



The Sensor



Perioperative Fluid Therapy

Optimal Fluid For High-Risk Surgical Patients, A Change In Thinking Page 6

The expansion of enhanced recovery programs throughout the world has forced us to rethink many aspects of our care including fluid administration.

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Obstetrics: Placenta Previa

A case study of how the anesthesia team addressed difficulties and potential risks.

Member Highlight

Meet Josh French, Cer. A.T.T., he is a Lead Anesthesia Tech at Kaiser Permanente Sunnyside Hospital.

Education Program Director Article

Michael Boytim, CRNA, EdD, discusses the beauty of distance education programs.



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Perspective

PRESIDENT'S LETTER




Greetings ASATT Members!

As 2021 comes to a close, I would like to wish you all a happy holiday season and hope everyone had a great Thanksgiving. We remain in unprecedented times, in which being surrounded by loved ones is of paramount importance. Despite the collective turbulence we have all experienced over the last two years, it remains an important tradition for many at this time to recognize what we are thankful for. For myself, in addition to the many things that immediately come to mind such as family, friends, and good health, I am also thankful for this profession which we all share, and the many opportunities it has afforded me over the years, which would have never been possible had I decided not to enter the field of Anesthesia Technology.

During my career I have been fortunate enough to have had pursued many very rewarding avenues, from working in highly clinically active and astute tech groups, to serving in a management role, securing contracts as a traveler at a variety of hospitals where oftentimes I've made lasting friendships, becoming an educator, and serving on the ASATT Board of Directors for many years, which has now culminated in the opportunity to serve you all as President, a role of which is both exhilarating and humbling.

Many of you, such as myself, have spent years in the profession and have seen a great deal of change, especially in the last decade. Others may have just recently entered the field and are perfecting your skill sets and expertise. Wherever you may be in the timeline of your career, there is one thing I am assured we all share in sentiment, that we love the specialty of Anesthesia but simultaneously realize there remains a long road ahead to further secure our place in the realm of nationally recognized allied health professions, whether it be at the local, regional, or state level. My agenda for this year is to continue to make strides in such fashion and, as you will see, 2022 will prove to be a pivotal year for this process, as the annual agenda is rolled out over the coming months. Stay tuned for updates in the Sensor and the website. I would like to sincerely thank you all for your support as members and look forward to a great year!

David Foster, Cer.A.T.T.
ASATT President 

Highlights

SOCIETY NEWS



Regional Meetings

Region 2 and 7 joint-hosted the most recent Regional Meeting for 2021 on November 20th, and it was a great success! The meeting was held via Zoom webinar. Thank you to all the attendees who registered for the meeting!

Thank you to Region 7 Director, Delbert Macanas and Region 2 Director, Karen Patrick, for hosting such a great regional webinar meeting!

Continue to check the ASATT website for future Regional Meetings! With the meetings in a virtual setting, this is a great opportunity to obtain more CEUs and attend different Regional Meetings. All meetings are posted under [EVENTS, MEETINGS/EVENTS](#).



Certification / Recertification

Right now, you can complete the recertification process through December 31. Don't leave it to the last minute! Start getting your CEUs in order and make sure your membership is up to date with one of ASATT's new membership pricing options to receive your membership benefits. To learn more, visit the [recertification](#) section on the ASATT website, as we will update the instructions as the date nears. If you have

questions about how many CEUs you have on file with ASATT, please reach out to customer care at customer care@asatt.org or by calling Nicole at 414-908-4942 ext. 116.



Join an ASATT Committee Today!

YOU should join a committee if:

- You enjoy being creative and brainstorming with others
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- You get a thrill out of seeing your work in action and getting to actually measure the results
- You enjoy being an active part in making a difference
- You want to genuinely impact on the future of ASATT
- You're looking to gain leadership experience
- You have a genuine passion for the Anesthesia Technologist profession

If this describes you, apply for a position on a committee today. A full committee list is below but their job description of responsibilities and the application to join a committee is on our website.

- Bylaws Committee
- Code of Conduct and Ethics Committee
- Financial Committee
- Nominations Committee
- Strategic Planning Committee
- Item Writers
 - Accreditation Committee
 - Continuing Education Committee 

Spotlight

MEMBER HIGHLIGHT



Josh French Cer. A.T.T.

What is your current job title?
Lead Anesthesia Tech at Kaiser
Permanente Sunnyside Hospital.

How many years have you been in the Anesthesia Technology profession?

Almost 20 years.

What do you find most challenging about your job?

Dealing with the differences between CMS and Joint Commission.

How many years have you been an ASATT member?

Almost 20.

What is your fondest memory of ASATT?

When ASATT would accept CEUs from Anesthesia Tech Pearls.

What has been your proudest accomplishment? (Personal life, professional life, or both.)

Going to France for the 75th anniversary of D-Day.

What is your favorite food?

Korean is my favorite type. Bulgogi is my favorite dish.

People would be very surprised to know that...

I get pedicures on the regular. If you spend all day on your feet you got to take care of them.

What do you enjoy doing in your spare time?

I enjoy doing anything outdoors with my time. Camping, hiking, backpacking or just going to the coast. Anything outdoors.

What is your favorite type of music?

The correct question should be: What is your least favorite music. Answer-New country and new rap.

What is your favorite movie?

The Goonies.

What would you like to get around to doing one of these days?

Backpacking the Appalachian Trail. 

Happenings

ASATT AND RELATED EVENTS


Regional Meetings

The implementation of a virtual platform to hold the Regional Meetings has been a great success so far. Our attendance numbers have never been higher. Many of you have expressed appreciation of the virtual option for its easy accessibility to the regional meetings. The goal as always is to provide as many educational opportunities as possible each year.

Regions 2 and 7 just hosted a joint meeting November 20th which resulted in a large number of attendees from all over. Thank you to all our participants and speakers for making this meeting a success.


Your Regional Directors are continuing to plan for more virtual regional meetings throughout 2022. Meetings will

continue to be posted to the website and announced via the eblasts and on social media. In the next year the regional meetings will change to a quarterly basis. Doing so will benefit all participants with,

- Meeting times that allow most anesthesia technologist and technicians across the country to attend meetings.
- By holding one virtual meeting per quarter, operations for members and Regional Directors are streamlined.
- Furthermore, holding one meeting per quarter allows members sufficient time to register. This strategy also aligns with the ASATT 'New Path Forward' Initiative. 



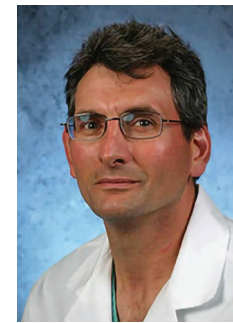
2022 Annual Educational Conference

ASATT is currently planning an onsite 2022 Annual Educational Conference! Believing in the power of in-person networking and education, the ASATT Board will continue to monitor COVID-19 guidelines and adjust if necessary to ensure a safe and valuable experience. SAVE THE DATE and plan to join us August 10-12, 2022 in Fort Worth, Texas! Details, including registration information, will be coming soon! 

Perioperative Fluid Therapy

Optimal Fluid For High-Risk Surgical Patients, A Change In Thinking

Based on the lecture from the 2021 ASATT Annual Educational Conference and reprinted from the PSA Sentinel.



JOSEPH F. ANSWINE, MD, FASA
ASA LIAISON TO THE ASATT

As I researched the topic of intra-operative fluid management for a resident lecture, I (as frequently occurs) was surprised to find out how much I did not know about the topic. The expansion of enhanced recovery programs throughout the world has forced us to rethink many aspects of our care including fluid administration whether calling it restrictive fluid therapy or more appropriately, goal-directed fluid therapy.

First, we must think of fluids as medications and not just carriers since their administration can alter the composition of electrolytes within the body as well as organ perfusion.

To put this into perspective, the administration of a liter of 0.9% normal saline which can occur over minutes with a large bore IV or central line increases the patient's weight by about 2.2 pounds (1/3 the daily requirement for water) and provides three times the daily requirement of salt (9 grams). This is the salt equivalent of a few dozen bags of potato chips.

Pre-operative fluid deficit is greatly overestimated based on the formulas we used when we trained. The NPO requirements have been relaxed allowing and even encouraging clear liquids up to two hours before surgery. Furthermore, the placement of drains such as nasogastric tubes and foley catheters is now discouraged. Lastly, many procedures are performed using minimally invasive techniques reducing the blood and evaporative losses. Therefore, if we give fluids as freely as when we trained, volume overload can be expected.

Recent studies show that fluid administration is not given much thought when in the operating room. A study from 2017 titled *Analysis of Variability in Intraoperative Fluid Administration for Colorectal Surgery: An Argument for Goal-Directed Fluid Therapy* found that there was significant variability in the type and amount of fluid administered as well as the fluid administration rate during colorectal surgery. The mean for total crystalloid administration was 2578 ml with a standard deviation (SD) that was approximately 50% of the mean value. A combination of both normal saline and lactated Ringer's solution was used in almost all cases without a clear rationale for fluid choice. Fluid administered to patients was disproportional to measured intraoperative fluid losses (estimated blood loss and urine output) by a factor of 10. The average rate of fluid given was 1050 mL/h with an SD of nearly the same amount (951 mL). And there was a variability of over 67% in total crystalloid administered based on both ideal body weight and total body weight.¹ Another study from 2015 titled *Variability in Practice and Factors Predictive of Total Crystalloid Administration during Abdominal Surgery: Retrospective Two-Centre Analysis* found a wide variability in crystalloid

administration both within and between individual anesthesia providers, which might contribute to variability in surgical outcomes.²

What is goal-directed fluid therapy? The goal is to optimize stroke volume. It requires a pre, intra and post-operative plan. At any point, the plan can fail if not followed. Low urine output protocol: tolerate it. Studies show that intra-operative urinary output does not correlate with post-operative acute renal injury. What the patients require is "oxygen delivery", therefore they need "flow" not necessarily pressure. Without a device to measure stroke volume/flow intra-operatively, the best determinant of a fluid deficit is a hemodynamic response to a fluid bolus. The administration of 250 ml of crystalloid or colloid is common. There are two parts to the fluid therapy: maintenance therapy and volume therapy. Maintenance therapy replaces insensible losses and urine output which should be 1-1.5 ml/kg/hr for most procedures with higher rates for those involving the larger incisions. Volume therapy treats hemodynamic changes with fluid boluses. Vasopressors are added to increase blood pressure if you feel that the fluids are optimized.

In a Cochrane analysis from 2018 titled *Colloids versus Crystalloids for Fluid Resuscitation in Critically Ill People*, the preponderance of the studies demonstrates that using starches, dextrans, albumin, FFP, or gelatins versus crystalloids probably makes little or no difference to mortality. Starches probably slightly increase the need for blood transfusions and renal replacement therapy. Albumin or FFP may make little or no difference to the need for renal replacement therapy. Evidence for blood transfusions for dextrans, albumin or FFP, is uncertain. Similarly, evidence for adverse events is uncertain.³ Therefore, the choice between crystalloids and colloids appears to be up to the individual administering it.

The crystalloid of choice should be an **isotonic, balanced crystalloid** (lactated ringer's, hartman's, plasmalyte). The electrolytes contained in the solution should closely mimic

the blood plasma. It is important to note that 0.9% normal saline is NOT a balanced salt solution since it only contains Na⁺ and Cl⁻ in equal parts, and we know that large volumes of saline (30 ml/kg/hr or greater) can cause hyperchloremic metabolic acidosis.


So, why does normal saline lead to a metabolic acidosis? It is based on the strong ion difference (SID) within the body. (SID = [strong cations] – [strong anions] = [Na⁺ + K⁺ + Ca²⁺ + Mg²⁺] – [Cl⁻ + lactate⁻]). Disturbances that increase the SID increase the blood pH (alkalosis) while disorders that decrease the SID lower the plasma pH (acidosis). Hyperchloremia caused by large volumes of normal saline decreases the SID leading to hyperchloremic metabolic acidosis due to movement of bicarbonate (a weak anion) intracellularly or bicarbonate wasting through the kidneys to reestablish the normal SID.

This has been demonstrated clinically in a study from 2001 titled *Normal Saline versus Lactated Ringer's Solution for Intraoperative Fluid Management in Patients Undergoing*

Abdominal Aneurysm Repair: An Outcome Study. When normal saline was used as the primary intraoperative solution, significantly more acidosis was seen on completion of surgery. This acidosis resulted in no apparent change in outcome but required larger amounts of bicarbonate to achieve predetermined measurements of base deficit and was associated with the use of larger amounts of blood products.⁴

Furthermore, studies also demonstrate that the use of normal saline in renal transplant patients leads to more acidosis and higher serum potassium levels when compared to balanced salt solutions. For example, a study from 2005 titled "A randomized, double-blind comparison of lactated Ringer's solution and 0.9% NaCl during renal transplantation" showed lactated ringers was associated with less hyperkalemia and acidosis compared with normal saline.⁵ This is assumed to be due to the hyperchloremic metabolic acidosis leads to movement of hydrogen ions intracellularly and potassium ions extracellularly.

Lastly, we should discuss the "endothelial glycocalyx" which may be responsible for maintenance of fluid homeostasis. It is a jelly-like protective layer made of mostly glycosylated proteins covering the luminal surface of the endothelium. It is the molecular barrier for plasma proteins. Perioperative damage to the glycocalyx increases vascular permeability leading to interstitial fluid shifts, edema, platelet aggregation, leukocyte adhesion, creation of a prothrombotic environment and increased surgical morbidity. Pathological shedding of the glycocalyx occurs in response to hypervolemia (endovascular expansion), endotoxins, inflammatory mediators, atrial natriuretic peptide, ischemia-reperfusion injury, oxygen free radicals and hyperglycemia. Protecting this structure during surgery means limiting the surgical trauma and avoiding intravascular hypervolemia. Hypervolemia induces a significant amount of protein movement into the interstitial space. Studies show that most of the proteins in colloids are lost during hypervolemic administration, however, most, or all stay in the intravascular space during euvolemic hemodilution.^{6,7}

I hope that after reading this, you will never look at fluid administration in the operating room the same way. You will be hanging a medication no different than any other infusion of say norepinephrine, vancomycin or propofol with the ability to benefit or hurt the patient depending on how administered. 

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"...using starches, dextrans, albumin, FFP, or gelatins versus crystalloids probably makes little or no difference to mortality."

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Outlook

PROGRAM DIRECTOR INSIGHTS



**MICHAEL BOYTIM
CRNA, EDD**
KAISER PERMANENTE/
PASADENA CITY COLLEGE
ANESTHESIA TECHNOLOGY
PROGRAM DIRECTOR

"Earn a bachelor's degree in your pajamas!" "Attend college full time without leaving the house!" "Study at your convenience whenever and wherever you want!"

Marketing of a variety of online degree programs has made these options vary desirable. This affords more flexibility

than the traditional on campus face to face experience. Distance learning is an educational process where students receive instruction through online classes, video recordings, video conferencing, or any other audio/visual technology medium. It enables people to receive education without having to be physically present in a classroom.

Accessibility to a large population makes distance education an appropriate vehicle for learning. It's convenience way provides students the ability to maintain employment while completing college coursework or vocational training

Distance education is an effective learning process where students experience a learning environment through synchronous/asynchronous online course, video conferencing, pre-recording posted lectures, as well as a variety of audio/visual technology medium. Distance education provides an educational opportunity enables without face-to-face classroom presence.

There are a variety of positive factors regarding the accessibility of distance educational programs such as students living from rural areas where institutions of learning are a far distance.

International students now have the ability to attend their college of choice.

A variety of technologies are used to enhance the distance education learning experience. Specialized computer programs, high speed Internet, and webcam broadcasting technology are just a few of the modern technologies utilized in distance learning. Educational opportunities that weren't attainable in various distant and rural now exist. It's now possible for a student living in a rural area of Arkansas to enroll in courses and obtain a degree in a California college.

Students have the ability in converse with fellow students and instructors via chat rooms in completing groupwork projects in posted website courses. Students also use e-mail, other forms of instant messaging, and web broadcasting technology such as Zoom and MS Teams to discuss course material with fellow classmates or instructors.

Many course assignments are completed on a college website platform such as Canvas or submitted as email attachments. Most reference materials are supplied as electronic textbooks instead of the traditional hard copies.

There are instances where distance education offers students an opportunity for a career in which there is a need of a specific workforce, but that area does not have any educational programs. For example. The Kaiser Permanente/ Pasadena City College Anesthesia Technology Program(KPAT/PCC) was approached by a Kaiser Permanente facility in Northern California (NCal) as a dire shortage of certified anesthesia technologists exists in that area. Therefore these are

very hard to fill positions, and Kaiser Permanente wanted to collaborate to find an effective solution to address the problem. It was decided that we will begin a distance educational program where we will utilize Kaiser Permanente NCal as a "satellite campus". Students from NCal will enroll in the 31 unit 1 year KPAT/PCC program after meeting all of the admissions requirements. All academic course work will be completed through live synchronous coursework broadcasted from the KPAT/PCC program in Southern California (SCal) through Zoom, as well as asynchronous instruction where prerecorded lectures will be posted on the website. All students will learn all didactic instruction at the same time. Student may ask questions live in the synchronous session, post questions in Chat, or can e-mail or text the instructor. Various discussion boards will be utilized in all courses for student group work on projects, assignments, and student presentations.


Separate clinical sites will be used in NCal but will offer the same clinical experiences as in SCal. Each clinical site will have a clinical coordinator for student assignments and cases. Students are clinically evaluated using a clinical evaluation tool that will be submitted to the SCal location. A Regional Clinical Director will be hired in NCal to oversee all of the clinical sites and will instruct all of the required labs and patient simulation experiences.

Therefore, the students in NCal will attend the same program as the students in SCal but not have to relocate which affords them the ability to continue to work if needed and spend time with their families. Kaiser Permanente NCal will now have the ability to recruit and retain

certified anesthesia technologists that graduate from the program in the NCal satellite campus, and hire in these hard to fill positions.

The beauty of distance education!!

Michael Boytim, CRNA, EdD

Director
Kaiser Permanente/
Pasadena City College
Anesthesia Technology Program 

TID BITS

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Learnings

STUDENT CORNER



Full Circle

As a program director, I am often amazed of the accomplishments of our students and graduates. Our students put in countless hours in class and clinical preparing for and assisting in anesthesia care delivery to multitude

of patient populations. Our graduates not only are proficient healthcare professionals, but many are also clinical instructors/coordinators, team leads, administrators, and educators. Many have become registered nurses, nurse practitioners, and PA's. Some are continuing to become nurse anesthetists. I would like to personally acknowledge all of them and the contributions they provide to our program and students, but the list would be exhaustive! They know who they are.

One of those graduates is Sara Paraspolo. Sara is a graduate of the Kaiser Permanente/Pasadena City College Anesthesia Technology Program (KPAT/PCC) and was in the first graduating class 2011. I am so very proud of Sara as she came full circle as an applicant, student, clinical instructor, clinical coordinator, and now a full-time didactic faculty member who also directs the clinical aspects of our anesthesia technology program. Let me introduce Sara:

"My name is Sara Paraspolo, a very eager and excited full-time faculty member of the Kaiser Permanente/Pasadena City College Anesthesia Technology Program. I have been looking forward to this day for a long time. I am also a proud graduate of the first graduating class of the KPAT program in 2011.

Prior to being the new Didactic Instructor & Director of Clinical, I've spent the last ten years as a Certified Anesthesia Technician and Technologist. With gratefulness, I received great experience and training during my employed clinical years at Huntington Hospital in Pasadena, UC Irvine Medical Center and Kaiser Permanente Baldwin Park. I worked with a wonderful group of co-workers along the way. So many of them helped strengthen and shape who I am today.

Consequently, my enthusiasm and interest for the medical field did not

start there. My beautiful mother has been a Registered Nurse for the last 42 years. Growing up with an ICU nurse as mother, you can imagine how many knocks at the door we had from the neighborhood, phone calls from family & home visits, to those in need. The thrill of helping someone enticed my want even greater, to know how to help people. My father gave me a choice to study and become what I want. He encouraged me to go after my dreams no matter what it was. He (and his immediate family) escaped from Cuba during a very hostile time in our world. Although my father was able to finish growing up here, learn & become a citizen, his father gave him only one choice: become a painter/construction worker like him. There is no shame in that, but without the ability to make my own choices, I think my life would be very different. I cannot thank my parents enough, for the influence, love and support they gave my brothers and I growing up. It's because of their encouragement and example of hard work, that brought me through each job, as well as failures and triumphs in life. The only thing he gave me no choice on, was the kind of job I was able to obtain out of high school. "It has to be something related to your future career!" he said. Thanks to earning Associate Degrees in Fine Arts & Music Theory and in Biological Science, Certificates of Biblical Studies and in

Anesthesia Technology, and 7 years of experience as an EKG Technician, I am where I'm supposed to be today. As colorful as my education has been thus far, I look forward to furthering my education to obtain advanced degrees in the near future to compliment my new faculty position.


Let me not forget about my amazingly supportive husband Dustin and loving daughter Sofia. They've gone through each adventure with me. Sofia was born 4 weeks before I graduated from (KPAT/PCC). She became the class mascot and honorary Anesthesia Technologist.

My new adventure will be to give more of myself to the coming generations of certified anesthesia technologists. I look forward to imparting the most current academic and clinical education to students to facilitate their goal in becoming certified anesthesia technologists, as well as working alongside such an innovative team of faculty in a great anesthesia technology program that has provided me this once in a lifetime opportunity."

Sara Paraspolo is the epitome of a successful graduate of our anesthesia technology program. Her formal didactic and clinical education, as well as her clinical experience as a certified anesthesia technologist has prepared her to return to where she started as a student and pay it forward and give

back to future certified anesthesia technologists. I am very proud of you Sara and congratulations on your new faculty position!

Michael Boytim CRNA, EdD

Director
Kaiser Permanente/
Pasadena City College
Anesthesia Technology Program 

Obstetrics Case Study: Placenta Previa



CARMEN GARIA
HOVIK BAGHDESERIAN
KAISER PERMANENTE SCHOOL
OF ANESTHESIA TECHNOLOGY

Placenta Previa is defined as a condition where the placenta lies in the lower region of the uterus, partially or entirely covering the opening of the cervix. Symptoms include bright red vaginal bleeding during the second half of pregnancy as well as cramps, sharp pains or contractions. Risk factors include history of smoking, age over 35, previous pregnancies, multifetal pregnancy, having had previous cesarean section deliveries and previous uterine surgeries (Dulay, 2020).

Obstetric and pregnancy complications include a wide scope of childbirth challenges that may have fatal consequences to the mother and newborn. Consistent checkups and examinations with a primary healthcare provider during pregnancy can help early diagnosis and treatment. Placenta previa can lead to serious complications such as an emergency cesarean section, premature labor, and life-threatening bleeding (hemorrhage). The purpose of this research paper is to discuss the risks of Placenta Previa, difficult airway management during emergency cesarean sections, preparation for potential hemorrhaging during the operation, and the role of the anesthesia technologist to best prepare for this scenario.

Patient History

The Anesthesia care team is presented with the case of a 38-year-old female, gravida 3, para 2, who is 34 weeks pregnant. The patient arrived at the hospital due to experiencing vaginal bleeding, contractions, and abdominal pain. She has a blood pressure of 120/60, weighs 200 pounds, and is 165 cm tall upon admission. According to Swamy (2018), "3 to 4% of women have vaginal bleeding" during the late pregnancy stage after 20 weeks. Bleeding

during the third trimester of pregnancy can indicate possible complications such as placenta previa (low implantation of the placenta in the uterus) and abruptio placentae (premature separation of the placenta from the uterus). In order to work out what is causing the bleeding, the patient would need to have a vaginal examination, an ultrasound scan and blood tests to check her hormone levels. After a vaginal examination, her bleeding increased drawing concern to its bright red color. An emergency caesarean section under general anesthesia is scheduled to deliver her fraternal twins.

The patient does not have any preexisting medical conditions. However, she exhibits risk factors for placenta previa which include "multiparity, older maternal age over 35 years old, and multifetal pregnancy" (Dulay, 2020). The placenta is normally located where a developing embryo implants itself into the lining of the uterus, which is usually in the upper part of the uterus. Placenta previa is a condition where the placenta is at the lower region of the uterus, partially or entirely covering the opening of the cervix. Therefore, the placenta is prone to antepartum bleeding and doctors will need to use ultrasonography to check the location of the placenta. Due to the "high risk of massive bleeding, general anesthesia is usually recommended for a patient who has more than 1500mL of vaginal bleeding" and performing an emergency cesarean section will help avoid the potential for fatal hemorrhage (Eldemrashed, 2017). The use of general anesthesia is preferred in this scenario due to the potential for hemodynamic instability, risk of ongoing massive hemorrhage, and prolonged surgery time. It will also provide a very rapid and reliable onset, control over the airway and ventilation, help with patient discomfort for extreme anxiety in parturients, and ensure focus on volume resuscitation.

Proper Equipment

As anesthesia technologists, our role in the anesthesia care team is to prepare all anesthesia equipment that will be used in surgical procedures. We begin by doing a full FDA anesthesia machine checkout and ensuring that all auxiliary equipment is in good working order prior to any case. As we will see in this case, all that prior preparation will be useful and necessary. Furthermore, checking that the suction apparatus is in working condition as it is extremely important for the provider to suction and clear any secretions throughout the surgical procedure. Warming devices such as convective warming blankets are needed to keep the patient warm to prevent hypothermia associated with coagulation abnormalities. Have a bag-valve mask available nearby the anesthesia machine. The patient needs to be monitored

continuously for rapid hemodynamic changes by setting up and placing standard ASA monitors. However, special care should be placed on pulse oximetry and blood pressure, as those will be important factors to keep an eye on. Two large-bore intravenous (IV) lines would be preferable. However, in most instances the patient will only have one. Therefore, we would need to discuss with the anesthesia care provider if we should begin a second large bore IV prior to surgery starting. Placing the largest possible bore IV will help if fluid resuscitation is needed. Colloids in general and crystalloids such as ringer's lactate or normal saline are infused to achieve and/or maintain hemodynamic stability. We are selecting to prepare units of blood on type and cross instead of type and screen, because we are almost assured that this patient will need blood.

The units of blood are readily available in an active or passive cooler in the operating room where we can start those units and maintain their refrigerated temperature when not utilized. Furthermore, a rapid infuser machine and fluid warmer should be available in the room. Consult with the anesthesia care provider if an arterial line (A-line) will be needed to have ready for this case. During pregnancy, "engorgement of the respiratory mucosa predisposes the upper airway to trauma, bleeding, and obstruction" (Butterworth et al., 2018, p.845). Setting up a smaller cuffed endotracheal tube (6.5mm-7mm) and a Macgrath with MAC 3 disposable laryngoscope blade is recommended.

Potential Complications

A preoperational examination of the "neck, mandible, dentition, and oropharynx" will help predict if the patient has or may have potential airway complications (Butterworth et al., 2018, p.876). Again, according to Butterworth, there are useful predictors for a difficult intubation including "Mallampati classification, short neck, receding mandible, or prominent maxillary incisors" (p. 876). Anticipation of a difficult endotracheal intubation helps decrease the incidence of failure to intubate. However, a clear plan can be formulated using an algorithm for a difficult intubation in obstetric patients. Additional equipment to have

readily available are the difficult airway cart, "a variety of laryngoscope blades, a short laryngoscope handle, a styletted endotracheal tube, Magill forceps, a laryngeal mask airway, intubating supraglottic airway, a fiberoptic bronchoscope, a video assisted laryngoscope, the capability for transtracheal jet ventilation, and possibly an esophageal-tracheal Combitube" (Butterworth et al., 2018, p.876).

"According to Stoelting, we may experience issues that were not planned because the patient has many physiologic alterations in their anatomy..."

We should keep in mind that when we are dealing with pregnancy. According to Stoelting, we may experience issues that were not planned because the patient has many physiologic alterations in their anatomy including cardiovascular, gastrointestinal, and pulmonary systems. The patient is undergoing an emergent surgical delivery without an elective fasting period, so an H2 blocking

drug, orally or intravenously, "should be considered in high risk patients and in those expected to receive general anesthesia" to reduce gastric volume and pH (Butterworth et al., 2018, p.863). Therefore, according to Butterworth, the patient should be given a clear antacid 30 minutes prior to the procedure in order to maintain gastric pH and reduce the risk of severe aspiration pneumonitis (p. 863).

Since there is a high risk for hemorrhage, the patient will need to be monitored continuously and providers must be prepared to initiate massive transfusion protocol when necessary. The patient may need blood transfusion, so they will need to have intravenous access prepared in preop. If time permits, an arterial line should also be inserted to measure blood pressure more accurately during the procedure. Lab tests should be run immediately before the procedure. Type and screen is appropriate upon admission for "patients who are at low risk of bleeding, not pregnant, and have not had a prior positive antibody screen" (Bennett, 2016).

However, type and cross is the best option as the possibility for rapid infusion is significant. External monitoring of the baby should be set up to check if they are in distress and monitor the mother's vital signs to ensure they are not going into shock during surgery. Finally, serial sampling such as arterial blood gas with hematocrit, type and cross, complete

blood count for platelets, coagulation profile fibrinogen and a thromboelastogram are some of the potential tests that will be run for this procedure.

"In pregnant and obstetric patients, we should consider that the increased cardiac output, increased oxygen consumption, and decreased Functional Residual Capacity (FRC) may potentially become a serious matter that can impact the anesthesia care plan." (Thompson, 2020). The other potential problem for cesarean section surgeries is Venous Air Embolism (VAE). This problem takes place due to Trendelenburg surgical positioning, hemorrhage, surgical site, and some other medical procedures. Air embolism lowers EtCO2 level and increases EtN2 levels in blood. VAE could be fatal. Indeed, symptoms and signs that may occur because of VAE include dyspnea, cyanosis, hypoxia, and chest pain. If a VAE is determined, it can be mitigated by frontloading fluids to the patient, begin central venous catheterization (CVC), repositioning the patient to place the heart level above the level of incision, and administering 100% Oxygen. Fluid administration or hydration is the effective way to reduce the risks of air embolism. "VAE can be prevented significantly by proper positioning during surgery, optimal hydration, and avoiding use of nitrous oxide" (Shaikh, et al, 2009). Since CVC requires sterile technique and sterile field, the anesthesia technologist should be aware of proper methods of scrubbing, sterile gowning and gloving, and how to prepare the ultrasound machine. Therefore, preoperative CVC line placement could be a good choice for high risk obstetric cases.

Plan of Anesthesia

Prior to entering the operating room, the patient should be positioned with her left side laying to increase perfusion to the uterus, more perfusion to the baby via the placenta. The anesthetic medication plan will be as follows: The patient receives intravenous Versed to decrease anxiety and sedate for induction. Steroids can be given to increase maturity of both fetuses so they can be ready for delivery. Once the patient enters the operating room and is

transferred to the operating table, the anesthesia technologist can help by placing the standard ASA monitors, obtain the initial set of vital signs, and place a rolled towel under the shoulders of the patient to elevate the chest. Extending the neck and positioning the head to facilitate insertion of the laryngoscope blade will improve visualization of the glottis.

Induction of Anesthesia

The induction of general anesthesia starts with rapid sequence technique using cricoid pressure after denitrogenating and preoxygenating for 3 minutes has occurred. "The combination of decreased Functional Residual Capacity (FRC) and increased oxygen consumption promotes rapid oxygen desaturation during periods of apnea," therefore, preoxygenation prior to induction of general anesthesia is an absolute to avoid hypoxemia (Butterworth et al., 2018, p.876). A standard induction agent is Propofol (2 to 4 mg/kg IV) followed by Succinylcholine (1 to 1.5 mg/kg IV) or Rocuronium to help ease the tracheal intubation. Propofol produces "neonatal depression, but is rapidly redistributed and cleared from the neonate resulting in a rapid emergence" (Nagelhout, 2018, p. 1081). Usually tracheal

intubation increases systemic blood pressure. "Drugs that could be useful to control the blood pressure during the operation are: sublingual Nitroglycerin, Esmolol, Fentanyl, and Lidocaine" (Varon, J. et al, 2008).

Intraoperative hypertension might be controlled by volatile anesthetics. Induction of anesthesia is delayed until the surgical team confirms that they have fully prepped the patient with chlorhexidine gluconate solution and draped. All surgical

tools and staff are ready to follow the anesthetic and surgical plan stated during the surgical timeout. The operating surgeon delays incision until the anesthesiologist verifies correct endotracheal tube placement through "capnography, auscultation of breath sounds over the chest, and bilateral chest expansion" (Nagelhout, 2018, p. 1081). Drugs such as vasodilators, antihistamines, ephedrine, and β -adrenergic blockers are transferred to the fetus. Therefore, immediately after the patient has been induced and an endotracheal tube

"The combination of decreased Functional Residual Capacity (FRC) and increased oxygen consumption promotes rapid oxygen desaturation during periods of apnea..."

Continues on next page . . .

is in place, the obstetrician will begin cutting immediately to minimize fetal exposure to depressant drugs.

Maintenance of Anesthesia

Risk of failed intubation is higher in the obstetric patients, than in non-pregnant patients (Nagelhout, 2018). The main logic behind it is physiological and biochemical changes that occurs in the body during pregnancy such as elevation of intragastric pressure due to gravid uterus, a relaxed gastroesophageal sphincter because of progesterone imbalance, and etc. any of these situations increase the risk of aspiration. High probability of having allergies to sedation, muscle relaxants, and analgesia drugs in the operating room greatly increase the cause of pulmonary aspiration and difficult intubation. Preoxygenation for 3-5 minutes, using a well-fitting mask is mandatory before intubation. Rapid sequence induction as mentioned above, in the general anesthesia is the best choice in these scenarios. The most important role of anesthesia technologist in this part could be helping to provide cricoid pressure, that is the best way to prevent

aspiration and help the provider to do a safe intubation. In the case of failed intubation, the anesthesia tech should maintain oxygenation and have a difficult intubation cart close to the provider. On the other hand, aspiration of gastric fluids leads to serious clinical consequences such as bronchospasm, hypotension, hypoxemia, and tachypnea. Possible edema of the upper airway structures in emergency cesarean delivery will require preparation of different sized endotracheal tubes and oral airways.

According to Stoelting, "during the maintenance of general anesthesia for cesarean section, both Sevoflurane and Propofol are the proper choices. Volatile agents with or without nitrous oxide can be administered for maintenance." Inhaled agents are appropriate in emergency obstetric patients, but otherwise would be avoided to not affect the fetus. Inhalation agents generally produce little fetal

depression when they are given in limited doses and delivery occurs within 10 minutes of induction. In cesarean deliveries, "opioids are administered after the delivery in order to avoid the side effects or concern of placental transfer to the neonate" (Stoelting et al., 2006, p.495). Newborns are more sensitive to the respiratory depressant effects of morphine compared to other opioids. Fentanyl has minimal neonatal effects unless larger intravenous doses are given immediately before delivery. An interval of 3 minutes between uterine incision to delivery is ideal to prevent neonatal depression. In the event that complications

arise, and the infant delivered becomes depressed, they will require active resuscitation by a neonatologist.

"Regional anesthesia is appropriate for elective cesarean delivery in a woman with known placenta previa, but for emergency situations with active hemorrhage, general anesthesia may be required, and ketamine is useful drug for induction of anesthesia." (Stoelting et al., 2006, p.496). Based on Eldemrdash's (2017) article, "the estimated blood loss in patients from the general anesthesia group [is] higher than average of the regional anesthesia group, and


the proportion of patients who receive fresh frozen plasma and packed red cells [is] significantly higher in the general anesthesia group". Rapid blood loss during the operation can lead to serious consequences both for mother and the fetus. Such as a drop in the mother's blood pressure and even shock. The rapid infuser should be ready and available in the room for this situation to infuse the blood at high speed in order to compensate for the blood loss.

Anesthesia Emergence

Once the surgery has ended, the patient is extubated awake after they have recovered neuromuscular function and extubation criteria is met. Tocolytics can be given to stop contractions. Airway obstruction is common in the postoperative period, so before extubation we have to make sure that the patient is awake and breathes on her own, the risk of (cannot ventilate cannot intubate) is one of the main

disadvantages of general anesthesia. Patients should receive supplemental oxygen after surgery and the whole time in the recovery room because of hypoxemia after surgery. The other postoperative issue is hypotension due to blood loss and hypertension because of surgery pain or anxiety, therefore postoperative pain management is needed. The patient's blood pressure, heart rate and rhythm should be monitored carefully in the recovery room. Making sure that the oxygen tank is full during transportation to the post-op area, and have the nasal cannula or oxygen mask ready next to the patient could be important points that anesthesia technicians take into consideration.

Conclusion

Taking care of all patients in the operating room is the moral and professional responsibility of all individuals during the whole case. Communication with the provider and following the scope of practice and job description are essential. Helping with positioning the patient, preoxygenation, rapid sequence induction, difficult airway cart set up, prepare laryngoscope, extra O2 tank, bag-valve-mask are alternatives that might be useful in critical situations. Caring for the patient, anticipating, and providing for the best outcome, having a clear understanding of potential problems, and being able to assist the provider in any unexpected events, makes for a successful anesthesia technologist. 

"Regional anesthesia is appropriate for elective cesarean delivery in a woman with known placenta previa, but for emergency situations with active hemorrhage, general anesthesia may be required, and ketamine is useful drug for induction of anesthesia."

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Take the
QUIZ
Click here for a copy of the quiz.

Partners

Notes

ASA

I attended the American Society of Anesthesiologists (ASA) 2021 annual meeting in San Diego, October 9-13. The in-person meeting included the Committee on Equipment and Facilities (E&F) annual meeting where the ASA liaison to the ASATT sits (which is me). I gave an update on the ASATT, and the committee as a voice for the ASA continues to support the ASATT and will continue to help in any way to advance the specialty of Anesthesia Technology.

Joseph F. Answine, MD, FASA
Liaison to ASATT 



REGIONAL UPDATE

REGION 1




Happy Fall Everyone!!

Well, the trees are not as colorful as they were, however not much snow yet. Although I will tell you that I do not think that it is very far away. Please make sure you keep your eyes open for Meetings on the website. The Annual Meeting for next year

will be in Fort Worth. Start planning now. It is going to be so much fun. The dates are August 10th- August 12th. Get ready to put your cowboy hats and boots on.

Region 2 & Region 7 held a Virtual Regional Meeting on November 20th. Please check the Meeting link for times and registration information of future meetings. These are a great way to get even more CEUs. Remember you do not have to live in that region to attend another regional meeting. Anyone is welcome to attend them and what a great way to get some CEUs. The price is right for sure.

Recertification opened on November 1st, so please get all your eggs in one basket, and make sure you have enough if it is your year to recertify. Please do not wait until the last minute. Get it done early!

Respectfully submitted,
Jonnalee Geddis, Cer.A.T. 

REGION 2



Hello to our members,

I hope everyone is doing well. With summer gone and Fall is upon us hopefully you will get a chance to enjoy the changing of the seasons with some fun family activities planned!

I would like to say Thank You to

our members that attended the Virtual National Conference. I think it was a big success.

I held a Region 2 Zoom Meeting on November 20, 2021. This was a combined meeting with region 7. It was worth four (4) CEUs. Remember the nice thing about zoom meetings is that you can attend any of the Regional Meetings that are going on.

Have you ever thought about being more active in our society? ASATT members may want to consider writing an article for the Sensor, ASATT is always looking for members to contribute to our quarterly publication, remember you can earn CEUs and may be eligible for the Science and Technology award and this could be a great way for you to get more involved.

Don't forget to visit our ASATT website it has very useful information and articles on Healthcare news. Plus don't forget the discussion boards where you can ask questions and share ideas.

Remember if you are up for Recertification this year don't wait till the last minute to get your CEUs lined up. It's much quicker if you have them on the ASATT website when you are a member, that's one of the perks being a member because it makes it easier and faster to get your application submitted.

Stay safe,
Karen Patrick, Cer.A.T. 

REGION 3




Greetings Region 3,

I would like to thank Greg Farmer for his hard work and dedication to the Society as well as to each of us for the successful completion of a second virtual national conference! Speaking of the

virtual conference, if you attended, please check your database NOW to be sure that your CEUs have posted to your profile. Please stay tuned to the website and your email for further details on future regional meetings.

Recertification for the period ending 2021 has begun. Every year, we say the same thing, please do not wait until the last minute to submit your application and CEUs. Yet every year, we have at least 25 individuals who hold out until the very last minute and then face being suspended without pay until they renew their certification. Please do not be one of these individuals!!

As the pandemic continues to wreak havoc on work and life, I hope each and every one of our members is staying safe and healthy.

As always,
Stay Safe and Stay Healthy!
Sue Christian, Cer.A.T.T. 

REGION 4



Hello Region 4!

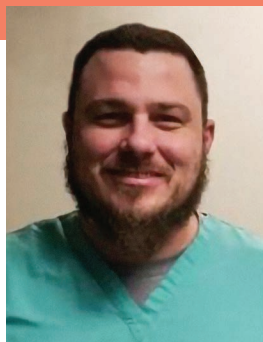
My name is Mike Kosanke. Just wanted to introduce myself. I've been an anesthesia tech for 20 years and proud to say I've been certified the entire time. I've been the lead tech for the last 8 years

at the VAMC in Milwaukee. Being from Wisconsin I love everything outdoors and get out as much as possible. My wife and I (25 years) have 3 rescue dogs to make up our family. I'm looking forward to representing this region and continue to help our profession grow. If you have any questions in relation to any of that feel free to contact me.

Mike Kosanke, Cer.A.T.T. 

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REGION 5

**Hello from Region 5.**

Now that it is getting closer to the end of the year, make sure all your credits are up-to-date in the database, and if it's your year to recertify make sure, you are ready as early as the beginning of November. Make

sure to look into the new memberships as well, they have many good credits to earn from them. You will be setup for whichever you choose for one virtual region meeting a year that is up to six CEUs, and get discounts on other regional meetings as well as the national conference. In addition, you will get the Sensor and there are credits in those as well. If you are member, the database will keep your CEUs on record for you and you can login to check your status. Depending on which one you pick, the recertification fee is waived with a two-year membership and \$100 for a one-year membership.

We will be putting on more regional meeting next year, if there is any type of presentations you are looking for let your regional director know and we will try to get some in. As the year ends, the days get busier and you have to work longer hours, remember to take care of yourself as well as your family. I hope everyone has a great holiday season and a great new year.

Stay safe,

Jason Menchey, Cer.A.T.T. 

REGION 6

**Hello Region 6!**

My name is Lauren Luna and I am so happy to be here and look forward to connecting with you. I hope you were able to attend the (Virtual) National Conference. We were lucky to have some great presentations

this year; and I look forward to going in person in the years to come. I currently live in Southern California and have worked as an Anesthesia Technologist about 8 years.

I previously worked in Ohio before moving here. I have seen the variety of different roles of anesthesia technicians and technologists and am hopeful to expand the role and educate managers on our scope of practice. I love being hands on and working so closely with the providers and I want that opportunity for all technicians and technologists. I have to mention I even met my husband in the OR! We have three girls (twins and a baby) and 3 step-sons and they are amazing! I look forward to planning a meeting soon for another opportunity for CEUs!

Also if you are up for renewal this year and have any questions please feel free to reach out. It's time to make sure you're getting all the CEUs and your updated BLS/ACLS/PALS if needed.

Lauren Luna, Cer.A.T.T. 

REGION 7

**Howzit Region 7!!!**

Winter is here. Wow, the year is almost over. The NFL & NCAA football is in full swing. Major League Baseball is done, and NBA & NCAA basketball has started. It's a great time of the year. The temperature are

dropping for everyone. Fall was beautiful for whoever lives where the leaves in the trees change color. That doesn't really happen in Hawaii.

This was our second Covid fall; this is also the beginning of flu season. So, we must take everything in stride and move forward. Please continue to stay vigilant and have "Situational Awareness". Don't let your guard down and stay alert.

**"Enjoy every moment.
All of them will be precious later."**
~ Unknown ~

Life before Covid 19, was how we lived, and what our holiday season look will like. Hopefully, we can all gather and enjoy getting together with our family and friends. We all need to make lasting memories of the holidays again. This year while attending your gatherings, take time to reflect and appreciate the time that you have with the people you treasure.

**"The best thing about Memories...
is making them"**
~ Unknown ~

ASATT has had a very successful year. There have been changes and some of the changes have not made everyone happy. But, change is not always easy. We have had numerous virtual meetings that were well attended. The 23RD Annual Region 7 Hawaii meeting had over 200 attendees, while the Annual meeting had over 600 attendees. Wow!!! But, I still miss getting out into our regions, talking and meeting with our members/peers. I hope that we can have a few face to face meetings in 2022.

"Change is the heartbeat of growth."
~ Scottie Summers ~

I'll say it again and again... ASATT is the society that will help our profession grow and move forward into the future. I know ASATT's plan WILL NOT make everyone happy, but you must look at the overall direction that our profession is headed. Give our leaders the benefit of the doubt they are not out to short change you. There will be some hard decisions to be made and they are making these decisions with careful consideration to improve our profession. I have been around for a LONG time and we have grown and improved more than many of you know. There's only a small percentage of our peers that have been in this profession over 30 years like I have. I was around when we had NOTHING and look at where we stand now. As I have said before... We are laying the foundation for future generations of Anesthesia Technicians & Technologist and we MUST build this together.

**"In life and business,
if you want to go fast, GO ALONE.
If you want to go far, GO TOGETHER."**
~ African proverb ~

Please enjoy your holiday season with family and friends. Make Memories.

PLEASE BE SAFE AND PROTECT YOURSELVES...

Aloha,

Delbert Macanas, Sr., Cer.A.T.T. 

Academy

ASATT ACADEMY

Virtual Meeting Realignment


The ASATT Board is excited to announce the implementation of a new virtual meeting realignment structure that will offer consistent Regional meetings every quarter. The new model will combine two to three regions each quarter to provide our members with an option to attend a regional meeting nearly every other month throughout the year. This structure will allow our members to plan ahead and register for Regional meetings months in advance.

At the end of November, Regions 2 & 7 held their regional meeting! Check your email and our website for specific details on future webinars! We look forward to everyone joining us again for these great education opportunities!

NEW! Earn CEUs for *SENSOR* Publications!

We want to hear from you! Have you recently written an article on Anesthesia Technology or a subject related to the Anesthesia Technology field?

If so, this is the perfect opportunity to showcase your publication in an issue of the *SENSOR* and earn CEUs! ASATT is always seeking Feature Articles from you to share with our membership.

The Board of Directors are reviewing the details so keep your eyes open for more details! 

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Looking to Volunteer on a Committee?

Join one of our ASATT Committees by visiting our [Committee page](#).

- Bylaws Committee
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- Financial Committee
- Nominations Committee
- Strategic Planning Committee
- Item Writers
- Accreditation Committee
- Continuing Education Committee

The logo for the American Society of Anesthesia Technologists and Technicians (ASATT). It features the lowercase letters 'asatt' in a bold, teal, sans-serif font. A white ECG (heart rate) line is integrated into the letter 'a', starting from the left and ending at the top of the 'a'.

AMERICAN SOCIETY OF
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