

Published: June 30, 2023

Citation: Maria Teresa Egídio Vilhena de Mendonça, 2023. *Anesthesiology, from the Magic Days to the Present Time: The Role of Anesthesiology in Modern Medicine*, Medical Research Archives, [online] 11(6).
<https://doi.org/10.18103/mra.v11i6.3945>

Copyright: © 2023 European Society of Medicine. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI
<https://doi.org/10.18103/mra.v11i6.3945>

ISSN: 2375-1924

RESEARCH ARTICLE

Anesthesiology, from the Magic Days to the Present Time: The Role of Anesthesiology in Modern Medicine

Maria Teresa Egídio Vilhena de Mendonça¹

Email: teresaeegidio@gmail.pt

ABSTRACT

Anesthesiology is nowadays an independent and multidisciplinary speciality of great demand and responsibility and plays a preponderant role in the human life, from the moment of birth. Anesthesiology has evolved since the earliest times to the present, along with the advances of science, intercepting most medical and surgical specialties, to the extent of being essential to us nowadays. From the days of magic to the present time, the history of the speciality deserves to be visited.

This article of historical research provides a timeline review of the main themes and milestones of the specialty all over the world and particularly in Portugal, from ancient control of pain, the evolution of resuscitation and critical care until the new technics and holistic care provided by modern Anesthesiology.

Keywords: Anesthesia; Anesthesiology; Anesthetics; History; Pain; Resuscitation; Safety

¹. CUF Sintra Hospital; CUF Cascais Hospital; CUF Descobertas Hospital, Portugal.
Graduate Hospital Assistant in Anesthesiology Received: 27/03/2016 - Accepted: 03/May/2023

INTRODUCTION

Can we imagine life in our era without recourse to the techniques mastered by anesthesiologists?

The first letter of the alphabet does not always do justice to the position of anesthesiology as a specialty of fundamental importance to the realm of medicine.

Of all the medical specialties, the one shrouded in the most mystery is anesthesiology. Wrong ideas and concepts, and old myths and fears related to complications and undesirable effects of outdated drugs and techniques persist.

Anesthesiology, however, is one of the medical specialties that has evolved the most in recent years. Based on a culture of safety and risk prevention that allows safe procedures, anesthesiology is today a multidisciplinary specialty, highly demanding and entailing great responsibility - and it plays a preponderant role in human life from the moment of birth.

From its origins in mystical and empiric-traditional medicine, it is a long journey that has brought us to modern anesthesiology, an essential specialty of central importance that intersects practically all medical sciences disciplines.

Surgical anesthesia, labour analgesia, chronic pain medicine, emergency care, intensive care and resuscitation are some of the cardinal points of a constellation in which anesthesiology is positioned as a dynamic centre, at the service of human life.

From the age of magic to the present day, the history of this specialty deserves a visit.

OBJECTIVE

The aim of this article is to disclose the main themes and milestones of anesthesiology all over the world

and particularly in Portugal, from ancient control of pain, the evolution of resuscitation and critical care until the new technics and holistic care provided by modern Anesthesiology. Objectives of this article includes to highlight the coverage of anesthesiology in modern medicine.

FROM MAGIC IN PAIN RELIEF TO THE BIRTH OF ANESTHESIA

“Pain in one part of the body is cured by placing over it the shirt of a twin”

(Algarve, VASCONCELOS: 1967, 41)¹

Even today, despite the evolution of technology and science, people still resort to formulas anchored in the roots of time and popular philosophy for the relief of pain and suffering. Evidence of ancient myths and practices adapted from the Arab sciences and magical exercises are still present, challenging the prudent rationality of medicine and keeping alive the use of “empiric-traditional medicine”, as Michel Giacometti called it.¹

The need to abolish pain and reduce suffering has always driven humanity towards the invention and discovery of new products and new techniques.

For primitive man, pain had connotations of possession of the body by evil spirits. Amulets, exorcisms and other types of magic were used, and the healer, magician, witch or shaman was used to alleviate suffering.

The treatment of pain with medicinal plants is mentioned in ancient Babylon (2250 BC) and in the Egyptian Ebers Papyrus (1550 BC), which cites as an example the use of opium for the headaches of the God Ra.



FIGURE 1. First public demonstration of general anesthesia using ether, 1846.

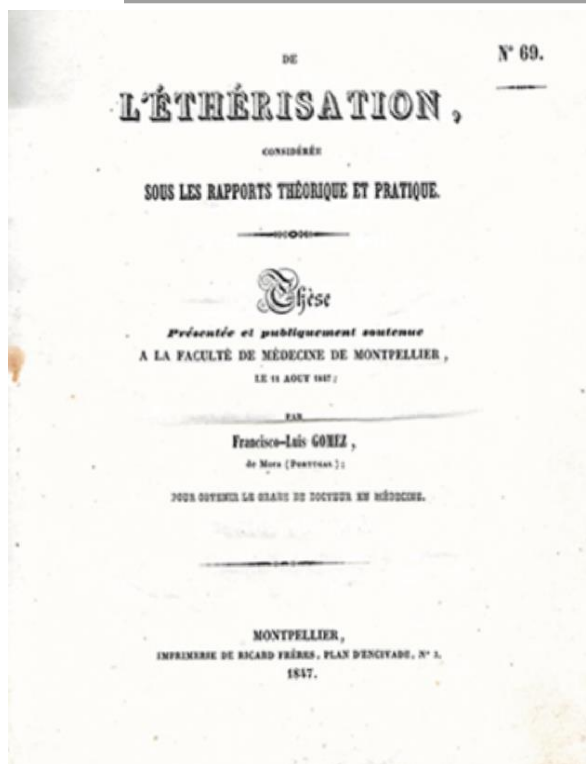


FIGURE 2. Reproduction of the frontispiece of the thesis by Francisco-Luis Gomez, 1847.

In Greco-Roman civilization there are references to the use of mandrake and opium.

In Christian civilization, the concept of pain acquired connotations of divine punishment for sins committed, in the belief that penance purified the soul.

Many centuries passed until Galen (12th century) established the anatomy of the cranial nerves, producing a complex theory of sensations, and only at the beginning of the 19th century did the first modern theories about pain appear (Bell and Magendie), at the same time as physiology and chemistry were developing.^{2,3}

In this search through time, only many centuries later, with the beginning of the use of ether, does the great advance in the control of pain and suffering actually take place - the modern era of anesthesia was born.

In Boston, on 16 October 1846, the first public demonstration of general anesthesia using ether took place.

William Thomas Green Morton - a dentist specialized in the manufacture of dentures - was already familiar with the effects of laughing gas (nitrous oxide, used by Horace Wells) and decided to investigate the effect of ether in eliminating pain, experimenting on animals and on himself.

Convinced of the analgesic power of ether, Morton invited surgeon John C. Warren to make a public

demonstration of a surgery (surface tumour of the neck) on the patient Edward Gilbert Albert Abbott, before a large audience of doctors and medical students at Massachusetts General Hospital (Boston, USA).

INHALED ANAESTHETICS: A DECISIVE STEP FORWARD IN THE EVOLUTION OF ANESTHESIA

"Dr. Snow gave me the blessed chloroform and the effect was immensely soothing, reassuring and pleasant."

Queen Victoria's Diary, 1853.

John Snow, a well-known epidemiologist from London, became interested in the use of ether and chloroform, publishing a series of articles in the *London Medical Gazette* on the subject of inhalation anesthesia; in 1847, at St. George's Hospital, he initiated the use of ether during surgical operations. At that time, various segments of society criticised such procedures, namely labour analgesia, for religious reasons and due to fear of the risks involved.⁵

Inhalation anesthesia and particularly labour analgesia received a generous boost upon the birth of Prince Leopold of England. Queen Victoria's wish for a painless delivery was fulfilled, with John Snow administering chloroform through a handkerchief during the Queen's labour - "Anesthesia à la Reine", as it came to be called.⁴

"It was twenty minutes past 12 o'clock on the clock in the Queen's room when I began to give small doses of chloroform on each occurrence of pain, pouring about 15 minims per measure into a handkerchief. Her Majesty expressed relief from the pain during the contractions."

John Snow's Diary, 7 April 1853.

General inhalational anesthesia dominated the field for decades and was the basis of anesthetic practice and its evolution.

Probably the oldest thesis by a Portuguese author on anesthesia also refers to the use of ether and dates from a few months after Morton's report.

Francisco-Luis Gomez, doctor of Mora, Portugal, wrote the *Thesis of Etherisation, considered from the Theoretical and Practical Point of View*, which he presented and publicly defended at the Montpellier Faculty of Medicine (France) on 11 August 1847 in order to obtain the Doctoral Degree in Medicine.^{4,6}

Arthur Guedel (May 1920), in his paper *On the importance of the physiologic factors in inhalation anesthesia*, described the stages and signs of general anesthesia using ether, which for decades remained the basis of clinical anesthesiology and the teaching of clinical monitoring of the patient undergoing general anesthesia.⁴

CHRONOLOGY OF THE START OF CLINICAL USE OF INHALATIONAL ANESTHETICS²⁻⁴

1956 – Halothane

1966 – Enflurane

1980 – Isoflurane

1987 – Desflurane

1990 – Sevoflurane

FROM INHALATION ANESTHESIA TO INTRAVENOUS ANESTHESIA

To overcome the risks and side effects of general anesthesia, various pharmacists, chemists and doctors have tried to adapt multiple drugs to anesthetise specific regions of the body, thus limiting their effects and giving rise to local and regional anesthesia techniques.

Cocaine was one of these drugs. Isolated from the coca plant in 1859, it was successively used to anesthetise the eyeball (1884, Karl Koller), peripheral nerves (1885, William Halsted), intrathecally (1885, James L. Corning) and for local anesthesia by infiltration (1892, Carl L. Schleich - surgeon, philosopher and poet from Berlin, Germany).⁴

The use of cocaine was a major advance in pain control in several surgical procedures, but its addictive properties and toxic effects spurred efforts in research and synthesis of new and more promising local anesthetics.⁴

However, at the beginning of the 20th century, quality and safety had barely evolved and the side effects, difficulty in titration of the right dose and explosiveness of the anesthetic gases used by inhalation led to an intensified search for new drugs and other routes of administration for anesthetics. The intravenous route was researched and in 1932 hexobarbital was developed - the first intravenous general anesthetic.

In 1934, thiopental emerged as a breakthrough drug after the results of a clinical trial were published by John Lundy and Ralph Waters of the Mayo Clinic (USA). Thiopental was practically the only general anesthetic to be used for decades, with enormous experience in its use accumulated during World War II.

In 1962 the use of ketamine began, followed by etomidate in 1972; these drugs were widely used during the Vietnam War (1955-1975) and are still in use today.

Propofol appeared in 1986, and proved to be the great revolutionary drug in terms of anesthetic practice. Among its notable pharmacological characteristics are the rapid onset of action, the short duration of action, its rapid elimination from tissues and the lower number of side effects,

including nausea and vomiting, traditionally associated with general anesthetics.

Additionally, propofol, given its characteristics, could be used in other areas of anesthesiology such as outpatient clinics, sedation for complementary exams, sedation for invasive procedures and intensive care. This allowed the definitive expansion of its area of application, not solely limited to the operating room, but also in intersection with numerous specialties.²⁻⁴

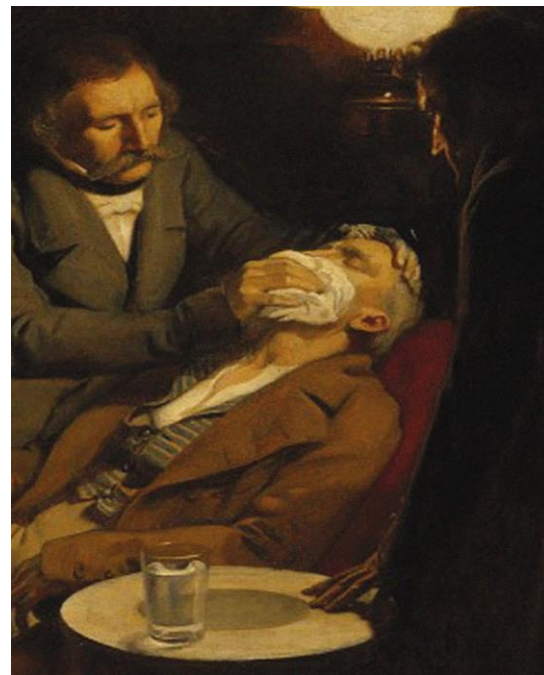


FIGURE 3. Beginnings of general inhalation anesthesia.

The first use of ether in dental surgery, 1846.

AIRWAY SAFETY: LARYNGOSCOPY AND TRACHEAL INTUBATION

The safety of the anesthetic act was contingent on control of the airway, for decades limited to the use of a face mask, but successively improved with the invention of new devices which are still in use today:

- Endotracheal tubes and Magill forceps
 - Sir Ivan M. Magill, 1919
- Oropharyngeal tubes and tracheal tubes
 - with Guedel cuff – Arthur Guedel, 1928

- Macintosh curved blade laryngoscope
 - Sir Robert R. Macintosh (1942)

The first orotracheal intubation on record was performed in 1878 on an awake adult by surgeon William Macewen, using his fingers as a guide.³

At that time, tracheal intubations were done without muscle relaxation.

Between 1857 and 1865, Claude Bernard described the effect of curare and its action on the neuromuscular junction but it was not until 1942 that the use of curare during anesthesia (Harold Griffith) began, thus responding to the need for immobilisation of the patient during surgery.⁴

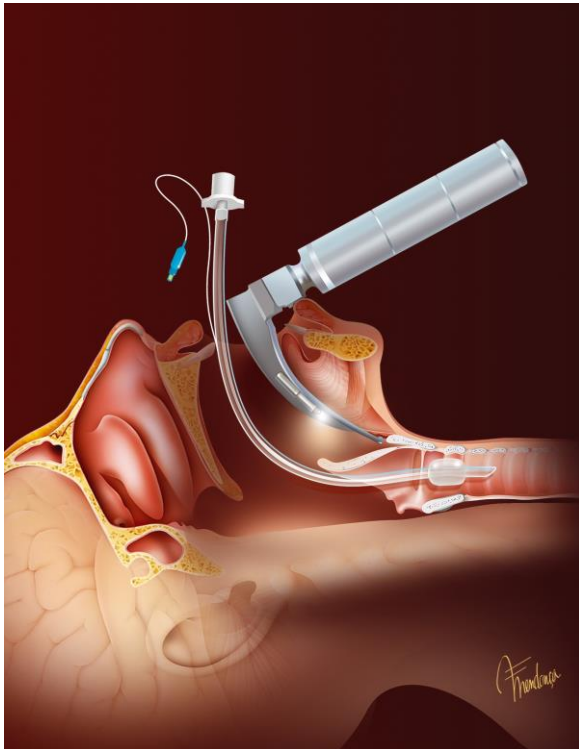


FIGURE 4. Laryngoscopy and tracheal intubation.

THE MOMENT OF BIRTH AND LABOUR ANALGESIA

“To relieve the labour pains, the parturient woman should gird herself with the cord of St Francis”

(Alentejo, PIRES:1909, 184)¹

“To avoid the pains of future childbirths, after the first, it is good to eat chopped citrine”

(Vila Seca, Viseu)¹

“To soothe the labour pains, the belly of the parturient is rubbed with water heated in a pot with bay leaves and ivy”

(Germil, Viana do Castelo)¹

As the anesthetic techniques became safer, anesthesiologists expanded the scope of their work. Obstetrics, since it involves simultaneously two human beings, is a challenging area in day-to-day clinical practice.

Since the distant year of 1847, when James Young Simpson, an obstetrician from Edinburgh, performed the first labour analgesia with ether, the performance of anesthesiologists in the field of obstetrics has changed a great deal. Later, the same James Simpson used chloroform, trying to obtain an analgesic effect but with fewer risks associated, and after John Snow (1853) administered chloroform to Queen Victoria for labour analgesia, the concept of painless labour was able to overcome the prevailing religious constraints.^{4,5}

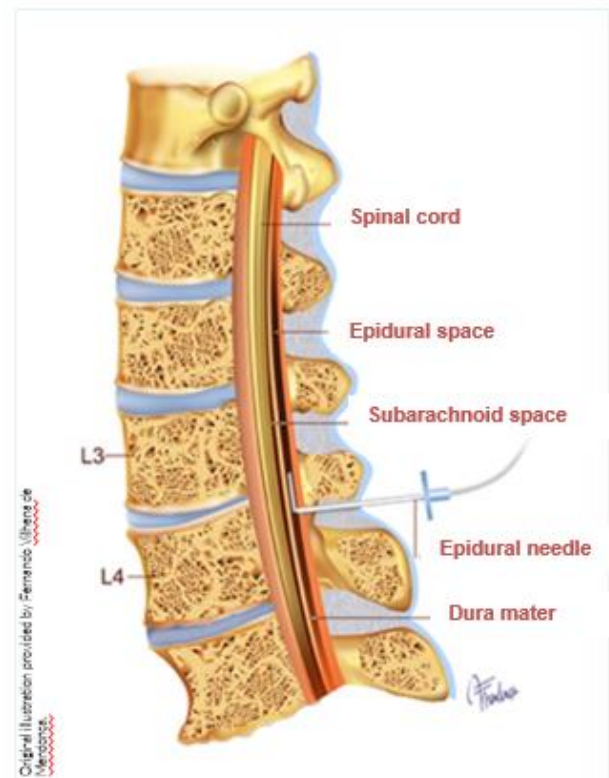


FIGURE 5. Placement of epidural catheter.

Virginia Apgar, an American anesthesiologist (1909-1974) and pioneer in neonatal care, created the scale for assessing the vitals of newborn babies - the Apgar Score - which is used today in maternity wards.³

Women’s demand for labour analgesia increased in the 20th century and it is now a right that is meant to be accessible to all parturient women today . Pain relief during childbirth contributes to the safety of the birth: a pregnant woman without pain is a pregnant woman who is more cooperative with the multidisciplinary team that assists her and is better

able to make appropriate decisions, preventing complications, leading to an evident decrease in morbidity and mortality.⁷

Current labour analgesia includes the performance of various techniques, depending on what is most appropriate to the situation in question; regional techniques are the most used and effective - the epidural (the best known), the subarachnoid block (spinal or spinal block) and the sequential technique (combining epidural and spinal block).⁷

Anesthesiology has kept up with the evolution of obstetrics, its effective presence available in delivery wards 24 hours a day, seven days a week : a factor that ensures quality services and safe care are provided to pregnant women, allowing the moment of birth to be unforgettable and take place in a safe environment.⁷

REANIMATION, RESUSCITATION AND RECOVERY OF LIFE

“Then the Lord God formed man out of the dust of the ground and breathed into his nostrils the breath of life, and man became a living soul.”

The Bible, Genesis 2:7

For centuries, humanity saw death as inexorable and all attempts at resuscitation were regarded as blasphemy until the mid-18th century, when mankind finally began to believe in the possibility of performing effective resuscitation manoeuvres.⁴

RESUSCITATION derives from the Latin *resuscitatio/resuscitationis* (from the verb *resuscito/resuscitare*,

formed from the particle *re*, in the sense of renewal, and the verb *suscito/suscitare*) which, among other definitions, means to awaken, to wake up, to recover the senses. Among its etymological roots, *suscito*, in turn, derives from the verb *cito/citiciere*, which means to set in motion. Thus, the primary meaning of resuscitation is to re-establish movement, i.e., life.

REANIMATION (prefix *re* + *anima* + suffix); *anima* in Latin means breath, respiration, or life and soul: life is identified with the entry of air into the lungs. The number of fascinating descriptions published on the evolution of resuscitation attempts is enormous, but today's fundamental actions are based on this development of knowledge about the mechanics of chest compressions.⁴

Paracelsus, in 1530, evaluated the use of fireplace bellows to introduce air into the lungs of apparently dead individuals, characterising the first attempts at artificial ventilation.

Andreas Vesalius, in 1543, at the age of 28, published *De Humani Corporis Fabrica*; his writings contained the first known descriptions of attempts at resuscitating hearts.

William Tossach, in 1732, provided the first account of resuscitation using the method of mouth-to-mouth ventilation.

In 1874, Moritz Schiff described closed-chest cardiac massage.

At the beginning of the 20th century, Schafer in England developed the compression technique in the prone position and in 1932 the Holger-Nielsen method - pressure on the back and raising the arms - became popular.



FIGURE 6. Beginnings of resuscitation - use of fireplace bellows.



Bjørn Aage Ibsen, an anesthesiologist specialising at Massachusetts General Hospital in 1949 learns about the new concept of positive pressure ventilation. During the polio epidemic that affected the USA and Europe in 1952, he applied his knowledge to maintaining manual ventilation using positive pressure, saving thousands of lives. In 1953 he was invited to organise an Anesthesia Department at the Kommunehospital (Copenhagen, Denmark) and on 1 August 1953 he inaugurated the first Intensive Care Unit.⁴

In 1948, in the USA, the National Academy of Sciences - National Research Council promotes a Conference on Resuscitation and in 1951 promoted a conference on Manual Methods of Artificial Respiration, concluding that:

The best method was pressure on the back, followed by lifting the arms (modified Holger-Nielsen), and that the other acceptable method was pressure on the back, followed by lifting the hips, called the modified Silverter method...

Peter Safar, anesthesiologist at the Baltimore City Hospital, where he created the first Intensive Care Unit in the USA, investigated mouth-to-mouth and mouth-to-nose ventilation and in 1958 published, along with Elam and Gordon in the Journal of the American Medical Association, the *Symposium on Mouth-to-Mouth Resuscitation* where the superiority of mouth-to-mouth ventilation is demonstrated.^{2,4}

In 1960, Kouwenhoven, Jude and Knickerbocker investigated electrical defibrillation in animals and explained that compression on the lower third of the sternum, done properly, provided sufficient artificial circulation to maintain life in animals and humans in cardiac arrest.

Safar, in later studies, indicated the need to associate cardiac massage with artificial respiration for the technique of cardiopulmonary

resuscitation (CPR) and pioneered the *ABC of Resuscitation*.⁴

FROM THE ANESTHETIST TO THE ANESTHESIOLOGIST: RECOGNITION OF THE IMPORTANCE OF THE SPECIALTY

“Your patient is ready, Sir!” said W. Morton to the Surgeon John C. Warren, commencing the surgery.²⁻⁴

From the anesthetist of Morton's time and the administration of ether and chloroform that allowed unconsciousness during surgery, until today, almost everything has changed.

The specialty has grown and gained in importance. The anesthetist who was limited to relieving the suffering during surgery gave way to today's anesthesiologist, who masters anesthesia inside and outside the operating room, including perioperative medicine, pain medicine, resuscitation, medical emergency care and intensive care.⁴

In the twentieth century, the discussion of bioethics concepts, such as the conception of life via artificial means, the possibility of controlling pain and prolonging life, intersects various segments of civil and religious society and anesthesiologists play a part in these issues, fulfilling their role of defending the right to a dignified life without suffering.⁵

Pope Pius XII in 1957 emphatically recognised anesthesiologists' activity in his speech to an International Assembly of Physicians and Surgeons:^{5,8}

“The duty of renunciation and interior purification, which is incumbent upon Christians, is not an impediment to the use of anesthesia, since this duty can be fulfilled in another way”;

“The fundamental principles of anesthesiology, as a science and as an art, and the end it pursues, raise no objection”;

“Narcosis, which implies a diminution or suppression of consciousness, is permitted by natural morality and is compatible with the spirit of the Gospel.”

Pope John Paul II delivered a speech on this subject to the Participants at the Congress of the Italian Association of Anesthesiology in 1984:^{5,9}

“In a few years, it has gone from an extraordinary and exceptional instrument to a providential component of health care, favouring, even in those who are subject to irreversible and lethal diseases, a less dramatic course of the disease”.

The Pontifical Council for the Pastoral Care of Health, in 1995, in the Charter of Health Professionals, states: “Both anesthesia and analgesia, by intervening directly on the most aggressive and deforming element of suffering, restore man to himself, providing him a more human experience of suffering”.⁵

In 2003, given the evidence of the wide range of competencies that the specialty has reached, the Union Européenne des Médecins Spécialistes, through the Section and Board of Anesthesiology, Reanimation and Intensive Care, adopted the term **Anesthesiology** to designate the specialty.

ANESTHESIOLOGY AT THE FOREFRONT OF FIGHTING PAIN

The invention of anesthesia demonstrated to the world that the abolition of pain was possible and desirable, and pain was not inevitable or inherent to surgical procedures and to life itself.^{4,5}

In the 1950s, John Bonica, an American anesthesiologist of Sicilian origin, investigated and dedicated himself to the treatment of pain, due to the need to address the suffering of wounded soldiers in World War II.

Bonica created the first Multidisciplinary Pain Clinic at the Tacoma General Hospital (Seattle, USA) involving a group of specialists from different areas.

In 1953 he published *The Management of Pain*, in which he laid the foundations of what would become modern pain medicine. Bonica's concept of care spread throughout the world and interest in the subject led to the creation, in 1974 in the USA, of the International Association For the Study of Pain (IASP) and the *Pain* journal, exclusively dedicated to pain research.^{4,10}

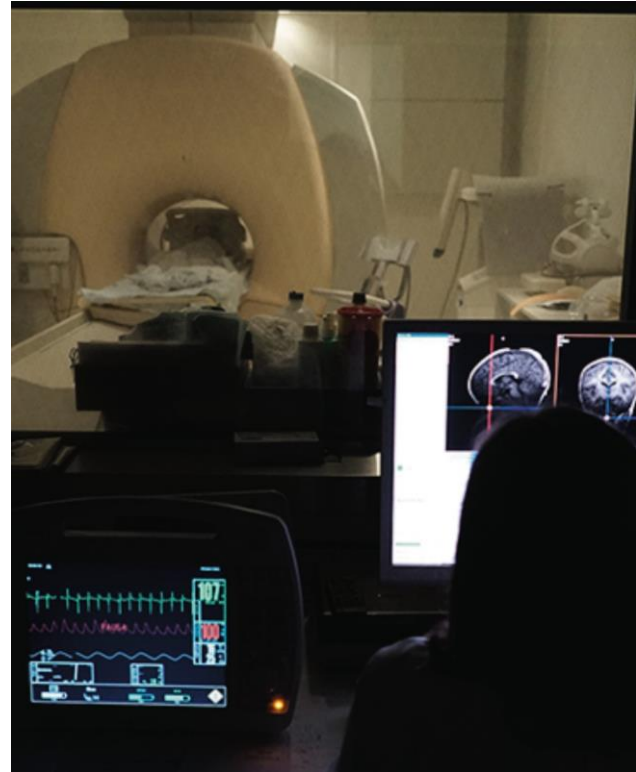


FIGURE 7. Anesthesia outside the operating room.

In Portugal, numerous health institutions include chronic pain treatment units and the following are important milestones in this area:

- 1991: foundation of the Portuguese Association for the Study of Pain (APED), affiliated with the IASP
- 1999: June 14 was established as National Day of Fight Against Pain
- 2001: National Plan to Fight Pain approved
- 2002: start of the 1st Postgraduate Course in Pain Medicine
- 2003: mandatory registration of Pain as the 5th Vital Sign

Addressing chronic pain is a challenge for health professionals and is part of the holistic view of medicine. Chronic pain has consequences for well-being, health, the ability to work and patients' daily activities, with important consequences for patients, their families and the country.

In Portugal, the fight against this silent epidemic, as Cousins termed it, is reliant on the committed participation of anesthesiologists.^{10,11}

RISK CONTROL AND THE SAFETY OF MODERN ANESTHESIOLOGY

“No improvement in the provision of care to surgical patients has had as profound an impact as the advance in safe anesthesia practices.”¹²

Anesthesiology has been a pioneer in the implementation of safety and risk management mechanisms. Based on the experience of civil aeronautics, the specialty adapted mechanisms for detection, reporting and analysis of adverse events to its practice, creating more reliable systems with effective self-regulation mechanisms capable of making the occurrence of accidents more unlikely, and is therefore considered one of the safest medical specialties.^{12,13}

Associated with clinical monitoring, the fundamental basis of patient surveillance, instrumental monitoring has evolved over the years, being adapted to the requirements of procedures by means of increasingly sophisticated devices.

Among the most recent, depth of anesthesia monitoring stands out: this uses monitors that analyse brain activity during anesthesia - the best known is the bispectral index (BIS). This type of monitoring has contributed to the fact that awareness, one of the complications formerly associated with general anesthesia, is nowadays an extremely rare phenomenon.

MODERN ANESTHESIOLOGY IN PORTUGAL

In Portugal, anesthesiologists have long been concerned with patient safety and have played a

decisive role in the implementation of standards, protocols and regulatory mechanisms for best practices in healthcare.¹⁴

In 1984, the European Union of Medical Specialists (UEMS) Anesthesiology and Resuscitation Specialist Section approved the guidelines on Anesthesia Departments in Hospitals within the European Community, adapted for Portugal by Professor Anselmo Carvalhas, in which fundamental concepts regarding the safety of anesthetic procedures are defined.

In 1992, appointed by the then-Secretary of State for Health, Dr J. Martins Nunes, the National Commission for the Modernisation of Operating Rooms, chaired by Dr Paulo Domingues, identified and defined safety levels for equipment and training requirements for professionals.⁴

In 2010, Portugal approved and signed the Helsinki Declaration on Patient Safety in Anesthesiology under the auspices of the European Society of Anesthesiologists and the European Union of Medical Specialists.¹⁵

In 2012, on October 16, World Anesthesiology Day, the Charter of Anesthesiology and Citizens' Rights and the Declaration of Coimbra were published.^{16,17}

In 2019 with the starting of Covid era the Portuguese Society of Anesthesia provided numerous and fundamental documents to deal with the disease, providing important guidelines that assured security to professionals and patients.

Citizens' Rights¹⁶

- Access without discrimination to perioperative medicine, intensive care medicine, emergency medicine and pain medicine.
- Receive care provided by anesthesiologists with competence and training in the various fields.
- Access to this care in a timely manner.
- Privacy and sympathy during the anesthesiological care provided.
- Confidentiality of all clinical information and identifying information.
- End of life with dignity, supported by doctors with competence in pain medicine and training in palliative care.
- Respect for the living will.
- Able to make suggestions and complaints.

THE FUTURE OF ANESTHESIOLOGY

“... anesthesiology is now concerning itself not only with new developments in technics and new drugs, important as these are, but also with such matters as the one mentioned by Waters: “Permanent improvement will develop in the future, as it has come in the past, mainly through

consideration of scientific facts - laborious learning, imaginative insight and accumulative application.”¹⁸

“The future lies in the hands of the generation which strives to build the phoenix of a new world that is to arise from the ashes of this war. We

have had enough of mediocrity; we now need the best - those who will not hesitate “to give, and not to count the cost; to fight, and not to heed the wounds; to toil, and not to seek for rest; to labor, and not to seek for any reward.”¹⁸

The anesthesiology of the future will be an integral and dynamic part of personalised, multidisciplinary medicine, supported by genetic knowledge and the vertiginous development of technology, robotics, pharmacology and the scientific preparation of teams that provide individualised care for each human being according to his or her uniqueness.¹⁸⁻²¹

The following will be fundamental axes for development of the anesthesiology of the future:

- New drugs that are more effective and safer.
- New equipment and technologies, such as ventilators, monitors, diagnostic equipment of great accuracy, comfort and safety, and nanotechnology capable of transporting drugs and monitoring the patient's condition in real time.
- Training of specialists in a perspective of perioperative medicine consolidated in the advancement of basic sciences and the use of technology.
- Consolidation of the unavoidable role of anesthesiology in emergency medicine,

intensive care, pain medicine and scientific research.

CONCLUSION

The history of humanity has moments that, due to the benefit they represent, are decisive to its development.

Anesthesiology is undoubtedly one of the most important milestones in human progress in Portugal and all over the world. As an independent specialty, it is the lodestar in a constellation of surgical specialties and also medical specialties such as cardiology, gastroenterology, neuroradiology, pulmonology, which, thanks to anesthesia, perform diagnostic and therapeutic techniques under the best conditions of patient safety and comfort.¹⁹⁻²¹

Because of its function throughout history and its decisive role in the health of communities, anesthesiology contributes to confidence in the quality of modern medicine on a daily basis.

What kind of civilisation would ours be if, despite tablets, computers and going to the Moon, we did not have the privilege of living in a time when Anesthesiology dedicates all of its art to us?



“If but a few members of the younger generation of the highest integrity and competence can but see the opportunity and decide to spend their lives and efforts in the service of anesthesia, the future is bright indeed.”¹⁸

TABLE 1. Important historical events of anesthesiology in Portugal^{3,4,22-30}

1847 First uses of ether in surgical anesthesia: Dr Lourenço António Correia, S. José Hospital(Lisbon) and Dr Luiz Pereira da Fonseca, Porto Medical-Surgical School; reported in the *Jornal da Sociedade Pharmaceutica Lusitana (Jornal de Pharmacia e Sciencias Acessorias)*, describes the use of an etherising device that he applied during a castration and two circumcisions.

1848 S. José Hospital, Lisbon: Dr Bernardino António Gomes Jr. uses chloroform for the first time in a surgical procedure in Portugal; Professor Magalhães Coutinho uses chloroform for the first time in a surgery performed by Dr Joao Pedro Barral; reported in the *Jornal de Pharmacia e Sciencias Acessorias*. Professor Câmara Sinval applies chloroform for the first time in an instrumental delivery, the first eutocic delivery under anesthesia with chloroform.

1900 The first spinal anesthesia: Professor Sabino Coelho, Lisbon.

1912 First caesarean section under spinal anesthesia: described by obstetrician and surgeon Dr Roberto Morais Frias, Porto.

1955 On 17 June 1955, the Specialty of Anesthesiology was created by the Portuguese Medical Association. Foundation of the Portuguese Anesthesiology Society, President: Dr Lopes Soares.

1964 Foundation of the Federation of Anesthesiology Societies of Portuguese-Speaking Peoples, S. Paulo, Brazil.

1979 1st National Meeting of Portuguese Anesthesiologists, Tomar.
Creation of the College of the Specialty of Portuguese Anesthesiologists of the Portuguese Medical Association.

1986 Inauguration of the Chair of Anesthesiology and Reanimation at the Lisbon Faculty of Medicine - Dr Pinheiro de Almeida.

1988 Teaching of anesthesiology commences at the Coimbra Faculty of Medicine - Dr Anselmo Carvalhas.

1990 Teaching of anesthesiology commences at the Porto Faculty of Medicine - Dr Jorge Tavares.

1991 Clube de Anestesia Regional (CAR) - (Regional Anesthesia Club). In 2010 it assumes the designation of CAR / ESRA - *European Society of Regional Anesthesia*.

2004 Annual Congress of the European Society of Anesthesiologists (ESA) in Portugal.

2007 Centre for Biomedical Simulation at Coimbra Universitary Hospital (CHUC), Department of Anesthesiology at CHUC, at the initiative of Dr Martin Nunes and Dr Nuno Freitas.

2008 Diploma of European Studies. First (oral) exam in Portugal, promoted by Dr Pedro Amorim.

2010 Portugal approves and signs the Declaration of Helsinki.

2011 Residency in the Anesthesiology Specialty changed from 4 to 5 years.

2012 October 16, World Anesthesiology Day, publication of the Coimbra Declaration and Charter of Anesthesiology and Citizens' Rights, by Dr Rosário Orfão and Dr Sílvia Vaz Serra.
Creation of the Obstetric Anesthesia Section.

2013 Creation of the Intensive Care Medicine Section and the Study Group for Pain Medicine, Portuguese Anesthesiology Society.

2014 How Anesthesiology changed the world. Exhibition, Portuguese Anesthesiology Society. Direction Dr Lucindo Ormonde, Scientific and editorial direction Dr Maria Teresa Egídio Vilhena de Mendonça, President of SPA Dr Rosário Orfão.

Card for the User “I will be anaesthetized”, authored by Dr Vítor Oliveira and Rui Guimarães, based on the project *I will be anaesthetised*, Dr Lucindo Ormonde.

2015 Creation of the Medical Simulation and Anesthesia Sections for Outpatient Surgery and the “Blood Alive” Working Group. Portuguese Anesthesiology Society.

2020 Publication of Recommendations for Covid patients. Portuguese Anesthesiology Society.

ACKNOWLEDGEMENTS:

Dr Rosário Orfão, former President of the Portuguese Anesthesiology Society, for rigour in bibliographical updating and enthusiasm for the expounded theme.

Dr João Duarte Bleck, former Coordinator of the Anesthesiology Functional Unit at CUF Descobertas Hospital, Lisbon, for the bibliography provided.

To the authors of the bibliography, particularly Professor Figueiredo Lima and Professor Jorge

Tavares, for their invaluable contribution to the History of Anesthesiology.

Dr Fernando Vilhena de Mendonça, for the iconography and scientific illustration provided.

CONFLICTS OF INTEREST: The author declares that there are no conflicts of interest in carrying out this work.

SOURCES OF FUNDING: There were no external sources of funding for this article.

REFERENCES

1. de Almeida AG, Magalhães NA, Magalhães M. Artes de Cura e Espanta-Males. Espólio de medicina popular recolhido por Michel Giacometti. Lisboa: Gradiva; 2009.
2. Lima JJF. Apontamentos Cronológicos sobre a História da Anestesia. Lisboa: Edição do autor; 2004.
3. Lima JJF. História da Dor e da Anestesia. Apontamentos Cronológicos sobre a História da Anestesia. Lisboa; 2008. ISBN 978-989-20-1666-5.
4. Tavares J. História da Anestesiologia Portuguesa. Lisboa: Sociedade Portuguesa de Anestesiologia; 2013.
5. Coutinho V. Sofrimento humano e alívio da dor: ética da anestesia e da analgesia. Essência da Vida e Dignidade Humana – Anestesia e Civilização. Lisboa: Universidade Católica Portuguesa; 2005.
6. Gomez FL. *Review of the Thesis of Etherisation, considered from a Theoretical and Practical point of view*. [Doctoral Thesis - Faculty of Medicine]. Montpellier;FMM;1847.
7. Bismarck JA. Analgesia em Obstetrícia. Biblioteca da DOR. Coordenador Dr. José Manuel Caseiro. Lisboa: Permanyer Portugal; 2003.
8. Catholic Association of Doctors and Nurses. Documents: Allocution to Doctors on the Moral Problems of Analgesia, By Pope Pius XII. 24 February 1957. [consulted in October 2014] Available at: http://www.acim-asia.com/Allocution_asia.com/Allocution_To_Doctors.htm.
9. Apostolic Letter Salvifici Doloris, on the Supreme Pontiff John Paul II. Given at Rome. 11 February 1984. [accessed on October 2014] Available at: http://www.vatican.va/holy_father/john_paul_ii/apost_letters/1984/documents/hf_jp-ii_apl_11021984_salvifici-doloris_en.html.
10. Aliaga L. Tratamiento del Dolor. Teoría Y Práctica. Madrid: Editorial MCR; 1995.
11. Bastos Z. Multidisciplinaridade e organização das Unidades de Dor Crónica. Biblioteca da DOR. Coordenador Dr. José Manuel Caseiro. Lisboa: Permanyer Portugal; 2005.
12. Directorate-General for Health. WHO guidelines for surgical safety: 2009 Safe Surgery Saves Lives. Lisboa: DGS; 2010.
13. Carvalhas J, Marques SC. Segurança: um longo caminho a percorrer. Rev Soc Port Anestesiol. 2014;23:103-104.
14. Citizens at the heart of the system. Professionals at the heart of change.

15. Final Report prepared by the Technical Group for Hospital Reform created by Order No. 10.601/2011 of the Minister of Health, published in Official Gazette No. 162, 2nd Series, of 24 August 2011.
16. Helsinki Declaration on Patient Safety in Anesthesiology. [accessed on October 2014] Available at: <http://www.eba-uems.eu>; www.euroanesthesia.org.
17. Charter of Anesthesiology and Citizens' Rights. *Rev Soc Port Anesthesiol.* 2013;22:10.
18. Coimbra Declaration. *Rev Soc Port Anesthesiol.*2013;22:11.
19. Keys TE, A.B., M.A. The History of Surgical Anesthesia. Wood Library – Museum of Anesthesiology. Park Ridge: MA; 1996.
20. Stylist J, Martins AP. Opinion article: Anesthesiology and Intensive Care Medicine. SPA Intensive Care Medicine Section - basis for its creation. *Rev Soc Port Anesthesiol.* 2013;22:7.
21. Araújo R. Anesthesiology and Intensive Care. Current reality and future challenges. *Rev Soc Port Anesthesiol.* 2005;14:11-13.
22. Portuguese Medical Association. College of the Specialty of Anesthesiology. Organisation of Anesthesiology Departments in Portuguese Hospitals. Lisboa: OM; 2014.
23. Nunes JM, Rocha MS, Mesquita A. Anesthesia in the 19th and 20th centuries and the Hospitals of the University of Coimbra. Coimbra: Anesthesiology Department, HUC:2007. [Consulted October 2014] Available at: <http://hdl.handle.net/10400.4/1354>.
24. Clode JJPE. Beginnings of General Anesthesia in Portugal. In: Otorhinolaryngology in Portugal. Lisboa: Circulo Médico, Lda; 2010.
25. Sociedade Portuguesa de Anestesiologia. www.spanestesiologia.pt. CIRCUITO DO DOENTE PEDIÁTRICO PARA PROCEDIMENTOS CIRÚRGICOS E MCDT EM CONTEXTO DE PANDEMIA COVID-19. [Consulted May 2023]
26. Sociedade Portuguesa de Anestesiologia. www.spanestesiologia.pt. VIA AÉREA EM DOENTES COM SUSPEITA OU INFEÇÃO COVID-19. [Consulted May 2023]
27. Sociedade Portuguesa de Anestesiologia. www.spanestesiologia.pt. Abordagem do Doente Cirúrgico Pediátrico na Pandemia Covid-19. www.spanestesiologia.pt.
28. Sociedade Portuguesa de Anestesiologia. Recomendações Spa. Anestesia fora do Bloco em Doente Pediátrico na Pandemia Covid-19. [Consulted May 2023]
29. Sociedade Portuguesa de Anestesiologia. www.spanestesiologia.pt. Recomendações da Secção de Anestesiologia Obstétrica da SPA no período perinatal em contexto COVID 19. [Consulted May 2023]
30. Sociedade Portuguesa de Anestesiologia. www.spanestesiologia.pt. Reanimação Pediátrica na Pandemia Covid-19. [Consulted May 2023]