AATS

AATS DAILY NEWS

Official newspaper of the AATS 102nd Annual Meeting

Preview Edition Saturday May 14, 2022

In this issue

Welcome!

It is with great pleasure that I welcome you to Boston for the AATS 102nd Annual Meeting. After a tough two years, I hope you are as delighted as I am that we can now be back together, in person, to be present with the newest developments and innovations in cardiothoracic surgery. This is our opportunity to learn together as we always have, to interact and network, and to catch up with our friends and colleagues from all over the world.

The 102nd Annual Meeting is focused on innovation. Innovation is an AATS Core Value, deeply imbedded in our culture. Surgeons are innovators by nature. The last two years have shown us repeatedly how important it is to incorporate innovation in how we work, as well as how we lead. So, look in this Annual Meeting for opportunities to understand the process of innovation, because it defines the future of cardiothoracic surgery. We will tackle how best to develop ideas, how to prove their worth, and what needs to be done to bring an idea from bench to bedside.

Over the next few days, you will be able to witness exemplary talks – the best from among more than a thousand submitted abstracts. There are sessions related to advances in adult cardiac surgery, thoracic surgery, congenital heart surgery, as well as perioperative and critical care streams. Each session is moderated by world leaders in the field who will guide the sessions and bring out the most important discussion points from the speakers and the audience.

This is a packed program. I want to draw your attention to key presentations from Dr. Valerie Rusch, Dr. Bartley Griffith, Martine Rothblatt, and Malcolm Gladwell, the details of which you will find later within these pages.

On that note, make sure you pick up a copy of *AATS Daily News* each morning to get the 'inside scoop' on upcoming talks, sessions, and events from the entire program. It will also offer lookbacks and live accounts of key moments you might have missed.

As we embark on this 102nd Annual Meeting, I have been reflecting back on the very first AATS meeting I ever attended. It was very exciting for me to come to that meeting as a resident. What struck me was how the Annual Meeting just exuded quality. It was a well-orchestrated meeting populated with world-famous names in the field, several of whom literally wrote the book on techniques and insights that define our field. Naturally, I haven't missed a single Annual Meeting since.

The quality of the Annual Meeting flows from the expertise and energy of so many. From our faculty and attendees, to the organizational team and venue staff, it is a collective effort to breathe life into this important gathering each year. I would like to give special thanks to the Program Committee – Drs. Rakesh Arora, Christopher Calderone, Joanna Chikwe, Marci Damiano, Thomas D'Amico, Maral Ouzounian, Glen Van Arsdell, Kazuhiro Yasufuku, and Marijana Zubrinic – for their invaluable contributions.

> "The last two years have shown us repeatedly how important it is to incorporate innovation in how we work, as well as how we lead. So, look in this Annual Meeting for opportunities to understand the process of innovation, because it defines the future of cardiothoracic surgery."
>
> **Shaf Keshavjee**

Shaf Keshavjee

And lastly, without the collaboration of our industry partners, this event would not be possible. Our sincere thanks to our sponsors and exhibitors for their support.

On behalf of everyone involved in the AATS 102nd Annual Meeting, we wish you an enlightening and engaging experience over the next few days. Enjoy the fascinating talks, have that long-overdue catch-up with your friends and colleagues, and if you are staying a little longer, take the opportunity to explore this great city.

See you next year in Los Angeles!

Shaf Keshavjee, MD

AATS President

Featured speakers at the AATS 102nd Annual Meeting

Plenary Session Ballroom ABC *Saturday, 1:30 PM*

Valerie W. Rusch

DAVID J. SUGARBAKER MEMORIAL LECTURE

Dr. Rusch has been a member of the Thoracic Surgery Service at Memorial Sloan Kettering Cancer Center (MSKCC) since March, 1989. A native New Yorker, she is a graduate of Vassar College and Columbia University College of Physicians and Surgeons. She completed her general surgery and cardiothoracic surgery residencies at the University of Washington in Seattle.

After an additional year of experience in thoracic oncology at MD Anderson Cancer Center, she returned to the University of Washington where she served on the faculty for six years prior to her appointment at MSKCC. Dr. Rusch was Chief of the MSK Thoracic Service from 2000 to 2013.

Plenary Session Ballroom ABC *Sunday, 9:45 AM*

Martine Rothblatt

DOING THE IMPOSSIBLE: TIME AND TIME AGAIN

Dr. Rothblatt is the Chairperson and CEO of United Therapeutics Corporation (UT). She started UT to save her youngest child's life from a rare illness after having previously created SiriusXM satellite radio and other satellite communications systems. She is also responsible for several innovations in aviation and architecture, including holding the Guinness Record for longest flight in an electric helicopter, and creating the world's largest zero carbon footprint building. Her company is now saving hundreds of lives a year with medicines for pulmonary hypertension and neuroblastoma, and by manufacturing transplantable lungs out of rejected donor lungs. UT is also in pre-clinical development of manufactured kidneys, hearts, and 3D printed autologous lungs to be delivered via autonomously flown electric vertical takeoff and landing (eVTOL) systems.

Presidential Plenary Ballroom ABC *Monday, 9:45 AM*

Malcolm Gladwell

EXPERIMENTING WITH EXPERIMENTS

Malcolm Gladwell is the author of five *New York Times* bestsellers — *The Tipping Point*, *Blink*, *Outliers*, *What the Dog Saw*, and *David and Goliath: Underdogs, Misfits and the Art of Battling Giants*. He has been named one of the 100 most influential people by *TIME* magazine and one of the Foreign Policy's Top Global Thinkers.

His newest book, *The Bomber Mafia: A Dream, a Temp-tation, and the Longest Night of the Second World War* (April 2021), was inspired by the four-part series about General Curtis LeMay on his podcast "Revisionist His-tory". In it, Gladwell weaves together the stories of a Dutch genius and his homemade computer, a band of brothers in central Alabama, a British psychopath, and pyromaniacal chemists at Harvard to examine one of the greatest moral challenges in modern American history.

Boston's Top 5

Boston has a mix of world-famous history and modern charm, filled with sightseeing opportunities, great eateries, beloved sports teams, and distinctive Boston character. Should you be staying a little longer, here are five 'don't miss' suggestions to get to know this fine city.

Freedom Trail

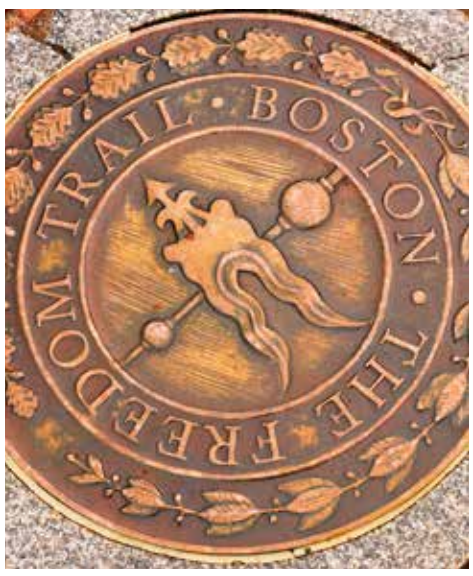
The iconic pathway through Boston is one the city's most famous attractions. Take a stroll through historic sites over 2.5 miles, and revel in the rich history and architecture of Beantown.

Boston Common

There's nothing 'common' about the oldest city park in the USA. Spread over 50 acres, this popular green space is the place to be on a fine day in May. It also marks the start of the Freedom Trail.

Boston harbor tour

Departing from Long Wharf, and lasting around one hour for the basic trip, a harbor tour is an excellent way to look back at Boston from the water. Expect lots of photo opportunities, especially if you opt for one of the whale watching tours.



Skywalk Observatory

Sat aloft the Prudential Tower, the Observatory is the perfect way to feast your eyes on the landscape of Boston. Pick a sunny day and see for miles and miles, or grab a bite to eat on the 52nd floor.

Indulge in a Boston Cream Pie

After all that sightseeing, refuel with this Massachusetts gold standard. In case anyone asks, it's really a cake, not a pie, supposedly created back in Boston in 1856. Now it can be enjoyed all over the city.

For more information and ideas, head to https://www.bostonusa.com/things-to-do/ for inspiration.

AATS DAILY NEWS

Publishing and Production
Captivate Media Limited
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www.captivatemedia.co.uk

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SESSION HIGHLIGHT

Cardiothoracic Careers College

Saturday, 10:00 AM, Room 311

MODERATORS

Amy Fiedler
UW Health Hospital and Clinics

Thomas Varghese
Huntsman Cancer Institute

Dominic Emerson
Cedars-Sinai Medical Center

The yearly Cardiothoracic Careers College at the AATS Annual Meeting provides a unique forum for trainees and junior attendings to hear from experts in the field of cardiothoracic surgery regarding career planning and development. Focused specifically on the needs of the more junior individuals in our field, the program is an exciting mix of presentations and panel discussions with ample time for questions and networking between the presenters and the participants.

Topics covered:

- Time Management for Cardiothoracic Surgeons
- How to Maximize Your Educational Experience in the OR
- Why and How to Choose a Super-Fellowship

Amy Fiedler

- Essentials of a Successful Job Search
- How to Evaluate a New Job

Thomas Varghese

- How to Negotiate
- How to Build Your Clinical Practice
- How to Build Your Academic Practice

Dominic Emerson

- How to Get Promoted
- Dealing with Burnout, Bias, and Bullies

SESSION HIGHLIGHT

AATS/WTS Joint Session: Thoracic Oncology Challenges

Sunday, 2:00 PM, Room 312

MODERATORS

Daniela Molena Memorial Sloan Kettering Cancer Center

M. Blair Marshall Brigham & Women's Hospital

This AATS/WTS (Women in Thoracic Surgery) joint session is going to be very exciting, touching on several of the current hot topics in general thoracic surgery. As we are in the midst of a revolution in the management of cancer patients, the keynote address, delivered by Jessica Donington, will highlight the critical importance of how the current strategies incorporating immunotherapy affect what we know and how we will treat patients with cancer in the future.

Daniela Molena

M. Blair Marshall

Could it be that thoracic surgeons are not as in demand as we thought? We will find out as Alexandra Potter discusses her research examining the shortage of thoracic surgeons, and the potential impact on patients with early-stage lung cancer. Paula Ugalde Figueroa will then add knowledge from a multi-institutional collaboration regarding the survival following uniportal video-assisted thoracic surgery (VATS) for lung cancer. This is long-awaited data. Will it be equivalent to VATS and robotics? Attend and find out!

We will have a couple of talks on complex chest wall cases. How to plan the reconstruction prospectively utilizing 3D imaging will be described by Emily Eickhoff, and a 3D printed reconstruction – truly the era of personalized medicine – will be demonstrated with a video presented by Motahar Hosseini. We are all expecting 3D imaging and personalized reconstructions to become the new standard of care in management of thoracic chest wall pathology.

Continuing with the theme of the technical aspects of general thoracic surgery, Matthew Rochefort will report on quality assurance in the performance of segmentectomy. Lastly, the session closes with Hope Feldman describing the intraoperative technical challenges during operations on patients after induction therapy.

There will be a lot to learn from this session. We expect these talks to help shape our future as thoracic surgeons. It is not to be missed!

SESSION HIGHLIGHT

Innovation Workshop: The Nuts and Bolts of Innovation

Monday, 1:45 PM, Room 304–306

MODERATORS

W. Randolph Chitwood Jr.,
East Carolina University/ECU Health System

Michael Mack Baylor Scott & White The Heart Hospital Plano

The overall theme of the 2022 AATS Annual Meeting is innovation, and myriad aspects of innovation will be presented throughout the meeting. But how exactly do you innovate? You have a great idea but how do you start? What are the key steps in the process? These are the cardinal questions most often asked by practicing cardiothoracic surgeons. And then there are the concerns, e.g. "I am too busy," or "I don't know how."

The AATS Innovation Workshop will show you the nuts and bolts of innovation. The faculty are leading cardiovascular specialists who themselves have been very successful in bringing their ideas from the bench to a clinical reality. They have all 'walked the walk'. This exciting session will focus how a busy cardiothoracic surgeon can generate new ideas, protect their intellectual property, get their idea funded, determine if there is a potential market for their device, and work with industry – even toward acquisition of their invention.

This is a must-attend session for those of you who have great ideas, and who want to mold the future of our specialty by providing the best and safest technological innovations for our patients.

W. Randolph Chitwood Jr.

Michael Mack

SESSION HIGHLIGHT

AATS/WTS Joint Session: Coronary Masterclass

Monday, 1:45 PM, Ballroom ABC

MODERATORS

Dawn Hui UT Health San Antonio

Patricia Thistlethwaite
University of California, San Diego

Dawn Hui

Patricia Thistlethwaite

The AATS/WTS Joint Session: Coronary Masterclass will be a stimulating session on contemporary topics in the practical management of coronary artery disease. Coronary artery bypass remains the cornerstone of treatment for many patients with coronary atherosclerosis. While outcomes of surgical revascularization are excellent in today's age, our specialty continues to push the envelope through scrutiny of revascularization strategies.

Attention to treatment equity represents further opportunity to improve the quality of care. As well, the balance of education, patient safety, and public reporting will be discussed by an esteemed quality expert. The session will culminate in a panel discussion by master surgeons, and we expect a dynamic discussion and debate to inform attendees' clinical practice, and program quality improvement efforts.

Wellness Session Room 313 *Saturday 10:00 AM*

Time for a little 'exerscience' in your life

This morning's Wellness Session takes a close look at general topics relating to the health of the surgical community, including how to heal after the pandemic, maintaining a sense of belonging, and how to keep control. The session will begin with 1968 Boston Marathon winner and former editor of *Runner's World*, Amby Burfoot, who spoke to *AATS Daily News* about his 60-year running career, and why he thinks more of us should get out there and 'just do it.'

The first question I must ask, Amby, is, what brings you to the AATS 102nd Annual Meeting to give a presentation to a group of cardiothoracic specialists?
I was invited by a member of the Academy. We met at the Boston Marathon a month ago – she's a serious marathon runner and finished way ahead of me – she was so nice, I couldn't say no. I'm no doctor, I'm a lay person – but one with 60 years' running experience, so she thought I might have something useful to share.

'Exerscience: A Runner's Guide to the Meaning of a Surgeon's Life' – that's a striking title for a presentation. Could you elaborate a little?
Exerscience is my Twitter handle, and one of my books is titled *A Runner's Guide to the Meaning of Life*. Of course, I don't know first-hand what it's like to be a surgeon, but I can imagine how demanding and stressful the job must be. There are only so many factors a surgeon can affect to bring about a successful outcome – that's a high-pressure life. And high-pressure lives need the benefit of exercise.

I spent my career on the editorial staff of *Runner's World Magazine*. We could walk to the cafeteria at any moment, and we could even leave the office to go out for a run. Surgeons don't have that kind of flexibility, and I think incorporating exercise into the working day, to maintain health and manage stress, is vital for everyone. So, that's one of the things I'll be covering in the talk.

Where did your running story start, and what's kept you running all these years?
I had an extraordinarily fortunate beginning to my running career. My father was a YMCA director, so I grew up doing all the major national sports like basketball and baseball. I was even quite good, but when I got to high school, I realized you had to be strong and fast to excel at them. I wasn't strong and fast, I was skinny and slow, and I couldn't jump very high.

Then, one day, after a bad basketball practice, the coach punished the whole team by making us run the cross-country course. I was the last player picked for the basketball team, but on this three-mile run, I came back first. That's when it started – that's when I chose distance running.

It turned out that the running coach at my high school was the best distance runner in the US: a Boston Marathon winner and a two-time Olympian. More importantly, he was the smartest, most progressive person I have ever met. He never once weighed me down with rules and dogma. In fact, he was completely anti-authoritarian. I simply followed his personal

> "I think incorporating exercise into the working day, to maintain health and manage stress, is vital for everyone."
>
> **Amby Burfoot**

example, which was to just get out there and run.

What's the most memorable moment in your running career?
There are a few. Winning the Boston Marathon in 1968 was obviously a great thrill. Returning to Boston in 2014 – the year after the finish-line bombings – to reclaim the streets, well, that was very emotional. And I've run the same Thanksgiving Day five-mile race in Manchester, Connecticut, for 59 years in a row. I think that's my greatest running achievement.

You run for personal reasons. Why do you encourage others to run?
For many years, we talked about heart health as the main reason for running. Now we tend to think more about mental health. When we miss our exercise, we start feeling anxious and less productive. There's no runner who doesn't feel more alive and engaged – and just plain 'better' – after a run.

Also, there's growing data on an inverse relationship between regular exercise and depression, cognitive decline, and Alzheimer's. When I first heard this 30 years ago, I laughed out loud. I thought it was ridiculous to connect running with better brain function and mental health. Now it seems obvious.

Agreed: exercise as medicine is a concept that has been around since the time of Ancient Greece. Is the concept still relevant?
You bet. Public health would be much better if more Americans exercised, period. No one doubts that; it's a simple correlation. The big challenge is: how do we turn society around so that it's easier to find time and space for exercise? And how do we make it easier to find and consume simple, whole foods?

Are there any myths attached to running?
The biggest myth is that running ruins the knees. We live in a country where lots of people are getting knee and hip replacements, right? People immediately link this to the growth in marathons and gym memberships, but the truth is, there's little research to link running with osteoarthritis and some to indicate that nonrunning – leading to weight gain and loss of muscle tone – is the bigger cause. The knees and hips were designed for walking and running. Football, skiing, tennis, basketball? Not so much!

Should more medical professionals take up running?
Here's my radical idea: hospitals and medical organizations should give employees an hour of exercise time a day, in addition to other break time. We all know the medical system is in crisis, and probably failing significant numbers of medical professionals and patients.

If I understand correctly, medical professionals are leaving medicine in droves. Who can blame them? We've somehow engineered a system that doesn't work very well for anyone. I'm not naive enough to think we can change this overnight, but I would like to see changes that make medicine healthier for all.

What are the commonest mistakes people make when starting a running regime?
Everyone tries to do too much, too soon. You're not trying to be an Olympian. Don't run by miles, run by minutes. Start with just a few and gradually build up. Walking is almost always the first step. All beginners' running programs encourage a run-walk system. Run for 15 seconds, walk for as long as you need to recover, then run for 15 seconds again. As you gain experience, and get in better shape, you increase the running and decrease the walking. Simple!

In your books, you describe running as a powerful tool for positive change and personal growth. Why?
Running is so inherently measurable. You run for X minutes or X miles, and then a few months later, you can do X + 5. You can track your progress. This makes you realize that if you approach other areas of your life with the same consistent dedication, you can make similar advances. Little in life comes easily; most success is achieved by putting one building block on top of another one, continuously, until you have constructed something valuable.

Do you have any especially moving running stories to share?
So many it's hard to pick just one, but there was a recent news story about a lady who's a below-the-knee amputee. She ran 104 marathons in 104 days. That's a truly remarkable achievement.

Running is a simple activity, yet there's a whole industry devoted to it. What does a person really need?
For me, the simpler and more essential we keep exercise, the better. Many of us are attracted to the simplicity of running – it's what homo sapiens were designed to do – anyone can see that. It was an essential survival skill long before we had Gatorade, New Balance shoes, GPS watches, and heart-rate monitors. No one needs any of those things to enjoy healthy running. I don't wear any of them on my runs. Shoes to protect my feet and a chronograph watch on my wrist – that's it. That rather famous slogan, 'Just do it', does actually sum things up well.

> "Of course, I don't know first-hand what it's like to be a surgeon, but I can imagine how demanding and stressful the job must be... and high-pressure lives need the benefit of exercise."
>
> **Amby Burfoot**

Photo courtesy of Thomas Greally

A lot of people have bad memories of track and cross-country from school. How does a person with a negative relationship to running turn that around?
My high school coach didn't force us to run endless laps around the track — he hated tracks. Instead, he took us through nearby fields and orchards, and along the marshlands of Long Island Sound. Running became linked to the natural environment and that heightened our enjoyment.

Getting out into parklands and nature is a very helpful tactic, but we live in an urbanized world, and we run where and when we can. The key is to find the right mental space and to go within.

What's your take-home?
Carve out the time you need, run slow and relaxed, stop to walk when you feel like it, and then start up running again. There are no rules. All runs are good runs. Do it for yourself – you deserve it!

Saturday resident ssessions	
6:00–8:00 PM Exhibit Hall	**Cardiothoracic residents poster competition** (non-CME)
	Resident case report poster viewing
6:30–7:30 PM Tech Theater 3 Exhibit Hall	**Resident case report competition**

Schedule at a Glance

Saturday, May 14–Tuesday, May 17

SATURDAY, MAY 14

SIMULTANEOUS SESSIONS

7:55AM-10:00AM
- CONGENITAL — Congenital Course Part I: Questions for Which We Need Answers — ROOM 210

8:00AM-12:00PM
- THORACIC — International Thoracic Surgical Oncology Summit at the Annual Meeting — ROOM 312

8:30AM-12:00PM
- PERIOPERATIVE — AATS ERAS® Cardiac Summit: Rapid Fire Basics and Advanced Concepts — ROOM 206

10:25AM-12:00PM
- CONGENITAL — Congenital Course Part II: When Neonatal Success Leads to Further Need for Intervention — ROOM 210

9:00AM-12:00PM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Cardiac Surgery Video: How I Teach It — ROOM 304–306
- Global Surgery Forum * — ROOM 302

10:00AM-12:00PM **SIMULTANEOUS SESSIONS**
- MULTI-SPECIALTY — Cardiothoracic Careers College — ROOM 311
- Wellness Session — ROOM 313

12:00PM-12:30PM **BREAK**

12:30PM-1:30PM **INDUSTRY LUNCH SYMPOSIA ***

1:30PM-3:50PM **PLENARY SESSION** — BALLROOM ABC

David J. Sugarbaker Memorial Lecture
Lung Cancer Care: A Glance Back, a Look Forward
Valerie Rusch, *Memorial Sloan Kettering Cancer Center*

3:50PM-4:15PM **BREAK**

4:00PM-6:00PM **MEMBER FOR A DAY** — REPUBLIC AB, SHERATON
Resident, Fellows, Medical Students Only

4:15PM-6:00PM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Aortic Valves for Young Adults: Essentials — ROOM 302
- Atrial Fibrillation Essentials * — ROOM 309
- Presidents' Masterclass: Coronary Complications — ROOM 304–306
- CONGENITAL — Improving Through Innovation and Quality * — ROOM 210
- PERIOPERATIVE — Transfusion Revolution in Blood Utilization — ROOM 206
- THORACIC — Screening, Staging, Treating Early Stage Lung Cancer — ROOM 312
- Thymic and Germ Cell Tumors in 2022 — ROOM 311

6:00PM-8:00PM **WELCOME RECEPTION IN THE EXHIBIT HALL ***
- Cardiothoracic Resident Poster Competition *
- Cardiothoracic Surgery Resident Case Report Competition *
- Cardiothoracic Resident Case Report Poster Viewing *
- Perioperative / Team-Based Care Poster Competition *

* non-CME

All sessions will take place at the Hynes Convention Center unless otherwise noted

SUNDAY, MAY 15

7:30AM-9:15AM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Coronary Bypass in Young Patients: Essentials * — ROOM 309
- Minimally Invasive Mitral Masterclass — ROOM 302
- Presidents' Masterclass: Valve Complications — ROOM 304–306
- CONGENITAL — Contemporary Transplant and Mechanical Support — ROOM 210
- PERIOPERATIVE — Perioperative Care Summit — ROOM 206
- THORACIC — Optimizing Esophagectomy — ROOM 312
- Optimizing Lung Allograft Success — ROOM 311

9:15AM-9:45AM **BREAK IN THE EXHIBIT HALL** Poster Presentations *
- Dose Escalation Study of Encoberminogene Rezmadenovec (Adenoviral Vector With Multiple Isoforms of Vascular Endothelial Growth Factor) in Refractory Angina: Phase 1 Results — TECH THEATER 1

9:45AM-12:30PM **PLENARY SESSION *** — BALLROOM ABC

Guest Lecture on Innovation: Xenotransplantation is Not Around the Corner Anymore: The First Pig to Human Heart Transplant
Bartley P. Griffith, *University of Maryland Medical Center*

Keynote
Doing the Impossible: Time and Again
Martine Rothblatt

12:30PM-2:00PM **LUNCH IN THE EXHIBIT HALL**
Poster Viewing * and Rapid Fire Oral Presentations *

12:30PM-2:15PM **C. WALTON LILLEHEI RESIDENT FORUM *** — ROOM 309

2:00PM-3:45PM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Adult Cardiac Summit — BALLROOM ABC
- CONGENITAL — Mostly Outlet Challenges — ROOM 210
- MULTI-SPECIALTY — Achieving High-Impact Publication: Insights from JTCVS Editors and Reviewers — ROOM 313
- PERIOPERATIVE — Controversies and Challenges in ECMO Management — ROOM 206
- THORACIC — AATS/WTS Joint Session: Thoracic Oncology Challenges — ROOM 312
- Mesothelioma: More Than Just the Resection * — ROOM 311

3:45PM-4:15PM **BREAK IN THE EXHIBIT HALL** Poster Presentations *

4:15PM-6:00PM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Aortic Root Masterclass — ROOM 304–306
- Heart Transplantation Masterclass — ROOM 309
- TAVR Masterclass — ROOM 302
- CONGENITAL — Functional Single Ventricle — ROOM 210
- PERIOPERATIVE — Drainology: Managing Chest Drains in the Postoperative Patient — ROOM 206
- THORACIC — Thoracic Summit * — ROOM 312

MONDAY, MAY 16

7:30AM-9:15AM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Aortic Arch Masterclass — ROOM 309
- Cardiothoracic Surgical Trials — ROOM 304–306
- Mechanical Circulatory Support: Essentials — ROOM 302
- CONGENITAL — Congenital Potpourri — ROOM 210
- MULTI-SPECIALTY — Surgical Ethics I — ROOM 313
- PERIOPERATIVE — Using Technology to Impact Patient Centered Perioperative Care * — ROOM 206
- THORACIC — Good to Great: Quality, Innovation, Education — ROOM 312
- Novel Pre-Clinical Approaches to Lung Cancer — ROOM 311

9:15AM-9:45AM **BREAK IN THE EXHIBIT HALL** Poster Presentations *
- The Future Financial Viability of Cardiothoracic Surgery — TECH THEATER 1

9:45AM-12:15PM **PRESIDENTIAL PLENARY *** — BALLROOM ABC

Keynote
Experimenting with Experiments
Malcolm Gladwell

Presidential Address
What's Next?
Shaf Keshavjee, AATS President

12:15PM-1:45PM **LUNCH IN THE EXHIBIT HALL**
Poster Viewing * and Rapid Fire Oral Presentations *

12:15PM-1:15PM **INDUSTRY LUNCH SYMPOSIA ***

1:45PM-3:30PM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — AATS/WTS Joint Session: Coronary Masterclass — BALLROOM ABC
- Mitral Valve Repair: Essentials — ROOM 302
- Cardiac Surgery Video Masterclass: Aortic — ROOM 309
- CONGENITAL — Congenital Summit — ROOM 210
- MULTI-SPECIALTY — Innovation Workshop: The Nuts and Bolts of Innovation * — ROOM 304–306
- Surgical Ethics II — ROOM 313
- PERIOPERATIVE — Prehab and Rehab Before, During, and After Cardiothoracic Surgery — ROOM 206
- THORACIC — Extra Corporeal Lung Support and Transplant — ROOM 312
- Technological Advances in Tracheobronchial Surgery * — ROOM 311

3:30PM-4:00PM **BREAK IN THE EXHIBIT HALL** Poster Presentations *

4:00PM-5:30PM **PLENARY ON INNOVATION: AN EXECUTIVE ROUNDTABLE ON BRINGING DISCOVERIES TO THE BEDSIDE *** — BALLROOM ABC

5:30PM-6:00PM **EXECUTIVE SESSION** AATS Members Only — BALLROOM ABC

TUESDAY, MAY 17

6:45AM-8:00AM **AMERICAN BOARD OF THORACIC SURGERY (ABTS): UPDATE AND MOC 2022 CERTIFICATION BREAKFAST** — ROOM 210

8:00AM-9:45AM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Aortic Dissection Masterclass — ROOM 304–306
- Cardiac Surgery Video Masterclass: Mitral — ROOM 302
- Durable Mechanical Support Masterclass * — ROOM 309
- CONGENITAL — Atrioventricular Valves — ROOM 210
- MULTI-SPECIALTY — Ethics Debate: Should a Questionably Competent Resident Be Allowed to Continue in the Program? — ROOM 313
- PERIOPERATIVE — Rescuing and Failing to Rescue the Postoperative Patient — ROOM 206
- THORACIC — Novel Technologies: Expanding Thoracic Surgery — ROOM 311
- Therapeutic Approaches for Locally Advanced Lung Cancer — ROOM 312

10:00AM-11:45AM **SIMULTANEOUS SESSIONS**
- ADULT CARDIAC — Aortic Valve Masterclass — ROOM 304–306
- Coronary Bypass Essentials * — ROOM 313
- Thoracoabdominal Masterclass — ROOM 302
- CONGENITAL — Complex Challenges in Congenital Heart Surgery — ROOM 210
- MULTI-SPECIALTY — High Performance Cardiothroacic Surgery in the Digital Age * — ROOM 309
- PERIOPERATIVE — 2021's Top Papers — ROOM 206
- THORACIC — Esophagectomy: Improving Outcomes — ROOM 311
- Pushing the Boundaries with Technology in Thoracic Surgery — ROOM 312

11:45AM **102nd ANNUAL MEETING ADJOURNS**

AATS ERAS Cardiac Summit: Rapid Fire Basics and Advanced Concepts Room 206 *Saturday 08:30 AM*

Avoiding AKI is as easy as ERAS

The incidence of acute kidney injury (AKI) following cardiac surgery is worryingly high, yet preventable, according to Daniel Engelman, a professor of surgery at UMass Chan Medical School, and Baystate Medical Center (MA, USA). A cardiac surgeon with a special interest in perioperative care, Dr. Engelman told *AATS Daily News* that cardiac surgery-associated AKI complicates 22–36% of procedures, doubling total hospital costs. Following all cardiac surgery, 2–3% of patients require renal replacement therapy in the postoperative period.

Dr. Engelman will be heading up one of many lectures discussing essential components of enhanced recovery after surgery (ERAS), which include preventing AKI. "In this particular session, we're going over the basic and more advanced elements that hospitals can immediately implement to improve outcomes and the patient experience," explained Dr. Engelman, who is president of the

> "We need a coalition of the willing – people who are interested in this topic – to pool their data and to do more trials to figure out the best possible way to treat these patients, and reduce perioperative morbidity."
>
> **Daniel Engelman**

ERAS® Cardiac Society, an international nonprofit with a mission to use evidence-based best practice to standardize care following cardiac surgery. The ERAS Cardiac Society was formed in 2017, and subsequently published guidelines for what should be included in an ERAS cardiac program. These guidelines recommend 22 evidence-based care bundles for cardiac surgery. "Some of the lowest-hanging fruit include optimizing the patient before surgery," he said. "We call that prehabilitation."

It also includes measures after surgery, including reduction of the amount of opioids patients receive after heart surgery via the use of opioid-sparing multimodal analgesia, as well as early mobilization and extubation. About seven elements will be discussed in this particular session, noted Dr. Engelman, who added that this is the first time the AATS has co-branded an independent session at their meeting with the ERAS Cardiac Society. "We hope to get as many providers as possible involved in these efforts, because many of them are very simple, easy to start, and will immediately result in better outcomes," he said.

AKI prevention techniques are great examples of easy wins, stressed Dr. Engelman, who will talk about his own research and experience using a novel Food and Drug Administration–approved urinary biomarker (UB) called NEPHROCHECK (bioMérieux, France), which identifies kidney stress before kidney injury.[1] It consists of two cell cycle arrest UBs – insulin-like growth factor-binding protein 7 (IGFBP-7), and tissue inhibitor of metalloproteinases-2 (TIMP-2). This biomarker provides early detection of kidney stress permitting time to prevent post-cardiac surgery stage 2/3 AKI, said Dr. Engelman. "We see this stress biomarker increase before any of the usual markers for kidney injury, such as a rise in the creatinine or decrease in the urine output. And, based on that early biomarker, we then activate our AKI resuscitation team."

Daniel Engelman

According to Dr. Engelman, such patients at risk for stage 2/3 AKI often appear perfect the morning after surgery. "They're sitting up, producing urine, are on no ionotropic medications, and have a perfect blood pressure," he said. "They look as if they can leave the ICU and go upstairs. And their creatinine and urine output are also still normal because they are delayed markers."

Yet 25% simultaneously have a significantly elevated UBs for kidney stress, or stress before injury. Dr. Engelman explained that this is when the multidisciplinary kidney response team at his hospital, which consists of a nephrologist, intensivist, advanced practitioners, and a pharmacist, start to work.

Dr. Engelman will outline his own research looking at the effects of markers, and the subsequent actions by the kidney response team. One paper reports an 85% reduction in moderate/severe AKI.[2] Another[3] noted that it is not possible to predict who will have kidney stress after cardiac surgery, and that the usual risk factors don't apply. "So basically, you need to test everybody or you're going to miss people," he explained. UBs, in contrast, may identify patients as early as one hour after cardiopulmonary bypass who are most likely to develop AKI following cardiac surgery. The levels of these UBs peak the morning after cardiac surgery, he noted.

Although a UB may not always be used, Dr. Engelman said it's important to monitor patients closely, particularly for small elevations in creatinine. He emphasized that even a small rise will irreversibly decrease patient's lifespans. "And that's not widely known by practitioners," he explained. "The thought is that if your creatinine rises and then comes back to where it was when you started, you're fine and no damage was done. In fact, those nephrons will never come back. They're irreversibly gone. And now your renal functional reserve for future insults is decreased."

As such, he recommends all hospitals start by reviewing historic measures of the incidence of each stage AKI following cardiac surgery. "And then we can benchmark across hospitals and develop protocols to reduce this number, because it is much higher than people appreciate, as the STS database only reports stage 3 and new dialysis-dependent renal failure," he explained.

AATS delegates may be reticent to use a biomarker that is not widely adopted, admitted Dr. Engelman. "It means that for a patient that looks otherwise perfect, I will institute a bunch of corrective practices that other practitioners won't," he explained. "What's not controversial, however, is that rates of AKI are too high, and we must do everything to reduce it."

The problem is definitely under-researched, Dr. Engelman went on: "We spent a lot of time looking at other postoperative complications: atrial fibrillation, blood transfusions, reoperation for bleeds, wound infections – these are just a few examples. We don't spend enough time delving into protocols for the prevention of AKI."

What's needed now, Dr. Engelman underlined, is to standardize how doctors respond to patients that have a decreased urine output, or a rise in creatinine after heart surgery. "We need a coalition of the willing – people who are interested in this topic – to pool their data and to do more trials to figure out the best possible way to treat these patients, and reduce perioperative morbidity," he explained. Thankfully, many drugs are in the pipeline to potentially ameliorate the risk of AKI after cardiac surgery, but more awareness is required too. "We need to be more conscious of the fact that patients with a transient doubling of their creatinine after cardiac surgery are not alright,"[4] concluded Dr. Engelman.

> "We need to be more conscious of the fact that patients with a transient doubling of their creatinine after cardiac surgery are not alright."
>
> **Daniel Engelman**

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1. Morton-Bailey V, Salenger R, Engelman DT. The 10 Commandments of ERAS for Cardiac Surgery. Innovations (Phila). 2021;16(6):493–497.
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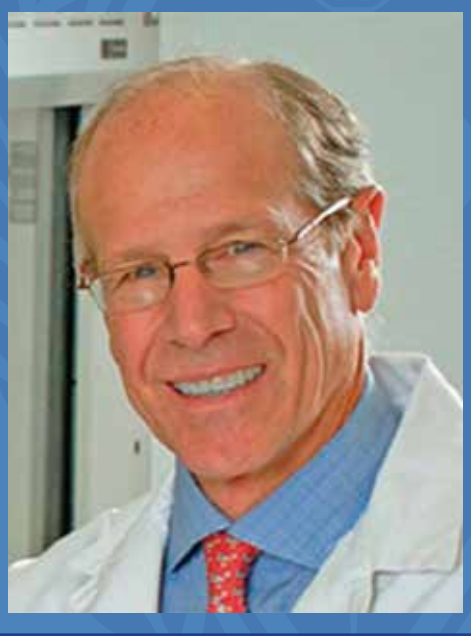
Don't miss!

Plenary Session
Ballroom ABC *Sunday 9:45 AM*

Xenotransplantation is not around the corner anymore: the first pig to human heart transplant

Bartley Griffith
University of Maryland School of Medicine



Presidential Plenary
Ballroom ABC *Monday 9:45 AM*

Presidential Address: What's Next?

Shaf Keshavjee
AATS President; Toronto General Hospital, University Health Network

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Aortic Valves for Young Adults: Essentials Room 302 *Saturday 4:15 PM*

Aortic valve replacement in young adults: what is the optimal strategy?

The challenge of selecting the best aortic valve replacement strategy for young adults will be explored this afternoon by Joseph Bavaria (Vice-Chief of the Division of Cardiovascular Surgery and Founder/Co-Director of the Penn Aorta Center at the Hospital of the University of Pennsylvania, PA, USA). In a keynote address, Dr. Bavaria will provide his insights on the surgical options available and discuss how to make the most appropriate choice.

"Aortic valve replacement in young adults is a particularly complicated area as there's no perfect option," he said, introducing his talk to *AATS Daily News*. "I will discuss mechanical valves, tissue valves, repair, and the Ross procedure, considering their pluses and minuses in this patient population."

The reasons why aortic valve replacement can be challenging in the young adult population are well-recognized. The longer life expectancy of young adults leaves more time for valve-related complications to develop, while a high postoperative activity level can place additional hemodynamic strain on the valve. In this context, Dr. Bavaria explained, it is essential to understand the advantages and disadvantages of each aortic valve replacement strategy and develop a sound treatment algorithm for choosing between them.

Running through the different options, Dr. Bavaria first considered mechanical valves, explaining that these are generally preferable to tissue valves for young adults. "Mechanical valves have relatively good long-term durability, and that's why the European and American guidelines strongly recommend using mechanical valves in younger patients under 50," he reported. "Evidence suggests that mechanical valves are associated with a better survival rate in young patients than tissue valves."

To illustrate this point, Dr. Bavaria drew attention to a study comparing outcomes between 6,097 patients who received a mechanical aortic valve prosthesis and 3,845 patients who received a biologic prosthesis. Amongst patients aged 45–54 years, higher 15-year mortality was observed in the biologic prosthesis group than the mechanical prosthesis group (30.6% vs. 26.4%, hazard ratio 1.23, 95% CI 1.02–1.48, p=0.03). As regards complications in this age group, reoperation rates were higher amongst patients who received biologic prostheses, but the cumulative incidence of stroke and bleeding was higher with mechanical prostheses.[1]

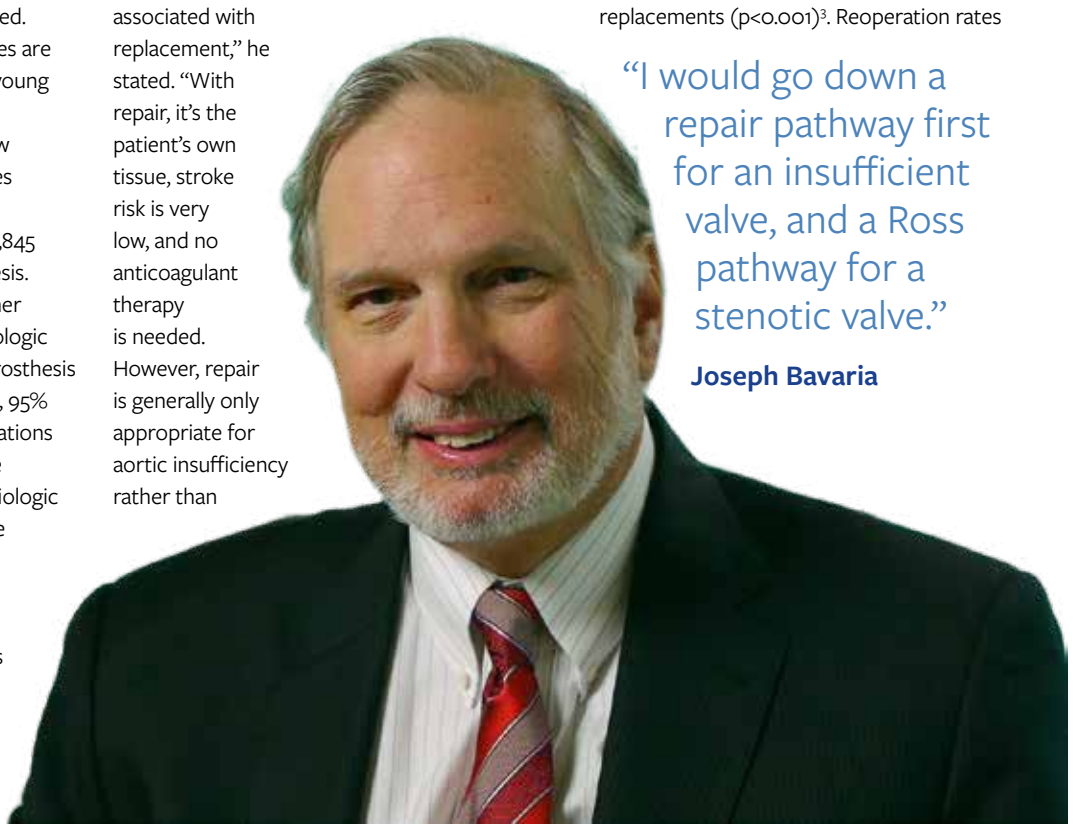
Reviewing this data, Dr. Bavaria emphasized the higher reoperation rates with tissue valves. "Young patients have a higher calcium metabolism, which means that tissue valves typically fail pretty quickly in this cohort," he observed. "So in general, tissue valves are not a good option for young patients. That being said, there are some new valves that may last longer, but we don't know yet as the data is just coming out."

Despite the poorer durability of tissue valves, there are some situations in which Dr. Bavaria would prefer them over mechanical valves in young adults. "We do use tissue valves in young women who want to have children – because mechanical valves raise the need for lifelong anticoagulant therapy, which can cause complications in pregnancy," he said. "For these patients, we explain that the valve will fail, so we go ahead fully aware that we will have to operate again."

> "The Ross procedure is having a resurgence, and reintervention rates are now relatively low."
>
> **Joseph Bavaria**

After comparing mechanical and tissue valves, Dr. Bavaria considered the option of aortic valve repair. This approach is preferable – if possible – he explained, but it is only appropriate in a small proportion of patients.

"To repair a valve is the best option of all because you avoid many of the complications associated with replacement," he stated. "With repair, it's the patient's own tissue, stroke risk is very low, and no anticoagulant therapy is needed. However, repair is generally only appropriate for aortic insufficiency rather than stenosis, and most cases that we see are stenosis. So, this treatment option is limited to a small subsegment of the population."



> "I would go down a repair pathway first for an insufficient valve, and a Ross pathway for a stenotic valve."
>
> **Joseph Bavaria**

For the sub-population in which repair is feasible, data indicates advantages of repair over replacement. For example, a propensity score analysis comparing 44 pairs of patients who underwent surgical correction of severe aortic regurgitation via either valve replacement or repair found that nine-year survival was better after repair than replacement (87% vs. 60%, p=0.007).[2]

The final strategy that Dr. Bavaria will discuss in his talk is the Ross procedure, in which the patient's aortic valve is replaced with a pulmonary autograft and the pulmonary valve is replaced with a homograft. In his opinion, this is generally the best choice for patients for whom repair is not feasible.

"The Ross procedure is probably the best option, as it's the patient's own tissue on the high-pressure side of the circuit, and the hemodynamics are excellent, which is great for young people with high cardiac outputs," he stated. "However, we must bear in mind that the Ross procedure is a two-valve operation for a single valve disease. Its Achilles heel is that it can fail in one of two ways – you can have reoperations on either side or both."

Regarding outcomes, a systematic review and meta-analysis of aortic valve replacement in young and middle-aged adults (n=12,975) found that mortality, bleeding and thromboembolic events were lower after the Ross procedure as compared to mechanical and tissue valve replacements (p<0.001)[3]. Reoperation rates after the Ross procedure were lower than after biological valve replacement, but slightly higher than after mechanical valve replacement (p<0.001).

Commenting on the reoperation rate, Dr. Bavaria noted an improvement in recent years, with better outcomes being reported now. "As a specialty, we performed a lot of Ross operations 20–25 years ago, and since then we've learned the main reasons for failure and updated the procedure to address that. The Ross procedure is having a resurgence, and reintervention rates are now relatively low."

In his talk, Dr. Bavaria will describe some new technical advances in the Ross procedure to improve durability and reduce reoperation rates. "We pay more attention to the suture line, and try to avoid having a dilated annulus," he outlined. "There are also various maneuvers for supporting the Ross so it won't dilate and cause problems later on."

One practical issue with the Ross procedure is that its availability is limited to centers where sufficient surgical expertise is available. "Your average heart surgeon will not be performing this procedure, because you need to do 10, 20, or even 30 a year to get optimal results," Dr. Bavaria noted. "The bottom line is that the Ross procedure is complicated, but especially for stenotic lesions it's probably the best operation there is. As a general rule, I would go down a repair pathway first for an insufficient valve, and a Ross pathway for a stenotic valve – provided the patient has the right anatomy for the Ross procedure."

After outlining his conclusions based on the current research landscape, Dr. Bavaria highlighted the need for future studies in this field. "We need more long-term data – ideally we need to be looking into 10–25-year outcomes when we're considering young patients who have a long life expectancy," he commented. "We also need large-scale comparative studies, which are probably going to be based on big registry datasets, administrative datasets, and national datasets."

Dr. Bavaria ended with the take-home message of his talk. "Every surgeon operating on these young patients should establish an appropriate treatment algorithm to determine which patients should be treated with which technique. That's the key: to have a reasonable treatment algorithm."

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AATS

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AATS ERAS® Cardiac Summit: Rapid Fire Basics and Advanced Concepts Room 312 *Saturday 8:30 AM*

Prepare for the best: the importance of prehabilitation on surgical outcomes

During this morning's joint Summit held between the AATS and the Enhanced Recovery After Cardiac Surgery (ERAS®) Society, Rakesh Arora (St. Boniface General Hospital/WHRA, Winnipeg, MB, Canada) will dive into the topic of prehabilitation ('prehab'), and the profound impact it can have on the optimization of patient recovery after surgery.

Dr. Arora spoke to *AATS Daily News* to offer a glimpse of his lecture, taking a journey through the aims, current challenges, and future goals of this important aspect of preoperative care.

Can you introduce the core aspects of prehab?
Prehab is the concept of preoperative rehabilitation. It's about finding ways to optimize people before they have surgery. It includes exercise, lifestyle and diet modifications, and addresses issues that may affect mood, such as depression and anxiety.

The paradigm of enhancing recovery after surgery, in general, is about 20 years old. For cardiac surgery, this has really developed in the past 4–5 years. At the base of an enhancing recovery process is engaging patients, family practitioners, cardiologists, and cardiac surgeons to address patient care in a more holistic fashion with emphasis on looking at a heart patient's overall journey – from diagnosis to preoperative optimization, and from operating theater to discharge and beyond.

So, you're trying to improve survivability?
It's not just about survivability, but also the ability to recover faster and get back to a full, normal life more quickly. The analogy I like to use is you have two cars sitting next to one another. From the outside, both look the same, but until you look at their fuel gauge, you really don't know how far they can go.

So, the idea is that if you have a patient with a low fuel level – a low reserve – you refuel them before they go through the stress of surgery. And we do that with nutrition and exercise, but also mental preparation.

Surgery is a stress to the body – that's well understood. The point of prehab is to help people get through that stress and improve their health-related quality of life after they leave the operating theater.

What constitutes a person's fuel reserves?
When you think of an older adult's resilience – which is their ability to bounce back – it's really a Venn diagram of three things: the biological component (nutrition, muscle mass, fitness); the cognitive component (a person's mental capabilities); and lastly, social aspects (psycho-social stressors such as social isolation, substance misuse, and low socioeconomic status). The intersection of all those factors is where the full picture of someone's vigor or frailty lies.

Are there other benefits to prehab?
There's the simple cost benefit of people not needing to stay in hospital as, but people's overall quality of life is also better. Lastly, there's often an attitudinal change that lasts after people leave the program.

For example, we've found that among those patients who have been in a prehab program, there's a much higher rate that go on to do postoperative rehab. The lifestyle changes they adopt prior to surgery seem to endure after they leave hospital. We are talking 80% of people, versus 20–30% of people who didn't have prehab. That's significant.

Is there any resistance or skepticism within the wider medical community as to the benefit and efficacy of prehab?
Prehab works in other surgical specialties, however, for cardiac surgery, there's been some trepidation. There isn't yet a great deal of data on prehab specific to cardiac surgery yet, and here you are proposing to put someone with an unresolved heart condition through a program of exercise. People sometimes have a hard time wrapping their heads around the concept. They want to know that it's safe and that it's worth delaying surgery for. We are keen to show that it is safe and that it does provide benefit.

> "There isn't yet a great deal of data on prehab specific to cardiac surgery yet, and here you are proposing to put someone with an unresolved heart condition through a program of exercise. People sometimes have a hard time wrapping their heads around the concept."
>
> **Rakesh Arora**

You're talking about diet and exercise. Surely, those are simple, easily implemented measures?
It sounds simple, but how many people do you know who eat properly and take enough exercise? It's a relative minority, particularly in heart patients in their 50s, 60s, 70s, or older.

That group may never have had a proper diet or taken enough exercise. It can be quite a challenge for patients to engage in new activities, especially when they've just been told they are going to need open heart surgery – itself a daunting and overwhelming prospect.

The key is to provide them with information they can assimilate and practical methods they can adopt. You need oversight and monitoring of their exercise program. You also need to teach people how to shop for and prepare new foods. It's quite a tall order and not as straightforward as it might first seem.

A lot of patients do say: "I can't process anything else right now — I'm just going to focus on the operation." They may be amenable to light modifications and so forth, but they can be resistant – they're a tougher nut to crack.

Then there are those who say: "I want to be as ready as I can be and get back to normal life as quickly as possible." This group is quick to adopt new habits and those good habits often continue well past surgery.

Then there's a third group which say: "Yeah, that sounds great, I'll do that." They start the program, but they don't continue. Finding ways to get that group to continue, that's where we've got work to do – that's our 'target market'. We want to find ways to get them to engage more fully and ensure they maintain their program until the time of surgery.

How do you assess patients for prehab?
The eyeball test that we've all used to evaluate a patient just by examining them, looking them up and own and saying: "You look fit enough for surgery – off you go!" That's probably not sufficient in the current era of cardiac surgery where, if you look for it, about half of our patients can be deemed frail, defined as (using that gas tank analogy again) having a mostly empty gas tank versus a full tank.

Just how important is mental outlook to a successful outcome, and do you see a time when mindfulness and mental preparation play a bigger role in prehab and postoperative recovery?

It's a huge question and one I'm learning about from one of postdoctoral fellows who is looking at exactly this aspect. I think the concepts of mindfulness and self-compassion are evolving themes and more research needs to be done, but for now, just addressing relatively mild or undiagnosed mental health issues in our patients – that's a good start.

To round things up, what's your 'elevator pitch' for prehab?
Prehab is about addressing vulnerabilities at the earliest time point possible and making sure patients don't just survive but thrive after their heart operation – it's about going home swiftly, and going home successfully.

Presidents' Masterclass: Valve Complications Room 304–306 *Sunday 7:30 AM*

Don't add to your patient's problems

Tirone E. David, Professor of Surgery at the University of Toronto, and the holder of the Melanie Munk Chair of Cardiovascular Surgery at the Peter Munk Cardiac Centre, Toronto, ON, Canada, will step up to the podium this morning to address the thorny issue of human error. "We, in most parts of the world, practice protective medicine," Dr. David told *AATS Daily News*. "We are afraid of what can happen to us if we do something wrong. But we are human beings like anybody else."

Dedicating a lifetime to research and development, Dr. David has developed numerous techniques, devices, and operations to treat patients with heart valve disease, complications of myocardial infarction, and thoracic aneurysms including the famous 'David operation.'

Say an aortic valve replacement does not go well, and the patient contracts an infection, suffers a stroke, or even dies. "When an elective operation does not go well, it means that the operation has created a new disease. That's why we have failed," he said. "Whether we like it or not, human error is a prevalent cause of heart damage."

> "We are afraid of what can happen to us if we do something wrong. But we are human beings like anybody else."
>
> **Tirone E. David**

Myocardial ischemia is the leading cause of failure of aortic valve surgery. "The message of my talk is to avoid myocardial ischemia," said Dr. David, who stressed that experienced surgeons will have seen hundreds if not thousands of operations, including many that did not go well. "We'll fail because during the operation, the heart is bloodless and may not be properly protected to keep the cardiac cells alive," he reflected.

There are many solutions to this, such as retrograde cardioplegia, but Dr. David cautioned that this can be a problem in some patients. "It is very good in patients who have extensive disease of the arteries that feed the heart muscle," he said. "However, it doesn't protect certain parts of the heart, and is no good in patients who have a very thick myocardium, muscle that has doubled in thickness because of high blood pressure, or because the aortic valve was very narrow.

"The best way is to deliver cardioplegia is to adhere to the way God made us – to pump blood where the arteries are. However, you can put tiny cannulas inside the artery, give cardioplegia, and keep the heart protected, but the physical presence of the cannula can cause harm. And

if that happens, you're introducing a new disease."

Dr. David will talk about the difficulty of cannulation in patients with unfavorable anatomies. "You have to be aware of the variations in anatomy and diseases and use multiple techniques to protect the heart," he said. "So, during those few minutes when the operation starts, you should really focus on how to protect the heart."

He also plans to outline the raft of potential pitfalls of replacing a valve, or replacing the aortic root (perhaps if there is an aneurysm, calcification, or an infection). "If you detach and then reattach the coronary arteries, you might cause occlusion of one or both arteries, and cause myocardial ischemia and death," he said.

Some surgeons may do everything perfectly when the heart is empty, but the moment the heart starts pumping blood again, the anatomy changes, and occlusion can again set in, he said.

"You say to yourself or to your team, 'maybe there's some air inside?'. You may wait for another minute, perhaps five, and the heart still doesn't work well. It lacks blood because you've rearranged the anatomy incorrectly," he added.

Dr. David will illustrate with two or three cases of his own. "This happened to me in my career and I'm going to show how I dealt with the problem."

Asked for potential solutions, Dr. David suggested that the single most important thing today is to have intraoperative electrocardiography and echocardiography, and both are needed because the heart frequently has to be paced artificially after long operations. "So, the electrocardiogram is no longer useful to diagnose ischemia or lack blood supply," he said. "With an echocardiogram probe down a patient's esophagus, right behind the heart, we can see how the heart muscle works. A heart muscle with inadequate blood supply does not move well."

> "Whether we like it or not, human error is a prevalent cause of heart damage."
>
> **Tirone E. David**

The echocardiogram is crucial, but so is surgeons' knowledge, said Dr. David. "Every segment of the heart can be examined to see if any area is lacking blood. If there is any, you have to ask yourself why? What's wrong? And then you fix it," he said. "So, to have an echocardiogram during the operation is indispensable to aid the surgeon in avoiding complications."

> "When an elective operation does not go well, it means that the operation has created a new disease. That's why we have failed."
>
> **Tirone E. David**

But the single most important thing is to be aware of all the pitfalls and avoid them, advised Dr. David. "Do not create a new pathology during surgery. What the patient has is enough. Go in there, fix only what is wrong. Don't add new problems," he concluded.

102nd Annual Meeting Papers published simultaneously with abstract presentations

The American Association for Thoracic Surgery (AATS) proudly announces the simultaneous publication of 20 AATS Annual Meeting Papers with their respective abstract presentation during the AATS 102nd Annual Meeting. Most papers will publish in the *Journal of Thoracic and Cardiovascular Surgery* (*JTCVS*), but others will publish in *JTCVS Open*, *JTCVS Techniques*, and *Seminars in Thoracic and Cardiovascular Surgery*. To coordinate publication with the meeting presentation authors were asked to submit their Annual Meeting Paper before March 1st, 2022, to the *JTCVS*. We received an unprecedented number of early submissions, and we are grateful for the support from authors who expedited their initial submissions and revised their paper per the requests from our Editors and reviewers.

The Association would like to take this opportunity to thank the Editors, Editorial Board Members, and reviewers for providing an expedited review process for these early submissions. We deeply appreciate their valuable time to peer review manuscripts. Their efforts are responsible for the success of the AATS Journals.

The 20 abstract presentations listed below will be accompanied by the simultaneous publication of their 102nd Annual Meeting Paper, which will be available online the morning of the presentation date.

AATS Journals

SATURDAY, MAY 14, 2022

9:30 AM, Room 302

Global Geographical Discrepancy in Numerical Distribution of Cardiovascular Surgeries and Human Resource Development in South Asia
Invited Discussant **Zachary Enumah** *Johns Hopkins Hospital*
Abstract Presenter **Nazmul Hosain**
Chittagong Medical College Hospital

4:30 PM, Room 302

Outcomes of Reinterventions After Ross Procedure
Invited Discussant **Gébrine El Khoury** *Cliniques Universitaires St-Luc*
Abstract Presenter **William Brinkman**
Baylor Scott & White Health

4:30 PM, Room 309

Remote Survival Following Addition of Surgical Ablation to Another General Cardiac Surgery Procedure in Atrial Fibrillation
Invited Discussant **Jennifer Walker**
UMass Memorial Medical Center
Abstract Presenter **Michal Pasierski**

SUNDAY, MAY 15, 2022

7:45 AM, Room 302

Robotic-assisted Cryothermic Cox Maze and Left Atrial Appendage Obliteration for Persistent Atrial Fibrillation: Longitudinal Midterm Follow-up
Invited Discussant **Ralph Damiano**
Barnes Jewish Hospital
Abstract Presenter **Ayman Almousa**
West Virginia University

8:00 AM, Room 210

A Single Institutional Experience with 65 Children Supported with the Berlin Heart Ventricular Assist Device Over 16 years: Comparison of Patients with Biventricular Versus Univentricular Circulation
Invited Discussant **Iki Adachi**
Texas Children's Hospital
Abstract Presenter **Mark Bleiweis**
Shands Hospital

8:45 AM, Room 311

Thoracic Retransplantation: Does Time to Retransplantation Matter?
Invited Discussant **Elie Fadel**
Marie Lannelongue Hospital
Abstract Presenter **Asvin Ganapathi**
Ohio State University Wexner Medical Center

12:53 PM, Tech Theater 1 (Exhibit Hall of Hynes Convention Center)

Coronary Transfer Technique has No Impact on the Neoaortic Root Size following an Arterial Switch Operation in the Simple Transposition of the Great Arteries
Abstract Presenter **Gananjay Salve**
The Children's Hospital at Westmead

2:45 PM, Room 206

Variation in Survival Over Time in Patients with COVID-19 Supported with ECMO: A Multi-institutional analysis of 471 consecutive COVID-19 patients supported with ECMO across 55 centers in 21 States
Invited Discussant **J.W. Hayanga**
West Virginia University
Abstract Presenter **Jeffrey Jacobs**
University of Florida Shands

4:30 PM, Room 309

Heart Transplantation with Donation after Circulatory Death in the United States: Initial Results from the United Network for Organ Sharing Database
Invited Discussant **Hermann Reichenspurner**
University Heart & Vascular Center Hamburg
Abstract Presenter **Dominick Megna**

4:30 PM, Room 210

Impact of Right Ventricular Dominance and AVV Surgery in Patients with Fontan Circulation and AVSD
Invited Discussant **Robert Jaquiss, MD**
Children's Medical Center
Abstract Presenter **Edward Buratto**
Royal Children's Hospital, Melbourne

4:30 PM, Room 304–306

Well-Functioning Bicuspid Aortic Valves Should be Preserved During Aortic Replacement for the Ascending Aortopathy Phenotype
Invited Discussant **Ismail El-Hamamsy**
Mount Sinai Hospital
Abstract Presenter **Matthew Thompson**
Cleveland Clinic

5:15 PM, Room 210

Timing of Reintervention is Significantly Associated with In-Hospital Mortality following the Norwood Operation
Invited Discussant **David Winlaw**
Cincinnati Children's Hospital Medical Center
Abstract Presenter **Aditya Sengupta** *The Mount Sinai Hospital/Boston Children's Hospital*

TUESDAY, MAY 17, 2022

8:00 AM, Room 210

Outcomes of Mitral Valve Repair in Children with Infective Endocarditis: A Single-Center Experience
Invited Discussant **Jennifer Nelson**
Nemours Children's Health
Abstract Presenter **Damien Wu**
Royal Children's Hospital, Melbourne

8:15 AM, Room 309

Less Is Better? Comparison of Median Sternotomy and Thoracotomy Surgical Approaches for Left Ventricular Assist Device Implantation on Post-Operative Outcomes and Valvulopathy
Invited Discussant **Akinobu Itoh** *Brigham and Women's Hospital, Harvard Medical School*
Abstract Presenter **Alice Vinogradsky**

9:00 AM, Room 210

The V-shaped Double-layer Patch Technique for Complete Atrioventricular Septal Defect: A Novel Surgical Technique
Invited Discussant **James Jaggers**
Children's Hospital Colorado
Abstract Presenter **Yangxue Sun**
National Center for Cardiovascular Disease and Fuwai Hospital, Chinese Academy of Medical Sciences

10:00 AM, Room 206

2021's Top Papers
Moderators **Rakesh Arora**
St. Boniface Hospital
J. W. Hayanga **West Virginia University**

10:00 AM, Room 302

What We Have Learned in 1000 Thoraco-Abdominal Aortic Repairs
Keynote **Lars Svensson** *Cleveland Clinic*

10:05 AM, Room 309

Heart Rate Variability Correlates with Emotional Exhaustion in Thoracic Surgery Trainees
Invited Discussants **Mara Antonoff, MD**
Anderson Cancer Center and
Andrew Goldstone *NYP-Columbia*
Abstract Presenter **Lauren Barron**
Barnes Jewish Hospital

10:30 AM, Room 313

Graft Flow Evaluation with Intraoperative Transit-Time Flow Measurement in Off- Pump versus On-Pump CABG – A propensity score analysis
Invited Discussant **George Tolis**
Brigham and Women's Hospital
Abstract Presenter **Dror Leviner**
Carmel Medical Center

11:15 AM, Room 210

Long-term Outcomes of Tetralogy of Fallot Repair in Children with Anomalous Coronary Arteries
Invited Discussant **Lauren Kane**
Children's Hospital New Orleans
Abstract Presenter **Xin Tao Ye**
Royal Children's Hospital Melbourne

AATS

LOS ANGELES

103rd Annual Meeting

Save the Date

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Los Angeles Convention Center
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President
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