

## Contribution of the Pitié-Salpêtrière Hospital to French Anesthesiology

**Editorial Note:** This issue includes 13 articles and 3 Editorials from or about work from the Department of Anesthesiology and Critical Care in Pitié-Salpêtrière in Paris, which celebrated its 400-yr anniversary this year. All articles underwent rigorous peer review with no special consideration and we are pleased to highlight the recent and past contributions of this outstanding department and institution.

THE Pitié-Salpêtrière hospital, founded in 1612 as a home for the poor and then as a hospice, has been progressively transformed over the years to become a center of excellence in the field of health (fig. 1). The 2,000 conventional hospital beds have been decreased to allow the construction of modern technical units, which have allowed both the development of major surgery and the management of outpatient surgery patients. Today, the Pitié-Salpêtrière hospital is one of Europe's oldest, largest (1,500 beds, 47 operating rooms, and 140 surgical and multidisciplinary critical care unit beds, including the 80 surgical and multidisciplinary critical care unit beds managed by the Department of Anesthesiology and Critical Care) and best renowned hospitals with a long-standing affiliation with the University of Paris, now University Pierre et Marie Curie-Paris 6. The Pitié-Salpêtrière hospital's reputation dates back to the middle of the 19th century with the discoveries of Charcot. In the second half of the 20th century, the hospital's surgical activity, particularly major surgery and transplantations, developed with the support of the Department of Anesthesiology and Critical Care. It was at the Pitié-Salpêtrière, that Christian Cabrol, in 1968, performed the first successful heart transplantation in Europe, allowing the development of very active research on the care of brain-dead organ donors in our department.<sup>1</sup>



***“In France, the anesthesiology-critical care specialty, driven by the impetus provided by Pierre Viars, M.D. ... [and further developed by Pierre Coriat, M.D.] has largely contributed to the modernization of both our specialty and, as a consequence, to surgical care.”***

Working in a hospital that is celebrating its 400th anniversary implies constantly projecting medical practice into the future. In France, the anesthesiology–critical care specialty, driven by the impetus provided by Pierre Viars, M.D. (Professor, University Pierre et Marie Curie, Paris, France (1930–1998), head of the Pitié-Salpêtrière hospital Department of Anesthesiology and Critical Care from 1972 to 1995, has largely contributed to the modernization of both our specialty and, as a consequence, to surgical care. Professor Pierre Viars was the real founder of the Pitié-Salpêtrière hospital Department of Anesthesiology and Critical Care, by forming a team that enabled him to ensure clinical care, teaching, and research in the fields of both anesthesiology and critical care, as clearly illustrated by the numerous articles published in this issue concerning studies performed in the department that he founded.

It is relatively simple to describe the past and predict the future, but it is much more difficult to be clear-sighted in everyday practice. This particular quality enabled Pierre Viars to make French anesthesiology–critical care a full-fledged medical specialty. Observing that anesthesiology was not considered to be a real medical specialty, but rather a “necessary evil,” all his life's work was devoted to recognition of our specialty by the hospital community, based on the principle that anesthesiology–critical care physicians play a central role in surgical practice, and are therefore essential. When recruiting physicians, he therefore required a high level of medical and scientific training, as he was convinced that only constant reference to medical progress would enable them to be recognized and considered by physicians of other specialties. He was the first to understand that basic and clinical research was essential for

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**Fig. 1.** Image of the hospital at the 17th century (with permission of the assistance Publique Hopitaux de Paris).

French anesthesiology to ensure recognition of our specialty by other medical specialties and to ensure a leading role in medical progress.

He clearly understood that medical progress in anesthesiology and critical care, as in any field of medicine, had to be driven by science and research and that transfer of discoveries in the fields of physiology or pharmacology to medical practice would allow significant progress in the management of high-risk patients requiring anesthesia, as well as critically ill patients. Basic cardiovascular physiology and molecular biology and description of the structure of ion channels that are critical for central nervous system functions are just a few examples of how basic science can be transposed to clinical practice.

Today, in the footsteps of Professor Viars, the department's philosophy is based on identifying residents interested in research and convincing them to select a topic before the end of their residency as the subject of their research work once they have been recruited as a young member of staff, regardless of the clinical sector to which they are allocated. The best residents were encouraged to obtain a master's degree and/or Ph.D. in experimental research in various fields related to anesthesia, critical care, or pain. Our objective has been clearly to ensure each resident presents at least one abstract at our national meeting, many of them present an abstract at an international meeting, and a significant proportion of them will be able to finally publish an article. Presentation at the American Society of Anesthesiology meetings was considered to be a must before the creation of the European Society of Anesthesiology in 1992. I remember that, in 1988, at the San Francisco American Society of Anesthesiology meeting,

our department presented more abstracts than any country in the world, except for the United States. These first steps in clinical research for our residents probably play a crucial role in encouraging them to conduct research.

Management of the department also ensures that physicians have sufficient time for clinical research, by providing them with a salary equivalent to that received by physicians with a full-time clinical activity.

In our department, analysis of postoperative outcome is performed prospectively in all high-risk patients, particularly those undergoing cardiac and vascular surgery. Studies published in this issue on the harmful effects of  $\beta$ -blockers<sup>2</sup> and on the relevance of intubation criteria<sup>3</sup> demonstrate that the large number of operated patients managed in our hospital allow powerful statistical analyses addressing clinical questions.

Pierre Viars was encouraged and helped by Bruno Riou, M.D., Ph.D., to form an experimental research laboratory in the Pierre et Marie Curie School of Medicine specialized in the pathophysiological mechanisms of our specialty. This laboratory has enabled a large number of anesthesiologists from all over France to conduct experimental research in our field. Over recent years, we have also asked young anesthesiologists in our department to obtain international experience for at least 1 yr. The international cooperation that we have developed with many centers (Charlottesville, Milwaukee, and San Francisco in the United States, London and Oxford in the United Kingdom) is a further step designed to improve both the level of our research and the appeal of our department.

Pierre Viars was also one of the first to understand that critical care medicine requires dedicated anesthesiologists

specifically trained in critical care medicine, working full-time in the critical care unit and ensuring global management of the patient.

The articles published in this issue of *ANESTHESIOLOGY* show that our department has continued its basic research and clinical research activities in both anesthesiology and critical care, and that this research has been facilitated by progress in other fields, such as pharmacology, cardiovascular and neurological pathophysiology, and biotechnological innovations, allowing improved recordings and evidence-based medicine, supported by high-level clinical trials that have defined precise guidelines designed to improve patient outcome.

Each of the main fields of research in our department is illustrated by at least one of these articles: (1) acute lung injury;<sup>4</sup> (2) neurological critical care;<sup>5</sup> (3) reducing cardiac risk of cardiac and noncardiac surgery;<sup>2</sup> (4) trauma;<sup>6</sup> (5) airway control;<sup>3</sup> and (6) experimental research in cardiology.<sup>7</sup>

Our department has also been actively involved in *ANESTHESIOLOGY*, the leading journal of our specialty, providing four associate editors (Jean-Jacques Rouby, M.D., Ph.D., Julien Amour, M.D., Ph.D., Yannick Le Manach, M.D., Ph.D., and Bruno Riou, M.D., Ph.D.) and one editor (Bruno Riou, M.D., Ph.D.).

Progress in anesthesiology–critical care in France has been marked by several specific approaches designed to ensure safe management of operated patients, define the role of anesthesiologists and anesthetic nurses, and anticipate the demographic pressures affecting anesthesiologists in France. Our department played a major role in the first two approaches, under the impetus of our prestigious colleagues at Pitié Salpêtrière, Andre Lienhart, M.D. and Francois Clergue, M.D., who is currently the chairman of the Department of Anesthesia at the University Hospital of Geneva (Switzerland).

In parallel with similar changes in the United States and other north European countries, anesthesiology–critical care has become a high-technology field in France, at the forefront of patient safety and quality of care. In most countries, patient safety, and more broadly, quality of care, has been considered with respect to both the reduction of preventable adverse events in hospitals and the compliance with practice guidelines concerning healthcare procedures, designed to achieve a “care-centered approach.” The United States was a leader in this field, whereas French anesthesiology adopted another approach to patient safety and quality of care, defined as a “system-centered approach,” which focuses on access to a timely and effective continuum of healthcare services: clinical prevention, primary care, and appropriate referral and access to specialty care. An example of this approach is the change in French legislation, encouraged by anesthesiologists–critical care physicians, that requires a mandatory preoperative consultation to ensure patient evaluation and information, intraoperative respiratory and circulatory monitoring (including capnography and pulse oximetry), and admission of patients to a recovery room.

The French law of 1994 therefore overcame the reticence expressed by various hospital communities to enforce certain rules ensuring better patient safety and confirming anesthesiology as a full-fledged medical specialty.

A survey of anesthesia-related mortality in France illustrates the active role played by French anesthesiology in the field of patient safety.<sup>8</sup> This very large-scale, nationwide study confirmed a 10-fold decrease in anesthesia-related mortality in France in 1999. Determination of the anesthetic risk was based on analysis of the number of accidents and deaths over a given period of time and the documented total number of anesthetic procedures performed over the same period, whereas in other studies, the anesthetic risk was based on estimation of the total number of anesthetic procedures.<sup>10</sup> The number of anesthetic procedures has increased by 120% since 1980 (the annual anesthetic rate in the population was 13.5/100 in 1999, compared with 6.6/100 in 1980).<sup>11</sup> The major change was observed in patients aged more than 75 yr and in patients with an American Society of Anesthesiologists physical status of 3.<sup>11</sup> The number of regional anesthetic procedures increased 14-fold over the same period.<sup>11</sup> The improved knowledge concerning anesthetic practices derived from this survey improved the recognition of anesthesiology by other healthcare providers, policy makers, and patients.

*ANESTHESIOLOGY* in France has, for many years, clearly defined the respective roles and responsibilities of anesthesiologists–critical care physicians and anesthetic nurses. The prerogatives and the scope of the decisions that can be taken by anesthetic nurses are also defined by French legislation, allowing effective and harmonious functioning of all operating-room personnel.<sup>12</sup>

*ANESTHESIOLOGY* was also the first and only medical specialty to specifically focus on the changing demographics of its practitioners. In the mid-1980s, a severe shortage in the recruitment of young anesthesiologists was observed in France, resulting in a fourfold reduction the total number of anesthesiologists in training, that lasted at least a decade. The threat of a looming manpower shortage led the French College of Anesthesiologists and the French Society of Anesthesia and Critical Care to conduct national surveys of French anesthesiologists to estimate the number of anesthesiologists on the basis of the number of job positions and determine the specific characteristics of anesthesiologists, analyze professional practices, and project the provision of future services.<sup>13</sup> As a result of these surveys, corrective measures were initiated, namely a significant increase in the number of physicians admitted to our specialty. Practitioner density increased from 13.1 anesthesiologists and critical care physicians per 100,000 inhabitants in 1989 to 15.3 on January 1, 2009.<sup>13</sup>

This focus on the changing demographics of French anesthesiology helped to avoid a demographic catastrophe in this specialty, especially as demographic constraints are all the more serious when they remain unknown.

Consequently, today, French anesthesiology has asked the right questions to both be recognized as a full-fledged

medical specialty, which ensures a central role in the modernization of the hospital. Our department is most proud of having largely contributed to providing the right answers to these questions and reinforcing the scientific and academic contribution of our specialty to the community of medical and surgical specialties.

**Pierre Coriat, M.D.,\*** \*Department of Anesthesiology and Critical Care, University Pierre et Marie-Curie-Paris 6, Assistance Publique-Hôpitaux de Paris; Hospital Pitié-Salpêtrière, Paris, France. pierre.coriat@psl.aphp.fr

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