

DOI: <https://doi.org/10.5554/22562087.e1151>

Thirty years of the Anesthesiology Department at Clínica Reina Sofía

Treinta años del Departamento de Anestesiología de la Clínica Reina Sofía

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Abstract

This article describes the establishment of the first anesthesiology department of a hospital of a health maintenance organization (HMO) in Colombia. It was founded by a heterogeneous group of anesthesiologists, several of them with formal subspecialty training abroad, who designed its administrative, academic and clinical strategies. This led to innovative approaches of perioperative medicine including preanesthetic assessment, deep venous thrombosis prophylaxis, optimization of preoperative testing, massive transfusion protocols, patient blood management (PBM) protocols, enhanced recovery after surgery (ERAS), intensive care unit bypass for neurosurgical procedures, and perioperative outcome analysis, all which were novel in the country. Moreover, for over three decades it hosted an annual anesthesia course to address original topics, hosting global opinion leaders in anesthesia and reinvesting the profits in continuous medical education, more than 20 anesthesia journal subscriptions and simulation equipment as well as physiological data acquisition software and equipment. Lastly, it established the first four-year residency program in Colombia, focusing on perioperative medicine based on interventions for improving patient outcomes.

Key words

Perioperative medicine; Outcomes; Pre-anesthesia assessment; ERAS; Fast track in neurosurgery; Data analysis; Anesthesiology; Colombia.

Resumen

Se describe la gestión del primer departamento de anestesiología de un hospital de medicina prepagada en Colombia. Fue constituido por un grupo heterogéneo de anestesiólogos, varios con entrenamiento formal en el exterior, quienes planificaron su funcionamiento administrativo, académico y asistencial. Esto permitió innovar con aproximaciones de medicina perioperatoria: evaluación preanestésica con intervenciones para optimización, seguridad perioperatoria, profilaxis de trombosis venosa, optimización de pruebas preanestésicas, protocolos de transfusión masiva, programa de ahorro de sangre (PBM, por las iniciales en inglés de patient blood management), recuperación mejorada después de la cirugía (ERAS, por las iniciales en inglés de enhanced recovery), bypass de unidad de cuidado intensivo en procedimientos neuroquirúrgicos y análisis de desenlaces, todos de manera novedosa en el país. Además, la realización de un curso anual de actualización anestesiológica durante tres décadas, con temas originales en el país, y con la participación de los principales líderes de opinión del mundo y con la reinversión de las utilidades de esta actividad en educación continuada, suscripciones a más de 20 revistas anestesiológicas y adquisición de equipos de simulación y registro fisiológico. Por último, la creación del primer posgrado de cuatro años en Colombia con énfasis en medicina perioperatoria entendida como la intervención para mejorar los desenlaces de los pacientes.

Palabras clave

Medicina perioperatoria; Desenlaces; Evaluación preanestésica; ERAS; Fast track en neurocirugía; Análisis de datos; Anestesiología; Colombia.

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INTRODUCTION

In January 2023, the Anesthesiology Department at Clínica Reina Sofía (CRS) celebrated its first 30 years, a milestone of particular interest due to its atypical development in anesthesiology at the national level.

This experience was the result of a fortunate coincidence of leadership, manpower quality, teamwork, and institutional evolution amidst the 1992 healthcare system reform.

Leadership – In contrast to what is commonplace in many settings, Alvaro Sarmiento the leader appointed for this project, devised a collaborative management approach that added to, and leveraged the strengths of individuals.

Human group - enriched by the participation of several members who were trained abroad and contributed with new ideas and approaches.

Teamwork – all the initiatives suggested were supported by everyone involved; without such endorsement they would never have come to fruition.

Institutional evolution - CRS was the first institution exclusively devoted to patients of a HMO (pre-paid medicine), which pursued value (improved outcomes at lower cost); so this had a significant impact on the way the anesthesia department was managed. Furthermore, this new experience paved the way to the development of novel strategies.

The amendment of the healthcare system with Law 100 in 1993 changed the dynamics in the practice of anesthesia, because the increasing demand for surgery services strengthened the position of anesthesia within the system.

This turn of events led to the development of the following four process areas: 1) advocacy; 2) quality of practice and innovation; 3) governance; and 4) extension – continuing education.

Advocacy

Drawing a parallel with the sports world, teams such as the Yankees or Real Madrid

show a close relationship between investment in human resources (the team) and successful results. This is also relevant in medicine. Poor remuneration leads to an unfavorable work environment, lack of motivation to go the extra mile, high staff turnover, and a very low probability of recruiting people with special expertise.

In the late 1980s, in Colombia, there were two approaches for hiring anesthesiologist: through a work contract or fee for service. The problem with the latter is that several institutions made significant deductions for billing services, which negatively affected the remuneration of anesthesiologists. An original approach by Germán Parra was to agree with the payer, Colsanitas, to bill anesthesia services using the same methodology as was the case of surgeons. This improved the compensation level because the avoidance of discounts resulted in a competitive remuneration against the most prestigious institutions. Simultaneously, he designed a case registry tool for accurate billing and minimize losing track of cases which was then a frequent occurrence.

Simultaneously, Pedro Ibarra analyzed the remuneration of anesthesiology procedures in the city for prepaid medicine patients and designed a fee schedule totally segregated from surgical fees, eliminating the traditional approach of using a percentage of the surgical fee which is still practiced in numerous institutions.

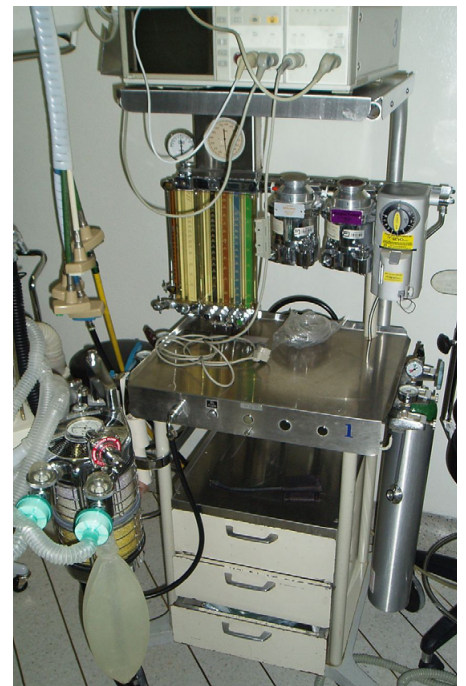
Another important achievement of the Álvaro Sarmiento's administration was to ensure close interaction between the CRS leadership and the payer in the process of designing the structure and equipment provision for operating rooms starting with the construction phase of CRS, for shared decision-making about investing the limited resources available at that stage. Hence, Pedro Ibarra and German Parra as advisors, encouraged the decision to acquire Hewlett-Packard state-of-the art monitoring systems and to accept temporarily refurbished anesthesia

machines. This combination ensured the best approach in terms of use of the available resources with the highest impact on patient safety.

This collaboration with the leadership of the institution paved the way for shared decision-making some years later, when additional resources became available, in the process of selection of state-of-the-art anesthesia machines and monitors. As a result, the quality of the equipment acquired thereafter has ensured over fifteen years of seamless operation (Figures 1 and 2).

Another example of Álvaro Sarmiento's management impact is the uninterrupted availability of dantrolene kits since 1995, the only institution in the country to achieve this. This represents a clear example of good management lobbying practices; as the availability of a non-routine medication in an institution is a low priority, notwithstanding the modest investment involved.

Figure 1. Old Ohio anesthesia machine, but with a state-of-the-art Hewlett-Packard monitor (January 1993).



Source: Authors.

Figure 2. Julian machine, by Dräger, with Phillips MP70 monitor (April 2006), under Álvaro Sarmiento's financial administration.



Source: Authors.

Quality of practice and innovation

The broad heterogeneity of the team organized in the institution was a significant advantage. Its members included people from different academic and professional backgrounds; and the manager of the department sought to leverage each member's strengths and support divergent ideas from the usual anesthesiology practice at that time. Notably, the formal training that several group members received abroad played a crucial role in these achievements.

Thus, multiple innovative approaches were implemented within the practice of anesthesiology in the country, including:

- As a result of the leadership of Álvaro Sarmiento and Germán Parra, a remunerated and mandatory preanesthetic consultation was established for all surgical patients. In 1993, this became the first institution in Colombia to implement a routine system in which the consultation was

recognized and compensated from day one as a practice independent of the administration of anesthesia.

- Pedro Ibarra introduced systematized preanesthetic assessment since 1994. (1) The development of this tool was aimed at demonstrating both economic and practical benefits such as the rational use of pre-anesthesia tests, avoiding unnecessary delays in patient care, and preventing potentially harmful studies. This tool also contributed to a marked reduction in surgery cancellations due to preventable medical issues. Very quickly, these approaches proved the payer of the benefit for accepting to reimburse for the preanesthetic consultation. (2-4)
- In 1995, Jaime Arbeláez introduced the practice of thromboprophylaxis, which was adopted by the institution as part of the perioperative process. For almost five years, the CRS Anesthesiology

Department was the only one to use thromboprophylaxis, until internal medicine adopted this initiative.

- Since the late 1990s, Pedro Ibarra advocated for strategies to optimize fluid administration, challenging the reliability of static indicators such as central venous pressure. In 1999, he proposed the adoption of dynamic parameters, such as systolic pressure variation (5) which, within a few years, became standard practice in the Anesthesiology Department. Phillips monitoring was introduced in 2009 for automatic measurement of systolic blood pressure variations based on the invasive blood pressure curve. For over fifteen years, the measurement of central venous pressure has been discontinued in the practice of anesthesia. Another important milestone was the routine use of intraoperative infusion pumps for fluid administration, implemented consistently for over a decade. This strategy has significantly reduced fluid overload-associated morbidity, a benefit consistently supported by the literature for more than fifteen years.
- In 2003, 2007, and more recently in 2021, using analytics from the pre-anesthesia visit information, Pedro Ibarra published the pragmatic pre-anesthesia tests protocols developed heuristically at the institution. The impact of these protocols have been huge; so much so that actually over 300 hip replacement surgeries are performed annually without a single preanesthetic test. (6,7)
- A morbidity analysis conducted in patients undergoing colectomy by Giovanni Cuccaro in 2003, identified several issues which led to significant institutional changes.
- In 2008, Pedro Ibarra, on behalf of the department of Anesthesiology, submitted a proposal to adopt the ERAS program for abdominal surgery.

Unfortunately, the suggestion was not adopted until 2014, following an initiative of the Department of Surgery when Eduardo Zarate became Program Information Manager, and the implementation of ERAS showed a positive impact.

Another milestone was the involvement of the Department of Anesthesia with the multidisciplinary committees. Thus, for example, in 2007 Pedro Ibarra changed the institutional transfusion protocols by adopting the empirical transfusion scheme 1:1:1 of red blood cells, plasma, and platelets for volume restoration in patients with major hemorrhage. This resulted in a significant reduction in the amount of blood products administered to these patients.

In 2016, Pedro Ibarra from the Anesthesiology Department, designed and implemented the patient blood management (PBM) protocol which was the first in Colombia and one of the first in Latin America: This protocol is intended to minimize perioperative anemia and achieve improved patient outcomes.

In 2017, Jaime Arbeláez implemented the "No ICU - Unless" approach for most anterior fossa neurosurgical patients, with a significant impact on the perioperative dynamics of these patients.

Governance

An important but usually neglected aspect with regards to the management of a department of Anesthesia is governance. Unfortunately, a lack of governance means that the department may be subject to significant inappropriate interference from institutional leaders. This ranges from a daily problem, like late arrivals, to risky practices or preventable adverse events.

Jaime Arbeláez, Germán Parra, Álvaro Sarmiento, and Pedro Ibarra submitted an original proposal to the Department of Anesthesiology which was approved. It involved the appointment of a team member to oversee the practice of anesthesia, and any blunders were subject to a proportionate economic penalties. This atypical approach strongly influenced the behavior of anesthesiologists to the extent that over the last 30 years there has never been a situation in which an anesthesiologist was not readily available to ensure anesthesia coverage in the institution.

This governance approach is essential for preserving the Department's prestige within the institution. By recognizing that the Department has effective internal control mechanisms, the institution refrains from imposing sanctions on anesthesiologists.

Extension – continuing education

One key area for medical practitioners is continuing education. As a result of the past experience of Álvaro Sarmiento and Pedro Ibarra organizing academic courses in the Cundinamarca Society of Anesthesiology, the idea of conducting such activities in the institution was promoted. The first formal academic activity at CRS was a hemodynamics workshop held in August 1993 during the XX Latin American Congress of Anesthesiology in Bogotá. Based on this experience, Álvaro Sarmiento suggested organizing a CRS-specific anesthesiology course; together with him obtaining pharmaceutical/equipment sponsorship and Pedro Ibarra's academic guidance, the first course was held in September 1994, and since then over 30 editions have been completed.

As an original idea, this course (8) has featured many workshops, a methodology adopted by other events almost ten years later. Over the course of these 30 editions, nearly a hundred international speakers—renowned leaders in their respective fields with thousands of publications—have

been invited. Following is a list of some of the participants in the different editions:

- **1995:** Alonso Mesa, co-author of the first Difficult Airway Management Guide.
- **1997:** Antonio Aldrete, developer of the Aldrete score for post-anesthesia care unit (PACU) discharge criteria, and Raúl Muchada, one of the first researchers in esophageal Doppler cardiac output measurement devices.
- **1998:** David Dewan and Mark Norris, editors of one of the most important obstetric anesthesia textbooks.
- **2000:** Maureen McCunn presented hepatic extracorporeal support schemes implemented at Baltimore's Shock Trauma Center.
- **2001:** An anesthesiology informatics workshop was held with the participation of Keith Ruskin, designer of the world's first anesthesiology discussion list.
- **2002:** Frances Chung, leader in ambulatory surgery anesthesia and creator of the universally used STOP-BANG scale.
- **2003:** Manuel Pardo, director of the Simulation Center at the University of California, San Francisco, addressed the virtues of simulation in continuing education.
- **2004:** Andrea Casati, president of the European Society of Regional Anesthesia (ESRA), lectured on regional anesthesia.
- **2005:** Christer Svensén, the first person to study crystalloid kinetics, together with Stefan De Hert who was later elected president of the European Society of Anesthesiology (ESA), who spoke about the cardioprotective benefits of inhaled anesthetics.
- **2006:** Birgitte Brandstrup presented her research on fluid rationalization in colon surgery, the most searched study on Google on the topic of perioperative fluids. She was joined by Enrique Goytosolo, who presented Nigel

Sharrock's controlled hypotension regimens, the standard practice in anesthesia at the most reputable orthopedic hospital, the Hospital for Special Surgery (HSS) in New York.

- **2007:** Franco Carli, precursor of preoperative prehabilitation, together with Wilton van Klei - the first anesthesiologist to win the European Society of Cardiology (ESC) research award - and Jørgen Viby Mogensen, president of the European Society of Anesthesiology.

- **2008:** Spencer Liu, from HSS, and Navparkash Sandhu, pioneer of ultrasound use in anesthesia since 1998, together with distinguished Brazilian regional anesthesia specialists Marildo Gouveia and Luiz Imbelloni.

- **2009:** Ruth Landau and José Carvallo, two leaders in obstetric anesthesia.

- **2010:** Arthur Lam, one of the neuroanesthesiologists with the largest number of publications, and Karim Bendjelid, cardiologist researcher of dynamic volemic measurements.

- **2011:** Angela Enright, president of the World Federation of Societies of Anesthesiology (WFSA) and the renowned Ronald Miller, head of the world's most recognized Anesthesiology Department, at the University of California, San Francisco, and again Jørgen Viby Mogensen, former president of ESA, spoke about the future of the specialty (Figure 3).

- **2012:** Arthur Wallace, anesthesiologist and researcher of perioperative cardiac morbidity, participated alongside Christian Apfel, developer of the Apfel nausea and vomiting scale.

- **2013:** Matthias Jacob, an outstanding researcher on perioperative fluid use, participated alongside Richard Dutton, trauma anesthesiologist and business administrator leader of the Anesthesia Quality Institute (AQI) of the American Society of Anesthesiology (ASA).

- **2014:** Richard Urman from Harvard University, one of the leaders in the development of anesthesiology guidelines in the United States, participated alongside cardiologist Philip James Devereaux, who has led perioperative medicine research worldwide.

- **2015:** James Dukakis, internist, leader in perioperative anticoagulation research, participated together with José Díaz Gómez, Colombian anesthesiologist and one of the leaders in the use of

Figure 3. Guests at the XVIII Annual Anesthesiology Course, Angela Enright, president of the World Federation of Societies of Anesthesiologists (WFSA) and Ronald Miller, head of the Anesthesiology Department at the University of California, San Francisco (UCSF).



Source: Authors.

Figure 4. Randy Loftus, anesthesiologist, infection researcher, during a conversation with Sanitas postgraduate students, a year before the pandemic (February 2019).



Source: Authors.

echocardiography in critical care in the United States

- **2016:** Franklin Dexter, leading researcher in operating room dynamics analysis, and Zeev Kain, who conceived the first perioperative medicine protocol developed by the ASA.

- **2017:** Aryeh Shander, pioneer in PBM implementation, spoke about his extensive research in this area.

- **2018:** Adrián Gelb, neuroanesthesiologist, with numerous publications and former WFSA president, participated together with Hugo van Aken, the German anesthesiologist with the most publications.

- **2019:** Randy Loftus, pioneer in anesthesiology infection research, participated alongside Wayne Morris, developer of the Essential Pain Management course, who led the first EPM workshop in Colombia (Figure 4).

- **2020:** Carol Peden and Lizbeth Evered, leaders of the ASA's Anesthesia Brain Initiative project to improve perioperative brain health, and Jonathan Wanderer, IT expert from Vanderbilt, discussed their experience at their medical care center.

- **2021:** Marcos Vidal, one of the leaders in pulmonary mechanics research, participated with internist Azra Bihorac, expert in perioperative renal morbidity.

- **2022:** Phillip Vlisides, one of the most outstanding researchers in neuroanesthesiology.

- **2023:** Angela Edwards, director of the Society for Perioperative Assessment Quality Improvement, and Gerardo Tusman, a renowned Argentine anesthesiologist with multiple publications on mechanical ventilation.

These courses have been a unique experience to learn about new concepts that had never been previously discussed at other national events. In fact, several workshops proposed for this activity have become routine activities both at the national and international level, such as the Crisis in Anesthesia for Plastic Surgery course by Jorge Bayter, Use of Ultrasound in Regional Anesthesia by María Vázquez and Patricia González, and Maternal Collapse by Mauricio Vasco. All these workshops that were held for the first time at the CRS annual anesthesiology course have become part of the routine training of anesthesiologists in the country.

Additionally, and supported by the Department of Anesthesiology, the Ophthalmic Anesthesia Blocks workshop developed by Rafael Ordóñez, Juliana Rojas, and Carlos Gómez from Clínica Sebastián de Belalcázar in Cali, was presented at the 2016 American Anesthesiology Congress, and received the best scientific exhibit award, a first for Colombia.

Another innovation was the investment of part of the annual course profits in continuing medical education and research activities, including the purchase of an AdInstruments® physiological polygraph (AdInstruments® PowerLab), in addition to over a decade of collecting the latest editions of reference texts and more than 20 anesthesiology journal subscriptions, outnumbering all the libraries in the country.

The extension (continuing education) initiative involved the creation of the first Anesthesiology and Perioperative Medicine postgraduate program, which also innovated with a four-year duration and an emphasis on perioperative outcomes. For fourteen years, this initiative was conceived and directed by Pedro Ibarra, who fostered rigorous academic and professional training. This

led to the achievement of significant milestones, such as obtaining first places in two levels of residency in academic exams at one of the editions of the SCARE Residents Congress, and the appointment to the Chair of the SCARE Residents Committee, remarkable achievements for a new postgraduate program in the country. Very special activities during the postgraduate program have resulted in three publications and a lecture delivered at a Latin American Anesthesiology Congress — the only one ever presented by a resident — in addition to a dozen posters at national and international meetings.

Challenges

The underlying factor of the "atypical" activities of the CRS Anesthesiology Department is the realization that anesthesiology is not simply a specialty that supports surgery; anesthesia plays a genuine perioperative role affecting patient outcomes.

This is a huge challenge because few anesthesiologists share this perception. Failing to acknowledge the true value of anesthesia can lead to the department's decline, reducing it to a mere support service within the institution.

CONCLUSIONS

The authors describe the experience of a unique department that, in their view, has played a far more significant role than simply functioning as a support service for the institution.

Conflict of interest

None declared by the authors.

Funding

None declared by the authors.

Acknowledgment

To all the members of the Anesthesiology Department, who were instrumental in achieving all these milestones.

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