The Evolving Roles in Anesthesiology and the Team-based Model

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ABSTRACT

Due to the growing need to improve access to Canadian healthcare and reduce spending, many specialties have had new roles emerge, changing their delivery of care. In delivering anesthetic care, the roles for certified registered nurse anesthetists and anesthesia assistants are increasing. This has led to the development of the Anesthesia Care Team in Ontario. The team increases access to care by decreasing time spent in hospital, and has also decreased costs to the health care system, and thus, may be the future of anesthesia care in Canada.

KEYWORDS: *anesthesiology, team-based model, health care roles, anesthesia care team*

The health care system is always evolving to meet the needs of Canadian society. With government reports stating that Canadians require improved access to health care, coupled with the need to find savings in our health care spending, many specialties are finding their roles and work environment changing dramatically.[1] Anesthesiology is no exception to this, and Canada is now beginning to see an increasing number of Anesthesia Assistants (AAs) across the country, as well as the introduction of Certified Registered Nurse Anesthetists (CRNAs) in British Columbia, which continue to change how anesthetic services are being delivered. By looking at a brief history of anesthesia, the roles of CRNAs and AAs, and understanding their contribution to new team-based models, we can better understand where the future of anesthesiology is headed.

Many date the advent of modern anesthesia back to the 18th century when Joseph Priestley created nitrous oxide, which, along with other gases like diethyl ether and chloroform, were found to have analgesic properties. By the mid-1800s, many used these gases as anesthetics for surgical procedures ranging from tooth extractions to leg amputations, and thus became the first anesthetists. The field grew exponentially with the development of intubation and laryngoscopes, and powerful machines that were able to administer gases and monitor vitals. With this complexity came the need to ensure that there were adequate safety measures in place, and as a result, anesthesiology self-regulating bodies were developed to train physicians in the delivery of perioperative care.[2]

While physicians were being trained to be anesthesiologists, the field of nursing also trained anesthetists and were actually the primary anesthesia providers before the American Medical Association endorsed anesthesiology as a medical specialty in 1937.[3] The credential of CRNA was adopted in 1956 and today there are over 40,000 practicing in the United States. Their scope of practice varies by state but involves working under the direction or supervision of an anesthesiologist to provide anesthetic services to patients.[4] In terms of quality of care, a 2010 U.S. study looked at over 41,000 surgery reports and found that although there were no increases in adverse outcomes in cases performed by CRNAs alone (e.g. death in low mortality diagnoses, failure to rescue from a complication, iatrogenic pneumothorax), there was a statistically significant difference in the complexity of the surgeries that were performed when compared to anesthesiologists.[5] While there are currently no CRNAs in Canada, the B.C. government has made plans to introduce them in an effort to reduce health care costs and address the shortage of anesthesiologists in the province.[6] This was prompted after a 2012 conflict between the B.C. Medical Association and the province's anesthesiologists when the anesthesiologists threatened to withhold non-emergency services due to concerns over remuneration and staffing issues.[7] Dr. Jeff Rains, the head of the B.C. Anesthesiologists' Society at the time, stated that he was not opposed to CRNAs, but was not impressed that it was being used as a threat rather than an idea to improve patient care.[8]

> **"The role of the Anesthesiologist may evolve into more of a perioperative medical director with responsibilities ranging from preoperative assessments through intraoperative management.**

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While the B.C. Ministry of Health predicts it may take a few years before CRNAs become established in Canada, respiratory therapists (RTs) have been around since the 1960s and, starting in 2005, the Canadian Society of Respiratory Therapists allowed RTs and RNs to train to become anesthesia assistants.[9] There were an estimated 132 AAs who had graduated in Ontario by the end of 2011.[10] Like the CRNAs, their role varies by site but may include technical duties such as setting up anesthesia workstations, troubleshooting equipment, and stocking carts, as well as clinical duties such as preparing the patient, inserting IVs and arterial catheters, assisting with regional blocks, airway management, administering therapies as directed by the anesthesiologist, and assessing the patient intra- and postoperatively.[10] A 2010 survey sent to 115 sites showed that, of responders, 43% of departments used AAs and that this was distributed fairly evenly between academic and community settings (53% vs. 47%). The sites that were utilizing AAs were all in communities with a population of more than 10,000 people. The survey also described that 93% of responders agreed that AAs contributed to improved efficiency, productivity, patient safety, and job satisfaction.[11]

“What do anesthesiologists think about this? In a 2009 questionnaire, 86% of responders agreed they prefer working in a team and 91% agree the ACT model has enhanced OR safety. They also report greater job satisfaction and would like to see more AAs trained. With the increasing demand to cut health care costs, we may see the ACT be adopted in other provinces as more AAs continue to be trained.

The future of anesthesia across Canada will likely see these health care professionals working in teams, already demonstrated with the development of the Anesthesia Care Team (ACT) in Ontario in 2005 to address the shortage of anesthesiologists and to improve access to care.[11] The report that led to the development of the ACT team found that while the number of anesthesiologists grew, the shortage remained the same due to the increase in anesthesia services between 2003 and 2005.[12] The ACT is an anesthesiologist-led model, which may include AAs, RNs, and RTs and soon, CRNAs. In this team, the team members report to the Chief of Anesthesia and work under the supervision of an anesthesiologist. The Chief of Anesthesia is responsible for determining the extent of activities for team members and may identify when it is appropriate for an anesthesiologist to provide concurrent care to more than one patient with the assistance of the other team members.[13] Potential benefits and savings were predicted as follows: an RN could review patients in preoperative clinic and select only the more complex patients to discuss with the anesthesiologist, there could be one AA for two active operating rooms for both the technical and clinical duties of specific surgeries, and an RN could provide postoperative acute pain service.[13]

A safety audit stated that the ACT resulted in no increase in serious adverse events, and that it was associated with reduced time spent in the post-anesthesia care unit (PACU) and in hospital. An economical analysis claimed annual savings in cataracts surgeries of $132,000 per OR and almost $2,000 per hip or knee replacement.[13] While there were increased costs associated with the AA, the analysis found savings in time spent in the PACU as well as overall length of hospital stay. Further details into how safety was improved or how PACU and hospital length of time stay were reduced were not described, and it would be interesting to reassess what these outcomes have been over the past few years.

What do anesthesiologists think about this? In a 2009 questionnaire, 86% of responders agreed they prefer working in a team and 91% agree the ACT model has enhanced OR safety. They also report greater job satisfaction and would like to see more AAs trained.[13] With the increasing demand to cut health care costs, we may see the ACT be adopted in other provinces as more AAs continue to be trained. Some challenges may include standardizing this model across different provinces and determining the appropriate number of team members to employ per ACT to ensure that it remains cost-efficient while still providing strong patient care.

One of the concerns over the ACT was job security of anesthesiologists and AAs, and the report does not do much to ease these concerns with their statement “the extent to which any given role is retained will depend on the circumstances of each hospital and cannot be assured.”[13] So is this the end of anesthesiology? Not quite. While the Canadian Anesthesiologists’ Society fully endorses AAs, they believe that the practice of anesthesia should remain physician-based to ensure patient safety and will continue to lobby to ensure that it remains this way.[13] Similarly, the American Society of Anesthesiologists believes that “CRNAs and AAs are not trained to make medical judgments, and that physicians are better able to handle more complicated cases and emergencies.”[14] Due to these changes, perhaps the role of the anesthesiologist may evolve into more of a perioperative medical director. Their responsibilities would still range from preoperative assessments to intraoperative management, with the ability to handle difficulties as they arise in the OR, through to postoperative patient care. In addition, they would supervise the delivery of this care by the AAs and CRNAs, and would effectively manage emergencies, complex disease processes, patients in intensive care units, and those with chronic pain appropriately as the need arose.

Thus, the field of anesthesiology has changed greatly since its beginning, with new health care delivery models and health care professionals being trained in new roles. As we move into an age with further cost-cutting measures and increasing wait times, it appears we are going to see an increase in advanced practice health care providers and team-based models in all areas of medicine.

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