

## The Anatomy Laboratory: A Concept Ahead of Its Time

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John S. Lundy, MD, the first chair of the Section on Anesthesia at the Mayo Clinic, had an idea that profoundly affected not only the field of anesthesia but also the rest of medical training at the Mayo Clinic. In 1925, Lundy proposed establishing an institution-sponsored anatomy laboratory.

At that time, the Section on Anesthesia was still in its infancy, with anesthesia services split between Worrall, Saint Marys, Kahler, and Colonial hospitals.<sup>1</sup> These hospitals combined had 20 operating rooms and 1 obstetrical suite. Two physician anesthesia providers, 21 anesthetists, and 3 assistants<sup>1,2</sup> provided anesthesia for more than 20,000 patients who underwent surgery at the Mayo Clinic in 1925.<sup>1</sup> Besides managing these responsibilities, Lundy trained several surgical fellows each year in the art of regional anesthesia.<sup>2,3</sup>

Lundy noticed that the surgical fellows' interests did not lie in learning anesthetic techniques, but he believed that anesthesia should be delivered only by those trained in the specialty. Lundy, searching for a way to interest surgical fellows in the emerging field of anesthesiology, to entice more physicians into becoming dedicated anesthesia providers, and to develop a resource for anesthesia education, approached Mayo Foundation for authorization to establish an anatomy laboratory.<sup>4</sup> He predicted that the laboratory would be a great success and would serve as one of his most valuable assets for training anesthesia fellows. William J. Mayo gave his approval (Figure 1), and Lundy began work on the anatomy laboratory in 1925; however, no meaningful work occurred for almost 13 months.<sup>5,6</sup>

During this intervening period, Lundy solved several logistical problems. First he had to procure and furnish a room that would serve as the laboratory.<sup>6,7</sup> He accomplished this with Mayo Foundation assistance and with tools and instruments sometimes borrowed from operating rooms.<sup>5,7</sup> His next dilemma was how to prepare, store, and lay to rest the cadavers. He contacted the University of Minnesota and Stanford University anatomy departments

and obtained from them techniques for embalming, storage, and preservation.<sup>8-11</sup> The anatomy laboratory was established in the basement of the Palen and Lohse funeral home; the cadavers were obtained mainly from the state hospital; and the initial dissections finally began in 1927.<sup>10,12,13</sup>

The anatomy laboratory started as a single room without adequate lighting, no real ventilation, and borrowed equipment. With funding from the Section on Anesthesia, Lundy procured the rudimentary facilities to run a successful anatomy laboratory, the first to be associated with a private medical clinic.

In the first 7 months of 1927, 66 fellows and 10 staff members spent more than 3300 hours in the laboratory.<sup>5</sup> Besides being extremely popular, the laboratory was also a cost-effective training tool. Lundy determined that in the first 7 months, the average cost per student-hour in the laboratory was \$0.60.<sup>5</sup> The anatomy laboratory grew at a pace that far exceeded the facilities and the staff. Within 1 year of the laboratory opening, Lundy procured funds to expand and remodel, adding more dissection tables and equipment and obtaining a full-time anatomy teacher, Wilmot C. Foster, MD.<sup>5,12</sup>

What occurred next was a masterstroke by Lundy. He observed that surgical fellows who performed dissections before assisting with patients in the operating room fared better than those who did not. He encouraged surgical fellows to perform dissections and procedures on the cadavers to better understand the anatomy and technique involved in performing the procedure on living people. He then expanded this idea on two fronts. First, Lundy established a lecture series that covered purely anatomical dissections; he also initiated a series of lectures and dissections that covered the most frequently performed procedures at the Clinic.<sup>7,14</sup> Second, Lundy developed a simulation program. Lundy's idea was to re-create the operating-room environment in the anatomy laboratory and to have surgical fellows perform procedures under conditions similar to those in the operating room. This enabled the surgical fellows to practice procedures, learn anatomy, and get valuable feedback, advantages often not possible in the operating room.<sup>5,14</sup> Thus, Lundy established a simulation program for surgical fellows at the Mayo Clinic in 1927.

Another feature of Lundy's plan was to have a full-time anatomist, Dr Foster, teach and guide the fellows

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in their dissections, lectures, and simulations; this gave Lundy the time to explore other possible uses for the anatomy laboratory. Lundy believed that the laboratory would be one of his greatest anesthesia training assets because most physicians who chose to specialize in anesthesia would be leaving general practice to do so and would benefit from further studies in anatomy.<sup>12</sup> Thus, in less than 2 years, the anatomy laboratory was transformed from a simple room in which dissections were carried out into a multifunctional educational tool that was used across medical specialties and was an invaluable asset to the Clinic.<sup>12</sup>

In conclusion, John S. Lundy made a special contribution to the Mayo Clinic by establishing an anatomy laboratory; the repercussions of this contribution are still felt today. Lundy hoped to accomplish many things with the laboratory, and the success he enjoyed went far beyond anything he could have expected. Initially, he set out to learn more about nervous system anatomy to foster regional anesthesia techniques. He also sought more appropriate training for surgical fellows and ultimately hoped to establish a training program for physicians interested in anesthesiology. In creating the anatomy laboratory, he provided surgical fellows with an invaluable learning tool; he also developed a surgical simulation program while expanding his understanding of anesthetic techniques. Lundy supervised the anatomy laboratory for more than 30 years, from 1927 to 1959. Direction of the anatomy laboratory was eventually transferred to the Mayo Medical School. The first director of the medical school anatomy laboratory was Duane K. Rorie, MD, an anesthesiologist with a doctorate degree in anatomy who ran the laboratory from 1972 to 1980. The anatomy laboratory continues to thrive under the direction of the Mayo Medical School while remaining true to its roots. Today, the successful Procedural Skills Laboratory, the most recent iteration of which was begun in the Stable Building in 2000, is philosophically a descendant of Lundy's original surgical simulation program but much expanded. Of note, the leadership of the Procedural Skills Laboratory has once again crossed paths with the Department of Anesthesiology, with Dr Rorie, now Emeritus Chair of the Department of Anesthesiology, serving as Director of the Laboratory.

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Figure 1. Letter from Dr William J. Mayo to Dr John S. Lundy dated June 23, 1925, authorizing the establishment of the Mayo Clinic's anatomy laboratory.

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