

The history of office-based anesthesia¹

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Abstract

The history and evolution of office-based anesthesia are described, with particular emphasis on the role of the dental anesthesia community in the development of this style of practice. © 1998 Elsevier Science B.V. All rights reserved.

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The history of ‘office-based anesthesia’ depends upon the definition of two terms ‘office’ and ‘anesthesia’. In Genesis II:21, it is written “and the Lord caused a deep sleep to fall upon Adam and he slept. And He took one of his ribs and closed up the flesh instead thereof”. Cro-Magnon man, living 25–45 thousand years ago, was also believed to have inhaled smoke for medicinal purposes to expunge evil spirits. Thus, ‘anesthesia’ has been around much longer than have ‘offices’.

Since the dawn of anesthesia as we think of it today, anesthesia and dentistry have had ongoing symbiotic relationship. Extraction of a tooth without anesthesia is excruciating; so much so that in medieval times it was used as a form of torture. St. Appolonia was persecuted in this way because of her Christian faith, and has thus been named the patron saint of dentistry. So it is not surprising that dentistry and office-based anesthesia remain so closely intertwined [1]. This manuscript addresses the history of office-based anesthesia in dentistry and in medicine.

On 10 December 1844, a young Hartford dentist named Horace Wells attended a lecture by a travelling chemist, Gardner Q. Colton [2]. During the lecture, the effect of inhaling nitrous oxide (N₂O) was demon-

strated. Wells noticed that after inhaling N₂O, a volunteer stumbled into a bench, seriously injuring his leg, but reported feeling no pain. On the following day, Wells underwent extraction of one of his own teeth under the influence of this strange gas. Similarly, he felt no pain. Wells then sought to share this observation with Dr John C. Warren, Surgeon-in-Chief of the Massachusetts General Hospital, Harvard Medical School, in Boston. Wells performed a similar demonstration in the presence of Warren and a number of Warren’s students, but with less than an astounding success. Wells was jeered in the hall, “Humbug!” by the students. He quickly returned to Hartford, and the interest in N₂O by the medical community quickly subsided.

Colton, the chemist, manufactured N₂O for Wells. He subsequently established a number of dental institutes within the country, and by the 1880s had anesthetized over 120000 patients using 100% N₂O. Colton believed that N₂O was metabolized to form oxygen in the tissues. This belief would haunt the use of this drug for decades to come.

In 1846, another dentist, W.T.G. Morton, was to change the practice of anesthesia forever. On September 30, 1846, Morton performed a tooth extraction on patient Eben Faust under the influence of ether. This event was witnessed by Dr Henry J. Bigelow, a surgeon at the Massachusetts General Hospital. Bigelow subsequently arranged yet another demonstration of anesthe-

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sia to be performed in the presence of Dr John Warren. A tumor of the neck was removed from a patient under the influence of ether. In contrast to the reception afforded Wells, this demonstration was an astounding success. Dr Warren announced to the audience, “Ladies and gentlemen, this is no humbug”.

Nitrous oxide was first manufactured in liquid form in 1881 by the S.S. Kite Manufacturing Company of Philadelphia. The availability of N₂O in a form readily deliverable to customers and so easy to use markedly increased the use of this substance. In 1902, the forerunner of the modern day anesthesia machine was introduced by Carl K. Eter, also a dentist. It should be noted that in the early years, the use of N₂O was associated (intentionally) with cyanosis. In some instances, a patient’s color was titrated to a particular shade of blue which was matched to a slip of blue color resembling a paint chip. Similarly, in the presence of excitement, it was recommended that oxygen be entirely shut off, and N₂O’s flow increased in order to anesthetize the patient more quickly. “Each struggle he makes will become weaker and weaker until at the point of relaxation he will become subdued enough to give no more trouble. Then from 5 to 15% oxygen may be added, and the strap loosened to allow him plenty of room for respiration” [3].

Shortly after the turn of the century, physicians began to specialize in the practice of anesthesia. One of the earliest office-based anesthetic practices of a physician-anesthesiologist was opened in 1915 by Dr Ralph Waters [4]. In response to an occasional call from a dentist for anesthesia, Dr Waters set up “a modest office with a waiting room and a small operating room with an adjoining room containing a cot on which a patient could lie down after his anaesthetic.... In due time the place became popular and we moved”.

The role which regulations would play in office-based anesthesia perhaps first became evident in 1968, at the Dudley Street facility in Providence, Rhode Island.[2] In a letter entitled ‘Surgery in an Office Suite’ in the *Medical Economics Magazine*, Charles Hill wrote: “In Rhode Island, we have come up with what we hope will be the answer: incorporating in a medical office building an operating suite complete with OR facilities and a recovery room”. However, the facility was financially insolvent. It was not supported by the state government, which ruled that the suite was no more than a doctor’s office, and it lacked support from Blue Cross and other third party carriers. In subsequent years, office-based anesthesia continued to blossom and to evolve. The concept of patient monitoring, a separate practitioner to administer the drugs, and the use of different types of drugs followed. A multi-center study

by the National Institute of Dental Research of the National Institute of Health demonstrated that mortality following administration of anesthesia in a dentist’s office was minimal, and was probably not different from the patients receiving anesthesia in a hospital.

In addition to dentists, other types of practitioners have used anesthesia in the office setting. For example, a survey of the members of the American Society for Anesthetic Plastic Surgery noted that 50% of surgeons operate in their office over half the time, and almost 25% almost never perform anesthetic plastic surgery in the hospital [5]. During office surgery, an anesthesiologist was not present for about a third of the cases in patients receiving sedation or anesthesia; most commonly, the circulating nurse administered the drugs. Complications were not uncommon: 13% suffered respiratory arrest, 8% unplanned intubation and 1% death. A total of 2% of respondents were the subject of malpractice claims related to adverse anesthetic outcomes in their office. This group of patients continues to represent the fastest-growing segment of office-based anesthesia market. And clearly, it provides significant opportunities for anesthesiologists.

Office-based anesthesia will no doubt continue to evolve into the next millennium. It is safe, pleasing, and convenient for the patient, and substantially lower in cost than even the free-standing surgery centers. Indeed, office-based practices may now command an increasingly larger portions of the surgery center practice, as surgery centers increasingly commanded larger portions of the in-patient practice hospital populations during the last decade. Thus, we come full circle.

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