikaya, O., 2004. Attitudes of Turkish anatomists toward cadaver donation. *Clin. Anat.* 17, 677–681. <https://doi.org/10.1002/ca.20056>.
- Siuta, J., Domagała, Z., Pluta, D., Tokarski, M., Iwan, D., Jurek, T., Dobosz, T., 2020. Body donation as the basis for advance in medicine in past and today—meaning, principles, controversies. In: Bialy, L., Mlynarczuk-Bialy, I., editors. *Advances in Biomedical Research—from COVID to Medical Humanities*. Lublin, p 187-198.
- Sociedad Anatómica Española, 1996. Acta de Barcelona. SAE. <https://www.sociedadanatomica.es/materiales/ACTA-BARCELONA.pdf>.
- Sociedad Anatómica Española, 2015. Acta de Madrid. SAE. <https://www.sociedadanatomica.es/materiales/ACTA-MADRID.pdf>.
- Srdić Galić, B., Drvendžija, Z., Štrkalj, G., 2016. Attitudes of medical and allied medical students from Serbia toward whole body donation= Atitudes dos estudantes de medicina e áreas médicas afins da Sérvia em relação à doação completa do corpo. *Bioscience Journal* 32:1388-1402.
- SSAHE/SGAHE, 2023. The Swiss Society for Anatomy, Histology, and Embryology. last update: 2023/10/13/. <https://www.ssahe.ch>. (visited: 2023/10/13/).
- Supreme Council of the Republic of Latvia, 1992. Par miruša cilvēka ķermeniņa aizsardzību un cilvēka audu un orgānu izmantošanu medicīnā. *Latvijas Republikas Augstākās Padomes un Valdisas Ziņotājs* 1993:1/2.
- Swiss Academy of Medical Sciences, 2023. Medical-ethical Guidelines. last update: 2023/10/13/. <https://www.samw.ch/en/Publications/Medical-ethical-Guidelines.html>. (visited: 2023/10/13/).
- Swiss Association of Research Ethics Commissions, 2023. Mission statement of swissethics. last update: 2023/10/13/. [swissethics](https://swissethics.ch/en). (visited: 2023/10/13/).
- Swiss University Conference, 2016. Sonderprogramm Humanmedizin. In: Staatssekretariat für Bildung Forschung und Innovation SBFI, last update: 2023/10/13/. Swiss Confederation. <https://www.sbfi.admin.ch/sbfi/de/home/hs/hochschulen/hochschulpolitische-themen/sonderprogramm-humanmedizin.html>.
- Turkish Government - Ministry of Health and Social Assistance, 1979. Organ ve Doku Alınması, Saklanması, Asılanması ve Nakli Hakkında Kanun. Kanun Numarası: 2238. T.C. Resmi Gazete 17727:8-10.
- Turkish Government - Ministry of Health and Social Assistance, 1982. İnsan Cesedi Üzerinde Bilimsel Araştırma Yapılmasına İlişkin Yönetmelik. T.C. Resmi Gazete 16655:5153-5157.
- Turkish Government - Ministry of Health and Social Assistance, 2014. Sağlık Bakanlığı ve bağlı kuruluşların teşkilat ve görevleri hakkında kanun hükmünde kararname ile bazı kanunlarda değişiklik yapılmasına dair kanun. T.C. Resmi Gazete 28886:1-12.
- Turkish Society of Anatomy and Clinical Anatomy, 2012. "Ulusal Anatomi Haftası" Basın Duyurusu. In: <http://www.anatomiderneji.org.tr/belgeler>. Ankara. p 1-2.
- Turkish Society of Anatomy and Clinical Anatomy, 2013. Türkiye'de kadavra sorunu ve çözüm önerileri. In: <http://www.anatomiderneji.org.tr/belgeler>. Ankara. p 1-34.
- Vecanova, J., Hvizdosova, N., Hodorova, I., 2023. A report on accessory renal arteries incidence in Slovak adults: Cadaveric study and surgical correlation. *Bratislava Medical Journal/Bratislavské Lekárske Listy* 124:567-571. https://doi.org/10.4149/BLL_2023_088.
- Vojtšek, T., Prudil, L., 2006. informovaný souhlas s použitím částí těla použitím částí těla pro vědecké a výukové účely. *Med. Pro Praxi* 2006:48-49.
- Vrzgula, M., Mihalik, J., Vicen, M., Hvizdosova, N., Hodorova, I., 2023. Anatomical study of the ventral upper arm muscles with a case report of the accessory coracobrachialis Muscle. *Medicina* 59, 1445. <https://doi.org/10.3390/medicina59081445>.