

Beginnings of a Specialty: The Creation of the American College of Veterinary Anesthesia

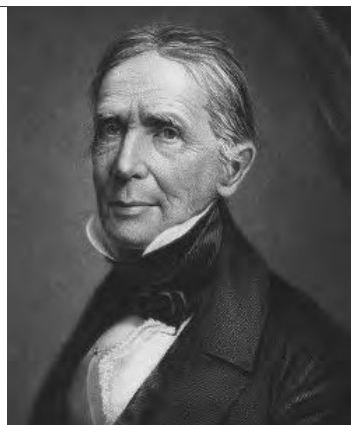
Charles E. Short and Lawrence R. Soma

The historical development of the specialty of anesthesiology in veterinary medicine in the United States is linked to its foundation in human anesthesia. At its early beginning, diethyl ether was first used by surgeon John Collins Warren, MD (1778-1856) (Fig. 1) at the Massachusetts General Hospital in 1846. Complications that could result from the administration of anesthetics were apparent enough that, in 1954, Drs. Henry Beecher and Donald Todd published a paper on the study of deaths associated with anesthesia and surgery.¹ By 1956, the development and use of halothane as a more effective, safer, nonexplosive inhalant anesthetic with a more rapid induction were underway.

This paved the way for development of other nonexplosive inhalation anesthetics for use in the operating room. In 1960, Drs. Joseph Artusio and Alan Van Poznak published the results of their studies of methoxyflurane in people,² an anesthetic that would soon be used in small animals. This use of halothane and methoxyflurane improved the quality and safety of anesthesia in human patients over the use of other currently available inhalant anesthetics (diethyl ether, nitrous oxide, and cyclopropane) or intravenous barbiturates.

However, little was known about their uptake and distribution, and the available equipment for their administration lacked the ability to control administered concentrations. When vaporizers were developed for use with halothane, clinicians now had much greater control of the gas concentration. These advances in human anesthesia begged the questions: would they have any major benefits in animals by improving anesthetic protocols in veterinary medicine? And if so, when and how?

Figure 1. John Collins Warren, MD (1855), the surgeon during the first public demonstration of surgical anesthesia on October 16, 1846. Source: Dunglison R. *Memoir of John Collins Warren, M.D.* [Boston: s.n., 1865?]; p. 4. <http://collections.nlm.nih.gov/catalog/nlm:nlmuid-56330480R-bk>



Veterinary Anesthesia in the 1950s

During the 1950s, instruction in anesthesiology at veterinary institutions usually consisted of a few lectures in pharmacology and a few procedures in physiology laboratories using either drip ether or barbiturates injected intravenously or intraperitoneally. Instructions for anesthesia, given by surgeons during small animal clinical procedures, consisted of administering pentobarbital intravenously or diethyl ether by facemask. These could be supplemented with procaine in local blocks; in some cases, epidural procaine was the primary anesthetic technique. Later, thiopental sodium became available for short procedures. Morphine sulfate was the primary analgesic for use in small animals, and it was used only in dogs.

Horses were anesthetized using solution combinations of chloral hydrate, magnesium sulfate, or barbiturates given by intravenous infusions. A local nerve block with procaine was commonly used to enhance analgesia and reduce the dose of the intravenous mixture. In a few cases, chloroform was administered by facemask, but results of this technique were unpredictable. In food animals, local anesthetics were predominantly used because of the high risk associated with general anesthesia. Therefore, unfortunately, many procedures were done without adequate anesthetic management.

Many high-risk veterinary patients needing surgical procedures (e.g., thoracic surgery in small animals or colic in horses) were too often not likely to recover from anesthesia. Improved anesthetics, anesthetic equipment, and advanced knowledge in their usage, along with monitoring capability, were crucial to further development of veterinary anesthesiology.

The Start of a Specialty

In addition to the continuing need for study and advancements in the use of anesthetics for people, medical school faculty were also interested in improving animal anesthesia and care during and after surgery. They realized that this would improve care not only in experimental animal surgery with intended applications for human medicine but also in a larger population of animals, which was sorely needed. Medical schools were thus willing to share information and train the few veterinarians interested in anesthesiology at that time. As a result, in the 1960s, Drs. Lawrence Soma, Charles Short, Donald Sawyer, and John Thurmon were among the earliest veterinarians to receive training from faculty at various human medical schools.

Coincidentally, during the late 1950s and early 1960s, the University of Pennsylvania was just beginning to develop specialty training in various medical disciplines through cooperation of their human medical school and the Graduate School of Medicine in Philadelphia. It was Robert Dripps, MD, Chairman of the Department of Anesthesia at the School of Medicine, one of the few departments that was not a subsection of the surgery department, who suggested to Dr. Mark W. Allam, Dean of the School of Veterinary Medicine at the University of Pennsylvania (and a Diplomate of the American College of Veterinary Surgeons), that the only way to improve anesthesia in animals was for veterinarians to acquire the same training in anesthesiology as physicians. With that promise, the first formal training program for a veterinarian was established via a cooperative effort at the Hospital of the University of Pennsylvania and the Department of Pharmacology in the medical school.

The Seven Founding Diplomates

With veterinary anesthesiology still in its embryonic stages, the founding diplomates of the American College of Veterinary Anesthesiology (ACVA) were a diverse group of veterinarians, many of whom had been trained by anesthesiologists at medical schools. Drs. Lawrence Soma, Charles Short, Donald Sawyer, and John Thurmon were recent graduates; Drs. E. Wynn Jones and William Lumb were board-certified surgeons; and Dr. Jerry Gillespie was a respiratory physiologist. How did this group come to establish the ACVA in the 1970s? What were

they doing before and what motivated them at that time to establish a college of veterinary anesthesia? How and why did four young veterinarians acquire postdoctoral training in anesthesia when the specialty did not exist in veterinary medicine?

Some biographical background on these seven “first-generation” founding veterinary anesthesiologists (listed in order of contributions) provides some insights.

Dr. Lawrence R. Soma: After graduating from the University of Pennsylvania in 1957, Dr. Soma (Fig. 2) completed a 1-year internship at Speyer Hospital in New York City, was inducted into the US Army Veterinary Corps, and served for two years at the Walter Reed Army Institute of Research. He was aware of the development of specialties in veterinary medicine and when he returned to Penn in 1960, he was offered a resident-fellowship in anesthesia by Robert Dripps, MD. The advanced training was an exciting challenge, but equally as exciting was the prospect of returning to his alma mater to develop a new specialty. He completed a 2-year residency, plus one year in the Department of Pharmacology at the University of Pennsylvania School of Medicine.

In 1963, he returned to the veterinary school and established a section of veterinary anesthesia. In 1965, Dr. Alan Klide (UPENN '65) became the first postgraduate trainee in a veterinary-based anesthesia program. In the 1990s, Dr. Soma developed an equine pharmacology research program, in supported of the forensic chemistry program sponsored by the Pennsylvania Department of Agriculture and Horse Racing Commission. He became a chaired professor in 1993 and received the ACVAA President's Award in 2019. Dr. Soma wrote and edited *Textbook of Veterinary Anesthesia* published in 1971.³

Dr. Charles E. Short: Dr. Short (Fig. 3) went into a mixed animal practice in Tennessee after graduating from Auburn University in 1958. In 1963, he joined the faculty of the University of Tennessee Atomic Energy Commission Research Laboratory in Oak Ridge, Tennessee, where his major responsibilities were in animal surgery. He obtained an NIH fellowship in 1965 to study at Baylor University College of Medicine in Houston, Texas, with an assignment to develop anesthetic methods in the experimental surgical facilities of Michael DeBakey, MD, a noted cardiac surgeon. Dr. Short's anesthesia training was supervised and coordinated by Arthur S. Keats, MD, Chair of the Anesthesia Section of the Department of Surgery. In 1967, Dr. Short received his MS degree in Biophysics and Physiology from Baylor University. Also in 1967, Dr. Short established the section of anesthesia at the College of Veterinary Medicine at the University of Missouri; in 1971, Robert Paddleford (MO '70) became his first resident.

In 1977, Dr. Short was appointed to a professorship at the Cornell University College of Veterinary Medicine and started the section of anesthesia at that school. Dr. Short received a PhD in Biochemistry and Pharmacy from Abo Akademi University in Turku, Finland in 1991. An honorary doctorate degree was granted by the University of Helsinki College of Veterinary Medicine in 2015. He received the ACVAA Ca-

Figure 2. Lawrence Roger Soma, VMD



Figure 3. Charles E. Short, DVM, MS, PhD, Dr.h.c. (hon) Photo courtesy Cornell University



reer Achievement award in 2015. Dr. Short edited the two textbooks, *Clinical Veterinary Anesthesia* in 1974⁴ and *Principles and Practice of Veterinary Anesthesia* in 1987.⁵

Dr. Donald C. Sawyer: Dr. Sawyer (Fig. 4) graduated from the College of Veterinary Medicine at Michigan State University in 1961 and received his MS degree in 1962. After a year in small animal practice, he was inducted into the Air Force Veterinary Corps and was stationed at the School of Aerospace Medicine in San Antonio, Texas, where he served 2 years as a support surgeon in the animal research projects section. In 1965, the School of Aerospace Medicine sponsored a symposium on experimental animal anesthesia, and Drs. Sawyer, Lumb, and Soma were among the many contributors, with Dr. Sawyer serving as editor of the proceedings.⁶

In 1965, Dr. Sawyer entered the advanced degree program headed by Dr. William Lumb at Colorado State University. His original focus was surgery, but he switched his major to anesthesia and spent blocks of time at the Denver General Hospital with Bob Virtue, MD, an anesthesiologist. Dr. Sawyer received a PhD in anesthesia and surgery from Colorado State in 1969. To further his training in anesthesia, he was accepted for an 18-month postdoctoral research and residency training program under the leadership of E.I. Eger II, MD, in the Department of Anesthesiology of the School of Medicine at the University of California, San Francisco. He joined the veterinary faculty at Michigan State University as Associate Professor of Anesthesia in June 1970. During his tenure at Michigan State, he wrote several books on veterinary anesthesia, including for exotic animals.^{7,8,9} His first resident was Sandee Hartsfield (TEX '71).

Dr. John C. Thurmon: Dr. Thurmon (1930–2017) (Fig. 5) received his veterinary degree from the University of Missouri in 1962. He was an ambulatory clinician at the School of Veterinary Medicine at the University of Illinois and became a faculty member in the large animal clinical department in 1973. He received advanced anesthesiology instruction from Mort Shulman, MD, and Max Sadoly, MD, at the University of Illinois Medical College in Chicago. Dr. Thurmon headed the anesthesiology section at the School of Veterinary Medicine at the University of Illinois in 1971. He led this program until 1998, serving as advisor to more than 25 residents and graduate students. His most noteworthy accomplishments were in the development of injectable anesthetics for large animals and the use of mechanical ventilators for equine anesthesia. He co-authored *Lumb & Jones' Veterinary Anesthesia* in 1996 (and later editions).¹⁰

Dr. William V. Lumb: Dr. Lumb (1921–2018) (Fig. 6) graduated from Kansas State University in 1943 and received his PhD from the College of Veterinary Medicine in 1957. From 1958 to 1960, he served on the faculty at Michigan State University, teaching in the small animal clinic and conducting research. He went to Colorado State and became director of the surgical laboratory in 1963, where he developed a graduate teaching and research program in surgery and anesthesiology.

Dr. Lumb was a past president and founding diplomate of the American College of Veterinary Surgeons. He retired from Colorado State as Professor Emeritus in 1980. In retirement, Dr. Lumb briefly taught anesthesiology at Ross University in St. Kitts.

Dr. E. Wynn Jones: Dr. Jones (1924–2016) (Fig. 7) graduated from the Royal Veterinary College in London in 1946 and then went to Cornell University for advanced training in large animal surgery. While at Cornell, he developed a strong interest in equine anesthesia. In 1954, he joined the veterinary faculty at Oklahoma State University. Along with Dr. William Lumb, he was a founding diplomate of the American College of Veterinary Surgeons, and the two of them guided the ACVA organizing committee through the accreditation process. Drs. Jones and Lumb also co-authored the text, *Veterinary Anesthesia*, published in 1973.¹¹ Dr. Jones received the ACVAA Career Achievement award in 2017.

Figure 4. Donald Craig Sawyer, DVM, MS, PhD



Figure 5. John Carl Thurmon, DVM, MS (1930–2017) <https://vetmed.illinois.edu/john-c-thurmon-veterinary-anesthesiologist/>

Figure 6. William Valjean “Bill” Lumb, DVM, PhD (1921–2018) <https://source.colostate.edu/in-memory-william-v-lumb/>



Dr. Jerry R. Gillespie: After graduating from Oklahoma State University in 1956, Dr. Gillespie (Fig. 8) was in private practice for a short time. He then obtained a PhD in comparative pathology at the University of California Davis, where he became Professor of Clinical Sciences, Professor and co-Chair of the Department of Physiological Sciences, and Associate Dean of Student Services. At Kansas State University, he headed the Veterinary Teaching Hospital and the Department of Clinical Sciences. From 2000 to 2002, he served as Head of the Joint Institute for Food Safety and Security under the President's Science Advisor. He returned to UC Davis until his retirement in 2007. His contributions in the field of veterinary anesthesia focused on equine pulmonary physiology with studies of V/Q abnormalities contributing to low oxygen tensions, hypercarbia, acid-base imbalances, and the effects of general anesthesia on pulmonary function.

Expanded Training by Physician Anesthesiologists

As time went on, the role of physician anesthesiologists at colleges of human medicine in the training and development of veterinary anesthesiologists was significant. Four of the founding diplomates of the ACVA had been trained by physician anesthesiologists. In addition, the annual meetings of the American Society of Anesthesiologists included two days of refresher courses¹² conducted by leading anesthesiologists, and the scientific programs included many research studies

completed in experimental animals. The knowledge obtained at these meetings was easily applied to the didactic instruction and clinical applications at veterinary institutions. Part of Dr. Gillespie's training in respiratory physiology was at a human medical college, which was helpful to him in conducting respiratory studies in anesthetized horses.

Improving the practice of veterinary anesthesia, critical care, and pain management in animals was receiving more than casual interest by the mid-1960s, but there were major questions. Would there be enough veterinarians interested in a separate specialty? If so, would they prefer to be part of the surgical teams at universities, research labs, or in private practice? Drs. Soma and Short met during the 1968 American Veterinary Medical Association (AVMA) annual convention to discuss these and related issues.

Before their meeting, Dr. Short met with Henry Beecher, MD, an anesthesiologist at Harvard Medical School and Massachusetts General Hospital. Dr. Beecher discussed the development of his teaching programs in anesthesiology and the progress in anesthetic management at the hospitals where he worked. He offered suggestions for how rapid progress could be made, and he encouraged use of the guidelines that had been developed in human medicine. Dr. Beecher expressed confidence that veterinary anesthesiology could be successfully developed, even though so few veterinarians were involved at that time. However, it was evident that more emphasis would be needed to attract and develop residents in departments of veterinary anesthesiology before board certification could become a reality.

The American Society of Veterinary Anesthesiology

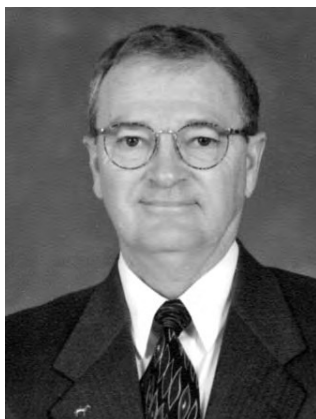
The first step was to determine how much interest there really was in veterinary anesthesiology. A meeting, held in conjunction with the AVMA conference in Las Vegas, Nevada in 1970, was organized by Dr. Short. The more than 40 veterinarians in attendance expressed strong interest in development of an organization to promote improvements in anesthesia, critical care, and pain management for animals. Thus, the American Society of Veterinary Anesthesiology (ASVA) was established. Drs. Short, Sawyer, Lumb, Soma, and Dr. Daniel Roberts (TAM '64) became the first officers of the ASVA. Membership was open to any veterinarian with an interest in anesthesia. To increase awareness of efforts to improve the quality of anesthesia for animals, the ASVA requested approval by the AVMA, which was received in 1971.

In addition to establishing advancements in teaching, clinical services, and research by full-time faculty in anesthesiology, major efforts were made to provide information through professional lectures and publications. These included presentations at the national meetings of the AVMA, the American Animal Hospital Association, and the American Association of Equine Practitioners; state and local meetings; and other conferences. Dr. Bruce Heath (ISU '62) was instrumental in establishing and editing a scientific program proceedings on veterinary anesthesiology.



Figure 7. E[ric] Wynn Jones, MRCVS, FRCVS, PhD (1924–2016) [https://www.vaajournal.org/article/S1467-2987\(16\)30001-0/pdf](https://www.vaajournal.org/article/S1467-2987(16)30001-0/pdf)

Figure 8. Jerry R. Gillespie, DVM, PhD <https://www.vetmed.ucdavis.edu/2002-recipients>



The ASVA Became the ACVA

In 1971, ASVA president Soma appointed an ad hoc committee with the objective to establish veterinary anesthesiology as a formal, recognized specialty. The committee chairman, Dr. John Thurman, appointed Drs. Sawyer and Short to serve as liaisons to the AVMA, in addition to Drs. Lumb and Jones, who had experience in developing the American College of Veterinary Surgeons in 1968. William Eggers, MD, Chairman of Anesthesiology at the University of Missouri Medical School, was also enlisted to assist in development of the specialty college.

The constitution and bylaws of various other specialties were reviewed by the ad hoc committee, and a draft constitution and bylaws for the planned American College of Veterinary Anesthesiologists (ACVA) was developed and sent to the AVMA Council of Education (COE) for approval in 1973. The COE suggested that anesthesiologists become part of an umbrella group of the already recognized specialty colleges of internal medicine or surgery. The committee rejected this concept. Drs. Sawyer and Short continued to lobby for a specialty in anesthesia ultimately convincing the AVMA leadership of the importance of having a separate recognized specialty. In 1975, the COE granted preliminary approval.

Original ACVA Officers	
President	Dr. John Thurmon
President-elect	Dr. E. Wynn Jones
Vice President and Chairman of the first examination committee	Dr. Lawrence Soma
Representative to the AVMA	Dr. Donald Sawyer
Executive Secretary and Treasurer	Dr. Charles Short

It was 12 years since the time the first anesthesia position had been established in veterinary medicine at the University of Pennsylvania in 1963 until the ACVA became a reality. The original seven veterinarians were developing teaching, clinical, and residency programs at a number of veterinary institutions, and many veterinarians were already well-established anesthesiologists by the time the College was recognized by the AVMA in 1975. They formed the backbone of the ACVA and trained the next generation of veterinary anesthesiologists.

The AVMA had established guidelines for selection of charter diplomates of specialty organizations. At least one of the following four specific requirements had to be met: 1) active service in the specialty for at least 10 years, 2) publication record, 3) training in anesthesiology or related subjects, and 4) head of or associated with an anesthesiology type program. The 14 successful charter diplomates of the ACVA, approved in 1976, were Drs. Ian L. Anderson, Max M. Bree, Hugh W. Calderwood, Robert Hart, R. Bruce Heath, James E. Heavner, Alan Klide, Delbert J. Krahwinkel, Wayne McDonnell, William W. Muir, Robert Paddleford, Mike A.E. Rex, Eugene P. Steffey, and Rhea J. White.

The First Certifying Examination

A primary responsibility of the ACVA was the development of training and residency guidelines, continuing education programs, and rules for testing and certification of new diplomates. The first specialty examination was administered in 1976, which included written and oral examinations. The following candidates were the first to become diplomates through training by ACVA diplomates and the examination process: Drs. John Benson, David Brunson, Hons de Vries, David DeYoung, Arthur Thomas Evans, Beverly Gilroy, Sandee M. Hartsfield, Steve C. Haskins, Susan Hildebrand, Lin V. Klein, Charles J. McGrath, Cynthia Trim, and Alistair I. Webb.

Maturing of the ACVA and Full Accreditation

The new specialty college continued to grow from 1975 to 1980 with the development of new training programs and faculty positions for trained veterinary anesthesiologists. By 1980, the ACVA was ready to seek full accreditation. As the then-president of the ACVA Dr. Eugene Steffey spearheaded this process, and the AVMA granted full approval. In 1981, Dr. Sawyer was elected president, and Dr. Short continued his role as executive secretary and treasurer.

Epilogue

Twenty years elapsed from the humble 1960 beginning of anesthesia training in veterinary medicine in the United States to the maturing of the specialty and official accreditation in 1980. The founding diplomates never envisioned the expansion of the specialty to today's current membership. The efforts of those early diplomates of the ACVA, coupled with those that followed, resulted in major improvements in anesthesia, the addition of new drugs and equipment, the development of critical care and pain management, and expansion of the specialty in the United States and other countries. The objectives of the ACVA and its diplomates have always been veterinary anesthesia, pain management, and critical care. The text entitled *Animal Pain* by Drs. Short and Allan Van Poznak, included contributions from 17 ACVA diplomates in 1992.¹³

In the last decade, the management of postoperative pain and pain created by other disease processes significantly improved, and diplomates were engaged as consultants in pain management in all veterinary species. Based on this increased role, in 2012, the ACVA voted to amend the constitution and add "analgesia" to the name of the organization. In July 2019, the ACVA became the ACVAA, adopting the trademark name "board-certified specialist in veterinary anesthesia and analgesia." The ACVAA is known in both the veterinary and human medical professions for its dedication to teaching, clinical service, and research. The founding diplomates of the ACVAA wish to acknowledge the help and guidance of the many physician anesthesiologists who were instrumental in the development and advancement of veterinary anesthesia.

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Equipment—Old and New

The advances in anesthetic equipment and medications parallel the advances in anesthetic management in the US. Use of modern equipment resulted from ACVAA efforts in the 1960s to 1970s. Equipment used in humans was easily adopted for small companion and farm animal use, and smaller, more compact units were being developed for veterinary use. For large species, the equipment needed to be upgraded in size. Here again, as in the human field, veterinary anesthesia equipment increased in sophistication over the years.

In 1856, George H. Dadd, MD, VS (1813-1868) anesthetized horses using a combination of ether and chloroform delivered by face mask.¹⁴ More than a hundred years later, diethyl ether was still being administered by oxygen flowing through a wicked glass vaporizer. (Fig. 9) Today, large animal anesthesia workstations are controlled by computer software, with a piston-ventilator allowing feedback on ventilation parameters; multiple vaporizers; respiratory, anesthetic gas and cardiovascular monitors; and patient data recorded for later retrieval. (Fig. 10)



Figure 9. Anesthesia machine, circa 1950, built by the Ohio Chemical Company. Originally made for US Army hospitals, this unit was purchased still in its shipping crate, which has runners on the bottom to ensure it landed upright when parachuted into army field medical units.



Figure 10. A Tafonius anesthesia work station designed for use in horses, currently located at New Bolton Center, University of Pennsylvania. Photo courtesy Lawrence Soma and the University.

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Note: The dates and events detailed in this paper were based on notes and written reports of the various committee meetings, documents from various organizations, and the memory of the founding diplomates.

This article is part of a series of historical reviews on various subjects coordinated by Dr. Jerry M. Owens.

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