

Bioethics and ERAS: a relevant microcosm

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Abstract

The objective of this article is to present a reflection on the concepts and applications of bioethics, its relationship with the development of the moral competence of health professionals, as well as to suggest strategies to mitigate ethical dissonances and clash of paradigms, which can become facilitators of other protocols or institutions. This is an experience report on developing a local protocol to accelerate pediatric cardiac surgical recovery. During this process, the health personnel presented critical points of discussion and dissonance related to venous access, anesthetic induction, parental presence, and pain control. Several reasons were presented and interpreted according to the four main scientific philosophical currents. Considering and reviewing bioethical principles was necessary, especially the autonomy applied to minors and the interrelationship between the principles and their hierarchy of importance. This reinforces the importance of continuing education and the role of medical ethics committees.

Keywords: Bioethics. Ethics, medical. Anesthesia. Anesthesia in cardiac procedures. Emergence delirium. Attitude of health personnel. Bioethical issues.

Resumo

Bioética e Eras: um microcosmo relevante

O objetivo deste artigo é apresentar uma reflexão sobre conceitos e aplicações da bioética, sua relação com o desenvolvimento da competência moral de profissionais de saúde, assim como sugerir estratégias para mitigar dissonâncias éticas e choque de paradigmas, as quais podem tornar-se facilitadoras de outros protocolos ou instituições. Trata-se de relato de experiência sobre o processo de elaboração de protocolo local de aceleração da recuperação cirúrgica cardíaca pediátrica. Durante esse processo, a equipe de saúde apresentou pontos-chave de discussão e dissonância relacionados a acesso venoso, indução anestésica, presença dos pais e controle da dor. Diversas razões foram apresentadas e interpretadas conforme as quatro principais correntes filosóficas científicas. Foi necessário considerar e revisar os princípios bioéticos, principalmente o da autonomia aplicado a menores, a inter-relação entre os princípios e sua hierarquia de importância. Reforça-se assim a importância da educação continuada e o papel das comissões de ética médica.

Palavras-chave: Bioética. Ética médica. Anestesia. Anestesia em procedimentos cardíacos. Delírio do despertar. Atitude do pessoal de saúde. Temas bioéticos.

Resumen

Bioética y Eras: un relevante microcosmos

Este trabajo reflexiona sobre los conceptos y aplicaciones de la bioética, su relación con el desarrollo de la competencia moral de los profesionales sanitarios, además, sugiere estrategias para mitigar las disonancias éticas y el choque de paradigmas que pueden convertirse en facilitadores de otros protocolos o instituciones. Este informe de experiencia aborda el proceso de desarrollo de un protocolo local sobre aceleración de la recuperación quirúrgica cardíaca pediátrica. Durante este proceso, el equipo sanitario presentó puntos de discusión y disonancia relacionados con acceso venoso, inducción anestésica, presencia de los padres y control del dolor. Se presentaron e interpretaron varias razones según las cuatro principales corrientes filosóficas científicas. Se consideró y revisó los principios bioéticos, especialmente el de la autonomía aplicada a los menores, la interrelación entre los principios y su jerarquía de importancia. Esto refuerza la importancia de la educación continua y el papel de los comités de ética médica.

Palabras clave: Bioética. Ética médica. Anestesia. Anestesia en procedimientos quirúrgicos cardíacos. Delirio del despertar. Actitud del personal de salud. Discusiones bioéticas.

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The enhanced recovery after surgery (ERAS) protocol consists of a set of patient-centered measures carried out by a multidisciplinary team that aims to improve recovery, reduce the response to surgical stress, optimize physiological function, and decrease the length of stay and postoperative complications. Since the first reports of Kehlet¹, ERAS has evolved a lot and gained great notoriety in the medical world, to the point of having its own society—the ERAS Society—and, over time, several specialties and societies joined the cause, contributing their own protocols.

The ERAS protocols in pediatric cardiac surgery provide an evidence-based, multidisciplinary structured approach encompassing all perioperative care aspects to optimize a child's recovery after surgery². Protocols are sets of potentially beneficial measures whose systematicity cannot culminate in a rigid system. Therefore, the physician will always be responsible for the care and must conform to or modify the planned path based on individual needs and the child's best interests.

In this regard, the *Code of Medical Ethics*³, in its chapter III, states:

Art. 3 Failing to assume responsibility for the medical procedure indicated or in which they participated, even when several physicians have assisted the patient.

Art. 4° Failure to assume responsibility for any professional act performed or indicated, even if requested or consented to by the patient or their legal representative.

Given this non-transferable responsibility for the medical act, it is unsurprising that the surgeon or anesthesiologist responsible for the surgery is the primary vector of protocol deviations⁴.

Many barriers to interprofessional cooperation exist, such as lack of personnel, resistance to changes in traditional surgical concepts, low patient adherence and collaboration, and lack of unified management and effective operational plans for a multidisciplinary team⁵⁻⁹. Well-established, evidence-based local protocols available to professionals through continuing education are more readily accepted and promote the bioethical principle of justice, as a more significant number of patients will receive standardized equal

treatment rather than based on individual criteria, which can differ significantly depending on the attending team.

Through an experience report on developing a local ERAS protocol, this article aims to present a reflection on the concepts and applications of bioethics and its relationship with the development of the moral competence of health professionals during the implementation of acceleration protocols of surgical recovery. Furthermore, strategies are suggested to mitigate ethical dissonances and paradigm clashes to facilitate establishing other protocols or applying protocols in other institutions.

The program

A group of collaborators was assembled to develop an institutional program based on the ERAS project in a cardiology hospital focused on pediatric cardiac surgeries (ERAS-PED/INC). The first phase proposed a set of evidence-based, multimodal, and multidisciplinary clinical interventions associated with family engagement and applied synergistically pre-, intra-, and post-operatively for specific patient groups.

The ERAS-PED/INC program was also inspired by the patient-centered care model (PCC), which has a broader perspective on health care and includes the participation of patients/family members in care and humanization in the professional-patient relationship within an interprofessional collaborative practice (ICP) proposed by the Unified Health System (SUS).

Patients aged between 30 days and 18 years, scheduled for elective congenital heart surgeries of low complexity, classified in the mortality score of the Society of Thoracic Surgeons and the European Association for Cardiothoracic Surgery (STS-EACTS) as STAT 1 or 2 and who accept to participate in the ERAS-PED/INC program can be included in the program. Patients in critical condition, with comorbidities that are known to affect the speed of recovery, who refuse to participate in the program, with an echocardiographic residual lesion score above 2, and with an unfavorable outcome during surgery or post-operatively are excluded.

After an extensive literature review and consultations with local professionals, the primary proposed interventions were determined, and a series of meetings were held to discuss them.

Different points of view were presented, and many concepts were modified. Table 1 summarizes the types of intervention and the main specific actions proposed.

Table 1. Types of intervention and main specific actions proposed

Types of intervention	Specific actions proposed
Consent collection, counseling, and family education	<ul style="list-style-type: none"> • Check eligibility • Verbal explanation, printed pamphlets, videos, and links about the ERAS program
Assessment of nutritional status	<ul style="list-style-type: none"> • Patients who present a Z score for weight-age equal to -3 (very low weight) will be referred to the nutrition outpatient clinic • Maintain nutritional support until surgery and early intervention of enteral or parenteral nutritional support in these cases
Preoperative anxiolytic measures	<ul style="list-style-type: none"> • Oral or intravenous premedication • Referral of a responsible person to the surgical center to monitor the anesthetic induction if pre-anesthetic medication is ineffective, depending on the psychological status of the family member and the wishes of the child and family member • The assessment of need will be made by the anesthesiologist attending the procedure, who will offer the family the possibility • Non-pharmacological measures such as videos or cell phone games, hero costumes, entering the operating room with a favorite toy
Multimodal pain management	<ul style="list-style-type: none"> • Continuous infusion dexmedetomidine • Bilateral plane block of the erector spinae muscles • Multidrug protocol according to the postoperative day • Use pain scales regularly (FLACC)
Delirium prevention	<ul style="list-style-type: none"> • Dexmedetomidine administered intraoperatively • Cornell scale for assessing delusions
Nausea prevention	<ul style="list-style-type: none"> • Intra and postoperative administration of antiemetic medications
Temperature control	<ul style="list-style-type: none"> • 36 °C to 37 °C at the CPB outlet
Respiratory status	<ul style="list-style-type: none"> • Extubation within six hours • Use the institutional extubation criteria described in the protocol
Target-directed fluid therapy	<ul style="list-style-type: none"> • Intraoperative fluid balance below +17 mL/kg, preferably zero or up to -10 mL/kg
Blood conservation	<ul style="list-style-type: none"> • Preoperative ferrous sulfate replacement • Tranexamic acid • Miniaturization of CPB circuits • Adoption of target hematocrits during CPB following institutional protocol • Use of conventional and/or modified ultrafiltration • Use of cell saver • Viscoelastic tests (ROTEM) • In stable patients, adopt a minimum postoperative hemoglobin of 7 mg/dL for acyanotic patients and 9 mg/dL for cyanotic patients
Early food reintroduction	<ul style="list-style-type: none"> • Oral trial diet will be provided two hours after extubation if the patient is awake (RASS 0 or -1) and hemodynamically stable
Early postoperative mobilization	<ul style="list-style-type: none"> • Sequential way following protocol
Early removal of drains and catheters	<p>The next day:</p> <ul style="list-style-type: none"> • <20 kg: less than 1 mL/kg/drain for a total of four consecutive hours • 20 kg: less than 0.5 ml/kg/drain for a total of four consecutive hours • Adult-sized patients: less than 10 mL/hour/drain for three consecutive hours

CPB: cardiopulmonary bypass; ERAS: enhanced recovery after surgery; FLACC: face, legs, activity, cry, and consolability; RASS: Richmond agitation and sedation scale; ROTEM: rotational thromboelastometry

Update

Different conceptions

For Plato¹⁰, virtue is knowledge, and its search must continue throughout life. On the other hand, for Aristotle¹¹, it is not about mere knowledge but about action, and it is necessary to practice it constantly as a habit. The search for virtue is individual, but it can be supported by tools that create virtuous habits and continually educate human beings. The more they prevent judgment conflicts between clinical team members, patients, and families, the more effective they will be.

The tyranny of tradition can often influence medical behavior, as human beings act according to what they have learned and resist changes to a greater or lesser extent. Thus, every time knowledge does not provide sufficient evidence to resolve a question, the domain of revered authorities enters the scene, and the individual will follow the opinion of someone they admire: a particular researcher, a more experienced clinician, or even the conduct from an institution more renowned than theirs. Depending on the education received, and the personal identification of each professional, different paradigms and social views of the world influence the implementation of protocols.

In this regard, Alderson and collaborators¹² reflect excellently on different lines of thought in research related to pediatric cardiac surgery and living bioethics. These philosophical influences can be applied to researchers and care professionals, who are ultimately the interpreters of this science daily.

Western medicine is based on ancient traditions influenced by Hippocrates, Cicero, and Aristotle. During medical training, the positivist paradigm is predominant, according to which one learns to make a diagnosis, reach a consensus based on universal laws, prescribe, and improve the prognosis¹². Positivists, in the Enlightenment tradition of Hume, Comte, and Durkheim, seek value-free objectivity and prefer to apply clear general rules based on evidence, caring mainly about outcomes considered more relevant, such as mortality.

From this perspective, adherence to a medical protocol will be guided almost exclusively by the degree of scientific evidence in critical events.

To date, meta-analyses have not revealed a significant impact on mortality from ERAS, only in the days of stay, complication rate, and satisfaction in general surgeries in adults¹³. There is still no substantial evidence in the pediatric population, a subterfuge for professionals' non-acceptance.

There was no significant difference in complications and readmission within thirty days. On the other hand, in the ERAS groups, the length of hospital stay, the volume of intraoperative fluids, the use of opioids in the postoperative period, the time until the first defecation, the time until the regular diet, the time until the ingestion of intravenous fluids, and the costs were much lower¹⁴.

Following Kant, Weber, and Heidegger, adherents of hermeneutics are now recognizing more significant differences between natural and social sciences. Increasing the focus on personal opinions and experiences makes it possible to make complex analyses regarding individual understandings. Despite less robust evidence, this group accepts these measures can increase emotional well-being and patient satisfaction.

Critical theory, developed by Marx, Adorno, Gramsci, and Habermas, breaks with traditional Cartesian matrices and aims to achieve social change by controlling decisions and resources to share them more equitably. Critical theorists more easily adhere to protocols with broad inclusion criteria, low costs, and good suitability for public services.

Functionalism, influenced by Durkheim, Talcott Parsons, and Merton, is the belief that everything generally works for the highest good of all. This sociological theory emphasizes the importance of social harmony and stability for society's functioning, assuming a conservative consensus of shared norms and values. Functionalists accept hierarchies and possible inequalities in patient inclusion when such tools appear to support the more efficient functioning of the healthcare facility.

A certain naturalistic relativism explains how the same disagreements related to major ontological issues, such as a pandemic, vaccines, climate change, and sustainability, also exist in a microcosm as specific in time and space as the implementation of a local protocol in a specific

healthcare establishment, involving people with similar scientific training.

A human characteristic is the inability to say what reality is and simultaneously say what reality is not, which is possible thanks to observing one's own errors in the attempt to theoretically "construct" that reality. However, how can we reconcile all this since there are several different realities? Each sociocultural position brings a cosmology inherent to a particular group, people, and culture until reaching the individual scope of their own experiences¹⁵.

Social justice

Such accelerated recovery protocols are based more on patient safety measures than on acquiring cost-impacting technologies. Therefore, they can be applied in different healthcare establishments in the public, private, or philanthropic system, regardless of the contribution of financial resources, thus promoting equity in care without differentiating social status.

Waiting lists can last years in overcrowded healthcare systems, lacking resources, equipment, and beds. Thus, reducing the length of stay for elective surgery can mean making a bed available in a dengue epidemic, and reducing the time for mechanical ventilation means freeing up a respirator for a case of COVID-19. Furthermore, it is possible to simply speed up the treatment of the following case in line, which may be about to miss the ideal time to correct its cardiac pathology. Saving resources means using them wisely.

The inclusion criteria are pretty broad and directly favor the majority of surgical patients. Simple preoperative measures included in the ERAS protocol to reduce transfusions and improve results, such as treating iron deficiency anemia and referring to the nutrition service when weight-for-height has a Z-score lower than -3, also contribute to treating diseases typical of social inequality.

The problem of autonomy

Attenuated fasting promotes postoperative metabolic recovery and reduces patients'

discomfort and anxiety. Protocols for non-replacement of losses through fasting and avoiding venoclysis in cases that are not extremely serious also facilitate the child's acceptance of the anesthetic procedure, as it is painless. The implementation team at the institution where the study reported here was conducted pointed out the need for prior venoclysis as the main point of discussion and non-adherence to protocols.

More severe patients, especially those with severe cyanotic heart disease requiring hemodilution, benefit from prior intravenous hydration. Premedication titration and intravenous induction are considered very safe, save time, and require less effort from the anesthesiologist, who is often alone with a series of simultaneous interventions to be performed on the patient.

Reflections on professional performance are valid, especially in the public sector, where staff shortages and work overload exist. However, these issues are intertwined with personal belief and the comfort of doing what is most practical. Thus, there were cases in which the patient was requested to return to the ward for venous access, and only then was readmission to the surgical center permitted. Although less "pleasant" for the patient, this conduct brings possible safety benefits from a functionalist and paternalistic view in the dystopian reality of many healthcare systems.

Beauchamp and Childress¹⁶ do not consider autonomy the only value in medical bioethics, nor is respect for autonomy considered the only existing moral imperative. Finding the right balance between autonomy and protection is a challenge.

The Child and Adolescent Statute (Law 8,069/1990)¹⁷ has complete protection as its doctrine, governed by three general principles: absolute priority, best interest, and municipalization. This law discusses a set of parental and State responsibilities that focus on the best interests of children and adolescents. However, it should not be forgotten that situations of vulnerability require recognizing everyone as autonomous agents, according to the capabilities already developed, and that anyone with diminished autonomy has the right to protection.

Autonomy can be seen along the spectrum between Kant's categorical imperative to "decide based on pure reason" and Mill's naturalistic conception of "self-government" and the right to self-determination, as Kuhnen¹⁸ points out. In practice, O'Neill¹⁹ criticizes that autonomy has become a mere requirement of informed consent because, without concern for how the choice is made (if it indeed involves reflection and consideration), the patient's autonomy is reduced to a simple right to accept or refuse treatment. The equivalence between informed consent and autonomy is called by O'Neill¹⁹ the concept of minimum autonomy.

Autonomy is based on the sole concept of the ability to decide for oneself. Regardless of the proposed strategy or theoretical discussions around the age at which decision-making or consent competencies are complete, more than one choice option is necessary for this concept to exist. It is not just about the dichotomy between accepting treatment or not but informing the existence of a myriad of possibilities.

For obvious reasons, any child will opt for a painless, sting-free option. This opinion should be considered a cornerstone when choosing the technique, and more delicate issues regarding safety should be discussed in depth with those legally responsible.

Alderson and collaborators¹² point out that the anesthetist is critical in managing a child's refusal to undergo elective pediatric cardiac surgery. From 4 years of age onwards, there is a practically unanimous agreement not to use restriction methods to enable induction so that non-emergency cardiac surgery can be canceled if there is strong resistance to anesthesia.

Therefore, a multidisciplinary team must work with these children until there is sufficient empathy before surgery. Furthermore, cardiac anesthetists value regular multidisciplinary clinical meetings, critically review problematic cases, and ensure that patient-centered policies are adhered to by all team members¹².

Treating the child-family binomial

Patient and family engagement can help reduce anxiety, promote active participation, and increase

satisfaction with care (ILA Recommendation)². In the clinical practice reported here, generally, after clarification, guidance, and a brief assessment of psychological conditions, a family member is encouraged to enter the surgical center with the child. This person is next to the patient or has them on their lap and can often even hold the face mask for inhalation induction, which generally occurs very smoothly.

This practice leads to a much greater feeling of safety for the child, making it easier to assent. Data from the literature vary, but it has been shown that calm parents with calm and cooperative children over four years have obtained the most significant benefits²⁰. There are still conflicting data on whether the practice reduces preoperative anxiety or anesthesia compliance²¹.

Many families also feel comforted by being together with their protected children at such a remarkable moment, even more so by actively alleviating the psychological suffering inherent to the situation. Likewise, family presence is encouraged as soon as possible after awakening. Stargatt and collaborators²² identified several factors that contribute to postoperative maladaptive behavior, which include parental anxiety, younger age, overnight admission, and cases in which there was some discussion with anesthesiologists during preparation.

The potential benefit of parental presence during induction of anesthesia (PPIA) generally depends on the age group of the children, being questioned in babies under six months of age with less pronounced separation anxiety. The same happens with cooperative school-age children who prefer to be told the truth and adapt well to the new challenging environment, being able to build trust in medical staff. On the other hand, PPIA can provide some form of relief to accompanying parents, in line with the biological instinct of a father who protects his children from potential threats, by being able to observe them being treated by the safe hands of an anesthetist²³.

The medical team's point of insecurity regarding the implementation of this routine was the concern about empowering and "over-empowering" already anxious parents, leading to unnecessary legal consequences. Added to this is a complex legal uncertainty regarding the

right to record images of the team and the minor, not only as a preparatory instrument for future litigation scheduled even before the damage occurs but often simply due to post-modern behavior of wanting to record everything on platforms like Instagram, Facebook, TikTok, etc. Even a moment of suffering and anxiety from one's own child, a good story of overcoming, gets many likes on Instagram stories.

A painful point

Analgesia is fundamental in the ERAS protocol. Pain management is present in the oldest medical traditions. "*Sedare dolorem opus divinum est*" is a maxim popularly associated with Hippocrates. Medicine still suffers adverse consequences from the dualism of Cartesian metaphysics, the view according to which it is people, not bodies, who suffer²⁴. Although bodies are the source of nociceptive impulses, suffering, whether or not produced by physical pain, is experienced by people and is, therefore, subjective.

If only the physical and mental realms existed, they would be categorically separate. For Veatch²⁵, medicine is considered an objective science belonging to the domain of the physicist. Consequently, if suffering is subjective and experienced within the individual consciousness, it exists in another domain with which clinical medicine has no trade.

Recently, there has been a great aversion to opioids due to the inability of their prescribers, fear of respiratory arrest, and fear of causing chemical dependence—and all the religious and Puritan implications related to the latter. Furthermore, the recent epidemic of drug addiction related to fentanyl is a topic of debate in several societies around the world. These factors can put the bioethical values of beneficence and non-maleficence related to pain relief into the background.

Multimodal strategies can significantly reduce pain, consequently reducing the use of opioids and accelerating awakening and mechanical ventilation time, which again confirms the commitment to the principles of non-maleficence and beneficence. This shortens the time of total dependence on health professionals

and equipment, increasing the feeling of autonomy and independence of the minor-family binomial.

However, for this strategy to be successful, parental education regarding the technique must be very well established. Most families already expect their child to be deeply sedated²⁶ because, in the popular imagination, the child would be pain-free and more comfortable. This highlights the need to differentiate between hypnosis and analgesia for those responsible.

Further safeguarding principalist bioethics

Adequate pain control and mild sedation with drugs that do not compromise neuropsychic development and at the same time prevent delirium, such as dexmedetomidine, abolish the need for old but still common practices, such as restricting the patient by mechanical restraint. Such a practice would be considered illegal in several situations in adult patients and violates all bioethical principles: respect for the person's autonomy; beneficence, which acts in the patient's best interests over the long term; non-maleficence and justice.

Heavy sedation and the involuntary occurrence of delirium act directly on the three foundations of Faden and Beauchamp's theory of autonomous action, as described by Naik and collaborators²⁷, preventing understanding, promoting unintentional actions, and leading to the loss of voluntariness. A recent meta-analysis identified the following risk factors for pediatric delirium: mechanical ventilation (odds ratio [OR] 6.02; 95% confidence interval [CI] 4.43-8.19), use of physical restraints (OR 4.67; 95%CI 1.82-11.96), use of benzodiazepines (OR 4.10; 95%CI 2.48-6.80), opiates (OR 2.88; 95%CI 1.89 -4.37), steroids (OR 2.02; 95%CI 1.47-2.77) or vasoactive medication (OR 3.68; 95%CI 1.17-11.60)²⁸.

The ERAS protocol's use in anesthesia and pediatric cardiac surgery focuses precisely on shorter mechanical ventilation times, opioid and benzodiazepine-sparing techniques, standardizing the controversial use of steroids for these surgeries, and greater postoperative hemodynamic stability.

Focusing on the future

Patients with congenital heart disease are at high risk of developing post-traumatic stress disorder after hospitalizations and medical procedures, which can last many years, with a prevalence of 12-31%²⁹. Humanized practices and protocols, which reduce both metabolic and mental stress, minimize pain and suffering, and the optimal use of pharmacology, reduce delirium, nightmares, and sleep disturbances, can have a crucial impact on reducing negative experiences. The ERAS protocol restricts several unnecessary medical practices, safeguarding these developing individuals from future long-term implications.

Final considerations

After reflecting on the dilemmas presented during the preparation and implementation of the local protocol, possible facilitators can be suggested:

1. Focus on continuing education. As knowledge is consolidated, some practices become more

accepted, and professionals disuse others spontaneously, without the manager's imposition.

2. Hold discussion meetings on key bioethical topics, such as minors' autonomy, parental control, and cases of refusal, which are generally not addressed by specialized teams.
3. Ask the medical ethics committee for help. The local medical ethics committee is rarely contacted during the development of local protocols. Drafters and reviewers focus on collecting scientific evidence, often forgetting to analyze human, ethical, and social aspects.

Specialized teams rarely resort to professional ethics bodies in a preventive manner to resolve dilemmas. It is the responsibility of the medical ethics committee to collaborate with regional councils in the task of educating, discussing, disseminating, and guiding professionals on topics relating to medical ethics. Such interdisciplinarity between theoretical bioethics and living practical bioethics would be fundamental to reducing conflicting points between different interpretations of members of the healthcare team.

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