

APRIL 2021

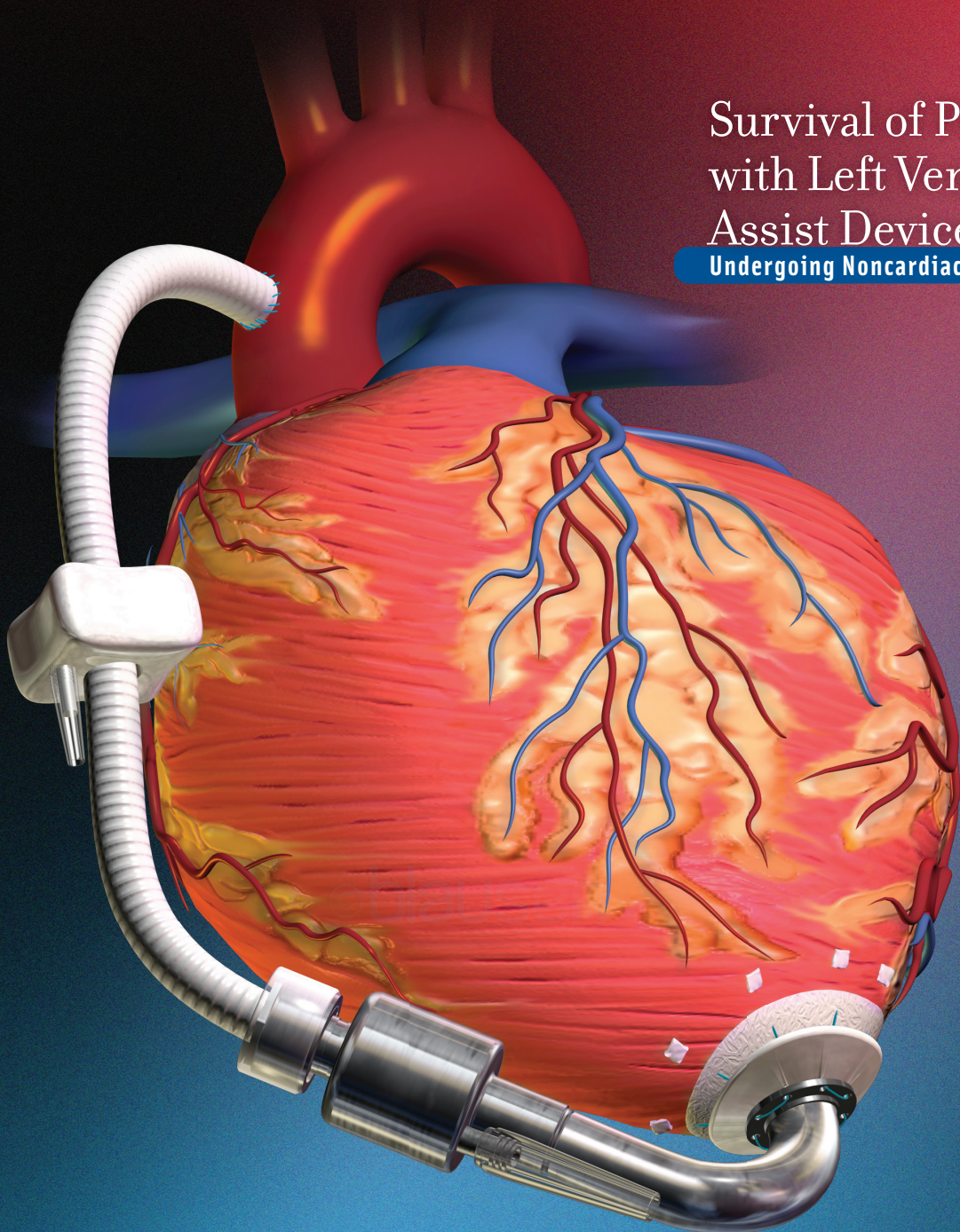
THE

VOLUME 53 NO 4

# SURGICAL TECHNOLOGIST

OFFICIAL JOURNAL OF THE ASSOCIATION OF SURGICAL TECHNOLOGISTS, INC.

Survival of Patients  
with Left Ventricular  
Assist Devices  
Undergoing Noncardiac Surgery







# AMERICAN SURGICAL PROFESSIONALS

American Surgical Professionals is the leading provider of surgical assistant and technologist solutions in the United States. For twenty years, ASP has partnered with healthcare facilities to manage and minimize staffing complexities and the expense associated with surgery, measurably improving patient outcomes.









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References: 1. Final Design Verification Report. Mölnlycke Health Care. Data on File. 2. Global Surgeon and Nurse Survey Conducted by SERMO 2020. Data on File.

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## 20%

of clinicians surveyed have experienced skin irritations from gloves<sup>2</sup>



\* Made without chemical accelerators known to cause contact dermatitis: Dithiocarbamate (DTC), Diphenyl thiourea (DPTU), Diphenylguanidine (DPG), Zinc mercaptobenzothiazole (ZMBT), Thiurams.<sup>1</sup>

  
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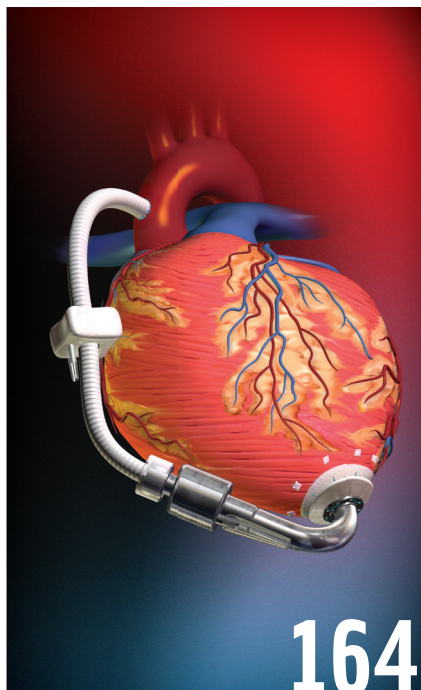
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**JOURNAL DEADLINES** The deadline for editorial copy is 8 weeks prior to the cover date (eg, the deadline for the June issue is April 1).

**POSTMASTER** Send address corrections to The Surgical Technologist, 6 West Dry Creek Circle, Suite 200, Littleton, CO 80120-8031.



## Survival of Patients with Left Ventricular Assist Devices Undergoing Noncardiac Surgery

AMGAD MENTIAS, MD, ET AL

This study examines the trends, patient characteristics and outcomes associated with noncardiac surgery among patients with LVAD. It further analyzes how many patients with LVADs underwent NCS and experienced major perioperative adverse events such as ischemic stroke, intracerebral bleeding, or all-causes mortality.

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# We're Forging Ahead Until We Can Meet Again in Person

HOLLY FALCON, CST, FAST

## PRESIDENT'S MESSAGE

Spring is always a busy time for AST. It is the time we host our Educators Conference, state assembly meetings, and make award selections for our most prestigious awards. Things are looking a little different this year, but we are still focused on these activities. Hopefully, we will be back to our normal routines soon, but in the meantime, we are finding innovative ways to continue business as usual.

In-person meetings are not possible in all states at this time. However, state assemblies are finding creative ways to keep members engaged through social media and virtual workshops. There are a few state assemblies who plan to host live events in areas where group-gathering restrictions are not an obstacle. Many other states are planning virtual events that will still provide CEs for members. We all miss the networking opportunities that an in-person meeting provides; however, kudos to those state assembly boards that have worked hard to make the transition to the virtual world in areas where restrictions prevent a live event.

In February, AST hosted its first virtual Educators Conference. Nothing truly takes the place of face-to-face meetings, but the virtual conference was a huge success. Hats off to our Educational and Professional Standards Committee and the AST staff for the dedicated efforts to make the transition to a virtual platform. This conference is an important event for educators as it provides them with the tools necessary for success in the classroom and clinical lab. A total of 380 educators, partners and vendors participated in this event, and despite a few technical issues, the overall comments from attendees were positive.

Each year at Educators Conference, I have had the honor to announce our AST Galaxy Awards and the Foundation for Surgical Technology's Constellation Awards. This year, I was not able to call those names up to the stage to receive an award, but the awards were still decided as we had many deserving educators. Each year AST recognizes two program

directors who promote student success in the profession by encouraging membership in AST. The winners of the Galaxy Award are:

- *Daisy Gibson, Great Falls College Montana State University*
- *Amy McCuen, Minnesota West Community and Technical College*

The Constellation Awards were designed to give recognition to our star educators with various levels of experience.

- *The Rising Star Constellation Award (1-5 years' experience) goes to Krista Hagemann.*
- *The Shining Star Constellation Award (6-15 years' experience) goes to Jennifer Jordan.*
- *The Guiding Star Constellation Award (16+ years' experience) goes to Lisa Reed.*

We are proud of all our educators, but it is a privilege to recognize a few who go beyond to ensure student success.

Another award AST sponsors is the FAST. AST awards the distinguished Fellows of the Surgical Technologists designation to those surgical technologists whose professional activities have been devoted to the practice of surgical technology, and who abide by the AST Code of Ethics and standards of practice.

Currently, 220 CSTs have been given the FAST designation; although, there are many others who deserve the title. The application deadline is May 15, and the awards will be decided and announced at the AST Surgical Technology Conference.

The AST Board of Directors is missing the in-person interactions we have each year with members through these various events. We continue to work to support members through the challenges we are facing, but we cannot wait to REALLY be back to business as usual where we are networking and sharing ideas in person.







# Advance Your Knowledge, Update Your Skills and Earn CEs

## FREE CE CREDITS FOR 2021

Log onto [www.ast.org](http://www.ast.org) and click on the “Earn CE” menu to access the library of CEs. Click on the numbers and take the tests for free:

**CE Test #410** - Article Date: February 2018; Vol 50 No 2; Hats Off: A study of Different Operating Room Headgear Assessed by Environmental Quality Indicators – 1.5 CE

**CE Test #418** - Article Date: October 2018; Vol 50 No 10; Bone Healing: Normal, Disrupted and the Complication of Fat Embolism – 1.5 CE  
Credits are awarded after passing the tests.

Whenever. Wherever. AST is making continuing education more accessible—more convenient—and even FREE. Now you can look, listen and learn from our quality education presentations that have been archived from national conferences and advanced specialty forums. Specialty topics range from orthopedics, OB/GYN, general and neurosurgery. You will actually see the medical professionals and slides as they were presenting their information. Each presentation is coded by specialty.

Topics include Intrauterine Repair for Spina Bifida, Pelvic and Acetabular Surgery, Infertility, Drug Abuse During Pregnancy, ACL Surgery, Issues in Patient Care, Advances in Spine Surgery, Epithelial Ovarian Cancer, and Preventing Preterm Delivery. Any or all are free to watch and study.

Whenever you're ready, take the examination—there is absolutely no charge. If you pass, you will be offered the opportunity to purchase the accompanying CE credit and register it with AST at a very affordable price.

LOG ON TO THE AST  
CONTINUING EDUCATION  
RESOURCE CENTER TODAY AT:

[www.ast.org](http://www.ast.org)



## ARTICLE VIII Meetings

*Section 1.* AST shall meet annually, and that meeting shall be known as the national conference, the date and place of which shall be determined by the Board of Directors.

*Section 2.* The voting body of the national conference shall be the House of Delegates. Voting by delegates shall be in person and each delegate will be entitled to one vote. In extraordinary circumstances, such as acts of God, war within the continental United States, disaster, or epidemic that result in the postponement of the annual meeting, voting by the national House of Delegates may be conducted utilizing a secure, online voting system approved by the Board of Directors.

*Section 3.* All officers and members of the Board of Directors and past presidents who maintain active membership status and certification currency shall be entitled to all privileges of a delegate at the time they assume office. This delegate category shall not affect state assembly delegate representation.

### *Section 4.* Delegate representation

#### A. State Assemblies

1. Each state, whether a single-state or as part of a multi-state assembly, shall be entitled to six delegates and six alternates, provided the assembly is in good standing as defined in the AST Policy Manual.

2. Delegates and alternates shall be active members elected by their state assembly.

3. The names shall be submitted to national headquarters at least sixty days prior to the national conference. Any forms received after that deadline must be presented during designated hours at the national conference.

### *Section 5.* Business Meetings

A. There shall be a minimum of two business meetings at each national conference.

B. Business meetings shall be open. Every member shall have voice, but only delegates may make motions and vote.

C. Twenty percent of the total possible delegates in AST, and at least ten percent of the total number of state assemblies in AST, shall constitute a quorum for a meeting of the House of Delegates.

#### D. Special Meetings

1. During the national conference, special meetings of the House of Delegates may be called by the President or upon written request of five members of the Board of Directors or by one-third of the total number of members of the House of Delegates.

2. Between conferences, special meetings of the House of Delegates may be called by two-thirds of the Board of Directors or by two-thirds of the delegates credentialed for the previous conference. Thirty days' written notice of the time, place, and business to be considered at the special meeting shall be given to all members.

*Section 6.* There shall be educational sessions provided at each national conference.



# SHARE THE VALUE OF AST

Recruit your friends and colleagues and earn **free membership**.



**EARN TWO  
MONTHS FREE  
MEMBERSHIP  
FOR EVERY  
NEW MEMBER  
YOU SIGN UP  
TO JOIN AST**

**For each new member you recruit at the \$80-membership level, you will receive a two-month extension on your membership!**

**HERE'S HOW:**

- Recruit a valid new member at the one-year membership rate of \$80.
- Make sure that each person you recruit provides AST with your name and AST member number when filling out their application.
- When AST receives the recruited member's application, we will extend your membership by two months for each person you recruit.
- Recruit two members at the \$80-level and we'll extend your membership by four months! And so on, and so on, and so on!

*Bonus membership months are not applicable to members who recruit themselves, students or retired/disabled members. No substitutions are permitted. Your membership must be current to receive bonus months. If a person's membership has lapsed for more than a year, they are considered a new member.*



**For more information, call Member Services at 1.800.637.7433 or visit [www.ast.org](http://www.ast.org)**



# AST News

## AT A GLANCE

### RECOGNITION

#### INTERESTED IN BEING A FELLOW OF AST? APPLY NOW

Interested in being considered for the designation of the Fellow of the Association of Surgical Technologists or FAST? This prestigious award recognizes those individuals who have upheld the highest professional, ethical and moral standards and traditions of the surgical technology profession, and whose professional activity has been devoted to the advancement of the profession toward improving the quality of surgical patient care.

Applications are available online and all applications are due by May 15.

When you are applying make sure to thoroughly read the selection criteria and gather all documents and information that are needed to complete the application prior to starting. Please allow for enough time to complete the application. If you close out of your window or browser before hitting submit, you will lose any details you have entered. Once you click submit, it will be submitted to the FAST Selection Panel.

All required information must be completed before are able to submit.

For more information or to apply, visit [ast.org](http://ast.org) – Members – Fellows of FAST

### CONTINUING EDUCATION

#### COLLEGE COURSES

Did you know that college courses you have taken may be eligible to also qualify for CE credit? Read more to see which classes are applicable:



College courses that are relevant to the medical-surgical practice of surgical technology or surgical first assisting can be submitted to AST for CE credits.

- College courses **MUST** be completed with a minimum grade of "C."
- The courses **MUST** be completed at an institution that is accredited by an organization recognized by the US Department of Education.
- Surgical first assistant college courses submitted for CE credits **MUST** be completed at a CAAHEP-accredited surgical first assistant program.
- General nursing and physician assistant college courses that are not specifically related to the medical-surgical practice of surgical technology or surgical first assisting will not be accepted for CE credits.
- Anatomy & physiology, microbiology, pathophysiology, and pharmacology must be advanced level college courses.

#### *Determining the Number of CE Credits:*

- College courses are awarded five CE credits for each semester hour completed. For example, a three-college-credit semester course:  $3 \times 5 = 15$  CE credits.

#### *Submitting College Courses for CE Credits*

- **Member and Nonmember:** Submit an unofficial college transcript from the institution where the courses were completed with the AST CE Reporting Form – no exceptions.
- **Nonmember:** Include the \$400 nonmember processing fee.

### *Recommendation*

- Provide a copy of the course descriptions from the current edition of the college catalog with the AST CE Reporting Form and transcript(s).
- The descriptions assist in determining the relevancy of the course(s) to the medical-surgical practice of surgical technology or surgical first assisting.

## **HEALTHCARE FACILITY SPONSORED IN-SERVICES**

Another way to earn CE credits is by submitted healthcare facility sponsored in-services. Healthcare facility sponsored in-services can be submitted to AST for CE credits as long as they are relevant to the medical-surgical practice of surgical technology or surgical first assisting. Employers are NOT required to submit healthcare facility in-services to AST for approval.

- AST accepts annual mandatory CE in-services relevant to the medical-surgical practice of surgical technology or surgical first assisting. For example, fire safety.
- Healthcare facility orientation is NOT accepted for CE credits.
- If the employer sponsors or provides funds for an employee(s) to attend a conference, forum, seminar, symposium, or workshop, or complete any other type of CE activity sponsored by an organization other than the healthcare facility, the program MUST be AST approved for the CE credits to count toward certification renewal.
- BLS, ACLS, and PALS are accepted for CE credits. Every 50-60 minutes of activity = 1 CE credit.
  - BLS includes CPR and automated external defibrillator (AED) training.
- CE credits are NOT awarded for on-the-job training, healthcare facility orientation, or work experience that the CST and CSFA completed as an employee of the healthcare facility providing the training.
  - Example: A CST is completing on-the-job training in learning the first scrub role to be a member of the healthcare facility's cardiovascular team. This training is distinct from attending healthcare facility sponsored in-services as described above.

### *Submitting In-Service CE Credits*

- A healthcare facility certificate of attendance, official healthcare facility transcript, or sign-in sheet with an authorized signature (for example, a surgery department supervisor, clinical educator, or other individual

authorized by the employer).

- The documentation must also include the name of the healthcare facility, indicate it is an in-service, title of in-service, date of in-service, number of CE credits, and signature of the CST or CSFA attendee.
- The documentation must be submitted with the AST CE Reporting Form.

## **WHY CE CREDITS ARE NOT ACCEPTED**

One of the best benefits about being an AST member is that AST tracks and records your CE for you in your membership profile. But sometimes there are reasons why CE that has been submitted is not accepted and, therefore, returned.

CE credits that are not accepted can present a challenge in recertifying if there is not sufficient time left to earn additional CE credits before the expiration date of the credential. As previously mentioned, it is encouraged to submit CE credits six months prior to the certification expiration date. This allows time to earn additional CE credits within the certification cycle if CE credits were not accepted and avoid taking the NBSTSA national certification examination to renew the credential.

The following are some of the more common reasons for CE credits not being accepted:

### **CE Credit Value NOT Met**

- If a CST or CSFA attends a lecture or program, or views a recorded CE lecture that is less than 30 minutes. (One CE credit equals 50-60 minutes of activity.)
- Partial CE credits are accepted by AST; however, the CE activity must last a minimum of 30 minutes.
- After 30 minutes, CE credits are accepted in 15-minute increments.

### **CE Credits NOT Earned During Current Certification Cycle**

- CE credits MUST be earned during the current certification cycle.
- CE credits are accepted based on the date of completing the CE activity, NOT when the CE activity was purchased or the date submitted to AST.

### **CE Activity is NOT Approved by AST**

- CE credits were earned by completing a CE activity or attending a CE event that is NOT AST approved.

### **CE Reporting Form NOT Submitted with CE Credits**

- CE credits were submitted without a completed CE



Reporting Form. The form is available on the AST site, [www.ast.org](http://www.ast.org).

- Each CE activity, with the exception of AST-sponsored CE, must be listed on the reporting form. Forms that state “see other pages” or “see transcript” will be sent back.

#### *Documentation NOT Included with the CE Reporting Form*

- Documentation verifying completion of CE listed on the CE Reporting Form is NOT included when submitted to AST.
- With the exception of AST-sponsored activities and state assembly meetings, copies of verification documentation must be included with the CE Reporting Form.
- Accepted documentation includes:
  - certificate of attendance or completion
  - attendance sign-in sheet for healthcare facility in-services (see previous information regarding healthcare facility sponsored in-services for details).

#### *Documentation that is NOT accepted includes:*

- tests,
- paid receipts,
- announcements of events
- program agenda/brochure

#### *CE Activity is NOT Relevant*

- CE credits are returned if it is determined the activity is NOT relevant to the medical-surgical practice of surgical technology or surgical first assisting.

#### *Previously Completed CE Submitted Again*

- Previously completed CE that was submitted to AST and processed, CANNOT be resubmitted for CE credits and will NOT be accepted.
- An exception is made for BLS, ACLS, and PALS. Each time the CST or CSFA renews one of those certifications it can be submitted for CE credits.

#### *Nonmember Fee NOT Included*

- The nonmember CE processing fee of \$400 is NOT included when CE credits are submitted.

## MILESTONES

### HAPPY ANNIVERSARY!

Congratulations to the following state assemblies as they celebrate anniversaries this month! AST appreciates your hard work, dedication and all your years of service for making our state assemblies the backbone of this organization.

- Alaska – 6 years
- Arizona – 17 years
- Idaho – 19 years
- Illinois – 20 years
- Iowa – 17 years
- Kansas – 17 years
- Maine – 15 years
- Michigan – 21 years
- Missouri – 21 years
- New Hampshire / Vermont – 14 years
- New York – 21 years
- Pennsylvania – 19 years
- Wisconsin – 21 years

## WRITE FOR US

### CALLING ALL WRITERS!

We are always looking for new CE authors and surgical procedures that detail the latest advancements in the surgical arena. We'll also help you every step of the way, AND you'll earn CE credits by writing a CE article that gets published! Here are some guidelines to kick start your way on becoming an author:

- An article submitted for CE must have a unique thesis or angle and be relevant to the surgical technology profession.
- The article must have a clear message and be accurate, thorough, and concise.
- It must be in a format that maintains the Journal's integrity of style.
- It must be an original topic (one that hasn't been published in the Journal recently).

Ready to get started? Email us at [communications@ast.org](mailto:communications@ast.org).

# Studying for the CST Exam? There's an App for That!

The only AST-authored study guide app is unmatched, giving you more than 1,300 questions to study and review right in the palm of your hands.

The app includes six tests that preps you for taking the CST examination sponsored by the National Board of Surgical Technology and Surgical Assisting.

Study with confidence whenever and wherever you are!

## AST Study Guide App Features:

- 6 practice exams, each featuring 175 questions
- 2 bonus science review sections, for a total of 330 additional review questions
- Study in whatever time you have by selecting a question range that fits your schedule
- Options include taking the exams in a random or chronological order
- Get immediate answers and explanations to each question so you can maximize your learning and determine which areas you might need more review

## User testimonials:

"Great study app! Practical, useful, easy. Totally worth the money and better than lugging around text books to study." – *B Marchington*

"Very helpful ... passed my certification test only using this app" – *T Bowers*

"If you're practicing for your national it's a very good app to practice off of" – *M Chang*

**"Thanks to this app, I passed!"**

– *Tovah M*



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# Professional Certification Coalition Issues

Josephine M. Colacci, Esq., AST DIRECTOR OF GOVERNMENT AFFAIRS

## LEGISLATIVE NEWS



AST is a member of the Professional Certification Coalition<sup>1</sup>, which consists of 115 organizations. This coalition was created to combat legislation/regulation that would prohibit the use of private organizations certifications. Over the last two years, there has been an increase in legislation intro-

duced that would eliminate professional licenses, define what a private certification is, and determine who can use the term certified. Below is an example of several pieces of legislation in 2021:

- Minnesota – HF266
  - Minnesota introduced legislation which is a complete prohibition against occupational licensing with no exemptions.
- New Jersey – A2178
  - New Jersey introduced legislation that could be used to challenge decisions by private professional certification organizations to enforce their eligibility requirements or codes of conduct.
  - PCC is asking for the following amendment:
    - ◆ Nothing in the legislation shall be construed to require a private certification organization to grant or deny private certification to any individual, nor alter or impair any requirement in a licensure statute or regulation for an individual to hold current private certification as a condition of licensure or renewal of licensure.
- Oklahoma – SB756
  - Oklahoma introduced legislation that prohibits a certificant who is not licensed, registered, or certified by the government from using the term “licensed,” “certified,” or “registered” to describe the individuals credential or “any words, titles, abbreviations or letters that induce a reasonably knowledgeable consumer of such services to believe the privately certified individual using them is occupationally regulated by the government” but permit the use of the term “privately certified.”
  - PCC is asking for the following amendment:
    - ◆ Amend section 7(D): Restrict an individual from using the title certified or the title registered to the extent that the title reflects a credential held by the individual that was issued by a private certification organization that confers credentials to individuals meeting the qualifications set by the organization’s certification or certificate program.

<sup>1</sup> <https://www.profcertcoalition.org/>



# One Card. Countless Rewards.



## The Association of Surgical Technologists Visa credit card features great benefits including:

- Online access to view account information and make payments
- Auto Rental Insurance<sup>1</sup> automatically covers the repair or loss of a rental car, whenever you use your Visa card to pay for the car rental
- Convenient cash access at thousands of ATMs
- Visa's Zero Fraud Liability Protection<sup>2</sup> from verified unauthorized purchases online and off
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The Association of Surgical Technologists Visa credit card — a credit card that gives back every time you make a purchase.

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\*Certain terms and conditions apply; see the Rewards Rules and Rewards Brochure that accompany the card for details.

<sup>1</sup> See the Rewards Rules and Guide to Benefits that accompany your card for details. Auto Rental Insurance and Travel Accident Insurance provided at no additional cost. Certain exclusions and conditions may apply. <sup>2</sup> Visa's Zero Liability Policy covers U.S.-issued cards only and does not apply to certain commercial card transactions or any transactions not processed by Visa. You must notify your financial institution immediately of any unauthorized use. For specific restrictions, limitations and other details, please consult your issuer.



# Surgical Technique Influences Patient Outcomes

OF INTEREST IN THE MEDICAL ARENA

A video study of 30 surgeons performing laparoscopic sleeve gastrectomy procedures linked patient outcomes to specific surgical techniques, regardless of the surgeon's level of skill.

Researchers at Brigham and Women's Hospital evaluated the surgeons' techniques by watching procedural videos for almost 7,000 patients. The evaluations covered the following technical approaches: dissecting the proximal stomach, including sleeve caliber, staple line reinforcement, and leak testing.

The most significant finding corresponded to higher ratings for the complete mobilization of fundus, leading to a drop in 30-day hemorrhage rate from 2.1% to 1.0%. Hemorrhage rate also decreased (1.5% to .94%) when surgeons scored higher in visualization of the left crus.

Researchers also found that higher ratings for complete mobilization of fundus also led to an increase in leak rate from 0.05% to 0.16%. Higher ratings for visualization of the left crus also increased leak rate from 0.1% to 0.2%.

Staple line buttressing was tied to increase in leak rates of one in 1,000 cases. Surgeons who reinforced the staple line with buttresses and over-sewing had a decrease of two per 1,000 cases. Leak testing itself was not associated with improvements in the staple line leak rate.

Michigan Bariatric Surgery Collaborative data was used to tie the surgeries with subsequent outcomes. Videos were submitted voluntarily by surgeons for laparoscopic sleeve gastrectomies performed in 2015 and 2016. The videos were peer reviewed to evaluate technique.

Participating surgeons performed a median of 91 sleeve gastrectomies annually and had an average skill rating of 3.5 of 5.

Researchers were surprised by the variation of technique used among surgeons in the same area of the state. They believe additional video peer review studies will synchronize surgical technique, inform video-based coaching efforts, and improve patient outcomes.

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## FDA Approves LVAD for Children

In December, the FDA approved updated labeling for Abbot's HeartMate 3 left ventricular assist device (LVAD) for use in pediatric patients with advanced heart failure. The device was approved in the United States as a bridge-to-transplant for adults in 2017 and received approval for long-term use in adults in 2018. The pump's design uses magnetic forces to operate its rotor and reduce trauma to blood passing through the pump.

Clinical data from the Advanced Cardiac Therapies Improving Outcomes Network (ACTION Learning Collaborative) was used to support the updated labeling. The study showed a 97% survival rate after a median of 78 days. The device was implanted successfully in children as small as 41 lbs.

"Our mission is to improve the outcomes of children with heart failure. Historically, this has been an underfunded and understudied area in pediatrics," said Angela Lorts, MD, MBA, and David Rosenthal, MD, co-founders of ACTION Learning Collaborative. "This technology will benefit our pediatric patients and is a leap forward for improving heart failure outcomes in children."

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## REBOA Aids Hemorrhage Control in Patients with Unstable Pelvic Fractures

At the 2020 virtual annual meeting of the American Society for the Surgery of Trauma, researchers at the University of Colorado School of Medicine presented study results of using REBOA as a bridge intervention to pelvic packing in unstable pelvic fractures.

Resuscitative endovascular balloon occlusion of the aorta (REBOA), used for temporary hemorrhage control prior to pelvic packing, was added to the researchers' pelvic fracture management protocol in 2015. Pelvic packing is an operative procedure that involves "direct packing of the preperitoneal space into the pelvic hematoma." The packing is removed within 24-48 hours. (See Procedural Outline – Preperitoneal Pelvic Packing.)

Previous studies by the authors showed that pelvic packing can shorten intervention time and control bleeding without the need for angiography and embolization (AE). The technique can be used when an angiography suite is not available, or patients are too unstable to be transported. In 2015, the mortality rate for pelvic fracture patients in shock was reported at 32% and average time to AE was 5 hours.

In the study, REBOA was used for the most severely injured patients, with systolic blood pressure readings less than 80 mm Hg, higher heart rates and higher injury scores.

The study involved 652 patients, 78 of whom did receive REBOA before pelvic packing. Despite the severity of patients' injuries, no deaths in the study were attributed to pelvic fracture-related hemorrhage – the lowest mortality rate demonstrated. After pelvic packing, 9% with continued bleeding were sent for angioembolization.

Due to the efficacy of the treatment, randomized trials for patients with such severe injuries are not planned for future studies.

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### Procedural Outline – Preperitoneal Pelvic Packing

- Patient position: Supine
- C-clamp, external fixator, or temporary pelvic binder is positioned to mechanically stabilize the pelvis and prevent further disruption.
- Draping extends from the nipple line to the proximal- or mid-thigh but can vary depending on other injuries.
- Two types of incision: a Pfannenstiel incision or a mid-line incision that extends from the umbilicus to the pubic symphysis.
- The linea alba is incised.
- The peritoneum is bluntly dissected from the pelvic ring and pubic symphysis.
- The bladder is retracted laterally.
- The pelvic brim is moved posteriorly from the pubic symphysis toward the sacroiliac joint.
- The peritoneum is left intact, attached to the sacrum.
- Laparotomy sponges are aimed toward branches of the internal iliac vessels and venous plexus lateral to the sacrum. Three sponges are placed below the pelvic brim in the space between the peritoneum and pelvic ring: 1) posteriorly below the sacroiliac joint; 2) in the middle of the pelvic brim, anterior to the first sponge; 3) deep and lateral to the bladder in the retropubic space.
- The sponge sequences is repeated on the contralateral side. In unstable fractures, more sponges may be necessary. No drains are placed in the wound.
- The fascia is closed with a single layer of running suture.
- The skin is stapled closed.
- Packing should be removed within 24-48 hours, taking care to remove all sponges.



# The How and Why of Your 2021 State Assembly Elections

SHERRIDAN E. POFFENROTH, CST, CRCST, EAST

## STATE ASSEMBLY



At the time of this writing, many state assemblies are still uncertain how they might hold an in-person annual meeting with elections and rebound from this time of a reduction in progress. It is important to continue to

move forward with the expectations for the best. At a recent Zoom meeting, a colleague stated that, “We have worked so hard to get our attendance numbers up and now I am afraid we have backtracked and will have to start over.” This is probably true, but with the continued efforts of the entire state assembly board and the desire of each to move onward, each assembly will be able to hold a future, successful annual meeting with elections.

At this time, our annual business meetings with elections must be held in person. Virtual elections are not allowed. Our state assembly policies are structured to hold one annual business meeting with elections each year. The timing of this meeting is decided by each individual state with about half holding spring meetings and elections and the others in the fall. Most meetings are modeled after what we see each year at our national conference, whereas officers and committee chairs offer an annual report of activities, any new business is presented, and elections are held. During odd years, the positions of president, vice president, treasurer, and two board of directors are elected. During even years, the secretary and the three remaining board of directors are elected. Each term is for two years and each person can hold a position for two full terms. If a replacement is named in the middle of a term, a full term is considered any length over one year.

But what happens when annual meetings are cancelled? Positions that were meant to be elected are carried forward until a business meeting can be held in person. This may mean that at your next election, all nine positions will be up for election. For example, in 2020, we were expecting to hold elections for the secretary and three board of directors. If elections were not held, those serving in these positions would stay in place until sometime in 2021. Then at the 2021 elections, these positions, along with the traditional odd-year elections, would take place. But note they would only be for one year and up for election again in 2022. By doing this, it will put the election rotation back in alignment with our State Assembly Bylaws.

Your ballot may look something like this:

- President – to serve from 2021-2023
- Vice President – to serve from 2021-2023
- Treasurer – to serve from 2021-2023
- Secretary – to serve from 2021-2022
- BOD Positions 1 & 2 – to serve from 2021-2023
- BOD Positions 3, 4 & 5 – to serve from 2021-2022

Sounds confusing, right? It can be, but the members of the State Assembly Leadership Committee can help. If you still have questions, please reach out to your SALC representative. We can review your state’s specific history and can help you determine who can run and how your elections may look. Locate your SALC representative at [https://www.ast.org/State\\_Assemblies/State\\_Websites/](https://www.ast.org/State_Assemblies/State_Websites/).

Here is to a new normal where we are looking forward to meeting in person and moving forward with progress and success.

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- Trauma

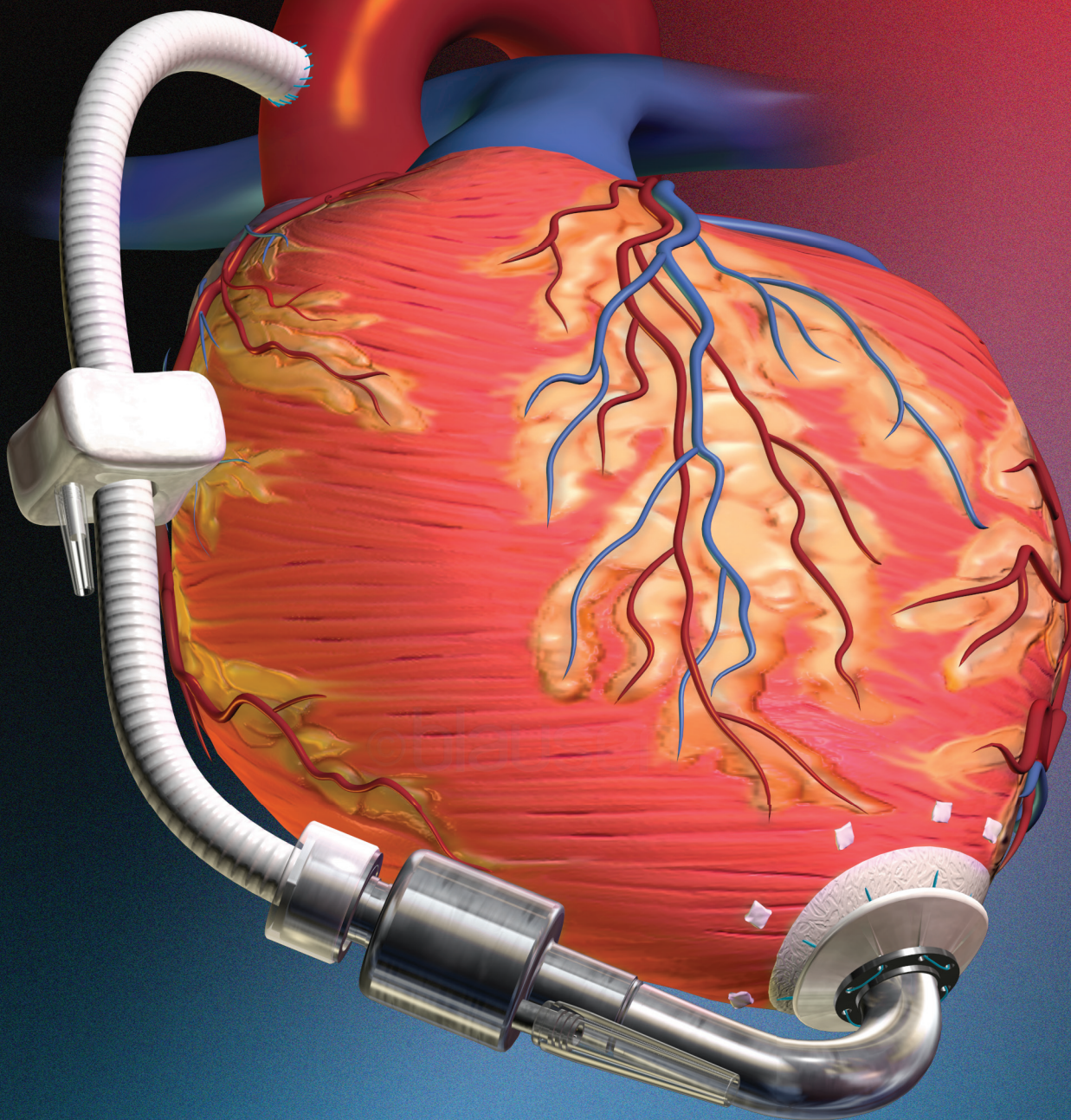
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# Trends, Perioperative Adverse Events, and Survival of Patients With Left Ventricular Assist Devices Undergoing Noncardiac Surgery

Amgad Mentias, MD, MSc; Alexandros Briasoulis, MD, PhD; Mary S. Vaughan Sarrazin, PhD; Paulino A. Alvarez, MD

## Abstract

**IMPORTANCE** Information regarding the performance and outcomes of noncardiac surgery (NCS) in patients with left ventricular assist devices (LVADs) is scarce, with limited longitudinal follow-up data that are mostly limited to single-center reports.

**OBJECTIVE** To examine the trends, patient characteristics, and outcomes associated with NCS among patients with LVAD.

**DESIGN, SETTING, AND PARTICIPANTS** This cohort study examined patients enrolled in Medicare undergoing durable LVAD implantation from January 2012 to November 2017 with follow-up through December 2017. The study included all Medicare Provider and Analysis Review Part A files for the years 2012 to 2017. Patients identified by *International Classification of Diseases, Ninth Revision Clinical Modification (ICD-9-CM)* and *International Classification of Diseases, Tenth Revision (ICD-10)* procedure codes for new LVAD implantation were included. Data analysis was performed from November 2019 to February 2020.

**EXPOSURES** NCS procedures were identified using the *ICD-9-CM* and *ICD-10* procedural codes and divided into elective and urgent or emergent.

**MAIN OUTCOMES AND MEASURES** The primary outcome was major adverse cardiovascular events (MACEs), defined as in-hospital or 30-day all-cause mortality, ischemic stroke, or intracerebral hemorrhage after NCS. Early (<60 days after NCS) and late ( $\geq 60$  days after NCS) mortality after NCS were analyzed in both subgroups using time-varying covariate and landmark analysis using patients who did not undergo NCS as reference.

**RESULTS** Of the 8118 patients with LVAD (mean [SD] age, 63.4 [10.8] years; 6484 men [79.9%]), 1326 (16.3%, or approximately 1 in 6) underwent NCS, of which 1000 procedures (75.4%) were emergent or urgent and 326 (24.6%) were elective. There was no difference in age between patients who underwent NCS and patients who did not (mean [SD] age, 63.6 [10.6] vs 63.4 [10.9] years). The number of NCS procedures among patients with LVAD increased from 64 in 2012 to 304 in 2017. The median (interquartile range) time from LVAD implantation to NCS was 309 (133-606) days. The most frequent type of NCS was general (613 abdominal, pelvic, and gastrointestinal procedures [46.2%]). Perioperative MACEs occurred in 169 patients (16.9%) undergoing emergent or urgent NCS and 23 patients (7.1%) undergoing elective NCS. Urgent or emergent NCS was associated with higher mortality early (adjusted hazard ratio [aHR], 8.78; 95% CI, 7.20-10.72;  $P < .001$ ) and late (aHR, 1.71; 95% CI, 1.53-1.90;  $P < .001$ ) after NCS compared with patients with LVAD who did not undergo NCS. Elective NCS was also associated with higher mortality early (aHR, 2.65; 95% CI, 1.74-4.03;  $P < .001$ ) and late (aHR, 1.29; 95% CI, 1.07-1.56;  $P = .008$ ) after NCS.

(continued)

## Key Points

**Question** What are the trends, perioperative adverse events, and mortality associated with noncardiac surgery in patients with left ventricular assist devices (LVADs)?

**Findings** In this cohort study, of 8118 Medicare patients who had an LVAD, 16.3% underwent noncardiac surgery during follow-up. Major adverse cardiovascular events, defined as in-hospital or 30-day all-cause mortality, ischemic stroke, or intracerebral bleeding, occurred in 16.9% of patients who underwent emergent or urgent procedures and in 7.1% of patients who underwent elective procedures.

**Meaning** A substantial proportion of patients with LVADs underwent noncardiac surgery and experienced major perioperative adverse events.

Author affiliations and article information are listed at the end of this article.



**CONCLUSIONS AND RELEVANCE** One of 6 patients with LVAD underwent NCS. Perioperative MACEs were frequent. Higher mortality risk transcended the early postoperative period in urgent or emergent and elective surgical procedures.

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## Introduction

Left ventricular assist devices (LVADs) as a bridge to transplant, a bridge to recovery, or a destination therapy have become standard of care for selected patients with advanced heart failure (HF).<sup>1,2</sup> Their use has steadily increased, and since 2012 more than 2000 implants have been performed each year in the US.<sup>3</sup> LVAD therapy has evolved through improvements in device technology and the performance of pragmatic clinical trials.<sup>4-6</sup> One-year survival increased from 52% in 2009 to 83% in 2018.<sup>6,7</sup> The current mean duration of support is 20 months, and reports of patients who have had an LVAD for 4 years or more are increasing.<sup>3,8,9</sup> Nevertheless, morbidity remains high with estimated 1-year readmission rates of 80%, gastrointestinal bleeding rates of 25%, and stroke rates of 13%.<sup>3,10</sup>

Approximately 50 million noncardiac surgery (NCS) procedures are performed every year in the US.<sup>11</sup> It has been estimated that 1.4% to 3.0% of patients will experience a perioperative cardiac event (30-day death, myocardial infarction, or cardiac arrest).<sup>11</sup> The presence of HF increases the risk of 30-day postoperative mortality. HF is a key component of surgical risk stratification indices.<sup>11-13</sup> The performance of NCS in patients with HF supported with LVADs has been described since their inception in clinical practice, and single-center reports have been increasing.<sup>14-25</sup> However, contemporary national data regarding NCS in patients with LVAD are scarce. The purpose of our study was to evaluate national trends, outcomes, and risk factors associated with complications of NCS in patients with LVAD using a large administrative database of hospital admissions.

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## Methods

### Study Cohort

The institutional review board of the University of Iowa approved the study with a waiver for individual informed consent because the study was retrospective and posed minimal risk to the participants. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Medicare patients who underwent new LVAD placement from January 2012 to November 2017 were identified from the 100% Medicare Provider and Analysis Review Part A files. These files included all general hospital admissions for Medicare beneficiaries during a given year and were obtained from the Centers for Medicare & Medicaid Services. LVAD placement was identified using *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* and *International Classification of Diseases, Tenth Revision (ICD-10)* procedure codes (O2HAOQZ and 3766), with *ICD-9-CM* codes used for discharges through September 2015 and *ICD-10* codes used for the period after September 2015. Patient characteristics, including age, sex, and race, were extracted from Medicare Beneficiary Summary files, and comorbidities were derived from Medicare inpatient claims during the 1 year before the LVAD placement admission. A unique patient identifier was used to link all admissions for each patient. We excluded patients who were enrolled in Medicare for less than 1 year before the LVAD placement date. We used comorbidity algorithms originally defined by Elixhauser et al.<sup>26</sup>

Patients were followed until December 2017, and patients who underwent NCS during follow-up after discharge from LVAD placement admission were identified. We included the following NCS categories: general (included abdominal, pelvic, and gastrointestinal procedures), thoracic,

genitourinary, vascular, orthopedic, and head and neck procedures. We excluded 673 patients who underwent neurological procedures to avoid confounding by surgical procedures done for the management of stroke or cerebral hemorrhage. Eleven breast and 27 gynecological procedures were excluded because of their low prevalence. Eighty-three patients who underwent tracheostomy and 92 patients who underwent gastrostomy were excluded because those procedures are usually performed to support critically ill patients. Seventeen procedures with missing surgery dates were excluded. We also excluded patients who died during LVAD placement surgery. If a patient underwent more than 1 surgery during follow-up, the first surgery was used in the study. Study cohort flowchart is shown in the eFigure in the [Supplement](#). We analyzed outcomes of elective surgery separate from urgent or emergent surgical procedures. The urgency of surgery was determined through the inpatient admission type code in Medicare claims.

## Outcomes

The primary outcome of our study was perioperative major cardiovascular adverse events (MACEs), defined as a composite point of in-hospital or 30-day all-cause mortality, ischemic stroke, or intracerebral hemorrhage after NCS. We analyzed early (<60 days after NCS) and late ( $\geq 60$  days after NCS) mortality after NCS in both subgroups. When assessing in-hospital outcomes, to ensure that an outcome was a new event and not a previous diagnosis, we used the present at admission indicator in the inpatient admission claims.<sup>27</sup> Secondary end points included individual outcomes of the composite end point, in addition to acute kidney injury (AKI), acute HF, sepsis, blood transfusion, and length of hospital stay. *ICD-9-CM* and *ICD-10* diagnosis codes used to define secondary outcomes are reported in eTable 1 in the [Supplement](#).

## Statistical Analysis

First, we compared characteristics of patients with LVAD who did and did not undergo NCS during follow-up. We used analysis of variance or Wilcoxon test as appropriate for continuous variables and  $\chi^2$  tests for categorical variables. All tests were 2-sided, and significance was set at  $P < .05$ . For patients who underwent NCS, to determine important factors associated with the composite end point of in-hospital or 30-day MACE, we performed a multivariable logistic regression and calculated adjusted odds ratios (aORs) and 95% CIs. In that model, we updated the age and comorbidities of patients who underwent NCS to reflect their status at the time of NCS admission. The model was adjusted for age, sex, comorbidities, and type of surgery, and then a stepwise backward selection process was performed by dropping variables with  $P > .10$ , one variable at a time, and also guided by lowest Akaike information criterion with insight from clinical experience and previous published data. Because of the limitations of standard Kaplan-Meier testing to account for the time-dependent variable of NCS,<sup>28</sup> we performed the Mantel-Byar test to compare all-cause mortality between patients with LVAD who did and did not undergo NCS.<sup>29</sup> The results of the tests were plotted using the nonparametric Simon-Makuch plot, which accounts for the time dependency of NCS.<sup>30</sup> Because the hazard of mortality after NCS was not uniform across time, we used a time-varying covariant in the Cox regression model to estimate the adjusted hazard ratio (aHR) of mortality early (<60 days) and later ( $\geq 60$  days) after NCS.

All analysis was performed with SAS statistical software version 9.4 (SAS Institute) and R statistical software version 3.4.3 (R Project for Statistical Computing). Data analysis was performed from November 2019 to February 2020.

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## Results

Of the 8118 patients with LVAD included in the study (mean [SD] age, 63.4 [10.8] years; 6484 men [79.9%]), 1326 (16.3%, or approximately 1 in 6 patients) underwent NCS (eFigure in the [Supplement](#)). There was no difference in age between patients who underwent NCS and patients who did not (mean [SD], 63.6 [10.6] vs 63.4 [10.9] years). Patients who underwent NCS were more likely than



patients who did not undergo NCS to be male (1104 patients [83.3%] vs 5380 patients [79.2%]) and to have a history of revascularization, smoking, and pulmonary hypertension (**Table 1**). The number of NCS procedures performed for patients with LVAD increased from 64 in 2012 to 304 in 2017. Of the admissions, 1000 (75.4%) were for emergent or urgent NCS procedures and 326 (24.6%) were for elective NCS procedures. The median (interquartile range) time from LVAD implantation to NCS was 309 (133-606) days. The most frequent class of NCS was general (613 procedures [46.2%]) followed by thoracic (219 procedures [16.5%]), orthopedic (199 procedures [15.0%]), genitourinary (154 procedures [11.6%]), head and neck (40 procedures [3.0%]), and vascular (101 procedures [7.6%]) procedures. The types of elective and emergent or urgent surgical procedures are shown in **Table 2**.

Adverse events, length of stay, and 30-day readmission rates according to surgery urgency are shown in **Table 3**. Perioperative MACEs occurred in 169 patients (16.9%) undergoing emergent or urgent NCS and 23 patients (7.1%) undergoing elective NCS. A total of 116 patients (8.7%) died within

**Table 1. Baseline Characteristics of the Study Cohort**

| Variable                        | Patients with LVAD, No. (%) |                        |                     |
|---------------------------------|-----------------------------|------------------------|---------------------|
|                                 | Overall (N = 8118)          | Without NCS (n = 6792) | With NCS (n = 1326) |
| Age, mean (SD), y               | 63.4 (10.8)                 | 63.4 (10.9)            | 63.6 (10.6)         |
| Male                            | 6484 (79.9)                 | 5380 (79.2)            | 1104 (83.3)         |
| Race/ethnicity                  |                             |                        |                     |
| White                           | 5672 (69.9)                 | 4723 (69.5)            | 949 (71.6)          |
| Black                           | 1908 (23.5)                 | 1611 (23.7)            | 297 (22.4)          |
| Hispanic                        | 191 (2.4)                   | 159 (2.3)              | 32 (2.4)            |
| Alcohol use disorder            | 202 (2.5)                   | 179 (2.6)              | 23 (1.7)            |
| Anemia                          | 2264 (27.9)                 | 1912 (28.2)            | 352 (26.6)          |
| Connective tissue disease       | 218 (2.7)                   | 181 (2.7)              | 37 (2.8)            |
| Lung disease                    | 2490 (30.7)                 | 2078 (30.6)            | 412 (31.1)          |
| Coagulopathy                    | 1082 (13.3)                 | 902 (13.3)             | 180 (13.6)          |
| Depression                      | 1438 (17.7)                 | 1204 (17.7)            | 234 (17.7)          |
| Diabetes                        | 3602 (44.4)                 | 2988 (44.0)            | 614 (46.3)          |
| Drug use disorder               | 202 (2.5)                   | 172 (2.5)              | 30 (2.3)            |
| Hypertension                    | 6044 (74.5)                 | 5080 (74.8)            | 964 (72.7)          |
| Hypothyroidism                  | 1359 (16.7)                 | 1132 (16.7)            | 227 (17.1)          |
| Liver disease                   | 445 (5.5)                   | 373 (5.5)              | 72 (5.4)            |
| Lymphoma                        | 99 (1.2)                    | 81 (1.2)               | 18 (1.4)            |
| Electrolytes abnormalities      | 4208 (51.8)                 | 3515 (51.8)            | 693 (52.3)          |
| Obesity                         | 2099 (25.9)                 | 1743 (25.7)            | 356 (26.9)          |
| Peripheral arterial disease     | 1078 (13.3)                 | 877 (12.9)             | 201 (15.2)          |
| Psychosis or dementia           | 245 (3.0)                   | 217 (3.2)              | 28 (2.1)            |
| Pulmonary hypertension          | 2166 (26.7)                 | 1736 (25.6)            | 430 (32.4)          |
| Tumor                           | 185 (2.3)                   | 158 (2.3)              | 27 (2.0)            |
| Weight loss                     | 679 (8.4)                   | 563 (8.3)              | 116 (8.8)           |
| Prior cerebral hemorrhage       | 0                           | 23 (0.4)               | 0                   |
| Coronary artery disease         | 5348 (65.9)                 | 4459 (65.7)            | 889 (67.0)          |
| Smoking                         | 2586 (31.9)                 | 2107 (31.0)            | 479 (36.1)          |
| Prior revascularization         | 2771 (34.1)                 | 2254 (33.2)            | 517 (39.0)          |
| Prior ischemic stroke           | 334 (4.1)                   | 270 (4.0)              | 64 (4.8)            |
| Implantable defibrillator       | 5655 (69.7)                 | 4745 (69.9)            | 910 (68.6)          |
| Pacemaker                       | 1013 (12.5)                 | 843 (12.4)             | 170 (12.8)          |
| Chronic kidney disease          | 4051 (49.9)                 | 3408 (50.2)            | 643 (48.5)          |
| End stage renal disease         | 93 (1.2)                    | 73 (1.1)               | 20 (1.5)            |
| Prior bleeding                  | 893 (11.0)                  | 756 (11.1)             | 137 (10.3)          |
| Preexisting atrial fibrillation | 4812 (59.3)                 | 4063 (59.8)            | 749 (56.5)          |

Abbreviations: LVAD, left ventricular assist device; NCS, noncardiac surgery.

30 days. Of the patients who underwent NCS, 493 (37.2%) were readmitted within 30 days, and 453 (34.2%) received blood transfusion. After multivariable adjustment, factors associated with perioperative MACE in urgent or emergent and elective NCS were vascular surgery (aOR, 18.30 [95% CI, 10.43-32.00] for urgent or emergent NCS and 8.51 [95% CI, 2.39-30.26] for elective NCS),

**Table 2. Type of Noncardiac Surgery in Patients With Left Ventricular Assist Devices**

| Surgery category   | Procedures, No. |                 |                 |
|--|-----------------|-----------------|-----------------|
|  | Overall         | Urgent          | Elective        |
| General  |                 | 458             | 155             |
| Hernia repair  | 142             | 89              | 53              |
| Cholecystectomy  | 107             | 80              | 27              |
| Colorectal resection                                       | 65              | 48              | 17              |
| Gastrectomy  | 63              | 36              | 27              |
| Colostomy or ileostomy                                     | 62              | NA <sup>a</sup> | NA <sup>a</sup> |
| Peritoneal adhesiolysis                                    | 55              | 40              | 15              |
| Other lower gastrointestinal tract surgery                 | 49              | NA <sup>a</sup> | NA <sup>a</sup> |
| Appendectomy   | 26              | NA <sup>a</sup> | NA <sup>a</sup> |
| Exploratory laparotomy or splenectomy                      | 23              | NA <sup>a</sup> | NA <sup>a</sup> |
| Small bowel resection                                      | 21              | NA <sup>a</sup> | NA <sup>a</sup> |
| Thoracic   |                 | 194             | 25              |
| Other thoracic surgery                                     | 206             | NA <sup>a</sup> | NA <sup>a</sup> |
| Lobectomy  | 13              | NA <sup>a</sup> | NA <sup>a</sup> |
| Orthopedic   |                 | 137             | 62              |
| Excision of bone   | 71              | NA <sup>a</sup> | NA <sup>a</sup> |
| Lower extremity amputation                                 | 58              | 43              | 15              |
| Hip or knee replacement                                    | 57              | 30              | 27              |
| Laminectomy or spinal fusion                               | 13              | NA <sup>a</sup> | NA <sup>a</sup> |
| Genitourinary  |                 | 106             | 48              |
| Removal of urinary obstruction or other urinary procedures | 71              | 52              | 19              |
| Nephrostomy or nephrectomy                                 | 50              | 35              | 15              |
| Transurethral resection of the prostate or prostatectomy   | 33              | 19              | 14              |
| Head and neck  |                 | 29              | 11              |
| Ear, nose, mouth, and pharynx                              | 27              | NA <sup>a</sup> | NA <sup>a</sup> |
| Thyroidectomy  | 13              | NA <sup>a</sup> | NA <sup>a</sup> |
| Vascular   |                 | 75              | 26              |
| Endarterectomy or aortic resection                         | 67              | 56              | 11              |
| Peripheral bypass  | 34              | 19              | 15              |

Abbreviation: NA, not available.

<sup>a</sup> Cells for which the number is less than 11 are suppressed per Center for Medicare and Medicaid Services policy.

**Table 3. Adverse Perioperative Outcomes According to Type of Surgery**

| Variable  | Patients, No. (%)                     |                            | P value |
|---|---------------------------------------|----------------------------|---------|
|   | Emergent or urgent surgery (n = 1000) | Elective surgery (n = 326) |         |
| 30-d Mortality                                  | 102 (10.2)                            | 14 (4.3)                   | .001    |
| In-hospital or 30-d                             |                                       |                            |         |
| Ischemic stroke                                 | 68 (6.8)                              | NA <sup>a</sup>            | .003    |
| Brain bleed                                     | 33 (3.3)                              | NA <sup>a</sup>            | .009    |
| Acute kidney injury                             | 455 (45.5)                            | 82 (25.2)                  | <.001   |
| Sepsis  | 103 (10.3)                            | 18 (5.5)                   | .009    |
| Acute heart failure                             | 101 (10.1)                            | 27 (8.3)                   | .30     |
| Blood transfusion                               | 375 (37.5)                            | 78 (23.9)                  | <.001   |
| Length of stay, median (interquartile range), d | 13 (8-23)                             | 8 (5-13)                   | <.001   |
| 30-d Any readmission                            | 387 (38.7)                            | 106 (32.5)                 | .045    |
| Major adverse cardiovascular event              | 169 (16.9)                            | 23 (7.1)                   | <.001   |

Abbreviation: NA, not available.

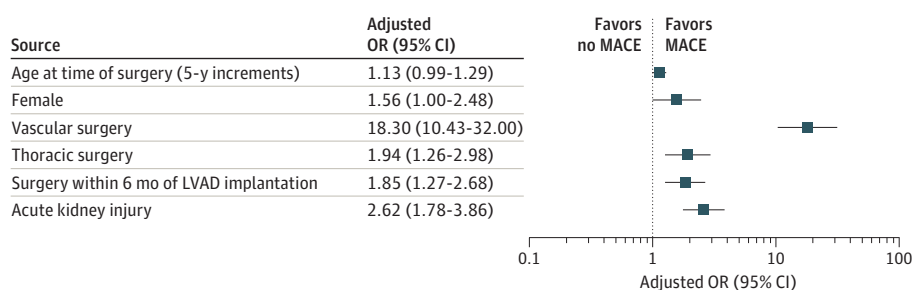
<sup>a</sup> Cells for which the number is less than 11 are suppressed per Center for Medicare and Medicaid Services policy.



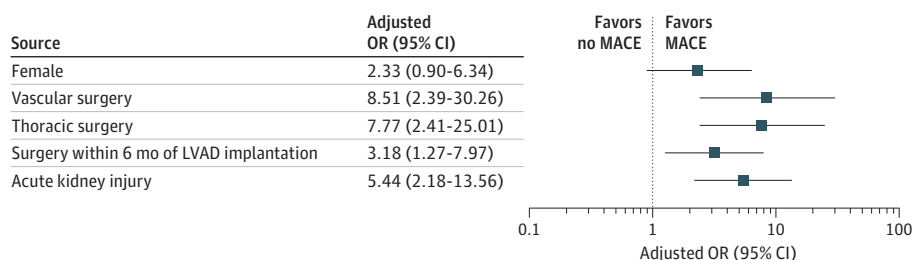
thoracic surgery (aOR, 1.94 [95% CI, 1.26-2.98] for urgent or emergent NCS and 7.77 [95% CI, 2.41-25.01] for elective NCS), surgery within 6 months of LVAD implantation (aOR, 1.85 [95% CI, 1.27-2.68] for urgent or emergent NCS and 3.18 [95% CI, 1.27-7.97] for elective NCS), and postoperative AKI (aOR, 2.62 [95% CI, 1.78-3.86] for urgent or emergent NCS and 5.44 [95% CI, 2.18-13.56] for elective NCS) (**Figure 1**). Urgent or emergent NCS was associated with higher mortality in the early postoperative period (<60 days after NCS; aHR, 8.78; 95% CI, 7.20-10.72;  $P < .001$ ) and also later in follow-up ( $\geq 60$  days after NCS; aHR, 1.71; 95% CI, 1.53-1.90;  $P < .001$ ) compared with patients with LVAD who did not undergo surgery (**Figure 2A** and eTable 2 in the [Supplement](#)). Elective NCS was also associated with higher mortality in the early postoperative period (aHR, 2.65; 95% CI, 1.74-4.03;

**Figure 1. Factors Associated With Major Adverse Cardiovascular Events (MACEs) Among Patients With Left Ventricular Assist Devices (LVADs) Who Underwent Emergent or Urgent and Elective Noncardiac Surgery**

**A** Urgent or emergent noncardiac surgery



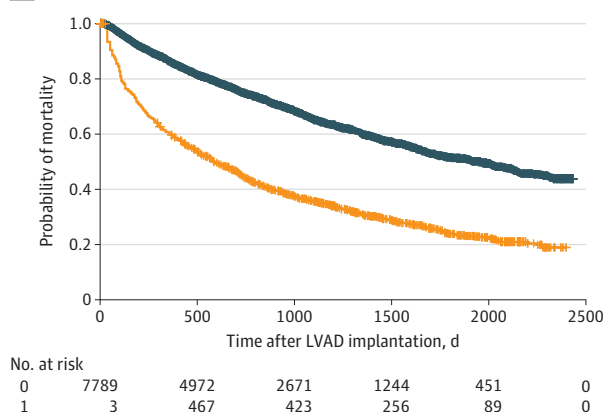
**B** Elective noncardiac surgery



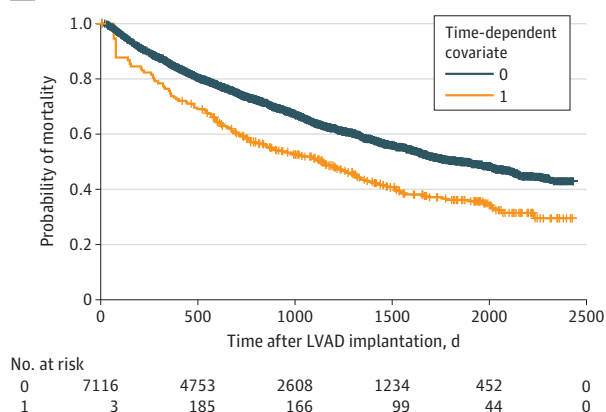
Adjusted odds ratios (ORs) and 95% CIs are shown for patients who underwent emergent or urgent (A) and elective (B) noncardiac surgery.

**Figure 2. Simon-Makuch Curves for All-Cause Mortality Among Patients With Left Ventricular Assist Devices (LVADs) After Emergent or Urgent and Elective Noncardiac Surgery**

**A** Urgent or emergent noncardiac surgery



**B** Elective noncardiac surgery



Graphs show probability of mortality for patients with LVAD after emergent or urgent (A) and elective (B) noncardiac surgery who did not have noncardiac surgery used as a reference ( $P < .01$ , Mantel-Byar test, for both comparisons).

$P < .001$ ) and later during follow-up (aHR, 1.29; 95% CI, 1.07-1.56;  $P = .008$ ) (Figure 2B and eTable 3 in the [Supplement](#)).

## Discussion

In this analysis of a large administrative database of patients with LVAD who underwent NCS, we report several findings. First, approximately 1 in 6 patients with LVAD underwent NCS after being discharged from the index hospitalization for LVAD implantation. Furthermore, the number of NCS procedures increased over the study years. Second, perioperative MACEs occurred in 7.1% of patients undergoing elective NCS and in 16.9% of patients undergoing urgent or emergent NCS. Third, the type of surgery, timing after LVAD implantation (within 6 months), and development of AKI after NCS were independently associated with MACE. In addition, the risk of mortality in patients who underwent NCS was higher both early (<60 days) and late ( $\geq 60$  days) after the index NCS. In addition, 493 (37.2%) of the patients who underwent NCS were readmitted within 30 days, and 453 (34.2%) received blood transfusion.

In a previous report,<sup>31</sup> the perioperative mortality of Medicare patients with HF, but without LVAD, undergoing NCS from 1997 to 1998 was 11.7%, compared with 6.6% in patients with coronary artery disease and 6.2% among controls. In a recent analysis<sup>32</sup> of the Veterans Health Administration System, 90-day postoperative mortality among patients with a history of HF was 5.5% compared with 1.2% in those without HF. In our study, the overall postoperative mortality rate was 8.7%, which is comparable to the previously reported estimates, in the context of patients with stage D HF and the challenges of LVAD management.

An analysis<sup>33</sup> of the National Inpatient Sample from 2007 to 2010 reported the outcomes of 298 patients with LVAD who underwent NCS: the inpatient mortality rate of the NCS group was 22.8% and was not significantly different from that for patients who did not undergo NCS (17.9%;  $P = .10$ ). Potential explanations of the higher mortality compared with our study include the fact that we excluded patients who underwent NCS during the index hospitalization for LVAD implantation, and our study included more contemporary generations of LVADs implanted from 2012 to 2017. In single-center reports<sup>16,17,21</sup> of patients with durable, continuous LVADs undergoing NCS, the perioperative mortality rates ranged from 0% to 16%. This variation in mortality rates appears to be attributable to heterogeneity in the inclusion criteria. For example, in the study by Nelson et al,<sup>21</sup> almost one-half of the procedures were endoscopies performed for gastrointestinal bleeding. Elective NCS constituted 88% of the procedures in the report by Morgan et al.<sup>16</sup> Bhat et al,<sup>17</sup> who reported the highest perioperative mortality rate, included neurosurgical procedures, and 50% of the deaths in that study occurred after neurosurgical procedures. We excluded endoscopies, given that they are considered a minor procedure. We also excluded neurosurgical procedures because one of our end points was stroke, and it would be difficult to differentiate whether a stroke was a reason for vs a result of a neurosurgical procedure.<sup>34</sup> Intrathoracic and vascular surgical procedures are known to be associated with higher risk of cardiac events and mortality and are included in most preoperative risk stratification measures.<sup>35</sup> Our results confirm that this is also true in patients with HF supported with LVAD.

In our study, postoperative AKI and undergoing NCS within 6 months of LVAD implantation were significantly associated with worse outcomes. Thus, it is probably reasonable to postpone NCS, if possible, for few months after a new LVAD is implanted. Furthermore, it is important to optimize fluid status of these patients in the perioperative period, to reduce the risk of postoperative AKI as much as possible. The experience in performing NCS in patients with LVAD has been accumulating, reflected by the increase in both original research and systematic and narrative reviews of the subject.<sup>36-41</sup> In our study, the number of NCS procedures performed for patients with LVAD increased over the years. Recommendations for monitoring, staffing, and management have been provided in the 2013 International Society of Heart and Lung Transplantation guidelines for mechanical circulatory support.<sup>42</sup> Most of the recommendations are based on expert opinion, and the

heterogeneity in resource utilization for NCS in patients with LVAD has been reported.<sup>43</sup> Our findings highlight the need for collaborative research in the perioperative management of patients with LVAD to answer important questions, such as management of anticoagulation and antiplatelets in the perioperative period, and the optimum timing of elective NCS after LVAD placement.

## Limitations

To our knowledge, our study represents the largest analysis of NCS in patients with LVAD that reported outcomes for both elective and emergent or urgent procedures and provided long-term follow-up. However, limitations should be recognized. First, the lack of hemodynamic and echocardiographic data precludes evaluation of the presence and severity of right ventricular dysfunction, which has been associated with worse survival in patients with LVAD and could potentially play an important role in risk stratification.<sup>44</sup> Second, we were not able to define specific LVAD models.<sup>45</sup> During the study period, only continuous-flow LVADs were implanted in the US.<sup>3</sup> Third, we were not able to define whether the indication for LVAD was a bridge to transplant or a destination therapy. Fourth, because our study cohort was derived from an administrative database, there is potential for misclassification because of coding errors, especially with the transition from *ICD-9-CM* to *ICD-10* codes.<sup>46</sup> Furthermore, approximately three-quarters of the cases were urgent or emergent. This means that an acute process is associated with the need for surgery and may affect the outcomes. This critical consideration should be kept in mind when interpreting the conclusions of our study.

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## Conclusions

NCS in patients with LVAD is frequent and associated with high morbidity and mortality. Factors associated with adverse outcomes included the type of surgery, the timing of operation, and the development of AKI. The proportion of patients who are readmitted and who receive red blood cell transfusion is high even for elective procedures. Further prospective studies to improve risk stratification and inform perioperative management of NCS in patients with LVAD are warranted.

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## ARTICLE INFORMATION

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**Author Contributions:** Drs Mentias and Vaughan Sarrazin had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

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*Critical revision of the manuscript for important intellectual content:* Mentias, Vaughan Sarrazin, Alvarez.

*Statistical analysis:* Mentias, Briasoulis.

*Administrative, technical, or material support:* Alvarez.

*Supervision:* Vaughan Sarrazin, Alvarez.



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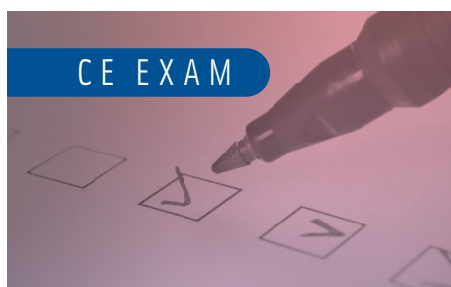
## SUPPLEMENT.

**eFigure.** Flow Chart for the Study Cohort

**eTable 1.** ICD-9 and ICD-10 Codes Used to Define Study Secondary Outcomes

**eTable 2.** Full Cox Regression Model for All-Cause Mortality With Urgent Noncardiac Surgery in LVAD Patients

**eTable 3.** Full Cox Regression Model for All-Cause Mortality With Elective Noncardiac Surgery in LVAD Patients



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# Survival of Patients with Left Ventricular Assist Devices Undergoing Noncardiac Surgery

#448 APRIL 2021 1 CE CREDIT \$6

1. Approximately \_\_\_\_\_ noncardiac surgery (NCS) procedures are performed every year in the U.S.
  - a. 10 million
  - b. 25 million
  - c. 40 million
  - d. 50 million
2. The most frequent class of noncardiac surgery procedures was \_\_\_\_\_.
  - a. General
  - b. Vascular
  - c. Thoracic
  - d. Orthopedic
3. Over a five-year period, the number of NCS procedures performed for patients with LVAD increased from \_\_\_\_ to \_\_\_\_\_.
  - a. 25 to 75
  - b. 64 to 304
  - c. 124 to 540
  - d. 320 to 867
4. True or false: In this study, postoperative AKI and undergoing NCS within 6 months of LVAD implantation were significantly associated with better outcomes.
  - a. True
  - b. False
5. Urgent or emergent NCS was associated with higher \_\_\_\_\_ rates in the early postoperative period compared with patients with LVAD who did not undergo surgery.
  - a. Readmittance
  - b. Blood transfusion
  - c. Mortality
  - d. All of the above
6. One of the findings of this study found the following to be associated with MACE:
  - a. Type of surgery
  - b. Timing after LVAD implantation
  - c. Development of AKI after NCS
  - d. All of the above
7. The median time from LVAD implantation to NCS was:
  - a. 133 days
  - b. 309 days
  - c. 439 days
  - d. 606 days
8. Intrathoracic and \_\_\_\_\_ surgical procedures are known to be associated with a higher risk of cardiac events and mortality and therefore were included in preoperative risk stratification measures for this analysis.
  - a. Neurological
  - b. Vascular
  - c. Endoscopic
  - d. General
9. Of the patients who underwent NCS, what percentage were readmitted and received a blood transfusion?
  - a. 20.6%
  - b. 25.7%
  - c. 34.2%
  - d. 52.3%
10. True or false: Patients who underwent NCS were more likely than patients who did not undergo NCS to be male.
  - a. True
  - b. False

**SURVIVAL OF PATIENTS WITH LEFT VENTRICULAR ASSIST DEVICES UNDERGOING NONCARDIAC SURGERY #448 APRIL 2021 1 CE CREDIT \$6**

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## Lighted Retractors

*Lighted for enhanced visual exposure*

All lighted retractors come with one (1) Disposable LED Light Source (#8010-01), and can also be attached to a fiber optic light cable with ACMI (female) connector.



### Jana Lighted Cobra Retractor

Designed by Ajay K. Jana, MD

#### PRODUCT NO'S:

6119-L-01

### Lighted Cobra Retractors

#### PRODUCT NO'S:

6120-L-01 [Narrow]

6130-L-01 [Standard]

6135-L-01 [Deep]

### Lighted Single Prong Double Bent

Hohmann Acetabular Retractor - Long

#### PRODUCT NO:

6210-02L-01

### Lighted Fukuda-type Retractors

Designed by Evan Flatow, MD & Louis Bigliani, MD

#### PRODUCT NO'S:

1930-L-01 [Lighted Narrow]

1940-L-01 [Lighted Wide]

## Wagner Osteotome Handle

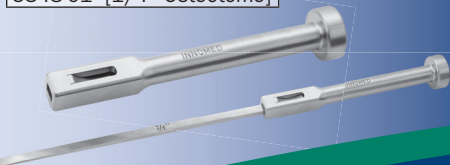
Designed by Russell Wagner, MD

Handle is designed for easier gripping, rotational control, and use with a mallet with a standard 1/4" Lambotte osteotome

#### PRODUCT NO'S:

5348 [Handle]

5348-01 [1/4" Osteotome]



## Reusable Light Wand and Disposable LED Light Source Kit

*Light wand designed for illumination of deep incisions – for use with the Innomed Disposable LED Light Source*



#### PRODUCT NO'S:

8010-00 [Kit – Wand with Light Source]

#### Available Options:

8010-01 [Light Source] **Package of 1**

8010-10 [Light Source] **Package of 10**



## Disposable LED Light Source

Each lighted retractor comes with one (1) Disposable LED Light Source (#8010-01)

#### PRODUCT NO'S:

#### PACKAGE OF 1:

8010-01 [Disposable LED Light Source]

#### PACKAGE OF 10:

8010-10 [Disposable LED Light Source]



## Lighted Yankaur Suction Device

*Designed to help provide effective suction with the addition of a light source for enhanced visualization*

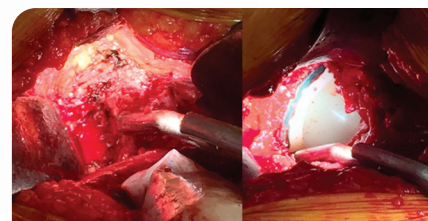
Designed by Adolph V. Lombardi Jr., MD

#### PRODUCT NO:

8016-L-01



Device comes with one (1) Disposable LED Light Source. Can also be attached to a fiber optic light cable with ACMI (female) connector.



## Light Wands – Short and Small Diameter

Designed by Anthony Unger, MD

*Short wand useful for proximal illumination, while thin diameter wands help illuminate deep cavities such as the femoral shaft*

Light wands come with one (1) Disposable LED Light Source (#8010-01). Can also be attached to a fiber optic light cable with ACMI (female) connector.

#### PRODUCT NO'S:

8011-01-L [Short Light Wand]

8011-02-L [Short Thin Light Wand]

8011-03-L [Long Thin Light Wand]



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# WHAT'S AN INFORMATIONAL INTERVIEW AND HOW CAN IT HELP YOU?

**I**nformational interviews are a career-building tool that can help you make long-term career decisions or job moves. They are very different than a job interview because **YOU** are asking all the questions.





### Why set up informational interviews? Here are a few scenarios:

- You work in a small surgery center but want to know what it would be like to work for a large hospital system (or vice versa).
- You enjoyed being a preceptor and think you might want to teach.
- You scrub general surgery cases and want to specialize, but in what?
- You don't have much OR experience yet, but you've always wanted to become a traveler.
- You're ready to advance your career and are not sure whether surgical assisting or nursing would be a better fit.

In all cases, you will need to gather information to figure out your best option. Talking to one person only gives you one perspective, so schedule three to five informational interviews – more if you're considering a drastic change.

Don't know who to ask? Check with fellow techs for referrals. Contact the program director at your surgical technology school. Email your state assembly board members and ask them for an informational interview or referral. Ask everyone you interview if they can refer you to someone else with the right knowledge.



**“Do you know anyone else I should talk to about becoming a traveling surgical tech?”**



## Here are some other dos and don'ts to follow.

### Do – Be prepared

First and foremost, be prepared. Ask for no more than 30 minutes of their time and use that time wisely. Know what information you need from each person you interview. Do some research in advance. Write down all your questions, then narrow the list to five or six targeted questions that will help you the most.

### Don't – Ask personal or obvious questions

Don't ask questions that are too personal or that you could find answers to on the internet. If you really need to know about salary, ask for confirmation instead of specifics.

#### Examples:

*"Your website says that XYZ Health builds teams of exceptional people who consistently do what is right for the individuals you serve. What does that look like for staff in your operating suite?"*

*"ZipRecruiter estimates that surgical first assistants in the Dallas area make between \$51,000 and \$200,000. Can you confirm or narrow that range?"*

### Do – Hone your pitch

The person you interview will want to know a little about who you are and what you're trying to accomplish. Prepare a two-minute introduction about yourself that includes how they can help you. The more time you give them to talk, the greater you will gain.

#### Examples:

*"I've been working in general surgery for three years, scrubbing whatever cases I get. In school, I was fascinated by brain anatomy and neurology cases – I would love to break into that specialty. I'm hoping you can tell me how you made the leap to neuro and offer any advice to someone who wants to specialize."*

*"I've been a Certified Surgical Technologist at this hospital for seven years and am thinking about going back to school. I love working in the operating room, but I have a lot of questions about billing and running my own surgical assistant business. Can you tell me what that side of being a surgical assist is like and how you decided whether that was the right path for you?"*

### Do – Honor their gift

The people you interview are sharing their time and experience. Listen carefully and ask clarifying or follow-up questions to show your interest. Stay engaged with their answers, even if it's clear that they aren't going to be as helpful as you had hoped. You are building relationships. They may be able to help you someday or connect you to someone who can.

Keep track of the time and wrap up your questions a minute or two before your appointment ends. If you have more questions, ask to follow up.

#### Examples:

*"I have one more question, but I know our time today is almost up. Could I email it to you to respond to at your convenience?"*

### Don't – Immediately ask for a favor

Your underlying goal may be to do similar work or get a job at that organization – but now is not the time to ask. They are already giving you their time and advice, don't be greedy. In fact, think about how you can return the favor. Offer to share your own knowledge or help them with something. If you're not sure how to help, ask. They may not need anything, but by offering, they'll be willing to help you again in the future.

#### Examples:

*I took a great class on precepting. I'd be happy to send you the link if you know anyone interested.*

*I worked for a while at a hospital in Des Moines. If you ever accept an assignment there, I'd be happy to send you some restaurant recommendations.*





## Sample Informational Interview Questions

In an informational interview, you ask questions that will help you determine your next move.

- What does a typical workday look like for you?
- What do you love about your work? What about it is fulfilling?
- What are the biggest challenges you face in your job? What about it gets you down?
- What personal characteristics do you need to be successful in your position/this organization?
- What does advancement look like in this role/organization?
- How would someone go about becoming a \_\_\_ (surgical assistant, educator, etc.)?
- What were the biggest obstacles you faced when making this transition?
- What advice do you have for someone in my position?
- Who else should I talk to?



<http://careercenter.ast.org/jobseekers/>



*I've worked with a urologist for 7 years at an outpatient surgery center and would be happy to talk about my experiences with anyone you know who would be interested.*

### Do – Thank them and follow up

Send a thank you note or email for meeting with you and follow up again after you've made your decision. If they give you the names of other people who can help you, contact them after interviewing that person and thank them for connecting you. Later, let them know how their advice helped you move forward and the steps you're planning to take to move your career forward.

The informational interview is a long-term career tool that helps you make decisions and build your network. Once you've chosen a path to move forward, then it's OK to go back to your connections and ask for a bigger favor, such as an introduction to a hiring manager or job referral. If you've thanked them, followed up and kept in touch, they'll be more than happy to help you succeed.

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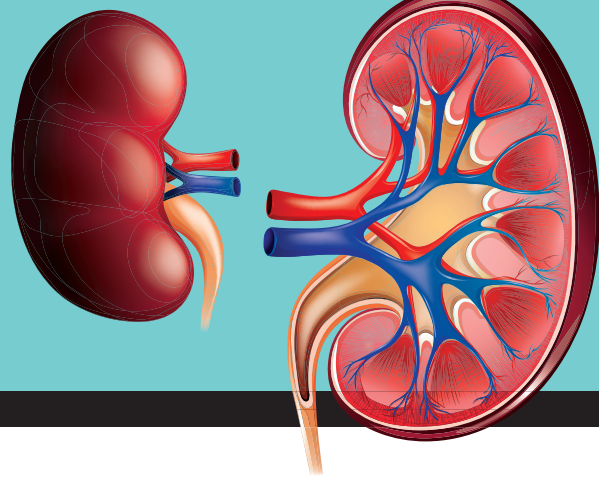
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# REVIEW: KIDNEY



Each month we will offer a short review on varying topics related to the surgical technology profession. Test your knowledge and then look up the answers in the back of this edition to see how well you did.

## 1. Define the following terms:

- Bowman's capsule \_\_\_\_\_
- Dialysis \_\_\_\_\_
- Ectopic kidney \_\_\_\_\_
- Gerota's fascia \_\_\_\_\_
- Glomerulus \_\_\_\_\_
- Haematuria \_\_\_\_\_
- Henle's loop \_\_\_\_\_
- Hydronephrosis \_\_\_\_\_
- Nephrectomy \_\_\_\_\_
- Parenchyma \_\_\_\_\_
- Podocytes \_\_\_\_\_
- Renal calculi \_\_\_\_\_
- Renal capsule \_\_\_\_\_
- Renal pelvis \_\_\_\_\_
- Zuckerkandl's fascia \_\_\_\_\_

## 2. Fill in the blanks.

- a. The kidneys are bilateral, positioned at the left and right in the \_\_\_\_\_ space between the \_\_\_\_\_ peritoneum and the posterior \_\_\_\_\_.
- b. Structures that service the kidneys enter and exit through the renal \_\_\_\_\_.
- c. Blood enters the kidneys through the \_\_\_\_\_ and exits through the \_\_\_\_\_.
- d. Urine is excreted to the \_\_\_\_\_ through the \_\_\_\_\_.
- e. The medial border of the right kidney is posterior to the middle portion of the \_\_\_\_\_.
- f. The superior portion of the right kidney is in contact with the \_\_\_\_\_ of the liver.
- g. The inferior third of the right kidney is lateral to the right flexure of the \_\_\_\_\_ and the \_\_\_\_\_.
- h. The \_\_\_\_\_ lies across the hilum of the left kidney.
- i. The \_\_\_\_\_ and \_\_\_\_\_ come in contact with the superior portion of the left kidney.
- j. The left flexure of the \_\_\_\_\_ lies laterally and the \_\_\_\_\_ medially to the left kidney.

3. What glands are connected to the superior and medial areas of the kidney? \_\_\_\_\_

4. Which kidney is located more distally and why? \_\_\_\_\_



5. What does the renal fascia separate? \_\_\_\_\_
6. Fill in the blanks:
- a. The kidney has two regions: the outer \_\_\_\_\_ and the inner \_\_\_\_\_.
  - b. The \_\_\_\_\_ consists of \_\_\_\_\_, separated by connective tissue called \_\_\_\_\_.
  - c. Each terminates into a \_\_\_\_\_, which drains into a collecting pool called a \_\_\_\_\_.
  - d. These come together to form a \_\_\_\_\_, which connect to the \_\_\_\_\_ and the ureter.
  - e. The \_\_\_\_\_ is a layer of tissue covered by renal fascia and the renal capsule. It contains arterioles, venules and glomerular capillaries to supply blood to the kidney.
  - f. \_\_\_\_\_ are the functional unit of the kidney.
  - g. There are two types. The \_\_\_\_\_ contains \_\_\_\_\_ and the \_\_\_\_\_ contains \_\_\_\_\_.
  - h. Nephrons have two parts – the renal \_\_\_\_\_ and renal \_\_\_\_\_.
7. What structures pass through the renal hilum? \_\_\_\_\_  
\_\_\_\_\_
8. Name the muscles that surround the kidney: \_\_\_\_\_
- a. Medially: \_\_\_\_\_
  - b. Laterally: \_\_\_\_\_
  - c. Posteriorly: \_\_\_\_\_
9. Describe at least three functions of the kidneys. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. In addition to the kidney, what is removed during a radical nephrectomy? \_\_\_\_\_  
\_\_\_\_\_
11. Which position is typically used for a radical nephrectomy? \_\_\_\_\_  
\_\_\_\_\_
12. Describe polycystic kidney disease. \_\_\_\_\_
13. Nearly \_\_\_\_\_ U.S. patients per year are affected by kidney failure.
- A: 78,000
  - B: 212,000
  - C: 500,000
  - D: 750,000
14. More than 100,000 are on the U.S. transplant list. In 2019, how many transplants were performed in the U.S.?
- A. 23,401
  - B. 36,862
  - C. 57,012
  - D. 66,423
15. What's the mortality rate for patients on dialysis after just one year of treatment?
- A. 3%-5%
  - B. 8%-12%
  - C. 15%-20%
  - D. 30%-35%

# UPCOMING PROGRAMS



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## ALASKA STATE ASSEMBLY

**Program Type:** Onsite Annual Mtg/Elections & Webinar  
**Date:** April 24, 2021  
**Title:** Alaska AST Pandemic Workshop and Business Meeting  
**Two Locations:** First: Providence Alaska Medical Center, 3200 Providence Dr, Anchorage, AK 99508, Second: Central Peninsula Hospital, 250 Hospital Pl, Soldotna, AK 99669  
**Contact:** Dawn Burns, 2911 Wiley Post Ave, Anchorage, AK 99517, 631-566-4600, [dawnalyssa@yahoo.com](mailto:dawnalyssa@yahoo.com)  
**CE Credits:** 6

## ARKANSAS STATE ASSEMBLY

**Program Type:** Webinar Workshop  
**Date:** April 17, 2021  
**Title:** Springtacular! A New Year  
**Contact:** Cynthia Lewis, PO Box 15772, Little Rock, AR 72231, 501-951-3180, [arsa.st@yahoo.com](mailto:arsa.st@yahoo.com)  
**CE Credits:** 5 Total, 5 Advanced

## COLORADO/WYOMING STATE ASSEMBLY

**Program Type:** Onsite Annual Mtg/Elections & Webinar  
**Date:** April 17, 2021  
**Title:** Spring Annual Meeting and Workshop  
**Location:** Parker Adventist Hospital, 9395 Crown Crest Blvd, Parker, CO 80138  
**Contact:** Karey Covington, PO Box 460667, Aurora, CO 80046, 720-227-2779, [surpriskarey@hotmail.com](mailto:surpriskarey@hotmail.com)  
**CE Credits:** 6

## IOWA STATE ASSEMBLY

**Program Type:** Onsite Workshop  
**Date:** April 10, 2021  
**Title:** IASA Spring 2021 Workshop  
**Location:** Radisson Hotel Ames Conference Center at ISU, 2609 University Blvd, Ames, IA 50010  
**Contact:** John Hadley, 9413 Rushbrook Dr, Johnston, IA 50131, 507-358-2332, 515-253-8004, [jhadley2@dmacc.edu](mailto:jhadley2@dmacc.edu)  
**CE Credits:** 8

## MINNESOTA STATE ASSEMBLY

**Program Type:** Webinar Workshop  
**Date:** April 10, 2021  
**Title:** MNSA 2021 Spring Webinar Workshop  
**Contact:** Amy Campeau, PO Box 163, Becker, MN 55308, 612-644-7674, [mnast2016@outlook.com](mailto:mnast2016@outlook.com)  
**CE Credits:** 3 Total, 2 Advanced

## MISSISSIPPI STATE ASSEMBLY

**Program Type:** Onsite Annual Mtg/Elections  
**Date:** April 10, 2021  
**Title:** Mississippi Spring Meeting  
**Location:** Holmes Community College, 412 W Ridgeland Ave, Ridgeland, MS 39157  
**Contact:** Travia Coleman, 412 W Ridgeland Ave, Ridgeland, MS 39157, 601-605-3396, [trcoleman@holmescc.edu](mailto:trcoleman@holmescc.edu)  
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## SOUTH DAKOTA STATE ASSEMBLY

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**Title:** SDSA Spring 2021 Webinar  
**Contact:** Tiffany Howe, 800 Mickelson Dr, Rapid City, SD 57703, 303-619-3666, [sunset4114@yahoo.com](mailto:sunset4114@yahoo.com)  
**CE Credits:** 4

## TENNESSEE STATE ASSEMBLY

**Program Type:** Webinar Workshop  
**Date:** April 17, 2021  
**Title:** Surviving the New Normal in the OR  
**Contact:** Marcia McMahan, 214 Golden Rod Dr, Seymour, TN 37865, 865-386-5712, [marciamcmahantnast@gmail.com](mailto:marciamcmahantnast@gmail.com)  
**CE Credits:** 6

## UTAH STATE ASSEMBLY

**Program Type:** Onsite Annual Mtg/Elections  
**Date:** April 10, 2021  
**Title:** Love What You Do  
**Location:** Intermountain Medical Center, 5121 Cottonwood St, Murray, UT 84107  
**Contact:** Sherri Nelson, 818 Cedarwood Road, Tooele, UT 84074, 435-840-1074, [bostonmom27@gmail.com](mailto:bostonmom27@gmail.com)  
**CE Credits:** 4

## WISCONSIN STATE ASSEMBLY

**Program Type:** Onsite Annual Mtg/Elections  
**Date:** October 2, 2021  
**Title:** Fall Together  
**Location:** Froedtert Hospital, 900 N 92nd St, Milwaukee, WI 53226  
**Contact:** Kimberly Schauer, 1443 S Parkview Ave, New Berlin, WI 53151, 414-807-6152, [k.schauer@live.com](mailto:k.schauer@live.com)  
**CE Credits:** 6

# STATE ASSEMBLY ANNUAL BUSINESS MEETINGS

Members interested in the election of officers & the business issues of their state assembly should ensure their attendance at the following meetings.

## ALASKA

Anchorage & Soldotna  
April 24, 2021  
Annual Meeting  
2020 - 2021  
BOD Elections  
& 2021 Delegate Elections

## UTAH

Murray  
April 10, 2021  
Annual Meeting  
2020 - 2021  
BOD Elections  
& 2021 Delegate Elections

## COLORADO/WYOMING

Parker  
April 17, 2021  
Annual Meeting  
2020 - 2021  
BOD Elections  
& 2021 Delegate Elections

## WISCONSIN

Milwaukee  
October 2, 2021  
Annual Meeting  
2020 - 2021  
BOD Elections  
& 2021 Delegate Elections

## MISSISSIPPI

Ridgeland  
April 10, 2021  
Annual Meeting  
2021 BOD Elections  
& 2021 Delegate Elections

**Program Approvals:** Submit the *State Assembly Program Date Request Form A1* no less than 120 days prior to the date(s) of the program for AST approval. The form must be received prior to first (1st) of the current month for program publication in the next month of the AST monthly journal *The Surgical Technologist*. The *Application for State Assembly CE Program Approval A2* must be received at least thirty (30) days prior to the date(s) of the program for continuing education credit approval. An application submitted post-program will not be accepted; no program is granted approval retroactively.

- ▲ **Approved** indicates a continuing education program approved by AST for CE credit.
- ▲ **Pending submission** of CE documentation indicates the state assembly has not submitted all required materials to AST for continuing education program approval.
- ▲ **Accredited** indicates a formal, college-based surgical technology or surgical assisting program that has been accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP).

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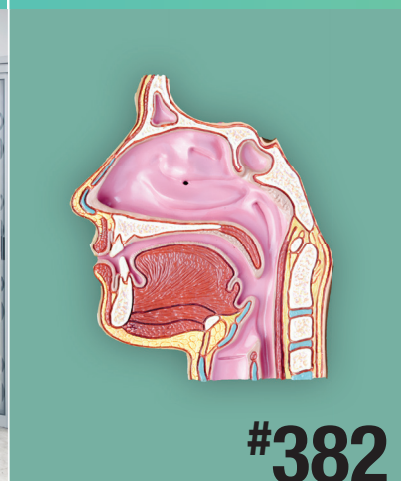
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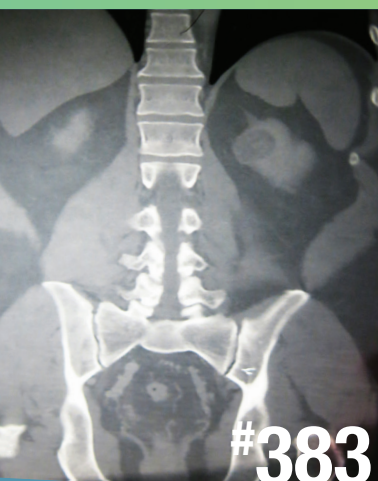
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# Review: Kidney

## Answers

1. Bowman's capsule – The outer area of a renal corpuscle that surrounds the glomerulus and connects to the proximal convoluted tubule at the beginning of a nephron.  
Dialysis – A treatment for kidney failure that filters waste products from the blood.  
Ectopic kidney – A birth defect where a kidney is not located in its normal position.  
Gerota's fascia – Anterior renal fascia.  
Glomerulus – The inner area of a renal corpuscle containing a network of capillaries and surrounded by Bowman's capsule. Also called a tuft.  
Haematuria – Blood in the urine.  
Henle's loop – The portion of a nephron that connects the descending limb of the proximal tubule to the ascending limb of the distal tubule, creating a high urea concentration deep in the medulla. Also called the nephron loop.  
Hydronephrosis – An obstruction in the kidney causing build-up of urine and swelling in the kidney.  
Nephrectomy – The total or partial removal of the kidney.  
Parenchyma – The functional tissue of the kidney (versus connective or supporting tissue).  
Podocytes – Epithelial cells within the Bowman's capsule that encircle the capillaries of the glomerulus, and act as one of the filtration systems of the kidneys.  
Renal calculi – Deposits of minerals and salts that form within the kidney. Also called Kidney stones, nephrolithiasis and urolithiasis.  
Renal capsule – Layers of fibrous and adipose tissue that surround and protect the kidney.  
Renal pelvis – The funnel-like part of the kidney where the major calyces converge, allowing urine to flow into the ureter.  
Zuckerkandl's fascia – Posterior renal fascia.
2. a. retroperitoneal, parietal, abdominal wall  
b. hilum  
c. renal arteries, renal veins  
d. bladder, ureter  
e. duodenum  
f. right lobe  
g. colon, jejunum  
h. pancreas  
i. stomach, spleen  
j. colon, jejunum
3. Adrenal glands (also called suprarenal glands).
4. The right kidney is displaced by the liver.
5. Adipose layers surrounding the kidney.
6. a. renal cortex, renal medulla  
b. medulla, medullary pyramids, renal columns  
c. renal papilla, minor calyx  
d. major calyx, renal pelvis  
e. renal cortex  
f. Nephrons  
g. medulla, juxtamedullary nephrons, cortex, cortical nephrons  
h. corpuscle, tubule

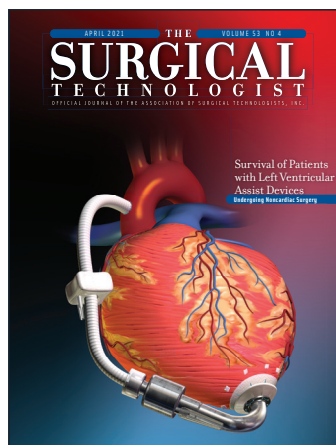
7. Renal artery, renal vein, ureters, lymphatics and nerves.
8. a. Psoas  
b. Transverse abdominal  
c. Quadratus lumborum
9. Functions of the kidneys:
  - Produce urine – Remove waste products and excess fluid from the body.
  - Control blood pressure by controlling fluid levels and producing a hormone causes vasoconstriction.
  - Aid in red blood cell production, by producing a hormone that signals bone marrow to produce more.
  - Produces Vitamin D that allows the body to absorb calcium and phosphorus – leading to stronger bones.
  - Controls the body's pH levels by removing acids or balancing chemicals that control acid levels.
10. The adrenal gland, perirenal fat, upper ureter, Gerota's fascia and possibly regional lymph nodes.
11. Supine
12. A condition, usually inherited, where many fluid-filled benign cysts grow within the kidney causing dysfunction.
13. D. 750,000
14. A. 23,401
15. C. 15%-20%

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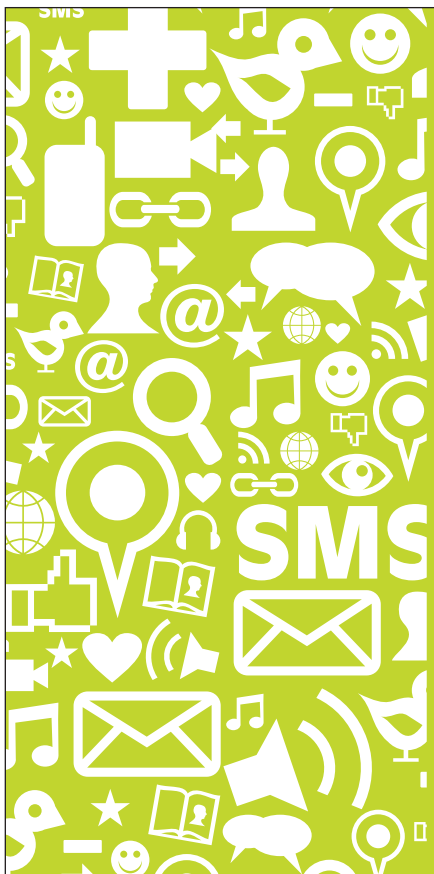
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