Review

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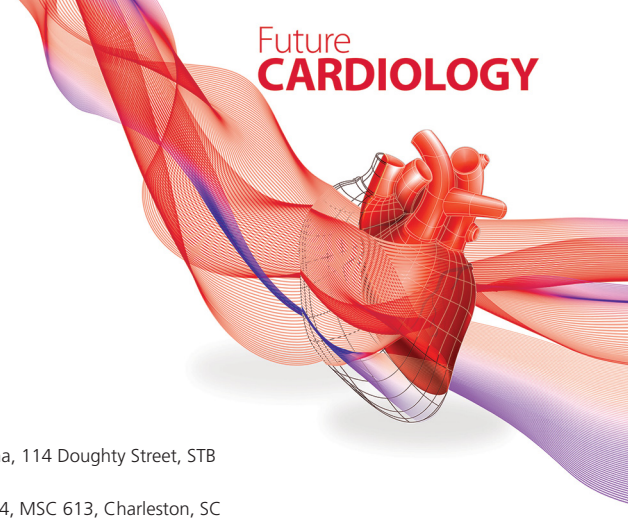

Surgical ethics: today and tomorrow

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Ethical behavior has always been deeply ingrained in surgical culture, but ethical deliberation has only recently become an important component of cardiac surgical practice. In our earlier review, we covered a range of issues including several related to informed consent, conflict of interest, professional self-regulation and innovation, among many others. This update covers several topics of interest to cardiac surgeons and cardiologists, focusing on controversial issues specific to the practice of cardiothoracic surgery: informed consent, relations with hospitals and euthanasia and physician-assisted suicide. The future holds much uncertainty for cardiac surgical practice, research and culture, and we provide an update on ethical issues to serve as a platform for envisioning what is to come.

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Ethical behavior is deeply ingrained in surgical culture, yet open discussion of ethical issues was uncommon in the surgical literature until the last 20 years. The Cardiothoracic Ethics Forum, sponsored jointly by the Society of Thoracic Surgeons (STS) and American Association for Thoracic Surgery (AATS), has played a role in popularizing ethics discussions through presentations at national cardiothoracic surgery meetings and publications [1]. Since 2000, the forum has published nearly 400 papers on ethical topics in cardiac, vascular and general surgery journals. It has presented over 50 programs at national cardiothoracic surgical meetings. These efforts have had a positive effect on the clinical practice of cardiac surgery [2].

Drawing largely upon that experience, we published a review of ethical issues in cardiac surgery in this journal 5 years ago [3]. That review consisted of discussions related to a broad range of ethical issues in cardiac surgery, including those related to professional self-regulation, research and innovation, conflicts of interest, cardiac surgery as a business, clinical equipoise in randomized controlled trials, and honesty in medicine; a detailed discussion of the nature of informed consent with related issues was also included. Since that publication, many additional controversial ethical issues specific to cardiac surgery have been discussed at cardiothoracic surgical meetings and published. In this update to the previous review, we add discussion of several issues related to informed consent, the business of surgery and euthanasia and physician-assisted suicide. These topics will be of interest not only to cardiac surgeons, but also to cardiologists and physicians in general.

Informed consent

The paramount responsibility of physicians when caring for patients is to the patients, placing their interests ahead of all other interests, personal and professional [4]. One of the fundamental principles of medical ethics is respect for the right of individuals to make decisions about what will happen to their own bodies and to act upon those decisions; this is known as the principle of respect for patient's autonomy. The manifestation of this principle in the practice of medicine is informed consent, which comprises three essential elements: the preconditions for decision-making (capacity to make decisions and voluntariness), the provision of information (disclosure of relevant

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facts and recommendations) and consent (including both the decision itself and authorization for others to act on the patient's decision) [5].

The decision-making process involves two principals, the physician and the patient. From ancient times until a few decades ago, decisions were made unilaterally and paternalistically by physicians, based on their expertise and specialized knowledge. Today, the process has evolved into 'shared decision making', in which physicians provide expert knowledge and advice, patients contribute their own preferences and values and patients are responsible for making the final determination of what is to be done [6].

The capacity to make decisions may be absent or diminished in several different ways. A patient may be rendered incapacitated by medical illness (e.g., stroke, dementia or traumatic brain injury), young age (e.g., infant through preadolescent) or severe mental disability. Recent discussions in the cardiothoracic surgery literature involve two such situations.

Advance directive limiting postoperative care: informed refusal by a surrogate

When a patient lacks capacity to make decisions, they generally are made for him by a substitute: a surrogate decision-maker (a person authorized by law to make decisions) or a proxy decision-maker (a person previously authorized by the patient to make decisions). The patient's (or authorized individual's) decision may consent to the physician's recommendation or may refuse the recommendation. The import and weight of refusal equals that of consent.

An 80-year-old man with a type A aortic dissection and multiple comorbidities develops chest pain and becomes confused and is intubated for ventilation. He needs urgent replacement of his ascending aorta and his wife, who is his health-care agent, says that although the patient wants everything done but does not want cardiopulmonary resuscitation (CPR) and does not want to be on a respirator. Despite information that a high-risk operation carries the possibility of kidney failure and prolonged mechanical ventilation, the wife insists that she will allow no more than a week of postoperative care after which she will withdraw all treatment, including dialysis. The question is whether the surgeon should do the operation, given this significant constraint [7].

The answer is not clear. The health-care agent must make decisions based on 'substituted judgment', meaning that her decision must be based on what her husband would have wanted, not necessarily on what she thinks is best. In the absence of a written document executed by the patient, the wife's decision should stand. The surgeon, however, is not obligated to do anything that will produce more harm than benefit; after weighing those factors, he could decide not to operate under the limitations placed by the wife. Refusal to operate cannot be based on race, sex or any other discriminatory criteria, conditions that are not present in this case. There is a high likelihood that this patient will require ventilation beyond the 1-week postoperative period, so refusing to undertake the operation may be reasonable.

Alternatively, the possibility exists that after an operation, were it to be done, the wife could be persuaded of the wisdom to continue support beyond the stipulated 1 week. The surgeon could take a chance on his persuasive powers to change the wife's mind, based on effective use of empathy, respect and negotiation, and do the operation [8]. If the surgeon refuses to do the operation, he also has the option of referring the patient to another surgeon who would find the limit on postoperative care acceptable. Either accepting or not accepting the limitations could be justified, depending on how the surgeon weighs his own professional character and obligations against his obligations to carry out the patient's wishes.

Family presence during resuscitation

The literature on family presence during resuscitation (FPDR) has been growing in recent years. FPDR is the policy of many hospitals of allowing or even inviting family members to witness CPR and other procedures, short of procedures in the operating suites [9–11]. Although surveys suggest that FPDR is not only acceptable but is beneficial to both families and health-care professionals, many remain skeptical about its wisdom.

A 72-year-old patient with chronic obstructive pulmonary disease and a non-small-cell carcinoma undergoes extensive pulmonary resection and cannot be immediately extubated. His pulmonary function becomes worse over the next few days and, while his wife is with him, he becomes more agitated, has a brief period of bradycardia followed by flat lines on his arterial monitor and electrocardiogram. A May-Day code is called. The wife remains in the room and when the surgeon arrives a few minutes after CPR begins, she is not sure whether to insist that the wife leave or allow her to stay [12].

Although several studies about FPDR have been published, many of them are small, and they mostly come from emergency departments; nevertheless, their information is probably transferable to intensive care units [13–15]. The

studies suggest that patients who survive CPR are comforted by their family's presence, connection with their family is enhanced and the overall impact on their care is positive. Family members who are present during resuscitation believe that witnessing the procedure eases their grief and aids their dying family member. Objective evidence shows that families who were randomized for FPDR had lower bereavement scores 3 months and 9 months after CPR [16]. After implementation of an FPDR program, the staff of one hospital overwhelmingly supported continuing the program and noted that family behavior was appropriate [17,18]. No litigation has resulted from an FPDR program and every family surveyed thought that all appropriate measures had been taken in support of their family member patient.

Arguments against the practice of FPDR cite the weakness of data that support FPDR. Survey data are well known to be incomplete and poorly representative of group experience. Negative experiences, such as the feeling that too much was done during CPR, are generally mentioned only in passing. Virtually all of the studies of FPDR are small and underpowered. In at least one study, only 29% of patients undergoing cardiac operations desired FPDR [19]. Most telling is the fact that most patients have not given permission for FPDR when it would be possible for them to do so preoperatively. Confidential information that the patient might not want to share could be revealed during CPR. Our primary responsibility, from this viewpoint, is to the patient, not to the patient's family, arguing against FPDR. Moreover, injury to a family member can occur, such as exposure to blood-borne pathogens in the chaotic situations that often accompany CPR; the ethical and legal implications of this possibility have not been studied. Significantly, a majority of health-care professionals would not want FPDR if they were the patient [20,21]. Although FPDR policies are spreading nationally, consideration of adopting such policies should weigh negative as well as positive implications.

Conflict over a family's request

One of the critical elements of the informed consent process is information disclosure: provision of relevant, material information about the nature of the procedure, its benefits and potential harms and alternative treatments that might be available, including no treatment. The question of whether to offer a potentially available treatment at all is not uncommon, especially if a particular therapy is considered to be futile or medically inappropriate for some substantial reason. Such situations can give rise to disagreement or even conflict, perhaps never more poignantly than when a child's life is at stake. The following scenario illustrates this problem.

An 8-year-old girl with trisomy 21 (Down syndrome) has a complete atrioventricular canal for which she underwent repair at the age of 5 months. She later developed obstructive sleep apnea and continuous positive airway pressure (CPAP) was prescribed, but she does not tolerate the mask and often removes the apparatus at night. She now has severe mitral valve insufficiency and moderately depressed left ventricular function, with pulmonary vascular resistance 4 Wood units. At operation, the mitral valve is repaired, but transesophageal echocardiography finds residual moderate mitral valve insufficiency. The patient is placed back on bypass and the mitral valve is replaced with a mechanical valve. Although the valve is functioning well, she cannot be removed from bypass because of poor left ventricular function, so she is placed on venoarterial extracorporeal membrane oxygenation (ECMO). Postoperatively she is re-explored for bleeding, adequate heparinization is difficult to maintain, and thromboemboli are found in several fingers and toes. After a week on ECMO and several attempts at weaning, successful removal from ECMO seems highly unlikely. The only two options seem to be withdrawal from ECMO, resulting in almost immediate death, or placement of a ventricular assist device as a bridge to heart transplantation. Her parents want her listed for heart transplantation. The question is whether it is reasonable for the surgeon to offer transplantation [22].

Organ transplantation in patients with Down syndrome was rare until the 1995 case of Sandra Jensen, a 34-year-old Down syndrome woman who was initially denied heart transplantation, but received a heart transplant after successful lawsuit [23]. We now know that short- and long-term outcomes are similar or even better than those of genetically normal individuals [24]. Moreover, mechanical support as a bridge to transplantation in children is now commonly done in the presence of end-stage heart failure [25]. It is also generally accepted that the ethical concept of justice requires equal treatment for similarly situated individuals, so children with Down syndrome should not be treated differently from normal children.

This particular patient might have contraindications to listing for heart transplantation, however [26]. Emboli to her fingers and toes suggest that more widespread vascular disease may have produced significant damage to her lungs, liver and kidneys, weighing against long-term graft survival. The patient also has a history of noncompliance in that she refuses to wear a CPAP mask to treat her obstructive sleep apnea; this is unlikely to change after transplantation. Even if accommodations are made to facilitate compliance with the complex treatment regimens associated with

heart transplantation, in view of her genetic disability, they are likely to be insufficient to protect her transplanted heart from noncompliance. Viewing the limited resource of medically suitable hearts for transplantation from a population-based perspective rather than an individual-based perspective, providing a heart to this patient and the relatively high risk of graft failure denies the transplant to another patient with a much better outlook, who will die without a transplant. Perhaps placing this patient on a ventricular assist device is prolonging her dying process rather than furthering her chance for a long life. The arguments for and against listing this child for heart transplantation seem nearly equally compelling. Making the clinical decision in such cases is likely to be extremely difficult.

Surgeons' relations with medical center administrations

Over the last few decades medical center administrations have experienced intermittent periods of financial distress; some would argue that this has led, to some extent, to administrative control of medical practice and to increasing administrative intrusion into relations between physicians and patients. Turmoil in the health-care industry related to uncertainties surrounding the future of federal involvement in health-care financing has intensified administrative interest in medical decisions, especially as they affect hospital revenue, ranging from local issues such as patient care and physician competence to judgments about personal lifestyle of physicians. Two such issues have been recently discussed in the cardiothoracic surgery literature.

Transfer of a patient to another medical center

A cardiothoracic surgeon in a community private hospital is referred a patient who suffered an esophageal perforation two days previously and now has early sepsis in the presence of several comorbidities, including alcoholism, diabetes mellitus and early renal failure. All of the cardiothoracic surgeons in the institution do cardiac surgery and most also do some general thoracic surgery, but none is especially expert in the treatment of esophageal diseases. They usually refer complex esophageal cases to the university hospital that competes with the hospital's competitor. The surgeon believes the patient should be transferred to the university hospital, but the hospital administrator intercedes as arrangements are made for transfer and informs the surgeon that she has to care for this patient locally; he does not want to send business to a competing institution. The surgeon is board-certified, so she knows how to care for such patients and has treated similar cases during her residency. Nevertheless, the best care for this patient would be provided in a more specialized center. The patient has no family and is intermittently confused, so cannot make a decision about potential transfer [27].

Given the patient's sepsis and substantial comorbidities, his mortality risk is close to 50% in the most experienced institutions, and probably much higher in less experienced ones. The principle of respect for autonomy does not operate here because the patient is incapacitated, so he cannot make the decision regarding where he wants his surgery done. Cardiothoracic programs that do a large volume of esophageal surgery have much better outcomes than smaller programs [28]. Therefore, the principles of beneficence and nonmaleficence (do more good for the patient than harm) strongly suggest that the patient should be transferred to the university hospital in order to minimize harm and maximize benefit. By violating the ethics of her profession and failing to do the right thing, the surgeon may be undermining her own character and increasing the likelihood that she will similarly fail in her ethical obligations in the future.

There are reasons for the surgeon to consider keeping the patient, however, and continuing to care for him locally. She has been trained to provide care for esophageal diseases and to do the best she can for each patient. No surgeon is required to provide the best possible care; the only requirement is that the surgeon be competent to provide the needed care, and it is clear in this vignette that the surgeon is competent, even though not expert [29]. Furthermore, the surgeon has obligations not only to the patient but also to her surgical group and the institution which she works. Moreover, the hospital administration has an ethical and fiscal obligation to maintain its long-term financial viability of the institution, so its demand that this patient be treated locally, other things being equal, is not unreasonable [30]. The balance between conceptual ethical demands and practical contingencies can be difficult to evaluate in cases such as this.

Medical center's demand that its physicians not smoke

Physicians in general and especially cardiothoracic surgeons strongly discourage smoking. Several major health systems, including the Cleveland Clinic, the University of Pennsylvania Health System, and the Baylor Health Care System, have instituted a policy of refusing to hire employees who smoke, including physicians [31]. The policies

are enforced by testing for urinary nicotine and nicotine metabolites. Such policies are highly controversial because they support healthy lifestyle, but also punish individuals for behaviors they engage in at home.

A cardiac surgeon is the president of the university physicians practice plan, which includes every physician in the medical center. The hospital administrator has given him a copy of a new policy that will soon be implemented by the medical center, under which no job applicant who currently smokes tobacco products will be hired. The administrator is requesting that the practice plan adopt a similar policy for physician applicants, and the surgeon wonders what he should do [32].

There is no doubt that smoking is harmful: heart disease, cancer, chronic lung disease and cerebral vascular disease – the four top causes of death in this country – are related to smoking [33]. Most physicians believe that the meager benefits of smoking (alertness, calmness and relaxation) are heavily outweighed by its harms [34]. Also, medical institutions have a responsibility to maintain a health-promoting image, which is undermined by the presence of smokers on its staff. Smoking also undermines the health of its staff. Prevention of illness, which is advanced by antismoking policies, both maintains health and reduces costs of health care, which is a major problem in this country.

Other unhealthy lifestyles contribute to morbidity and mortality, however. Obesity, for example, contributes to 15% of deaths and nearly 40% of adults in the USA are obese [35], twice the number of smokers. Alcohol use contributes substantially to the annual death rate, and the gay lifestyle reduces lifespan by 20 years [36,37]. The contribution of smoking to mortality has been overstated by antismoking advocates. Only 3% of physicians smoke [38,39], while 42% are overweight or obese, 35% exercise less than 30 min a week and alcohol consumption of two drinks a day is common. Where does the idea of requiring physicians to be role models for healthy lifestyles end? Which is more obvious to patients, a physician who smokes only at home, never in the hospital, or one who is obese? Perhaps an antismoking personnel policy that test urine for nicotine metabolites is unethical on grounds of unjustified discrimination.

Companies that have a no-hiring-of-smokers policy number more than 6000 and are increasing. Yet, 65% of the general population oppose such policies and 29 states have already passed laws prohibiting them [40]. This debate seems likely to continue well into the future.

Surgical tourism: evaluation by surgical specialty societies

Rationing of health-care services takes various forms in different countries. In the USA, for example, rationing is price-related: services are very expensive, so are not easily accessible to people with no health insurance or inadequate health insurance. In countries such as Canada where health care is cost-free at the point of service, rationing occurs by long waiting times. To escape such rationing, patients are taking advantage of high-quality, low-cost health care, especially surgery, in Third World countries by buying inexpensive packages that include travel, lodging, hospitalization and physician fees, and several days of postoperative care [41,42]. In 2016, 1.4 million Americans are estimated to have traveled outside the country for medical care [43]. This practice is known as medical tourism, and is associated with several problems. Among them is the difficulty of evaluating quality of care in distant locations; accrediting agencies already evaluate international health-care organizations, but their standards vary widely. Evaluation of international cardiac surgery programs might best be done by cardiothoracic surgery specialty societies, which already have sophisticated evaluation programs. An important question is whether surgical societies should evaluate and rate the quality of international centers in order to help patients wisely choose low-cost, high-quality surgery [44].

Although many factors motivate travel by patients from industrialized countries to surgical centers in developing nations, the best reason for surgical societies to undertake evaluation of international surgery programs is the motivation for patients to benefit from low-cost, high-quality surgery. The capability for doing this already exists: the STS National Database has been operational for nearly 30 years and has accumulated reliable clinical data from several million cardiac surgical operations [45–47]. Center-specific reports allow cardiac surgery programs to evaluate their own results in comparison with risk-adjusted benchmarks; this has been demonstrated to improve patient outcomes [48]. These sophisticated technologies could be used to rate accurately the quality of international cardiac surgery programs. The STS National Database already includes participants from North America, South America, the Middle East, and Asia, so adding programs in specific countries would not be a major problem [49]. For patients who become medical tourists, informed consent requires reliable information about the quality of surgical services. The STS National Database is in a position to provide such information [50].

Certain problems remain, however [51–53]. The quality of care internationally is very uneven, the risks of medical tourism are related to lack of oversight, and poor outcomes are attributable to substandard surgery. Also, long-distance travel increases the incidence of deep vein thrombosis and pulmonary embolism, and sepsis results from a poorly sterilized environment and improper use of antibiotics. Proper credentialing of international centers should require board certification for physicians and evaluation of services such as cardiac catheterization and pharmacies. These are poorly done at this time, and it is not clear how this will take place in the future, despite involvement of the Joint Commission International and the International Organization for Standardization [54].

Appropriate evaluation and rating of international health-care centers require a central international database that tracks clinical outcomes and informed consent practices, as well as the flow of medical travelers, physician qualifications, and institutional safety practices. Yet, the global marketplace is highly decentralized, making maintenance of a central database especially difficult. Some of the barriers to good patient care include wide variations in local and national cultures and language barriers that negatively impact informed consent processes. Encouraging medical tourism also is likely to have detrimental effects on the US economy by decreasing costs as foreign physicians and nurses increasingly returned to their home countries after training in the USA [55]. Moreover, the valuation and rating of cardiothoracic surgical programs overseas will be associated with substantial administrative costs and other daunting financial issues [56]. It is questionable whether our national cardiac surgery organizations will have the resources and the will to undertake international program evaluations.

Euthanasia & physician-assisted suicide

At the time of our previous review 5 years ago, three states had legalized physician-assisted suicide (PAS): Oregon and Washington by statute, and Montana by case law. Efforts to legalize PAS have accelerated, and as of this writing, three additional states have been added to the list (Vermont, Colorado and California), as well as the District of Columbia [57,58]. No federal statutes address this issue, which is a state responsibility. Every jurisdiction in the USA, including the federal government, prohibits euthanasia under general homicide laws. Among the ten countries globally that allow PAS, euthanasia is legal in four (The Netherlands, Belgium, Luxembourg and Colombia) and possibly legal (the law is ambiguous) in two others (Canada and Japan) [59]. It seems only a matter of time before euthanasia becomes permissible in at least a few states. When it becomes legal, should physicians participate in euthanasia?

Euthanasia for a severely disabled newborn

A full-term newborn infant becomes cyanotic shortly after birth, and is found to have heterotaxy syndrome with a group of severe heart malformations. The four therapeutic alternatives are surgical treatment consisting of a series of high-risk operations with the possibility of survival to the teenage years, but very unlikely to adulthood. Medical treatment could permit survival, at best, for a year or two. Feeding and comfort care only would result in progressive disability and suffering, and death within a year. Euthanasia would prevent suffering, and recently was made legal in this hypothetical state. After extensive deliberation and consultation with friends and advisers, the parents tell the cardiologist that they have decided that euthanasia is the most humane option. Should the cardiologist do what the family wishes [57]?

The newborn infant does not have the capacity to make decisions for himself, so the appropriate surrogate decision makers are the parents [60]. They have made their wishes clear. There is no question the infant will die sooner rather than later, passively (with palliative care, over a period of at least several days or weeks) or actively (by euthanasia, within the next few hours). Euthanasia could be justified on grounds that the child will inevitably die soon, and that prolonging the dying process would prolong suffering for the infant as well as for the family. A prolonged dying process would also be highly stressful for the health-care team. The interests of the child, the parents and the health-care professionals matter in a morally relevant way. The opposing position would argue that life is sacred and should not be actively terminated – the sanctity-of-life position – but a quality-of-life perspective would be more sensible in a secular society such as ours [61]. A long dying process would also be a waste of scarce health-care resources, which could otherwise be used to benefit other patients and improve their quality of life.

Yet, by assuming that the baby's life is a burden, we embrace his death as a good, accepting a willingness to intentionally kill the innocent as part of our character [62]. We abandon compassion, which requires that we suffer with the patient and not distance ourselves as if we were not equal in indignity. Two warrants for euthanasia are compassion for suffering individuals and respect for their self-determination; together these warrants may reinforce each other to sharply increase the categories of candidates for euthanasia [63]. Health-care professionals work continuously in a sea of suffering, so may be tempted to eliminate suffering by eliminating the sufferer [64].

Also, there is a certain wisdom that advises physicians always to care and never to kill. In short, our goal should be "*to affirm life even in the midst of death, and to commit ourselves to helping to shape a death we can live with*" [62].

Euthanasia to facilitate organ transplantation

In the case of the severely disabled newborn, secondary benefits of euthanasia may accrue to the family and the health-care team, whose suffering may be substantially shortened, and, less immediately, the health-care system, which avoids waste of scarce resources. But what if there were much more substantial benefits from euthanasia, including increasing rather than decreasing scarce resources? Would the arguments in favor of the practice become stronger and make it more permissible? Or would the arguments against euthanasia carry the day? These questions have been explored with a vignette and series of responses.

A senior cardiac surgeon is the chief of cardiothoracic surgery in a large Texas Medical Center and specializes in heart transplantation. He is invited by one of his former residents to visit his newly established cardiac surgery program in a medium-size city in Colombia to help with some difficult cases and decisions. PAS and euthanasia are both permissible under Colombian law. One of the difficult cases presented to the visiting professor involves a 42-year-old laborer whose wife died several years before, and whose 18-year-old son has developed rapidly progressive viral cardiomyopathy that has not responded well to medications. The son appears likely to survive for no more than a week. The father was recently found to have a glioblastoma adjacent to his brain stem, which is deemed to be inoperable and is likely to result in death within 1–2 months. He has severe headaches that respond poorly to medication. The father wants his son, his only surviving relative, to maintain the existence of his family in the only way possible: a heart transplant. He has asked the physicians to take his heart while it is still in good condition and give it to his son. Without this, they will both be dead within a few weeks or months, with a transplant, his son can survive to carry on the family name. The problem for the visiting professor is whether to participate in euthanasia by taking the heart of a living person, who is begging him to do so, to save the life of his only surviving child [65].

This scenario raises difficult issues at fundamental levels. Carrying out this operation could be the beginning of a slippery slope: how could one protect against undue pressure to donate a heart [66]? What protection against coercion by financially motivated hospitals, overzealous surgeons, greedy family members, perhaps even from the recipient? This case might set a dangerous precedent for the instrumentalization of dying patients who could be organ donors [67].

Euthanasia may be condemned because it lies outside the boundaries of the surgeon's role, yet the early kidney transplantations were criticized because the surgeon made the living donor less healthy than he had been, and exposed the donor to unnecessary risks [68]. Every code of ethics of medical professional organizations prohibits euthanasia, so to participate in this practice would undermine codes of ethics and thereby undermine trust – which is of fundamental importance to the effectiveness of physicians – in the profession the code serves. Yet it is not true that the surgeons in this case are ending a patient's life in order to preserve another life; they are in fact fulfilling the compelling desires of the father, simultaneously ending his suffering from his own terminal illness and providing him with a dignified and meaningful death. Denying the father this final act would violate both his dignity and his autonomous wish [69].

In Belgium, which permits euthanasia under certain circumstances, organ donation has been carried out after euthanasia, but only in accordance with Belgian law. The law requires that the patient be dead before organs can be removed, so organ donation would not be permitted in this case [70]. Over 40 cases of organ transplantation after euthanasia have taken place in The Netherlands and in Belgium. The ethical core of this process is that the rationale for euthanasia and the rationale for organ donation be completely separated and independent of one another [71]. Another problem with this particular case is that directed donation (as from father to son) after death is not permitted in those two countries.

Conclusion

Ethical dilemmas are common in surgery and we have touched upon a few of them in this update of our previous review of surgical ethics [3]. We have not attempted to cover the entire field of surgical ethics as this would be far too extensive an undertaking. Instead, we have focused on a few ethical controversies from the current cardiac surgical literature. Issues around informed consent continue to present challenges and will do so in the future. We also discussed a few aspects of medical ethics as it relates to hospital administrations. Several states in the USA have recently passed laws regarding end-of-life issues such as PAS and advance directives, and we have discussed some of

their implications and the possibility of their extension into euthanasia. We anticipate growth in the number and variety of ethical issues facing surgeons in the coming years.

Future perspective

For surgeons, problems with ethical implications are not likely to diminish; more likely, they will become more numerous in several broad areas. Challenges to professional integrity will be particularly troublesome as bureaucratic intrusions into the practice of medicine intensify. The nature of the intrusions will depend to a large extent on what happens in the field of health-care financing, which in turn will be related to the fate of the Patient Protection and Affordable Care Act as it either evolves or is replaced by a less bureaucratic, more market-oriented national health policy.

The interface of physicians with patients will produce new problems, particularly in the areas of informed consent and surrogate decision-making. The focus on disclosure of information will shift from providing facts of the patient's condition and treatment options to ensuring patients understand what they are being told.

Executive summary

Informed consent

- Informed consent is the clinical manifestation of the ethical principle of respect for patient's autonomy.
- The essential elements of informed consent are: preconditions for decision-making (capacity to make decisions and voluntariness), the provision of information (disclosure of relevant facts and recommendations) and consent (including both the decision itself and authorization for others to act on the patient's decision). Ethical dilemmas can arise from inadequacies in any of these elements.
- Physicians no longer make paternalistic decisions for patients; instead, they and their patients jointly make decisions in a process known as shared decision-making.
- Patients who lack the capacity to make decisions have a substitute decision-maker, either a surrogate authorized by law or a proxy designated by the patient. Decisions by substitute decision makers carry essentially the same weight of authority as decisions by patients themselves.
- If a substitute decision-maker demands an action the physician conscientiously disagrees with, the physician may refuse to carry it out and may refer the patient to another physician.
- Hospital policies allowing family members to be present during cardiopulmonary resuscitation are becoming more widespread; there is conflicting evidence as to whether or not this is a good idea.
- Medically inappropriate (futile) treatments requested or demanded by patients or families can be refused, but there is often disagreement as to what is or is not medically inappropriate.
- Disabled individuals such as those with trisomy 21 may be reasonable candidates for heart transplantation.

Surgeons' relations with medical center administrations

- Increasing intrusions into medical practice by third parties such as hospital administrations are becoming more widespread and may produce ethical dilemmas.
- If a hospital administrator countermands a physician's order to transfer a patient to a competing facility, the physician may face a difficult decision of how to resolve the conflict between doing what is best for the patient and doing what is good for the hospital.
- Antismoking sentiment has grown to such a degree that some medical centers do not hire physicians whose urine tests positive for nicotine or nicotine metabolites, raising the question of whether physicians should support such policies.
- Surgical tourism (travel to other countries for low-cost, high-quality surgery) may harm as well as benefit patients and threatens to undermine hospital care in this country, raising the question of whether surgeons and surgical societies should support surgical tourism by evaluating and rating Third World surgical programs.

Euthanasia & physician-assisted suicide

- The number of states that have legalized physician-assisted suicide has more than doubled in the last 5 years. Euthanasia is not legal anywhere in the USA, but is legal in at least four other countries.
- Severely disabled newborns may have little chance of survival or may be able to survive only with extremely low quality of life. Although the decision to withhold treatment, including feeding, is common, it is not clear whether euthanasia is the more humane way to manage these unfortunate children.
- In at least two countries that have legalized euthanasia, The Netherlands and Belgium, organ donation has been carried out after the patient has died, using a donation after cardiac death protocol. An imminently dying patient's wish to be an organ donor may be best respected, however, by removing organs before death has occurred, when the organs are in their best condition. This approach violates the dead donor rule, so is controversial.

The 2017 revision of the federal Common Rule (45 CFR part 46) introduced major changes for the first time since promulgation of the Common Rule 30 years ago; how the new guidelines are interpreted and implemented will have major effects on how heart-related research is carried out and how innovations in cardiac surgery and cardiology are approached.

Until there is a plentiful supply of organs for transplantation, dilemmas regarding patient selection and allocation of organs will continue to dominate the transplant field. When the organ supply becomes sufficient, most of the ethical issues relating to organ transplantation will disappear, as they largely arise from the shortage of organs for transplantation.

The relations between physicians and industry will continue to undergo critical scrutiny, particularly by government agencies, and surgeons will be prudent to evaluate carefully their dealings with colleagues in industry in the context of governmental and institutional policies.

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