

Arthur E. Guedel Memorial Anesthesia Center

Induction Rooms

By Merlin Larson, M.D., and Mert Senturk, M.D.

A conspicuous failure in our present anesthesia practice is the lack of induction or block rooms. Although such rooms are routine in some countries, they are not common in the United States. This room would be adjacent to the operating rooms and provide space for placing peripheral nerve and neuraxial catheters. It is now becoming clear that properly conducted regional anesthesia provides long-term benefits to the patient, but the pressure to “get the case started” or “keep it simple” places undue pressure on the anesthesiologist and adds stress to the normal workday.

When one reviews the origin of our specialty, it seems that this room was there from the beginning but somehow was eliminated from hospital architecture sometime between the origin of the hospital concept and the 21st century. It certainly was not developed in America, even after the successful introduction of regional anesthetics in the late 19th century.

This article originally appeared in the *Bulletin of Anesthesia History*, April 2006. Reprinted with permission.

The idea of hospitals arose in the Byzantine Empire and was perpetuated and improved as the Turks conquered Asia Minor. One of the first hospitals was built in the Roman city of Caesarea in the fourth century. When the eastern portion of the Byzantine Empire fell to the Seljuk Turks, Caesarea grew in importance because of its strategic position on the Silk Road. Its name was changed to Kayseri. Kayseri, now a city of 600,000 people, is renowned as the principal entry port to Cappadocia, a popular tourist destination in central Turkey.

Although it is commonly known that the scientific principles of observation and documentation begun by the Greek and Roman physicians were kept alive by Islamic scholars, it is less well known that the advancement of the “hospital concept” is considered one of the great achievements of medieval Islamic society. They also developed an extensive pharmacopoeia based upon herbalism and elementary chemistry, and improved methods of anesthesia begun by the Greeks and by physicians in the Indian subcontinent.

Kayseri is of special importance because of its medical center hospital, which was built in the year 1206. This was an institution of learning and healing, much like our university medical centers today. Many medical historians label

Guedel Center (cont'd)

it as one of the first medical institutions dedicated to research and teaching. Prominent physicians who practiced at Gevher Nesibe included Ebubekir, Gazanferi and Seyit Samit. Remarkably, this hospital is intact today and has been transformed into a museum, the History of Gevher Nesibe Medical Museum. A tour of this facility gives us a glimpse into the treatment of the surgical patient in the Middle Ages of Asia Minor.

The hospital was named after a Seljuk princess, Gevher Nesibe, who conceived and willed the institution on her deathbed. Scholarly medical treatments at Gevher Nesibe were based upon the study of the great Greek, Roman and Islamic physicians. A plaque in the entrance to the hospital shows images of Hippocrates (460–370 B.C.E.), Galen (130–200 C.E.), and Avicenna (980–1037 C.E.). Although the Seljuks were brutal conquerors, once the society stabilized in the early 13th century, physicians of all religious faiths were allowed to practice in a secular society. Consequently, Jewish, Christian and Muslim physicians worked cooperatively in the hospital.

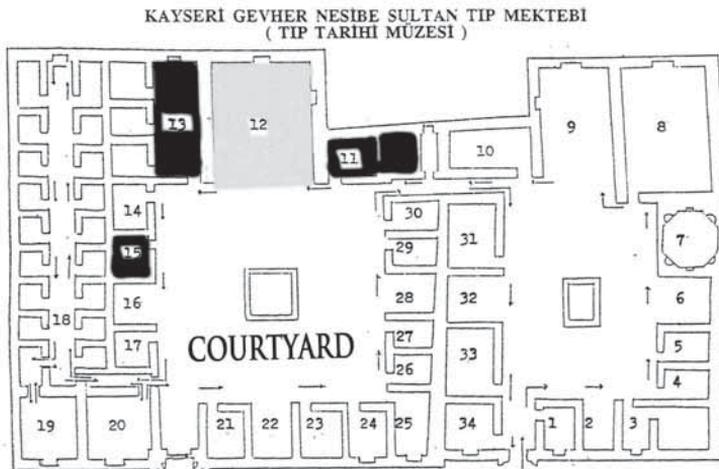


Figure 1: Floor plan of the Gevher Nesibe Hospital. The induction room is #12, operating room #13, History of Medicine Room #15, and History of Pharmacy and Medicine Preparation Room #11. Copied from the museum brochure, 2005.

The plan of this hospital is shown in Figure 1. The operating room was illuminated by a hole in the ceiling (Fig. 2), similar to the lighting in the hallway (Fig. 3) that separated the patients' rooms. One small (8 feet square) room near the operating room was devoted entirely to the study of the history of medicine. Presumably there was no lack of reading material. The Hippocratic

Guedel Center (cont'd)

corpus is 30 volumes. Galen wrote nearly 200 books on medicine (seven on the pulse alone) and Avicenna's *Canon*, a book that Osler called "the most famous medical textbook ever written," contains more than a million words. Galen's work would be a useful reference for the surgeons because much of his work was on treatment of the wounds of the Roman gladiators. His observations, made in the Roman city of Pergamon, about 800 miles east of Kayseri, were written nearly a thousand years before the founding of the Gevher Nesibe Hospital.

Figure 2 (at right): Looking directly upward in the operating room, one sees the hole in the ceiling that acted much like a spotlight on the center of the room. At midday the light fell directly onto the operative site so most operations were performed at that time. At other times, lighting was provided by candles and oil lamps. Kayseri has little rainfall during most of the year. Photograph by the author, 2005.



Figure 3 (at left): The hallway between the patients' rooms was illuminated by holes in the ceiling; electric lights are turned on when visitors arrive to tour the museum. Gevher Nesibe's will directed that patients would not have to pay for treatments given at the hospital, as was the custom in many of the hospitals built by the Caliphs. Photograph by the author, 2005.

Of special interest in the museum is the large anesthesia induction room next to the small operating room (see Fig. 4 on next page). They presumably did not use the term "anesthesia induction" but rather something like "soporific induction." The idea for this room seems obvious when one considers the slow-onset drugs that were used during this preparatory period before the operation was begun. The anesthetic potion described by the Greek physician Dioscorides (40–90 C.E.) in the first century consisted of *Mandragora* (mandrake) and wine, but Avicenna and others improved the formula. By the 13th century it consisted of multiple ingredients, including opium, *Mandragora*, *Hyoscyamus*, mulberry juice, lettuce seeds, *Lapathum* seeds, and climbing ivy. The drugs were administered orally, by inhalation, or through the skin (ointments). The History of Pharmacy and Medicine Preparation Room is conveniently located next to the induction room.

Guedel Center (cont'd)

It seems clear that the combination of opium, scopolamine, *Mandragora* and other additives, given properly, would produce a somewhat tranquil patient who might struggle during a short operation but might not remember much of the struggle. The key phrase is *given properly*, because the drugs are lethal if given carelessly. If we give these physicians due credit, then it seems possible that with adequate induction time and skilled anesthetists, oral inhalation and possibly transcutaneous administration of these drugs would produce a suitable anesthetic. A recent assessment of this anesthetic concoction concluded that it was indeed efficacious, but the correct formulation(s) and method(s) of administration were gradually lost through time.



Figure 4: The anesthesia induction room, shown here, is the largest room in the hospital. Photograph by the author, 2005.

In Europe between the 16th and the 18th centuries, there was almost no effectual attempt to control pain during surgery. *Mandragora* and henbane mixtures had passed into the realm of witchcraft and the church strictly prohibited their use. Physicians in Europe and America knew about these drugs in the early 19th century, but they were not skilled in their administration. The personal accounts from those patients who survived operations described terrifying pain, and it appears there was no concerted effort to control it. Mesmerism was largely ineffective, and alcohol/opium appeared to be mostly self-administered. The account of surgery by Ms. Fanny Burney, who had her breast removed in 1811 by the celebrated surgeon Dominique J. Larrey (1766–1842), is typical. The procedure was performed in her home and required not only the surgeon and his assistant, but also six strong men who were in attendance to hold her steady while the operation went forward.

Luckily, American physicians discovered the magic of inhalation vapors, but the idea of an induction room remained in the dustbin of history. It is true that holding a mask on an anesthetized patient while waiting for the operating room to become available does seem cumbersome. However, the rapid development of regional anesthesia in the early 20th century might have been a good time to realize the benefit of this 800-year-old idea. Recent articles have promoted the use of special rooms for the placement of regional blocks, so perhaps we will eventually reestablish this old custom that seems to have been present from the very origins of our specialty.

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