



Matthew O'Connor ('07), Major, CRNA (middle) deployed with the Belgian Special Forces surgical team in northern Iraq.

## MTSA Alumni Committee Chairman serves with surgical team in Iraq

*Team treated 221 casualties during battle of Mosul*

MTSA Alumni Committee Chairman Matthew O'Connor ('07), Major, CRNA, deployed in March 2017 to Iraq as part of an eight-person head and neck surgical team. In May he joined the Belgium Special Operations Surgical Team (SOST), providing ATLS and damage control surgery in Mosul.

The deployment began with the Belgians reaching out to him for assistance, as they were about to lose their only anesthesiologist. They asked if he wanted to go, and he jumped at the chance.

"There was a small degree of shock when I showed up and explained that I was a CRNA. (CRNAs do not exist in Belgium.) There was a flurry of email between myself, the exiting MDA and the Belgium government. After explaining my training and experience, they agreed [to take me on]," Matthew said.

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Chris Hulin  
DNP, MBA, CRNA  
President

# PRESIDENT'S MESSAGE

## Combatting the opioid epidemic

The opioid epidemic continues to dominate healthcare news. It seems we are warned daily about how urgent this crisis is and the devastation it's causing in communities across the country. The headlines are a constant reminder that this issue affects our families, friends and neighbors from all walks of life.

According to the Centers for Disease Control and Prevention (CDC), 91 Americans die every day from an opioid overdose, and that number is on the rise. CDC research shows that the majority of drug overdose deaths (more than six out of ten) involve an opioid. In July of this year, *JAMA Surgery* reported that in a study of 36,177 patients, 5.9-6.5% developed new "persistent opioid use" following surgery. As CRNAs, we should be alarmed by this statistic and at least elicit a practice self-evaluation.

MTSA is becoming part of the solution to fight the opioid epidemic by educating nurse anesthetists on treatment options that reduce or eliminate the need for opioids during and after surgery. The focal point of this effort is our new Acute Surgical Pain Management (ASPM) Fellowship, in partnership with the AANA.

In order to increase awareness of our efforts, we recently launched an advertising campaign featuring an important message:

*Fighting the opioid epidemic requires a collective effort from the entire medical community. Middle Tennessee School of Anesthesia is doing its part by educating nurse anesthetists to rethink the use of opioids in the operating room. In addition, MTSA continues to collaborate on a national level with lectures, workshops, and the new Acute Surgical Pain Management Fellowship. These efforts are helping provide solutions to the opioid problem while balancing patient safety and satisfaction.*

Our goal is to stay on the cutting edge and continue to raise awareness among healthcare providers across the nation that, in many cases, opioid-free surgery is a reality today. As ASPM fellows complete the program, they will be able to implement the advanced interventional techniques in their local communities. Ultimately, this equates to reduced opioid dependency, which decreases the likelihood of opioid-related deaths.

Beyond the Fellowship, we are seeking other forms of collaboration that promote opioid mitigation. This includes presentations at healthcare seminars, policymaking forums and other workshops that help propagate the message to a wider audience while promoting the nurse anesthesia profession and securing a seat at the table.

As alumni, your support in this arena would be especially helpful. If you know of opportunities locally, regionally or nationally in which MTSA can provide thought-leadership or practical application to combat the opioid epidemic, please contact me at [chris.hulin@mtsa.edu](mailto:chris.hulin@mtsa.edu). We appreciate your input and look forward to ways we can affect more positive outcomes!

# National Defense Authorization Act touts CRNA education



The American Association of Nurse Anesthetists (AANA) recently announced it was able to secure language recognizing CRNA pain management fellowships in the National Defense Authorization Act (NDAA) for Fiscal Year 2018.

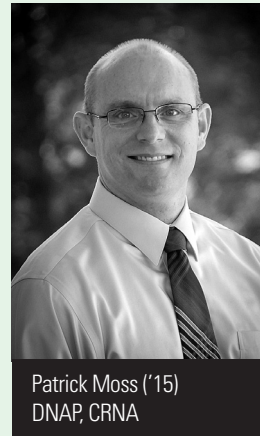
According to the AANA's announcement, the specific language encourages the Secretary of Defense to establish educational opportunities for military CRNAs to attend accredited CRNA post graduate pain management fellowships. It was included as an Item of Special Interest in the Chairman of the House Armed Services Committee's report for the NDAA, which means it cannot be amended or changed before the bill becomes law.

"Inclusion of this language in the NDAA is an important milestone," said MTSA President Chris Hulin. "I commend the AANA's efforts to raise the profile of pain management fellowships for military CRNAs. It's an area of specialization that continues to grow, and it's critical that our lawmakers realize how vital our profession is in this arena."

The AANA stated: "As part of the Department of Defense's Long-Term Health Education Training (LTHET) program, the language will bolster the AANA's argument that CRNAs are recognized by the federal government for their role in chronic pain management. The NDAA passed the House of Representatives on July 14. It remains one of the few pieces of legislation that is consistently signed into law each year."

# Patrick Moss named Didactic Instructor of the Year by AANA

Source: Newswise



Patrick Moss ('15)  
DNAP, CRNA

Patrick Moss ('15), DNAP, CRNA, from Hendersonville, Tenn., received the Didactic Instructor of the Year Award during the American Association of Nurse Anesthetists (AANA) Annual Congress, Sept. 8-12, in Seattle.

"It is very heartwarming to be recognized for that which I am most passionate, educating," Moss said. "The most rewarding aspect of nurse anesthesia is the ability to provide acute pain management."

A CRNA for nearly 20 years, Moss's innovation in ultrasound-guided regional anesthesia techniques led to a partnership between Middle Tennessee School of Anesthesia (MTSA) and Halyard Health, formerly Kimberly-Clark Health Care, a medical technology company. The two launched the nation's first peer-to-peer CRNA Center of Excellence (COE) housed within MTSA's school of nurse anesthesia.

Moss currently functions as the Regional Vice President for LifeLinc Anesthesia, where he focuses on leadership, management, consultation and education throughout various LifeLinc affiliated sites. In addition, he serves as a Consultant and the Clinical Liaison for MTSA/AANA's Acute Surgical Pain Management Fellowship.

According to the AANA, the Didactic Instructor of the Year award, established in 1991, is presented to an individual who has made a significant contribution to the education of student nurse anesthetists in the classroom.



# International mission effort expands to Guyana

*Programs are planned for the South American country, along with Haiti*

Middle Tennessee School of Anesthesia's Mission Initiative sent students and staff back to Haiti this year, and plans are progressing to add a new location for service work: Guyana.

## Guyana

MTSA's Board of Trustees voted to bring Guyana on as a new mission endeavor, according to MTSA President Chris Hulin, DNP, MBA, CRNA.

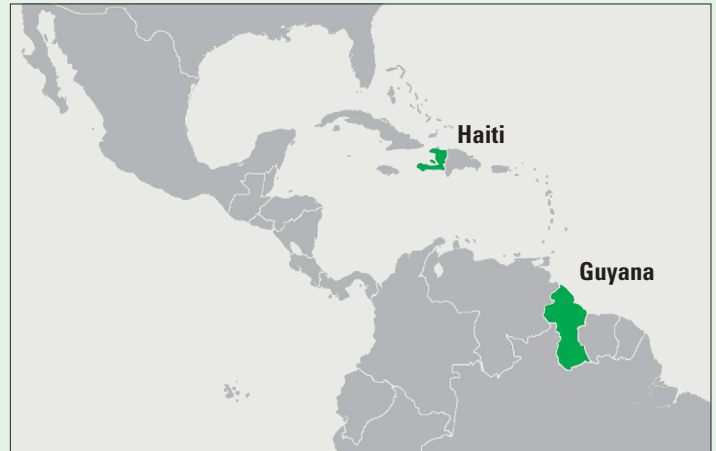
"As an initial step, we've already sent an iPad to each of the seven students attending the nurse anesthesia program at Georgetown Public Hospital System (GPHS), which is located in Guyana's capital," he said.

The iPads—funded by the generous support of alumni and others from the Gala and Sporting Clay Tournament in May—are allowing MTSA to share electronic information, including recorded classroom content, test databank questions, PowerPoint presentations, audio lectures, and access to the online learning system to supplement and enhance the GPHS curriculum.

Continuing the mission effort in Guyana, three trips are planned in 2018, beginning in January. Faculty and staff will travel there to deliver curriculum and provide review sessions between semesters. They also plan to run simulations with students for additional skill development.

Hulin explained, "The idea to add Guyana to our Mission Initiative came from two sources. First, a classmate in my doctoral program, who was from Guyana, planted the initial seed for me to consider how we could help. More recently, one of our current students, Morgan Rohde, encouraged us to join in the work she and her husband, Dr. J.P. Rohde, were doing there. They've been instrumental in Vanderbilt's ED nurse internship and physician residency programs at GPHS, so it was a perfect fit to join with their efforts."

The GPHS nurse anesthesia program has graduated a total of 30 nurse anesthetists, and there are currently seven students in the program. The country of Guyana is located just east of Venezuela, in South America.



## Haiti

Hulin said the Haiti trip was patterned after last year's and included providing Acute Surgical Pain Management (ASPM) care alongside hand surgeons from the Touching Hands Project, at Hopital Adventiste d'Haiti in Carrefour. The group also conducted BLS and ACLS education sessions for local doctors and nurses.

Eight MTSA students were part of the team, which also included Stace Dollar ('03), CRNA; MTSA Medical Director Rob Taylor, MD; MTSA Program Administrator Rusty Gentry, DNAP, CRNA; and Hulin.

"As always, our goal is to leave an enduring legacy. We're there to help improve the level of care for the long term. The educational component of the trip is what really makes a difference for years to come," Hulin said.

"These efforts are possible because of the generosity of our alumni, students and so many others who have supported our Mission Initiatives throughout the year. We truly appreciate their direct action and contributions," he added.

**The Haiti mission trip took place Oct. 7-14, 2017.**

**To contribute to MTSA's Mission Initiatives,  
visit [www.mtsa.edu/donate](http://www.mtsa.edu/donate).**

## MTSA Alumni Committee Chairman serves with surgical team in Iraq (continued from cover)

It turned out he and the team were in the right place at the right time. They were the primary Casualty Collection Point (CCP) for the battle to reclaim Mosul from ISIS in early July.

"Over the course of three weeks we treated 221 casualties, including approximately 60 chemical casualties. We performed 11 thoracotomies, 16 laparotomies, two repairs of puncture wounds to the heart, along with burr holes, burns and many arterial repairs, and inserted three ER-REBOA catheters."

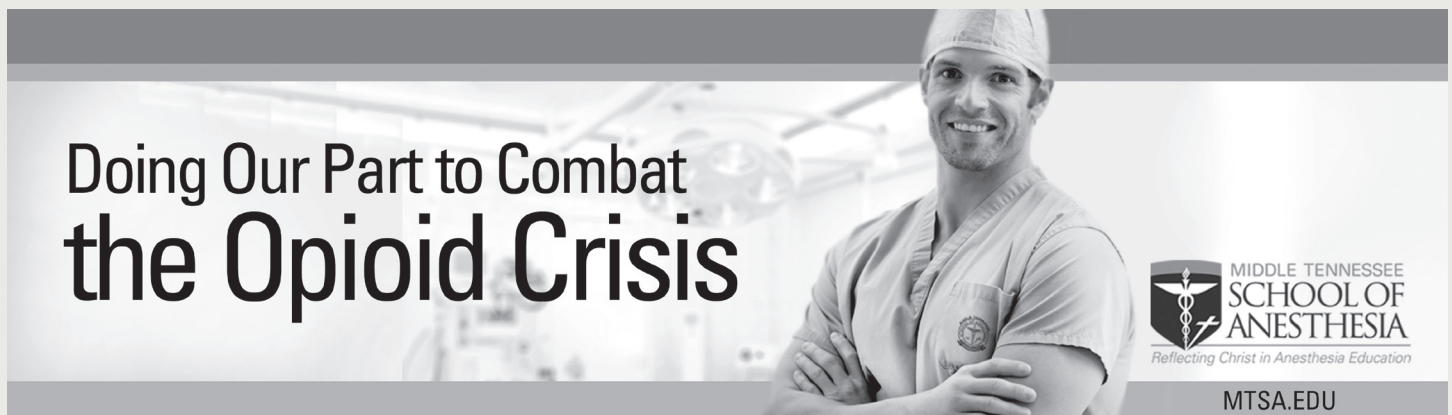
Matthew and the team were able to resuscitate a 4-month-old who had blast injuries to the chest and neck: "When I went to intubate that baby, he was blue; there was a lot of blood in the airway. As I got my first look into the mouth and couldn't see the vocal cords, I prayed out loud, 'Please God, guide me.' The ETT found the glottic opening. Then we placed two chest tubes and transported to a pediatric hospital 30 minutes away. The next day

we found out the child was alive and doing well. I still thank God when I think about it."

With plans to return home in late December, he describes his experience as the "clinical opportunity of a lifetime, though I miss my family immensely."

Originally from Manchester, N.H., Matthew has served in the U.S. Army for 20 years and is stationed at Fort Campbell, Ky. He and his wife, Vanessa, have been married for 25 years. They have three daughters: Courtney, 23, is an RN at Skyline Neuro ICU in Nashville; twins Anna and Madison are 19 and in their second year of college. He says Madison's goal is to attend MTSA.

*MTSA faculty, staff, students and alumni join together in thanking Matthew for his service and wishing him a continued safe deployment and journey home.*



## Opioid awareness ad campaign

MTSA recently launched an advertising campaign to raise awareness of the School's efforts to combat the opioid epidemic. The outdoor billboard associated with the campaign above was displayed in various locations around Nashville in early fall.

The ad campaign also included radio spots, which read:

*Fighting the opioid epidemic requires a collective effort from the entire medical community. Middle Tennessee School of Anesthesia is doing its part by educating nurse anesthetists to rethink the use of opioids in the operating room. In addition, MTSA continues to collaborate on a national level with lectures, workshops, and the new Acute Surgical Pain Management Fellowship. These efforts are helping provide solutions to the opioid problem while balancing patient safety and satisfaction.*

For more information, visit [www.mtsa.edu/opioids](http://www.mtsa.edu/opioids).

# Earn 1 Class A CE Credit

**This program has been prior approved  
by the American Association of  
Nurse Anesthetists for  
1.00 Class A CE credits;  
Code Number 1035337;  
Expiration Date 9/30/2020.**

## **HERE'S HOW TO PROCEED:**

1. Read the content inserted in this issue of *Airways*, or visit [www.mtsa.edu/CE](http://www.mtsa.edu/CE).
2. Take post-test online at: [www.mtsa.edu/CE-test](http://www.mtsa.edu/CE-test)
3. Complete evaluation at: [www.mtsa.edu/CE-eval](http://www.mtsa.edu/CE-eval)
4. Upon successful completion and passing of the post-test, your CE will be submitted to the AANA and you will receive a completion certificate.



MTSA is pleased to continue its series of free continuing education credits in the quarterly *Airways* magazine. These CEs are provided as a service for MTSA alum and other CRNAs throughout the country. The school has a volume of resources as its doctoral students create expert content on a variety of topics.

We invite you to read the inserted content written by MTSA alumnus Aaron Jones ('16), DNAP, CRNA. His topic is: *Maintaining Safety During Office Based Anesthesia Procedures*.

MTSA is grateful to Dr. Jones for his willingness to provide this scholarly project for this CE. The *Airways* editorial staff wishes to express appreciation to Steven Krau, PhD, for his expert editing and formatting of Dr. Jones's scholarly work for this CE presentation.

Aaron Jones is president and CEO of Nashville-based Sweet Dreams Anesthesia, Inc., which he founded in 2011 and currently covers 18 facilities (office-based, ambulatory surgery centers and hospitals) in four states. He was also the founder of Giles County Anesthesia in 2001 in Pulaski, Tenn. He graduated from MTSA's Master of Science in Nurse Anesthesia program in 2000 and earned his DNAP in 2016. He has been married for 26 years and is the father of five.

**NOTE: You will have only a single opportunity to take the post test. You must score at least 80% to pass. There is no provision to re-take the test.**

# MTSA's new 'entry-to-practice' DNAP program to start in January

With the Council on Accreditation of Nurse Anesthesia Educational Programs (COA) recently granting its accreditation to MTSA, the School has moved forward with the new DNAP Practice Doctorate program. The first cohort will begin classes in January 2018.

The "entry-to-practice" program is a course of study for 36 consecutive months. Following the first semester, online, all subsequent semesters require Middle Tennessee residency. In the third semester students begin rigorous clinical rotations that offer a vast array of clinical experiences throughout the peri-anesthesia setting, which continues through the remainder of the program.

"By 2025, all anesthesia education programs are required to offer only doctoral degrees," said Rusty Gentry, DNAP, CRNA, Program Administrator at MTSA. "MTSA decided to get ahead of the curve and worked diligently to begin our first entry-to-practice class in 2018. Candidates for this program are ICU bachelors-prepared nurses who want to become excellent nurse anesthetists."

The Practice Doctorate curriculum is designed to educate students on how to apply the scholarly process for translating evidence-based research into daily clinical practice. According to Gentry, the scholarly project is two-fold and includes a professional electronic portfolio to demonstrate a culmination of all course work during the program. Students produce a nurse anesthesia quality improvement project with a focus on one of the following areas: clinical practice, education, administration or business management.

Gentry added: "One difference between the completion program for CRNAs and this program is the method by which the scholarly project is produced. In the entry-to-practice program, students work in groups and collaborate, as opposed to working individually. This concept of collaborative work is new to nurse anesthesia education as well as the clinical setting. However, MTSA believes we need to prepare and educate students to be able to perform independently as well as collaboratively.

"We're also proud that the COA found our programs to be worthy of the longest amount of time allowed for accreditation—10 years," he said. In its letter to MTSA, the COA offered its high praise to the School's programs, stating:

*The COA would like the program to know that very few programs are granted accreditation with no progress report required. Even fewer programs have achieved the maximum accreditation of ten years. Therefore, the directors of the COA are particularly pleased to offer their congratulations to everyone at the program who has demonstrated their commitment to meeting the requirements for continued accreditation.*

For more information on MTSA's DNAP Practice Doctorate program, visit [www.mtsa.edu/academics](http://www.mtsa.edu/academics).



Tatyana G. Aultman  
PhD, CRNA  
Assistant Program  
Administrator

## MTSA welcomes new Assistant Program Administrator

Tatyana Aultman, PhD, CRNA, has joined MTSA as an Assistant Program Administrator. She earned her PhD from the University of Texas Health Science Center at San Antonio, Graduate School in Biomedical Sciences, School of Nursing. She graduated with a Master of Anesthesiology Education from Gonzaga University and a Bachelor of Science in Nursing from Washington State University. Most recently, she was an independent contractor with NIX Medical Center and San Antonio Endoscopy Center. And she is fluent in Russian and Ukrainian.



# FOURTEENTH ANNUAL GOLF CLASSIC

PRESENTED BY **RAYMOND JAMES®**

*Golfing for MTSA Mission Initiatives*

As summer faded into fall, golfers hit the links on Sept. 21 at the 14th Annual MTSA Golf Classic, presented by Raymond James. Nearly 100 participants joined in the outing, which helped provide critical support for the School's Mission Initiatives.

"Our friends at Raymond James provided a substantial financial commitment in partnership with us, helping assure the success of the event," said Jim Closser, CFRE, Vice President for Advancement & Alumni at MTSA.

The event was held at Hermitage Golf Course – General's Retreat and began with lunch and concluded with a full dinner and award ceremony. New to the event this year was an air cannon, launching golf balls over 300 yards and providing an exciting twist to the hole-in-one competition.



MTSA Golf Classic participants (l to r) Matt Knight, Vice President-FTB Advisors, Mark Wiggins and Joe Crockett.

## Major sponsors:

- Presenting  
Raymond James
- Dinner  
Cardiovascular  
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- Hole-in-One  
Harold Greene, RHU –  
Mass Mutual
- Skill Prize  
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(l to r) MTSA students Andrew Sloan, Jessica Slinger, Matt Marchese and Brandon Leroy receive the 1st place, 3rd flight award.



*"I'm especially grateful to our event committee, chaired by Harold Greene. Harold has participated in the MTSA Golf Classic for the last 13 years and has been a corporate sponsor. He and the committee did a fantastic job planning the event and lining up support for our upcoming mission trips to Haiti and Guyana. We are grateful for each player and sponsor that made this day so successful."*

—Jim Closser, CFRE, Vice President for Advancement & Alumni



Blake Wilson, Vice President, InsBank - TMA Medical Banking, aims the air cannon during the hole-in-one competition.



(l to r) MTSA students Matt Crane and Mo Stewart; Craig Smith; and MTSA Alum Bill England ('15) receive the 2nd place, 2nd flight award.

## MTSA alumni ballot mailed

The ballot to elect 2018 MTSA Alumni Officers and Decade Representatives has been mailed to all MTSA alumni. In accordance with MTSA Alumni Association Bylaws, this ballot must be returned and in-hand at the MTSA Alumni Office by close-of-business on Thursday, Nov. 2, to be counted. The ballot includes the following nominees:

President

Matt O'Connor ('07)

President-Elect

Matt Fosnot ('10)

Rod Schwindt ('01)

Treasurer

Dwight Kennerson ('00)

2000s Rep

David Murphy ('00)

Wade Rippy ('00)

1970s Rep

Betty Perales ('77)

Pre-1969 Rep & Retired

Lois Bernard ('68/'94)

All MTSA Alumni are invited to attend the MTSA Alumni Association Business meeting to confirm the ballot results. This meeting will be held at MTSA on Tuesday, Nov. 7, at 4:30 p.m. (CST). If you have any questions, please call (615) 732-7674 or e-mail [jclosser@mtsa.edu](mailto:jclosser@mtsa.edu).

## Advanced Physiologic Foundations course offered online

Due to overwhelmingly positive feedback from students, MTSA continues to offer the Advanced Physiologic Foundations online course, according to Maria Overstreet, PhD, RN, MTSA Dean. The course was first offered earlier this year.

The three credit-hour course will begin in January 2018 and continue for 15 consecutive weeks.

Last year, MTSA Professor Brett Clay, DNAP, CRNA, worked with an educational consultant to convert the in-person course to an online format.

Students who took the course had the following to say:

- "I have taken multiple online science courses at both undergraduate and graduate levels. This was, without a doubt, the best online class experience I have ever had. The instructor (Dr. Clay) goes above and beyond and was always there to walk students through material they might not have understood."
- "I learned more than I ever expected."
- "Would highly recommend to others."

For more information about the Advanced Physiologic Foundations online course, contact Pam Nimmo at the MTSA admissions office at (615) 732-7662 or visit [www.mtsa.edu/non-degree](http://www.mtsa.edu/non-degree).

## Class of 2017 Graduation Ceremony

MTSA graduation exercises for the Class of 2017 are scheduled for Friday, Nov. 17, 2017, at the Madison Campus Seventh-day Adventist Church. The ceremony recognizing this year's 69 graduates will begin at 10 a.m.

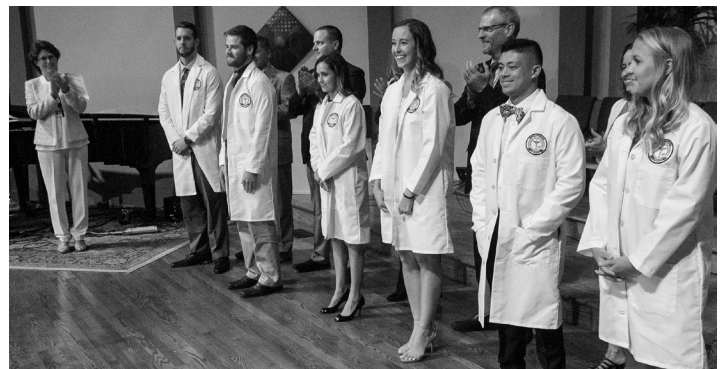
Claude Pressnell, EdD, President, Tennessee Independent College and University Association, will present the commencement address, and Ken Wetmore, MDiv, will offer the homily.

The event will be followed by an open house on the School's campus located adjacent to the church. Refreshments will be served.



# Class of 2019 recognized at White Coat Ceremony

*The annual White Coat Ceremony was held on Thursday, Aug. 17, at the Madison Campus Seventh-day Adventist Church.*







Middle Tennessee School of Anesthesia  
P.O. Box 417  
Madison, Tennessee 37116

ADDRESS SERVICE REQUESTED



## FROM THE ARCHIVES Class of 1977

This issue of *AIRWAYS* highlights the upcoming MTSA graduation ceremony to be held Nov. 17, 2017. Featured here are five women from the MTSA Class of 1977, who graduated 40 years ago. (l to r) Bonnie Ford Cox, Betty May Winburn Perales, Patrice Tracy, Linda Talley Almes Riley and Deborah Haas.

# Maintaining Safety During Office Based Anesthesia Procedures

Author: Aaron Jones, DNAP, CRNA  
aj@sweetdreamsanesthesia.com

This program has been prior approved by the  
American Association of Nurse Anesthetists for  
1.00 Class A CE credits;  
Code Number 1035337;  
Expiration Date 9/30/2020.

## Objectives

Upon completion of this C.E.U. offering, the CRNA will be able to:

1. Discuss the trends in Office Based Anesthesia (OBA) procedures.
2. Explain the advantages of Office Based Anesthesia and Office Based Surgical (OBS) procedures.
3. Evaluate the Standards for OBS as set forth by the American Association of Nurse Anesthetists (AANA)
4. Assess factors that contribute to patient safety throughout OBA procedures.
5. Discuss the efficacy of the Quick Reference Guide (QRG) in contributing to optimal OBA patient safety outcomes

## Introduction

Office-based surgery (OBS) has grown exponentially in the past thirty years due to advancements in diagnostic procedures and non-invasive surgical techniques.<sup>1</sup> It was estimated that 10 million office-based procedures were performed in 2005, which was double the amount estimated 10 years prior. It is now estimated that 17-24% of all elective ambulatory surgeries are performed in an office-based setting.<sup>2</sup> Convenience, efficiency, patient privacy, and financial benefits have also played a part in its growth.<sup>3</sup> Along with the exponential growth of OBS has been the associated need for equal growth of office-based anesthesia (OBA) care. Better technology for monitoring and shorter acting medications have facilitated anesthesia professionals in meeting the increased demand for OBS. Because of the growing prominence in OBA, there is a need for utilizing guidelines and standards ensure the quality and safety of OBA care.<sup>4</sup>

## State of Current Office Based Surgery and Office Based Anesthesia

Plastic surgeons, dentists, podiatrists, gastroenterologists and oral surgeons have been providing OBS, including OBA, for decades. The frequency and types of procedures performed have increased in almost all

areas including OBA.<sup>5</sup> Other specialists also are currently exploring and expanding their surgical practices to provide OBS and OBA.<sup>6</sup>

During this expansion, one of the major issues that has emerged is assuring patient safety during OBS and OBA. This rapid expansion in OBS and OBA has not coincided with oversight by healthcare regulatory and accrediting organizations, federal and state governmental agencies, or peer review. In order to assure safety and make sure quality of OBS and OBA is equitable to procedures done in tertiary settings and ambulatory care settings, oversight by regulatory and accrediting agencies as it relates to these procedures is warranted.<sup>5</sup>

## Advantages of OBS and OBA

There are advantages to performing OBS and OBA, including cost containment, patient privacy, patient and surgeon convenience, and decreased exposure to nosocomial infections.<sup>2</sup> Recently, however, the conveniences of OBS and OBA have been challenged by an increasing number of research studies and media reports addressing concern on the safety.<sup>7</sup> For example, a study by Vila et al. in 2003, concluded that OBS and OBA were not safe when compared to outcomes found in accredited ambulatory surgery centers.<sup>8</sup> The results of this study initially prompted the state of Florida to issue a moratorium on certain types of OBS and OBA.<sup>8</sup> These actions prompted much interest in providing evidence to further examine OBS and OBA practices. In 2011, a retrospective study done by Starling, challenged earlier findings and indicated that Villa's study was flawed and the conclusions were erroneous.<sup>6</sup>

Safety associated with OBS and OBA procedures not only has global implications, but the efficacy and outcomes of these procedures are linked to identifiable factors. Factors that are potentially associated with OBS and OBA safety include patient selection, procedure or surgery performed, surgeon qualifications, anesthesia provider qualifications and training, medications used, equipment for anesthesia administration and resuscitation, and office accreditation.<sup>1-3,5-7</sup>

### Thought Box 1.

1. What trends have you observed in OBS and OBA?
2. From your experience, what factors make a significant difference in outcomes associated with OBS and OBA as compared to procedures done in tertiary and ambulatory care settings?

### Safety Advantages associated with OBS or OBA procedures.

Hospital-based anesthesia has a current morbidity and mortality rate of approximately 1/400,000.<sup>3</sup> There is some discussion about the lack of rigorous empirical evidence related to OBS and OBA procedure. However, recent findings, including those featuring analyses of the American Association for Accreditation of Ambulatory Surgical Facilities (AAAASF) data bank, suggest that mortality rates are similar across the spectrum of accredited surgical facilities.<sup>2,3</sup> As one empirical indicator, this is strongly significant.

### Economic Advantages associated with OBS and OBA procedures

As healthcare costs continue to soar, patients, providers, and insurers are exploring new opportunities and venues to decrease the expense of medical care.<sup>2</sup> For example, the cost of an average inguinal hernia repair in a hospital setting is \$2,237 compared to \$895 in the office-based setting.<sup>9</sup> Prostate biopsies are almost 75% less expensive when performed in an office-based setting rather than a hospital.<sup>10</sup> The cost for pediatric dental rehabilitation has been demonstrated to be 13 times less in an office-based setting rather than a hospital, thus saving patients and families approximately \$6800 per surgery.<sup>2</sup> These large disparities in cost are largely due to office-based settings having lower overhead expenses and being less resource intensive than hospitals.<sup>9,10</sup> These economic benefits for individuals, insurers, and the health care industry are significant contributors in the rapid growth of OBS and OBA.

### Patient Privacy

In addition to cost-effectiveness, there are other significant factors in OBS and OBA for patients, such as improved patient privacy.<sup>2,3</sup> Patients

undergoing personal, and sometimes body image-sensitive procedures, or surgeries, take comfort in having their procedure done in an office setting that allows for minimal personal disclosure.<sup>2,3</sup> Increased convenience of scheduling and access also are significant to patients.<sup>1,2</sup> Patients prefer OBS and OBA to avoid the confusion of hospitals and easier experience in scheduling and length of stay.<sup>1</sup> Lower exposure to nosocomial infections for patients has also been suggested by Hausman et al.<sup>2,3</sup>

### Putting It Together

Certified Registered Nurse Anesthetists (CRNAs) have been leaders in providing anesthesia in office-based settings.<sup>11</sup> CRNAs are often consulted when a surgeon plans to develop an office-based practice that meets projected practice standards and safety requirements. For most nurse anesthetists and other anesthesia providers, these consults for office-based anesthesia service are met with a “learn in the trenches” mentality.<sup>12</sup> To that end, the American Association of Nurse Anesthetists (AANA) provides practice standards and guidelines for providing office-based anesthesia, yet, these practice standards and guidelines have not been fully integrated into the formal training or education for CRNAs or other anesthesia providers.<sup>5,11</sup>

There is current clinical literature that addresses the “education gaps” of healthcare providers, surgeons, and anesthesia providers who practice in the office-based setting.<sup>13</sup> For example, Dillon states that a survey of anesthesiology residents found that approximately 2% were exposed to any type of office-based practice during residency.<sup>12,15</sup> Though not fully informed by the evidence, many nurse anesthesia educators assume that the same problem exists in nurse anesthesia education. As initial evidence, a review of guidelines and requirements from the Council on Accreditation (COA) indicate that no requirement exists for the inclusion of office-based anesthesia in primary nurse anesthesia curricula.<sup>22</sup> There is increasing consensus, therefore, that a need exists to educate student nurse anesthetists in office-based safety factors (including the possible use of simulation), regulatory bodies requirements, state, and professional association standards.<sup>13</sup>

It is important to consider these standards and for CRNAs engaged in OBS and OBA to be familiar with the application of these standards. The following Table is an adaptation of these standards from The American Association of Nurse Anesthetists. Review these standards and consider their application to current practice.

**Table 1. Chart related to AANA's Standards of Anesthesia in the Office Setting**

Standard	Statement	Application to Office Practice
Standard 1	Perform and document a thorough preanesthesia assessment and evaluation.	Preanesthesia assessment of the patient undergoing office based surgery should include documentation of at least: a. assigned physical status b. assessment of airway c. previous anesthetic history d. allergies e. last meal eaten or oral intake f. history and physical
Standard 2	Obtain and document informed consent for the planned anesthetic intervention from the patient or legal guardian, or verify that an informed consent has been obtained and documented by a qualified professional.	The CRNA shall confirm that consent has been given for the planned surgical or diagnostic procedure. The CRNA validates and documents that the patient understands and accepts the plans and inherent risks for anesthesia in the office setting.



Standard 3	Formulate a patient-specific plan for anesthesia care.	A patient specific plan of care is based on patient assessment with the anticipation of potential problems in the office setting. The operating practitioner clears the patient for the planned anesthetic.
Standard 4	Implement and adjust the anesthesia care plan based on the patient's physiologic status. Continuously assess the patient's response to the anesthetic, surgical intervention, and/or procedure. Intervene as to maintain the patient in optimal physiologic condition.	The CRNA shall continuously assess and monitor the patient's response to the anesthetic. Prior to administration of anesthesia the CRNA shall verify a means to deliver positive pressure ventilation and treat emergency situations including availability of necessary emergency equipment and drugs.
Standard 5	Monitor, evaluate, and document the patient's physiologic condition as appropriate for the type of anesthesia and specific patient needs. When any physiological monitoring device is used, variable pitch 2 and threshold alarms shall be turned on and audible. The CRNA should attend to the patient continuously until the responsibility of care has been accepted by another anesthesia professional.	Minimum monitors in the office based setting include: pulse oximetry; electrocardiogram; blood pressure; O2 analyzer when O2 is delivered through the breathing system of the anesthesia machine; end-tidal CO2 when administering general anesthesia; a monitor for the presence of expired carbon dioxide when administering moderate or deep sedation; a body temperature monitor when clinically significant changes are intended, anticipated, or suspected; and peripheral nerve stimulator as indicated when administering neuromuscular blocking agents.
Standard 6	Document pertinent anesthesia-related information on the patient's medical record in an accurate, complete, legible, and timely manner.	The CRNA affirms a plan for accurate record keeping and documentation of the following: a. informed consent b. preanesthesia and postanesthesia evaluations c. course of the anesthesia, including monitoring modalities and drug administration, dosages and wastages d. discharge follow-up
Standard 7	Evaluate the patient's status and determine when it is safe to transfer the responsibility of care. Report the patient's condition, including all essential information, and transfer the responsibility of care to another qualified healthcare provider that assures continuity of care and patient safety.	Quality postanesthesia care is consistent with other practice settings in that there is a designated area operated by appropriately trained personnel. At least one qualified provider - a surgeon, anesthesia professional, or ACLS-certified registered nurse - should remain in the facility until all patients are discharged. An accurate postanesthesia record is documented.
Standard 8	Adhere to appropriate safety precautions as established within the practice setting to minimize the risks of fire, explosion, electrical shock and equipment malfunction. Based on the patient, surgical intervention or procedure, ensure that the equipment reasonably expected to be necessary for the administration of anesthesia has been checked for proper functionality and document compliance. When the patient is ventilated by an automatic mechanical ventilator, monitor the integrity of the breathing system with a device capable of detecting a disconnection by emitting an audible alarm. When the breathing system of an anesthesia machine is being used to deliver oxygen, the CRNA should monitor inspired oxygen concentration continuously with an oxygen analyzer with a low concentration audible alarm turned on and in use. Application to Office	The CRNA confirms equipment is routinely maintained by appropriately trained professionals. Prior to use, equipment is inspected for risk of malfunction and electrical/fire hazards.
Standard 9	Verify that infection control policies and procedures for personnel and equipment exist within the practice setting. Adhere to infection control policies and procedures as established within the practice setting to minimize the risk of infection to the patient, the CRNA, and other healthcare providers.	The CRNA shall confirm that policies are in place and a process exists to document compliance with Occupational Safety and Healthcare Administration (OSHA) standards relating to blood borne pathogens; medical waste and hazardous materials; personal protection devices; and disposal of needles, syringes and contaminated supplies.
Standard 10	Participate in the ongoing review and evaluation of anesthesia care to assess quality and appropriateness.	Prior to administration of any anesthetic in an office facility, the CRNA shall review the AANA minimal elements (Section II) and evaluate for compliance and applicability to the setting. The CRNA shall participate in assessment and review of appropriateness of anesthesia care provided in the office setting. There should be a process to document patient satisfaction and outcomes.
Standard 11	Respect and maintain the basic rights of patients.	The CRNA shall act as the patient's advocate. The patient has the right to dignity, respect and consideration of legitimate concerns in the office setting. Patients should be involved with all aspects of their care.

Chart Adapted from: American Association of Nurse Anesthetists. *Standards for Office-Based Anesthesia Practice*.  
<http://www.aana.com/resources2/professionalpractice/Documents/Standards%20for%20Office%20Based%20Anesthesia%20Practice.pdf>  
 Accessed August 30, 2017. Created by Stephen D. Krau, Ph.D, RN, CNE

## ***Thought Box 2.***

1. When reviewing these standards, how comparable are they to standards of anesthesia suggested for tertiary and ambulatory care settings?
2. How should these standards be incorporated into CRNA education?
3. Should standards of OBA and OBS be incorporated into certification exams?
4. To what extent did you learn OBA and OBS in your basic CRNA program?

### **Major focus on OBA**

A major objective for our considerations is to identify factors that impact safety during OBA procedures. The focus here will be on OBA in different contexts, as opposed to OBS, and will provide a practical framework for OBA procedures. The synthesized findings and resulting conceptual model will be used to inform and develop a quick reference guide for providers and administrators that categorizes, highlights, and briefly describes the associated OBA safety factors. The overall goal is to inform providers about safety factors associated OBA procedures in the hope of assuring optimal outcomes for patients undergoing OBA procedures.

### **What Does the Evidence Indicate?**

In terms of the nature of the evidence, no randomized controlled trials were found that comparatively evaluated OBA safety (e.g., anesthesia-related morbidity and mortality) across the spectrum of accredited surgical facilities. A potential reason for this may be attributed to the rapid expansion of office-based anesthesia – an expansion that has outpaced the process of discovery. There are, however, explorative analyses, retrospective studies, and expert opinions related to office-based anesthesia safety that are presented in Table 2.

Shapiro et al. published a recent systematic review that used data from the National Anesthesia Clinical Outcomes Registry (NACOR) established by the Anesthesia Quality Institute (AQI) founded by the American Society of Anesthesiologists (ASA).<sup>2</sup> There were approximately 30 AQI member practices from which OBA data were obtained.<sup>2</sup> Although, this study provided a sound literature review, the limited evidence resulted in potentially misleading conclusions. For example, the authors stated “The paucity of CRNAs functioning as the sole anesthesia provider was another surprising finding. This lack may be caused by an unwillingness on the part of the proceduralist/surgeon to take on a supervising role or the unwillingness of a CRNA to work in such a remote setting with no backup.”<sup>2</sup> The study results also report that independently working CRNAs in an office-based setting makes up 1% of all office-based practices reported to NACOR.<sup>2</sup> A likely cause for this lack of reported data used to frame this claim is that CRNAs find it a conflict of interest to report to NACOR - a registry developed by the ASA.

Shapiro et. al’s. combined program of inquiry has produced the most extensive review of the OBA evidence to date.<sup>14</sup> These studies report findings derived from a comprehensive exploration of the current literature, and, in the process, identified possible associated factors that contribute to OBA safety. These factors include: 1) procedure and/or surgery selection; 2) patient selection; 3) facility preparedness; 4) use of checklists; 5) provider education; and 6) accreditation.

### **Major factors that contribute to OBA safety include those related to:**

1. Procedure and/or surgery selection
2. Patient Selection
3. Facility Preparedness
4. Use of Checklists
5. Provider Education
6. Accreditation

## Procedure and/or Surgery Selection

Procedure and/or surgery selection and duration should be evaluated to ensure it is appropriate for an office-based location.<sup>2,14,15,16</sup> Although the American Society of Plastic Surgeons suggests surgical/procedure duration should be no longer than six hours, Shapiro et al. suggest that there is an increase in unplanned hospital admissions for procedures/surgeries greater than one hour in length.<sup>2,15,16</sup> The anticipated amount of postoperative pain and/or risk of postoperative nausea and vomiting related to the procedure or duration of the surgery should be considered when evaluating whether or not to provide office-based anesthesia.<sup>14</sup> Offices should have the appropriate personnel, proper equipment, and medications to care for patients peri-operatively with a reasonable discharge time goal.<sup>14</sup> Surgeries with increased fluid shifts and large anticipated blood losses are not appropriate for office-based anesthesia.<sup>2,14</sup> Additionally, certain procedures such as liposuction and some dental procedures have been shown to have an increased risk when performed in the office setting. Due to this, some states have developed guidelines for performing these specific types of procedures in offices.<sup>17,18</sup>

## Patient Selection

Patient selection is another factor that is identified in current literature as being associated with safety in office-based anesthesia. While there are no universally accepted criteria for patient selection, the American Association of Nurse Anesthetists (AANA) and American Society of Anesthesiologists (ASA) provide guidelines to aid in those decisions.<sup>11,18,19</sup> Criteria for identifying poor candidates for OBA could include patients with an ASA score greater than 3, obstructive sleep apnea (OSA), severe psychiatric disorders, uncontrolled hypertension or diabetes. A patient with a history of adverse events with anesthesia such as malignant hyperthermia would also be an example of a poor candidate for OBA.<sup>14</sup> Required laboratory studies should be completed before the day of surgery to prevent cancellations.<sup>14</sup> Certain home medications such as insulin, anti-hypertensives, and anticoagulants if not taken by the patient appropriately could also be problematic.<sup>14</sup> It is a good practice for each office to develop policies defining appropriate candidates using an interdisciplinary approach including the surgeons, anesthesia, nursing and surgical/procedural assistants.<sup>2</sup>

## Facility Preparedness

Facility preparedness and infrastructure, including proper equipment and medications, also are identified possible associated factors for the administration of safe OBA.<sup>2,14</sup> Office-based procedure/surgical rooms should have ample room to allow for the necessary equipment, personnel, and provide adequate space for patients to safely enter and exit.<sup>2</sup> The type of OBA – whether general anesthesia, monitored anesthesia care, or regional anesthesia - has not demonstrated a difference in safety-related outcomes. Of more importance are the availability of the proper medications, equipment, and monitoring devices used for the type of anesthetic performed.<sup>2,14</sup> The availability of difficult airway and emergency equipment, reversals and ACLS medications, and applicable policies and procedures (e.g., hospital transfer protocols) are necessary to provide a safe environment for the delivery of OBA.<sup>2,14</sup>

## Surgical Checklists

The results of studies by the World Health Organization and evidence trended from the application of surgical checklists in hospitals and some ambulatory settings have demonstrated a decrease in adverse perioperative outcomes.<sup>17</sup> As a result, checklists are now required by Centers for Medicare and Medicaid Services (CMS) for hospitals and accredited ambulatory surgery centers.<sup>17</sup> These results have led some experts to speculate that surgical checklists may also improve OBA outcomes. The results of early studies further suggest that the use of surgical checklists could potentially improve office-based surgical outcomes.<sup>1,17</sup> In these early studies, it was also identified that the limited use of checklists is probably due to the lack of financial incentive and governmental mandate.<sup>1</sup> Recently, the Institute for Safety in Office-Based Surgery has developed a customizable surgical checklist for offices based on the World Health Organization Surgical Safety Checklist.<sup>1</sup> Early evidence on the use of this checklist suggests an improvement in safety measures and decrease in complications.<sup>1</sup>

## Provider Education

It has been suggested that only two percent of anesthesia residents are exposed to OBA.<sup>14</sup> Furthermore, nurse anesthesia programs do not provide OBA training in the COA-approved core curriculum. This lack of formalized OBA training has resulted in a large variance in provider competency.<sup>13</sup> Professional societies, such as the AANA and ASA, and many office-based practicing anesthesia providers are aware of this lack of formal education. As a result, these professional societies have issued practice standards, in addition to provider-generated literature that increases levels of awareness, care, and safety for patients.<sup>13,14</sup> The lack of office-based education is not unique to anesthesia professionals, however, as surgeons and proceduralists also lack specific training. This lack of formal training has led many states to develop regulations for surgeons, proceduralists, and anesthesia providers when performing OBS and OBA.<sup>13</sup>

## Accreditation (Regulatory Agencies)

Accreditation in some form, either from an independent agency, individual states, or federal agency would increase the safety level of OBS and OBA.<sup>14,2</sup> It is estimated that 30 states now require accreditation of office-based practices in some form – such as that provided from the American Association of Ambulatory Surgery Centers (AAASC), American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF), Joint Commission on Accrediting Healthcare Organizations (JCAHO), to individual state mandated regulations.<sup>13</sup> Credentialing and privileging providers is, therefore, a strong argument for using accrediting agencies. This ensures proper training, education, and board certification of the providers performing procedures and providing anesthesia for patients.<sup>14</sup> According to some studies, however, board certification is not a contributing factor to office-based safety.<sup>14</sup> While accreditation provides basic standards, these agencies and states often vary on requirements to achieve a fully accredited status.<sup>2</sup> Furthermore, some agencies and states require adverse event reporting, and others do not.<sup>2</sup> Adverse event reporting and the resulting evidence would be beneficial in further evaluating factors that influence office-based safety.

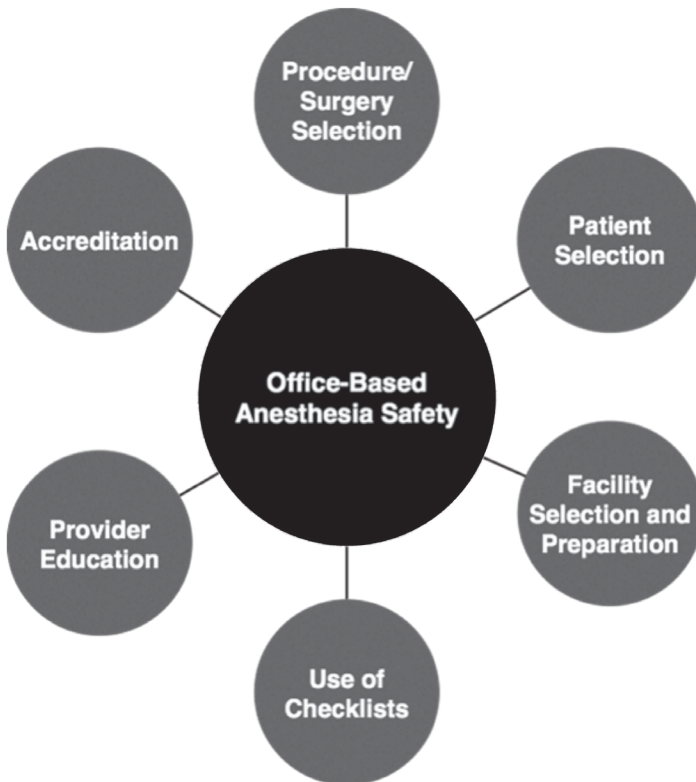


**Table 2: Studies Related to OBS Safety**

Studies on Office-Based Anesthesia Safety		
Study	Key Findings	Strength of Evidence <sup>21</sup>
<b>Failey et al.<sup>16</sup></b>	A plastic surgery office utilizing TIVA (conscious and deep sedation) for their patients retrospectively studied the outcomes of 2006 consecutive patients. Chart reviews were completed for surgeries from 2003-2011. There were no deaths, cardiac events or transfers to the hospital reported.	4
<b>Vila et al.<sup>8</sup></b>	A comparative analysis using required adverse reporting data from ASCs and offices in Florida during 2000-2002. The authors concluded that complication rates were 10x higher in office-based settings versus ASCs.	3b
<b>Starling et al.<sup>6</sup></b>	This comparative analysis expands on an earlier study by Vila et al. The authors used same data as Vila et al. and additional data from Florida (10 years) and Alabama (6 years) adverse events reporting system. The authors determined that the inferences from the previous article were inaccurate and that office-based surgery is safe.	3b
<b>Rosenberg et al.<sup>17</sup></b>	This is a prospective comparative analysis regarding the use of a safety checklist perioperatively on outcomes in office-based surgery. The authors suggest a statistically significant difference in outcomes when a safety checklist is used but suggest it is not clinically significant	3b
<b>Pollock et al.<sup>4</sup></b>	A retrospective review of 1400 plastics cases safely performed in an office-based setting utilizing anesthesia. Patient selection, types of cases, monitoring and types of anesthesia are discussed.	4
<b>Blake<sup>15</sup></b>	A retrospective analysis of 4800 office-based anesthesia cases performed safely with only 3 complications noted. This study speaks to the lack of overall anesthesia training for the office-based location.	4
<b>Hoefflin et al.<sup>18</sup></b>	A retrospective view of over 23,000 consecutive office-based anesthetics for plastic surgery with no significant anesthetic complications.	4
<b>Fleisher et al.<sup>19</sup></b>	A comparative analysis of 564,267 Medicare outpatient surgeries performed in office-based, ASC and hospital locations. One-week mortality and inpatient admission within 7 days rates were lowest in the office-based place of service.	3
<b>Keyes et al.<sup>20</sup></b>	A retrospective review of 1,141,418 cases performed in AAAASF accredited outpatient facilities. 23 deaths were observed and 13 being due to pulmonary embolism. 1 death was caused by an intraoperative event.	4
<b>Shapiro et al.<sup>14</sup></b>	A systematic review of scientific literature for office-based anesthesia. The authors explored and analyzed the literature for characteristics contributing to the safe delivery of office-based anesthesia.	3b
<b>Shapiro et al.<sup>2</sup></b>	A systematic review of literature about office-based anesthesia reveals no randomized controlled trials. Data was collected from the National Anesthesia Outcomes Registry (NACOR) and analyzed using the Pearson chi-square test to compare office-based locations to NACOR extract data. The results are informative and give deeper insight into office-based anesthesia and its characteristics as compared to other outpatient locations.	3a

## Conceptual Model Development

Based on evidence discussed above, the recurrent themes (factors) that were associated with OBA safety were conceptualized into a model below. The evidence did not provide, however, a basis for determining the relative weight of each factor and their effects on safety-related outcomes. As a result, the model gives equal weight to each of the factors included.



## Quick Reference Guide Development

Besides organizing the key findings from the evidence, this model was used as the foundation for the development of the namely the Quick Reference Guide (QRG). The QRG was developed for distribution to specialists and CRNAs that are interested in providing OBA. The model is featured on the front of the QRG to highlight the six recurrent associated factors derived from the synthesis of evidence. The six factors are then briefly described and explained by using bullet points on the reverse side. At the end of the QRG, references are offered that will further assist providers in developing a safe OBA service.

### Thought box 3.

1. Which of these factors or concepts of the model could be omitted and patient safety still be assured?
2. Are there factors that are not present that you consider important in assuring optimal safety outcomes for patients undergoing OBA procedures?
3. What weigh of importance would assign to each factor?

## Key Findings

Perhaps the most impressive finding of this exploration is the lack of formal OBA training for CRNAs and other anesthesia providers. CRNAs are required from the Council on Accreditation (COA) to have formal didactic and clinical training in specialties such as cardiac, neurology, and obstetrical care. These specialties have unique bodies of knowledge and skill sets needed to ensure positive patient outcomes. In the same regard, OBA is a specialty that demands a unique knowledge and skill set to ensure the same outcomes. Despite this assertion, currently there are no published didactic or clinical requirements from the COA for OBA even though it is estimated that 12% of CRNAs provide OBA.<sup>23</sup>

## Implications for Anesthesia Education, Practice, and Research

While the specialty of OBA has grown rapidly, the study of associated factors that make OBA safe have not kept pace. Furthermore, many specialists and CRNAs lack formal education in the provision of office-based care, and, as a result, lack a general understanding of the factors that potentially contribute to OBA safety. It is recommended that the COA address the lack of both didactic and clinical requirements for OBA education and implement core requirements for CRNA education. Furthermore, evaluating the effects of formal OBA training on patient safety-related outcomes would be a suitable target for future research.

The AANA developed and published guidelines for CRNAs providing OBA, and, as a result, provided some organization for clinical decision-making despite the lack of formal OBA training for providers. The purpose of the QRG developed in this capstone project is to provide an easily understood reference that will support clinical decision-making by highlighting, organizing, and explaining the current knowledge about factors associated with the safe delivery of OBA.

## Conclusion

OBA is growing exponentially due to economic and social factors, surgical technologic advances, and improved anesthetic agents and monitoring.<sup>14</sup> Despite this rapid expansion in OBA care, providers remain largely uninformed about factors associated with improved safety. In response, this capstone project included a synthesized review of existing evidence that identified key factors associated with OBA-related safety. For the purposes of clarification and informed provider decision-making, these factors were organized into a conceptual model and a Quick Reference Guide. Other recommendations were offered that address the lack of formal provider education in OBA care, as well as for the creation of OBA-related didactic and clinical content in the nurse anesthesia core curriculum.

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