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Original Contribution



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Nurse anesthetist; Nurse anesthesia; CRNA; History **Abstract** Despite the fact that anesthesia was discovered in the United States, we believe that both physicians and nurses are largely unaware of many aspects of the development of the nurse anesthetist profession. A shortage of suitable anesthetists and the reluctance of physicians to provide anesthetics in the second half of the 19th century encouraged nurses to take on this role.

We trace the origins of the nurse anesthetist profession and provide biographical information about its pioneers, including Catherine Lawrence, Sister Mary Bernard Sheridan, Alice Magaw, Agatha Cobourg Hodgins, and Helen Lamb. We comment on the role of the nuns and the effect of the support and encouragement of senior surgeons on the development of the specialty. We note the major effect of World Wars I and II on the training and recruitment of nurse anesthetists. We provide information on difficulties faced by nurse anesthetists and how these were overcome. Next, we examine how members of the profession organized, developed training programs, and formalized credentialing and licensing procedures. We conclude by examining the current state of nurse anesthesia practice in the United States.

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1. Introduction

Although nurses have administered anesthesia for more than a century, many health care providers, including certified

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registered nurse anesthetists (CRNAs), are not aware of the history of the profession of nurse anesthesia [1].

2. Early years

Before the first public demonstration of successful ether anesthesia by William T.G. Morton on October 16, 1846, at Massachusetts General Hospital, surgery was by no means an everyday occurrence [2,3]. Pain associated with surgery and the high rate of complications dissuaded patients and surgeons from most forms of elective surgery. The discovery of anesthesia might have been expected to result in an

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immediate increase in the number and complexity of surgical operations, but this did not occur [4]. Although the germ theory of disease was known, the concept of antisepsis had not been extended to surgical operations [5]. Postoperative infections were the rule rather than the exception, and early surgeons believed that pus in the wound was a sign of satisfactory healing [6-8]. Antibiotics were not introduced into medical practice until the Second World War [9], and opposition to the use of anesthetics to dull pain associated with surgery was actually opposed by medical practitioners, lay persons, and the clergy [10,11]. Therefore, for a variety of reasons, anesthesia remained unpopular and unrefined for nearly 50 years after its discovery. Anesthesia was considered dangerous due to high mortality associated with the aspiration of gastric contents, asphyxiation due to respiratory obstruction, or unrecognized events such as low blood pressure or cardiac arrhythmias, in the absence of clinical monitoring [12]. Anesthesia training programs did not exist in the late 19th century, and the job of administering anesthetics was often assigned to medical students, house officers, nurses, or orderlies, none of whom received formal instruction in anesthetic procedures [13,14].

3. A shortage of trained personnel

As surgical techniques improved and the demand for anesthesia increased, surgeons believed anesthesia to be a "mixed blessing" because patients were aware of the existence of pain-free surgery, but anesthesia was associated with high mortality, and there was a shortage of qualified anesthetists [1,15-17]. Thus, the job fell to anyone who was willing and available: mostly medical students and less senior physicians. However, most physicians were not interested in a position they considered to be subordinate and were more eager to learn the skills and techniques of the surgeon. Surgeons, on the other hand, were eager to find well-educated and intelligent professionals to fill the role of anesthetist. Unable to convince enough other physicians to undertake the administration of anesthesia, surgeons turned to graduate nurses to fill this role [2,17-19]. Although surgeons had identified nurses as likely candidates for "occasional anesthetist," many issues continued to plague medicine at this time, including lack of cleanliness and asepsis.

4. Advent of nursing as a profession

The transformation of nursing into a profession required changes in the way society viewed women. However, Thatcher in her 1953 *History of Anesthesia, With Emphasis on the Nurse Specialist*, recognized the important contributions of women to the field: "To women and to the discovery

of 'germs' must go the credit for the greatest contributions to the relief of human suffering during the years between 1860 and 1900" [17]. The birth of feminism and their changing status post–Industrial Revolution led women to seek higher education. Nursing experiences in the Crimean War (1853-1856) and the Civil War (1861-1865) allowed women to challenge male dominance in hospitals and "demand improvements in hospital housekeeping and the care of the sick" [17].

Nursing as a religious calling was never stigmatized, but women practicing nursing outside religious orders were viewed as socially and morally corrupt. After experiences in the wars, educated women began a campaign to train others in the field of nursing, thus opening up a new vocation for women.

Perhaps the most famous of all nurses and the woman considered the founder of modern nursing, Florence Nightingale (1820-1910) grew up in a prominent family in Victorian England. She surprised her family by choosing such a career (or perhaps a career at all), and during the Crimean War (1853-1856), she was given credit for advancing nursing by emphasizing cleanliness, hygiene, and ventilation. She established the first nursing school at St Thomas' Hospital in London and is also remembered as a great social reformer, statistician, and writer [2,20].

However, even after training programs were established, nurses continued to face challenges in the male-dominated medical system until there was a strong demand for their services, created by the discovery of germs. Once the germ theory of disease was understood and the importance of preventing infection accepted, a "new" nurse emerged. Her function was no longer limited to providing comfort, food, and housekeeping but now also required knowledge and application of science. As science expanded the role of the physician by improving our understanding of disease and how to surgically treat illness, the nurse's role also broadened. Nurses assumed duties once limited to physicians; in the operating room, this included administering anesthesia.

5. Pioneer nurse anesthetists

Catherine S. Lawrence (1820-1904) (Fig. 1) has been identified as the first nurse to administer anesthesia, which occurred during the Civil War, 1861 to 1865 [21]. It was during the Battle of Bull Run of 1863 that she administered chloroform to wounded soldiers who needed emergency operations in the battlefield [17,21]. Nevertheless, it still took several years for nurses to step forward and formally answer the call to provide anesthesia. Reasons for this delay included lack of training, the nonemergency nature of civilian surgical practice after the war was over, and the paucity of role models and sponsors. However, the wartime concept of nurses providing anesthesia care gradually took root as

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