



Vol. 161, No. 1, January 2021

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Editorial



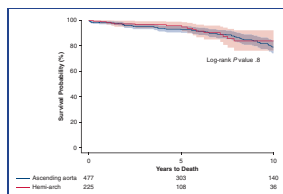
- 1 What to read?**
Richard D. Weisel, MD, and Spencer McGrath, BA, MA, Toronto, Ontario, Canada, and Beverly, Mass

The AATS journals propose new initiatives to curate our content and place it in the context of the current literature to assist our readers.

Adult Articles in AATS Journals

- 5 Adult**

Adult: Aorta



- 12 Open hemiarch versus clamped ascending aorta replacement for aortopathy during initial bicuspid aortic valve replacement**



Kevin L. Greason, MD, Juan A. Crestanello, MD, Katherine S. King, MS, Gabor Bagameri, MD, Sertac M. Cicek, MD, John M. Stulak, MD, Richard C. Daly, MD, Joseph A. Dearani, MD, and Hartzell V. Schaff, MD, Rochester, Minn

We identify no advantage to hemiarch replacement in comparison to ascending aorta replacement with respect to follow-up repeat arch operation or survival in the absence of aortic arch dilation.

- 21 Commentary: Aortic replacement for bicuspid aortic valve disease—How much is too much (or too little)?**

Peter J. Altshuler, MD, and Pavan Atluri, MD, Philadelphia, Pa

Recommendations for ascending aortic replacement for bicuspid aortic valve do not include extent of resection. With stratification of valvular phenotypes, tailored therapy may dictate treatment.

- 23 Commentary: Open hemi-arch replacement in bicuspid aortic valve aortopathy without arch dilatation? If it's not broken, no need to fix it!**

Francois Dagenais, MD, Québec, Québec, Canada

The extent of distal aortic resection in patients with BAV aortopathy is debated. The present study supports performing a clamped ascending aorta replacement in the presence of a nondilated arch.

- 25 Aortic balloon occlusion technique versus moderate hypothermic circulatory arrest with antegrade cerebral perfusion in total arch replacement and frozen elephant trunk for acute type A aortic dissection**



Yanxiang Liu, MD, Yi Shi, MD, Hongwei Guo, MD, Cuntao Yu, MD, Xiangyang Qian, MD, Wei Wang, MD, and Xiaogang Sun, MD, Beijing, China

The aortic balloon occlusion technique in total arch replacement and frozen elephant trunk shortens circulatory arrest time and has a certain protective effect on the liver and kidney.

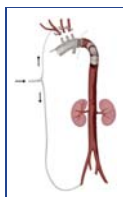
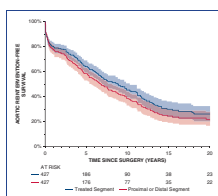


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- 34** **Commentary:** Aortic balloon occlusion of the frozen elephant trunk in acute type A aortic dissection: From “making virtue of necessity” to “uncertain virtuosism”
Giacomo Murana, MD, PhD, Luca Botta, MD, PhD, Alessandro Leone, MD, PhD, Luca Di Marco, MD, PhD, and Davide Pacini, MD, PhD, Bologna, Italy

Balloon occlusion of the stent into the descending thoracic aorta during an FET procedure allows a reduced visceral ischemic time but adds complexity to the operation and does not change the outcomes in acute type A dissections.



- 36** **Outcomes of open repairs of chronic distal aortic dissection anatomically amenable to endovascular repairs**



Akiko Tanaka, MD, PhD, Harleen K. Sandhu, MD, MPH, Rana O. Afifi, MD, Charles C. Miller III, PhD, Amberly Ray, BS, Madiha Hassan, MD, Hazim J. Safi, MD, FACS, and Anthony L. Estrera, MD, FACS, Houston, Tex

Open surgery provides satisfactory outcomes, with excellent durability in chronic distal dissection. It should be considered a mainstay of treatment, especially in patients without renal or lung disease and redo.

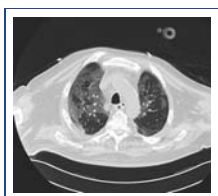
- 44** **Commentary:** Stents or surgery for chronic type-B dissection
Aamir Shah, MD, and Joanna Chikwe, MD, Los Angeles, Calif

Chronic type-B dissection should be treated by experienced multidisciplinary teams providing individualized patient care with deep expertise in both endovascular and surgical therapeutic modalities.

- 46** **Commentary:** Like most shortcuts, it could be an ill-chosen route
Michele Di Mauro, MD, PhD, MSc, Alessandro Parolari, MD, and Antonio M. Calafiore, MD, Chieti, San Donato Milanese, and Campobasso, Italy

Sometimes, in very expert hands, selecting the right patients for surgery is still the high road to take rather than pursuing less invasiveness at all costs.

Adult: Aorta: AATS and ASCTS Consensus Document



- 48** **Triage and management of aortic emergencies during the coronavirus disease 2019 (COVID-19) pandemic: A consensus document supported by the American Association for Thoracic Surgery (AATS) and Asian Society for Cardiovascular and Thoracic Surgery (ASCVTS)**

Christopher K. Mehta, MD, S. Chris Malaisrie, MD, Ashley N. Budd, MD, Yutaka Okita, MD, PhD, Hitoshi Matsuda, MD, PhD, Fernando Fleischman, MD, Yuichi Ueda, MD, PhD, Joseph E. Bavaria, MD, and Marc R. Moon, MD, Chicago, Ill; Kobe, Osaka, and Nara, Japan; Los Angeles, Calif; Philadelphia, Pa; and St Louis, Mo

An algorithmic approach to acute aortic emergencies during the COVID-19 pandemic can reduce the risk of exposure for patients and health care providers.

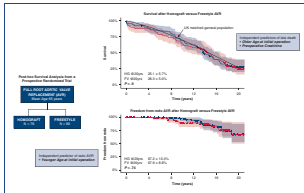
- 54** **Commentary:** Fool me once, shame on you, fool me twice, shame on me—preparing for acute aortic emergencies and the next wave of the COVID-19 pandemic
Christopher Lau, MD, and Mario Gaudino, MD, New York, NY

Pandemics overload the healthcare system and hinder care of emergent medical conditions. Management algorithms promote safe and expedient care of patients with acute aortic emergencies during these times.

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- 55** **Commentary:** Managing thoracic aortic emergencies during a pandemic
Roland Assi, MD, MMS, Arnar Geirsson, MD, and Prashanth Vallabhajosyula, MD, New Haven, Conn
- Developing practical guidelines for cardiac surgeons performing complex surgeries during a pandemic should aim to ensure excellent patient outcomes and a safe environment for patients and providers.

Adult: Aortic Valve

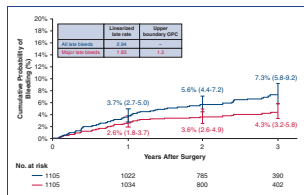


- 57** **Long-term survival after xenograft versus homograft aortic root replacement: Results from a prospective randomized trial**
Giovanni Melina, MD, PhD, Fabio De Robertis, MD, Jullien A. Gaer, MS, FRCS(C-th), Emiliano Angeloni, MD, PhD, Ismail El-Hamamsy, MD, PhD, FRCSC, Toufan Bahrami, MD, John R. Pepper, OBE, MA, MChir, FRCS, Johanna J. M. Takkenberg, MD, PhD, and Magdi H. Yacoub, OM, FRS, London, United Kingdom; Rome, Italy; Montreal, Quebec, Canada; and Rotterdam, The Netherlands



Long-term survival of patients undergoing surgery for aortic valve disease with Freestyle (Medtronic Inc, Minneapolis, Minn) or homograft full root replacement is comparable to that of the age- and sex-matched UK general population.

This article has an associated discussion and webcast.



- 66** **Antithrombotic therapy and bleeding events after aortic valve replacement with a novel bioprosthesis**
Robert J. M. Klautz, MD, PhD, Michiel D. Vriesendorp, MD, Francois Dagenais, MD, Louis Labrousse, MD, Vinayak Bapat, MBBS, Michael G. Moront, MD, Martin Misfeld, MD, PhD, Elizabeth Gearhart, MS, A. Pieter Kappetein, MD, PhD, and Joseph F. Sabik III, MD, Leiden and Rotterdam, The Netherlands; Quebec, Canada; Bordeaux, France; New York, NY; Toledo and Cleveland, Ohio; Leipzig, Germany; and Mounds View, Minn



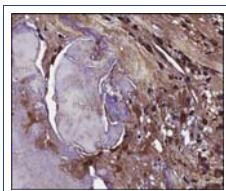
The rate of bleeding events in the PERIGON trial reflects recent developments in nonvalve-related indications for antithrombotic therapies and scrutiny of investigational trials.

This article has an associated discussion and webcast.

- 76** **Commentary:** Do old rules apply to new valves?
Nels D. Carroll, MD, and Dawn S. Hui, MD, San Antonio, Tex
- Regulatory criteria for valve performance may be affected by therapies for unrelated comorbidities. The effect on clinical practice in a changing population is a question for the surgical community.
- 78** **Commentary:** Bleeding events with novel bioprostheses: Still a mystery
Manuel J. Antunes, MD, PhD, DSc, Coimbra, Portugal

There have been several reports of increased rates of hemorrhagic complications in novel bioprostheses. It could be hypothesized that new methods of treatment of the pericardium may be related with it.

Adult: Aortic Valve: Basic Science



- e1** **Urotensin II, urotensin-related peptide, and their receptor in aortic valve stenosis**
Kashif Khan, BSc, Isabella Albanese, MD, MSc, BSc, Bin Yu, PhD, Yousif Shalal, Hamood Al-Kindi, MD, FRCSC, Hossney Alaws, BSc, Jean-Claude Tardif, MD, Ophélie Gourgas, MSc, BSc, Marta Cerutti, PhD, and Adel Schwertani, DM, PhD, Montreal, Quebec, Canada



This study supports the identification of the urotensin system as a key player in the pathogenesis of AVS, using human valve tissues and cells derived from these tissues.

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- e17** **Commentary:** The value of a surprise
Alden H. Harken, MD, Oakland, Calif
- A clinical surprise is the patient trying to tell you something—listen!
- e19** **Commentary:** Molecular pathogenesis of aortic stenosis: Will the puzzle pieces ever fit together?
Emily Shih, MD, John J. Squiers, MD, Ronald D. Baxter, MD, and J. Michael DiMaio, MD, Dallas and Plano, Tex
- Dozens of proteins and genetic pathways have been implicated in the pathogenesis of aortic stenosis. Future work should focus on the interplay of these various factors so that targeted therapies for the prevention of aortic stenosis can be developed.

Adult: Aortic Valve: Letters to the Editor

- e21** **The thrombocytopenia conundrum after aortic bioprosthetic implantation: Do we really need to solve it?**
Igor Vendramin, MD, and Uberto Bortolotti, MD, Udine, Italy
- e22** **Reply:** Look deeper into thrombocytopenia
Antonio Miceli, MD, PhD, Milan, Italy
- e22** **Reply:** Transient thrombocytopenia after Perceval S implantation: A good reason to continue with the research
Francesco Formica, MD, and Fabio Guarracino, MD, Parma and Pisa, Italy
- e23** **Reply from authors:** Thrombocytopenia after implantation of a perceval s aortic bioprosthesis should be studied more vigorously, not less
Philipp Stegmeier, MD, and J. F. Matthias Bechtel, MD, Bochum, Germany
- e24** **“Possum, sed nolo” (I could, but I don’t want to)**
Martin Misfeld, MD, PhD, and Michael A. Borger, MD, PhD, Leipzig, Germany, and Sydney, Australia
- e25** **Reply from authors:** “Nil difficile volenti” (nothing is difficult for the one who wants)
Ruggero De Paulis, MD, Rome, Italy

Adult: Mitral Valve



- 80** **Advanced experience allows robotic mitral valve repair in the presence of extensive mitral annular calcification**
Didier F. Loulmet, MD, Neel K. Ranganath, MD, Siyamek Neragi-Miandoab, MD, Michael S. Koeckert, MD, Aubrey C. Galloway, MD, and Eugene A. Grossi, MD, New York, NY
-   
- Advanced robotic experience and a dedicated team approach allow for a high rate of successful MV repair in the setting of extensive annular calcification and a pliable posterior leaflet.
- This article has an associated discussion and webcast.**
- 89** **Commentary:** Robotic approach to mitral annular calcification—Are we doing more with less, or is less still more?
Vinay Badhwar, MD, Morgantown, WV
- 
- Approaching mitral annular calcification robotically requires significant open surgical experience, with alternative strategies to ensure patient safety and a durable outcome.
- 91** **Commentary:** Handling mitral annulus calcification from behind the robotic console: The Pugachev’s Cobra in cardiac surgery
Gianluca Torregrossa, MD, Umberto Benedetto, MD, and Husam H. Balkhy, MD, Chicago, Ill, and Bristol, United Kingdom
- 
- Complex mitral valve repair is enhanced using a robotic approach with a dedicated, experienced 2-surgeon team even in the presence of complex pathology and severe MAC.

- 93** **Commentary:** Pushing the boundaries? Robot-assisted excision of mitral annular calcification
Anelechi C. Anyanwu, MD, Aarti Patil, MD, and David H. Adams, MD, New York, NY

Robotic excision of mitral annular calcification can be done by highly skilled surgical teams but is associated with increased morbidity. The everyday surgeon should consider simpler alternatives.

- 94** **Commentary:** Lessons from 1000 robotic mitral repairs
Joanna Chikwe, MD, FRCS, Alfredo Trento, MD, Wen Cheng, MD, Dominic Emerson, MD, and Danny Ramzy, MD, Los Angeles, Calif

Robotic mitral repair is reproducible, safe and effective, but requires great care when navigating the learning curve.

Adult: Mitral Valve: Letters to the Editor

- e27** **Is the fate of the anterior leaflet determined by original sin or by the weakness of man?**

Gerald M. Lawrie, MD, Houston, Tex

- e27** **Reply:** Generalizability of expert outcomes

Makoto Mori, MD, and Arnar Geirsson, MD, New Haven, Conn

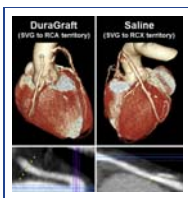
- e28** **Reply:** No secrets with the anterior mitral leaflet

Marc Gillinov, MD, Daniel J. P. Burns, MD, MPhil, and Per Wierup, MD, PhD, Cleveland, Ohio

- e29** **Reply:** Excellent and equal outcomes for anterior and posterior leaflet mitral repairs are equally achievable... if you equally eliminate MR

Alexander A. Brescia, MD, MSc, and Steven F. Bolling, MD, on behalf of the Michigan Mitral Research Group (MMRG), Ann Arbor, Mich

Adult: Coronary



- 96** **Sequential multidetector computed tomography assessments after venous graft treatment solution in coronary artery bypass grafting**



Louis P. Perrault, MD, PhD, Michel Carrier, MD, Pierre Voisine, MD, Peter Skov Olsen, MD,

Nicolas Noiseux, MD, Hugues Jeanmart, MD, Filippo Cardemartiri, MD, PhD,

Dave Veerasingam, MD, Craig Brown, MD, Marie-Claude Guertin, PhD,

Vilas Satishchandran, MS, Tracy Goeken, MD, and Maximilian Y. Emmert, MD, PhD, Montréal

and Québec City, Québec, and Saint John, New Brunswick, Canada; Copenhagen, Denmark;

Naples, Italy; Galway, Ireland; Jupiter, Fla; and Berlin, Germany

SVGs treated with DuraGraft (Somahlution Inc, Jupiter, Fla) demonstrated favorable results regarding wall thickness and various other SVG characteristics versus SVGs treated with saline in patients undergoing CABG.

This article has an associated webcast.

- 107** **Commentary:** How does the vein look? Intraoperative storage strategy and vein graft disease prevention

Malak Elbatarny, MD, Derrick Y. Tam, MD, and Stephen E. Fremes, MD, MSc, FRCSC, Toronto, Ontario, Canada

Intraoperative vein graft storage solution impacts 12-month vessel wall thickening.

- 109** **Commentary:** Dressing for success

Randall Wolf, MD, Houston, Tex

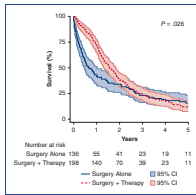
New hope for venous conduits. Lessons learned in treating vein grafts for coronary artery bypass, from the disappointing results of PREVENT IV to the promising results in this issue of the *Journal*.

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Adult: Coronary: Letters to the Editor

- e31 “How to BIMA?” is in fact the question**
Dimitri Kalavrouziotis, MD, FRCSC, and Siamak Mohammadi, MD, FRCSC, Quebec City, Quebec, Canada
- e31 Reply:** Bilateral internal mammary artery grafting: So many questions. So few answers
Gaetano Paone, MD, MHA, Atlanta, Ga
- e32 Reply:** In be-“Twix”: A BIMA argument
John Bozinovski, MD, MSc, Columbus, Ohio
- e33 Reply from authors:** A question versus the question
Thomas A. Schwann, MD, MBA, and Mario F. L. Gaudino, MD, Springfield, Mass, and New York, NY
- e34 Is preoperative extracorporeal membrane oxygenation effective for collapsed patients with left ventricular free wall rupture after myocardial infarction?**
Keiji Uchida, MD, PhD, Shota Yasuda, MD, PhD, and Munetaka Masuda, MD, PhD, Yokohama, Japan
- e35 Reply:** I would not underestimate the extracorporeal membrane oxygenation option; it offers chances of survival
Francesco Formica, MD, and Stefano D'Alessandro, MD, FECS, Parma and Monza, Italy
- e36 Reply from authors:** Is extracorporeal membrane oxygenation useful in cardiac tamponade?
Homare Okamura, MD, PhD, Saitama and Tokyo, Japan

Adult: Cardiac Tumor



110 Postoperative chemotherapy and radiation improve survival following cardiac sarcoma resection



Brandon S. Hendriksen, MD, MPH, Kelly A. Stahl, MD, Christopher S. Hollenbeak, PhD, Matthew D. Taylor, MD, Monali K. Vasekar, MD, Joseph J. Drabick, MD, John V. Conte, MD, Behzad Soleimani, MD, and Michael F. Reed, MD, Hershey and University Park, Pa

Postoperative therapy (chemotherapy, radiation, or both) is associated with improved median survival following resection of cardiac sarcoma. There is no improvement in overall survival at 5 years.

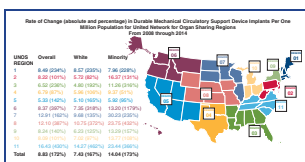
120 Commentary: Primary cardiac sarcoma—Systemic disease requires systemic therapy
Vinod Ravi, MD, and Michael J. Reardon, MD, Houston, Tex

Primary cardiac sarcoma is a rare and deadly disease. Surgical resection for appropriate tumors is first-line therapy. Adjuvant chemotherapy increases survival in this usually systemic disease.

121 Commentary: Adjuvant therapy for cardiac sarcomas: Slowly evolving beyond resection
Joe B. Putnam, Jr, MD, FACS, Jacksonville, Fla

Survival following resection for cardiac sarcoma may be improved with adjuvant therapy for up to 2 years compared with no adjuvant therapy or other nonsurgical care.

Adult: Mechanical Circulatory Support



123 Durable mechanical circulatory support device use in the United States by geographic region and minority status



Joshua L. Bourque, BS, Qixing Liang, MS, Francis D. Pagani, MD, PhD, Min Zhang, PhD, Keith D. Aaronson, MD, MS, Robert L. Kormos, MD, and Donald S. Likosky, PhD, the Michigan Congestive Heart Failure Investigators, Ann Arbor, Mich, and Pittsburgh, Pa

Geographical differences exist in rates of durable MCS implantation among whites and minorities among UNOS regions in the United States.

- 134** **Commentary:** Mechanical circulatory support variation in the United States
Joseph C. Cleveland, Jr, MD, Aurora, Colo
- The utilization of mechanical circulatory support varies by geography and race in the United States. The reasons for this variation are unknown.
- 135** **Commentary:** Disparities in use of durable mechanical circulatory support device: Does ethnicity tilt the balance?
Ademola Adeseye, MD, and Ravi K. Ghanta, MD, Houston, Tex
- Although geographic and racial disparities remain in virtually all fields of medicine and surgery, MCS use has increased in the United States in both minority and white patients.
- 137** **Commentary:** To transplant or to support with a ventricular assist device? Trying to uncover why differences in rates exist
Vakhtang Tchantchaleishvili, MD, and John W. C. Entwistle, MD, PhD, Philadelphia, Pa
- MCS use is unevenly distributed by race. The cause of this disparity is unknown. Changes in UNOS heart allocation policy may alter MCS use, and follow-up will show if disparities are exacerbated

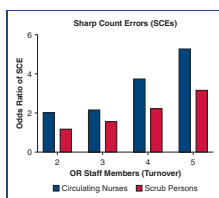
Adult: Mechanical Circulatory Support: Case Report



- e39** **A case of cytokine hemofiltration and extracorporeal life support as treatment of coronavirus disease 2019 (COVID-19) respiratory failure**
Omar Al-Qudsi, MD, Bryan Whitson, MD, PhD, Amar Bhatt, MD, Sheila Chucta, DNP, CNS, and Ravi Tripathi, MD, MBA, Columbus, Ohio
- A hyperactive immune response has been implicated in COVID-19 respiratory failure. Hemofiltration with a membrane designed to remove cytokines offers a potential avenue for treatment.

- e43** **Commentary:** Let's just celebrate this win
Jacob A. Klapper, MD, FACS, Durham, NC
- Ingenuity in a time of crisis can yield positive results.

Adult: Perioperative Management



- 139** **Impact of staff turnover during cardiac surgical procedures**
Jordan P. Bloom, MD, MPH, Philicia Moonsamy, MD, Rajshri M. Gartland, MD, MPH, Catherine O'Malley, RN, MSN, CNOR, George Tolis, Jr, MD, Mauricio A. Villavicencio-Theoduloz, MD, MBA, Carolyn Burkhardt, RN, BSN, MSN, MHA, Peter Dunn, MD, Thoralf M. Sundt, MD, and David A. D'Alessandro, MD, Boston, Mass
- SCEs in the cardiac operating room are more likely with increased nursing and scrub personnel turnover.

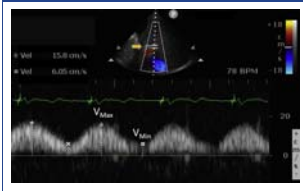
This article has an associated webcast.

- 145** **Commentary:** Chasing solutions versus chasing windmills
Anthony W. Kim, MD, and Elizabeth A. David, MD, Los Angeles, Calif
- Studying the impact of staff turnover on surgical outcomes is another measure that cardiothoracic surgeons can own and use in their efforts to achieve system improvements.
- 146** **Commentary:** Performance, safety monitoring, and needle counts in the operating room
John M. Karamichalis, MD, FACS, Memphis, Tenn
- Safety monitoring in the operating room is of paramount importance for cardiac surgery performance improvement. SCEs are associated with high staff turnover and are likely surrogates of suboptimal team member dynamics.

- 147** **Commentary:** Influence of staff turnover during cardiac surgical procedures: Less is more
LTC Julie Brian, AN, USAR, Lexington, Ky

Staff turnover for breaks and shift change during cardiothoracic surgery can lead to an increase in sharp count errors. This first-of-its-kind study reveals that poor outcomes may be associated with sharp count errors.

Adult: Perioperative Management: Invited Expert Opinion



- 149** **First step toward uncovering perioperative congestive encephalopathy**

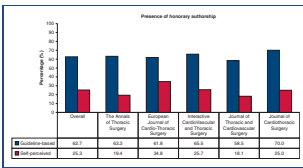
William Beaubien-Souligny, MD, Yiorgos Alexandros Cavayas, MD, MSc, André Denault, MD, PhD, and Yoan Lamarche, MD, MSc, Montreal, Québec, Canada

Cerebral venous congestion could be a mechanism leading to delirium in some patients after cardiac surgery. Portal flow assessment is a promising tool to identify significant congestion.

- 154** **Commentary:** Can ultrasound contribute to our understanding of postoperative delirium?
Hilary P. Grocott, MD, FRCPC, FASE, Winnipeg, Manitoba, Canada

Additional studies are needed to more confidently understand any link between ultrasound-derived indices of RV dysfunction and potential encephalopathy from cerebral venous congestion.

Adult: Education



- 156** **Honorary authorship in cardiothoracic surgery**

Anahita Noruzi, BSc, Johanna J. M. Takkenberg, MD, PhD, Busra Kayapa, MD, A. Verhemel, MD, and P. S. Gadjradj, MD, Rotterdam and Leiden, The Netherlands

Despite high awareness of the ICMJE guidelines on authorship, there is an abundance of honorary authorship in the cardiothoracic literature.

- 163** **Commentary:** Deserved honor, or honor among thieves?

Paul Kurlansky, MD, New York, NY

Despite widespread misunderstanding of current ICMJE guidelines for authorship, their careful application will foster the best approach to meaningful scientific research.

- 164** **Commentary:** Honorary or incorrect

Paul T. Sergeant, MD, PhD, Leuven, Belgium

The ghost absence as well as the honorary presence of an author does not provide the mandatory transparency of a scientific work and the mandatory respect for those having done the work.

- 166** **Commentary:** Of ghosts, phantoms, and authors

Robert M. Sade, MD, Charleston, SC

Phantom authorship harms the scientific enterprise. Its damaging effects arise from the fact that it is fundamentally dishonest.



168 Global perspectives on cardiothoracic, cardiovascular, and cardiac surgical training



Alexander P. Nissen, MD, Julian A. Smith, MBMS, MSurgEd, Jan Dieter Schmitto, MD, PhD, MBA, Silvia Mariani, MD, Rui M. S. Almeida, MD, MSc, PhD, Jonathan Afoke, BSc, MRCS, Tohru Asai, MD, PhD, Jessica G. Y. Luc, MD, Oz M. Shapira, MD, Ari Mennander, MD, PhD, Akiko Tanaka, MD, PhD, Vasily I. Kaleda, MD, Song Wan, MD, Alexander Wick, MD, Hermann Reichenspurner, MD, PhD, Benjamin M. Cohn, BS, and Tom C. Nguyen, MD, Houston and Fort Sam Houston, Tex; Clayton, Australia; Hannover, Tubingen, and Hamburg, Germany; Cascavel, Brazil; London, United Kingdom; Tokyo, Japan; Vancouver, British Columbia, Canada; Jerusalem, Israel; Tampere, Finland; Moscow, Russia; and Hong Kong, China

Varied cardiothoracic training paradigms exist across the globe; learning respective strengths and weaknesses from other nations may help train future surgeons while addressing anticipated challenges.

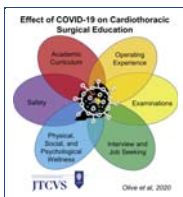
175 Commentary: Is there more than one way to shine a penny? International Training Variation While Standardizing Cardiothoracic Surgery Excellence
Ann E. Hwalek, DO, and Nahush A. Mokadam, MD, Columbus, Ohio

Globally, cardiothoracic training pathways vary greatly in length and quality of training. Educators and trainees should join together to produce definitive measures for a standardized curriculum and certification.

176 Commentary: Learning cardiothoracic surgery: More similar than not
James I. Fann, MD, Stanford, Calif

Addressing challenges in cardiothoracic surgery training will benefit from continued dialogue, which in turn depends on better understanding of each program.

Adult: Education: Young Surgeon's Note



178 The cardiothoracic surgery trainee experience during the coronavirus disease 2019 (COVID-19) pandemic: Global insights and opportunities for ongoing engagement



Jacqueline K. Olive, BA, Jessica G. Y. Luc, MD, Rui J. Cerqueira, MD, MSc, Jaime-Jürgen Eulert-Grehn, MD, Jason J. Han, MD, Kevin Phan, MD, and Ourania Preventza, MD, MBA, Houston, Tex; Vancouver, British Columbia, Canada; Porto, Portugal; Berlin, Germany; Philadelphia, Pa, and Sydney, Australia

The COVID-19 era presents unique challenges and clear opportunities for trainees in cardiothoracic surgery.

184 Commentary: From virtual to reality
Dawn S. Hui, MD, and Andrea J. Carpenter, MD, PhD, San Antonio, Tex

Solutions addressing the influence of COVID-19 on training of cardiothoracic surgeons provide opportunities to reflect on the fundamentals of our field.

185 Commentary: Training in the time of coronavirus disease 2019 (COVID-19)
Frederick A. Tibayan, MD, Portland, Ore

COVID-19 affects every aspect of cardiothoracic surgical training. Proposed responses to these challenges will require flexibility, innovation, and mentorship.

Adult: Education: Letters to the Editor

e45 The importance of mentorship and sponsorship for thoracic surgery residency applicants during the coronavirus disease 2019 (COVID-19) pandemic

Chi Chi Do-Nguyen, BS, Jonathan C. Hong, MD, MHS, and Jessica G. Y. Luc, MD, Philadelphia, Pa; Chicago, Ill; and Vancouver, British Columbia, Canada

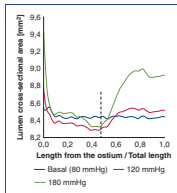
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- e46 Reply:** Diversity of our future workforce is contingent upon our virtual pandemic presence
Mara B. Antonoff, MD, Houston, Tex
- e47 Reply:** The more things change...
Frederick A. Tibayan, MD, Portland, Ore
- e48 Reply from authors:** Training the next generation of thoracic surgical trainees—the “Cardiothoracic Surgical Community” role in promoting mentorship and scholarship in the coronavirus disease 2019 (COVID-19) era
Sameer A. Hirji, MD, MPH, Marko T. Boskovski, MD, MHS, MPH, Marc Moon, MD, and Tsuyoshi Kaneko, MD, Boston, Mass, and St Louis, Mo

Congenital Articles in AATS Journals

187 Congenital

Congenital: Anomalous Coronary Artery



191 Anomalous aortic origin of coronary artery biomechanical modeling: Toward clinical application



Mauro Lo Rito, MD, Rodrigo Maximiliano Romarowski, Eng PhD, Antonio Rosato, Eng, Silvia Pica, MD, Francesco Secchi, MD, PhD, Alessandro Giamberti, MD, Ferdinando Auricchio, Eng PhD, Alessandro Frigiola, MD, and Michele Conti, Eng PhD, Milan and Pavia, Italy

Computational simulations show that coronary lumen of anomalous aortic origin lack appropriate expansion during effort.

This article has an associated discussion and webcast.

- 202 Commentary:** Modeling anomalous coronaries: Hard to predict the predictability of prediction
Ronald K. Woods, MD, PhD, Milwaukee, Wis

A creative model to predict the behavior of anomalous coronaries may enhance prediction of clinical behavior, but predictability remains to be verified.

- 203 Commentary:** Are we there yet?
Camille L. Hancock Friesen, MD, and Tarique Hussain, MD, PhD, Dallas, Tex

Personalized medicine is coming closer to reality in congenital cardiac surgery as a result of computational modeling.

- 204 Commentary:** Anomalous coronary arteries and car crash testing
Jacob R. Miller, MD, and Pirooz Eghtesady, MD, PhD, St Louis, Mo

Structural finite element analysis allows for the dynamic evaluation of an anomalous coronary arteries. It may, eventually, help determine if surgical intervention is necessary.

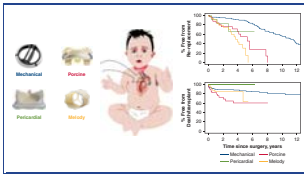
Congenital: Anomalous Coronary Artery: Invited Expert Technical Review



- 206 Current surgical management of anomalous aortic origin of a coronary artery**
Edward Buratto, MBBS, PhD, and Igor E. Konstantinov, MD, PhD, FRACS, Melbourne, Australia

Surgery for an anomalous aortic coronary artery carries a low risk of mortality. However, there is a risk of aortic regurgitation and new ischemia, which must be considered when counseling patients.

Congenital: Mitral Valve



213



Revisiting prosthesis choice in mitral valve replacement in children: Durable alternatives to traditional bioprostheses

Perry S. Choi, BA, Lynn A. Sleeper, ScD, Minmin Lu, MS, Patrick Upchurch, MD, Christopher Baird, MD, and Sitaram M. Emani, MD, Boston, Mass, and Baltimore, Md

Use of mechanical or stented bovine jugular vein valve for mitral valve replacement in children yields longer durability compared with fixed-diameter bioprosthetic alternatives.

This article has an associated discussion and webcast.

226

Commentary: Taking innovation to heart in pediatric mitral valve replacement
Matteo Trezzi, MD, Rome, Italy

In recent years, adaptation of the Melody valve for pediatric MVR has been introduced and results are promising when compared with currently available prosthesis.

227

Commentary: And the winner is...
Carl L. Backer, MD, Lexington, Ky and Cincinnati, Ohio

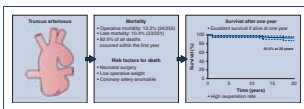
In a large series of infants and children undergoing mitral valve replacement, the best performance of an implanted valve was achieved by mechanical valves and stented bovine jugular vein valves.

228

Commentary: Mitral valve prosthesis in children: Is it the time to change our beliefs and practice?
Mauro Lo Rito, MD, Alessandro Frigiola, MD, and Alessandro Giamberti, MD, San Donato Milanese, Italy

Mitral valve replacement in children carries a high burden of reoperation, death, and adverse events. The perfect prosthesis currently does not exist, but valid alternative solutions are available.

Congenital: Truncal Valve



230



Truncus arteriosus repair: A 40-year multicenter perspective

Phillip S. Naimo, MD, Douglas Bell, MBBS, MS, Tyson A. Fricke, MBBS, Yves d'Udekem, MD, PhD, FRACS, Christian P. Brizard, MD, Nelson Alphonso, MBBS, MS, FRACS, and Igor E. Konstantinov, MD, PhD, FRACS, Melbourne and Brisbane, Australia

Neonates and coronary anomalies pose significant challenges to truncus arteriosus repair. Survival beyond the first year is associated with excellent outcomes.

241

Commentary: Outcomes of truncus arteriosus repair: Insights from time and numbers
Christoph P. Hornik, MD, PhD, MPH, Durham, NC

Large patient cohorts with complete long-term follow-up provide invaluable information to inform congenital cardiac care. Novel strategies to scale up complete long-term follow-up should be pursued.

242

Commentary: Truncus among us
Christopher E. Mascio, MD, Philadelphia, Pa

TA has been repaired successfully in the neonate for 30 years. Advances in imaging, operative techniques, and perioperative care have contributed to improving morbidity and mortality.

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Congenital: Aortic Valve: Invited Expert Review

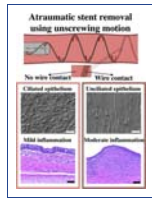


244 Aortic valve surgery in children

Edward Buratto, MBBS, PhD, and Igor E. Konstantinov, MD, PhD, FRACS, Melbourne, Australia

Aortic valve repair in infants is the best option, whereas it gives similar outcomes to the Ross operation in older children.

Congenital: Trachea: Evolving Technology



e51



Preclinical evaluation of a pediatric airway stent for tracheobronchomalacia

Abhijit Mondal, PhD, Junhyoung Ha, PhD, Vickie Y. Jo, MD, Fei-Yi Wu, MD, Aditya K. Kaza, MD, and Pierre E. Dupont, PhD, Boston, Mass; Seoul, South Korea; and Taipei City, Taiwan, Republic of China



Preclinical testing of a new airway stent system that minimizes foreign body reaction, promotes mucus flow, and enables atraumatic removal.



e61

Commentary: Malacia got you down? Unwind with a helical stent

Douglas M. Overbey, MD, Joseph W. Turek, MD, PhD, and Nicholas D. Andersen, MD, Durham, NC

The authors describe preclinical testing of a novel pediatric airway stent with a helical design that allows for minimal surface contact with the tracheal wall and atraumatic removal.

e62

Commentary: Toward a more ideal pediatric airway stent for tracheobronchomalacia

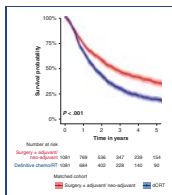
Roosevelt Bryant III, MD, Phoenix, Ariz

The helical Niti-S airway stent shows promise as a more ideal prosthesis for the management of tracheobronchomalacia

Thoracic Articles in AATS Journals

251 Thoracic

Thoracic: Lung Cancer



256



Treatment of cT3N1Mo/IIIA non-small cell lung cancer and the risk of underuse of surgery

Mohamed Rahouma, MD, Mohamed Kamel, MD, Abu Nasar, MS, Sebron Harrison, MD, Benjamin Lee, MD, Jeffrey Port, MD, Nasser Altorki, MD, and Brendon M. Stiles, MD, New York, NY, and Cairo, Egypt

In the NCDB, approximately half of patients with clinical T3N1Mo were treated with dCRT rather than surgery. This practice should be avoided in operable patients, because surgery is associated with better survival.

264

Commentary: Make surgery great again

Scott I. Reznik, MD, Dallas, Tex

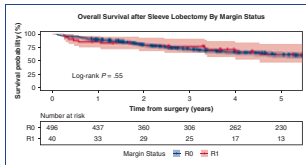
Surgery with adjuvant therapy remains the optimal therapy for T3N1 non-small cell carcinoma of the lung in appropriate patients.

265

Commentary: Is surgery better than chemoradiation for T3N1Mo non-small cell lung cancer?

Chi-Fu Jeffrey Yang, MD, Stanford, Calif

In appropriately selected patients, surgery for T3N1Mo lung cancer is likely associated with improved survival compared with definitive chemoradiation, but further research evaluating different types of T3 tumors is needed.



267



Clinical outcomes of microscopic residual disease after bronchial sleeve resection for non-small cell lung cancer

Tae Hee Hong, MD, Jhingook Kim, MD, Sumin Shin, MD, Hong Kwan Kim, MD, PhD, Yong Soo Choi, MD, PhD, Jae Il Zo, MD, PhD, Young Mog Shim, MD, PhD, and Jong Ho Cho, MD, PhD, Seoul, South Korea

Long-term fate of bronchial sleeve resection was not severely hampered by microscopic residual disease alone, although its pathological extent could be considered for actual decision making.

278

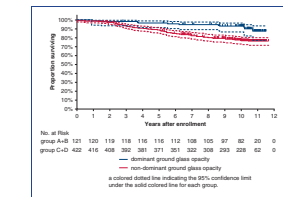
Commentary: Positive bronchial section margin: How certain is R uncertain?
Paul E. Van Schil, MD, PhD, Antwerp, Belgium

A positive bronchial section margin ranges from R uncertain to R1 or R2 involvement with different prognosis.

279

Commentary: Absence of evidence is not evidence of absence
Vignesh Raman, MD, and Oliver K. Jawitz, MD, Durham, NC

Although microscopically positive bronchial margins were not associated with worse survival in this study, only 28 patients had invasion at the margin, making the data difficult to interpret.



281



Long-term survival outcome after lobectomy in patients with clinical T1 No lung cancer

Hiroyuki Ito, MD, Kenji Suzuki, MD, Tomonori Mizutani, MD, Keiju Aokage, MD, Masashi Wakabayashi, MSc, Haruhiko Fukuda, MD, and Shun-ichi Watanabe, MD, on behalf of the Japan Clinical Oncology Group Lung Cancer Surgical Study Group, Yokohama, Tokyo, and Kashiwa, Japan

A 10-year follow-up analysis showed excellent prognosis after lobectomy in patients with clinical T1 No lung cancer with dominant ground glass opacity.

291

Commentary: Through the looking glass: Is the consolidation/tumor ratio more important than size for clinical T1No lung cancer with a dominant ground-glass opacity?
Jules Lin, MD, Ann Arbor, Mich

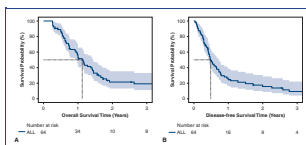
As we await results of randomized trials on sublobar resection, the consolidation/tumor ratio may need to be considered in determining treatment for T1No nodules with a dominant ground-glass opacity.

292

Commentary: Is segmentectomy ready to be accepted as the standard of care?
Wentao Fang, MD, Shanghai, China

Even though the results of 2 ongoing trials are expected, it is still too early to consider segmentectomy as the standard of care for early stage lung cancers.

Thoracic: Esophageal Cancer



294



Results of surgical treatment for primary malignant melanoma of the esophagus: A multicenter retrospective study

Liang Dai, MD, Zi-Ming Wang, MD, Zhi-Qiang Xue, MD, Ming He, MD, Yong Yuan, MD, Xue-Qian Shang, MD, and Ke-Neng Chen, MD, PhD, FRCS, the Chinese Cooperative Primary Malignant Melanoma of the Esophagus Group (CCPMMEG), Beijing, Shijiazhuang, and Sichuan, China

Dissection of lymph nodes should be emphasized in the surgical treatment of patients with PMME. The use of postoperative adjuvant treatment may improve outcomes over surgery alone.

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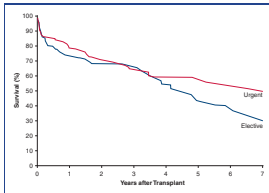
- 303** **Commentary:** Pigmented spot during esophagoscopy—a mole or melanoma?
Tahsin M. Khan, MD, and Chuong D. Hoang, MD, Bethesda, Md

Surgical resection accompanied by systematic lymphadenectomy and adjuvant therapy may improve survival for primary malignant melanoma of the esophagus, which remains a diagnostic dilemma.

- 304** **Commentary:** All that glitters is not gold
John S. Young, MD, and M. Blair Marshall, MD, Boston, Mass

A retrospective study of patients treated by a variety of strategies is discussed. With recent knowledge gained in melanoma, the risk factors and optimal treatment strategies remain to be defined.

Thoracic: Lung Transplant



- 306** **Urgently listed lung transplant patients have outcomes similar to those of electively listed patients**



Andrew Tang, MD, Lucy Thuita, MS, Hafiz Umair Siddiqui, MD, Jesse Rappaport, MD, Eugene H. Blackstone, MD, Kenneth R. McCurry, MD, and Usman Ahmad, MD, for the Lung Transplantation Center, Cleveland, Ohio

Most urgently listed patients undergo lung transplant within 1 month. Morbidity, long-term survival, and allograft function after transplant are similar for urgently and electively listed patients.

This article has an associated discussion and webcast.

- 318** **Commentary:** Does an expeditious evaluation for high-acuity lung transplant recipients make a difference?
Aakash Shah, MD, Chetan Pasrija, MD, Ronson J. Madathil, MD, and Christine L. Lau, MD, MBA, Baltimore, Md

Urgently listed lung transplant recipients may have equivalent outcomes to similar acuity electively listed patients in high-volume centers willing to perform transplantation in high-risk patients.

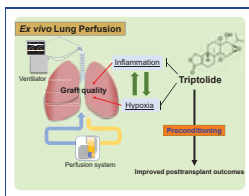
- 319** **Commentary:** Donor lungs allocated to critically ill patients listed urgently: No longer a waste of precious organs?
Dirk Van Raemdonck, MD, PhD, Laurens J. Ceulemans, MD, PhD, Arne Neyrinck, MD, PhD, Robin Vos, MD, PhD, and Geert M. Verleden, MD, PhD, Leuven, Belgium

Well-selected patients urgently listed for LTx because of acute respiratory failure have similar outcomes as those of electively listed patients with comparable disease severity and urgency.

- 321** **Commentary:** “To list, or not to list? That is the question”
Jing Yu Chen, MD, and Michael K. Y. Hsin, MD, FRCS, CTh, Wuxi, Jiangsu, China and Hong Kong

Lung transplantation for urgently listed patients is challenging and resource-intensive. Transplantation teams need to exercise good judgment in offering urgent listing to offset the risks of poor outcomes.

Thoracic: Lung Transplant: Basic Science



- e65** **Impact of triptolide during ex vivo lung perfusion on grafts after transplantation in a rat model**



Sarah Burki, MD, Kentaro Noda, PhD, Brian J. Philips, PhD, Murugesan Velayutham, PhD, Sruti Shiva, PhD, Pablo G. Sanchez, MD, PhD, Ajay Kumar, PhD, and Jonathan D’Cunha, MD, PhD, Pittsburgh, Pa, and Pheonix, Ariz

Treatment of lung grafts with TL during EVLP may serve to enhance graft preservation and improve graft protection resulting in better post-transplant outcomes.

e75 **Commentary:** A potential strategy to improve lung graft function after ex vivo lung perfusion
Roosevelt Bryant III, MD, Phoenix, Ariz

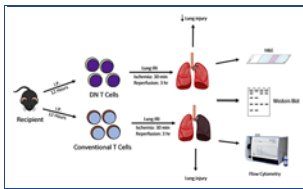
Triptolide, a diterpenoid triepoxide, has the potential to improve the posttransplant function of donor lungs resuscitated and preserved with ex vivo lung perfusion.

e77 **Commentary:** New era, old challenge
Jian-Yong Ding, MD, PhD, Shanghai, China

Introduction of triptolide into graft ex vivo lung perfusion is reasonable and wise for lung transplantation.

e79 **Commentary:** Ex vivo perfusion with green tea
Chadrick E. Denlinger, MD, Charleston, SC

Triptolide has been used for centuries as an anti-inflammatory agent. It is now being explored as an EVLP adjunct medication.



e81 **CD3⁺CD4⁻CD8⁻ Double-negative $\alpha\beta$ T cells attenuate lung ischemia-reperfusion injury**



Joshua Hsu, ScM, Aravind Krishnan, BA, Sul A. Lee, MD, Jefferey M. Dodd-o, MD, PhD, Bo S. Kim, MD, Peter Illei, MD, Kristine Yarnoff, BS, Abdel A. Hamad, DVM, PhD, Hamid Rabb, MD, and Errol L. Bush, MD, Baltimore, Md

Adoptive transfer with double-negative $\alpha\beta$ T cells attenuated lung ischemia-reperfusion injury. This discovery improves our understanding of unconventional T cells and their immunoregulatory roles.

This article has an associated discussion and webcast.

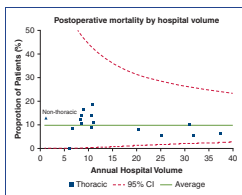
e91 **Commentary:** Double-negative T cells in the injured lung—evils or angels?
Alexander Sasha Krupnick, MD, and Yizhan Guo, MD, Charlottesville, Va

Double-negative $\alpha\beta$ T cells may be protective for lung ischemia-reperfusion injury via robust IL-10 productivity. This may challenge the conventional nonspecific immunosuppression therapies.

e93 **Commentary:** The cell without qualities?
Dagmar Kollmann, MD, PhD, and Konrad Hoetzenecker, MD, PhD, Vienna, Austria

In order to qualify as a potential therapeutic target, a better understanding of the function of double-negative T cells during ischemia-reperfusion injury is needed.

Thoracic: Health Policy: Invited Expert Opinion



323 **Regionalization in thoracic surgery: The importance of the team**

Gail E. Darling, MD, FRCSC, Toronto, Ontario, Canada

Regionalization may optimize patient outcomes by allowing a critical mass of specialty providers to work together and gain expertise. Increasing volume alone does not guarantee optimal outcomes.

330 **Commentary:** There is no “I” in team. Regionalization in thoracic surgery, the interdependence of the team, and surgical volume

Moishe Liberman, MD, PhD, Montréal, Québec, Canada

While an experienced team is probably more important than volume alone in thoracic surgery, if there is no volume, how do you build an experienced team?

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- 331** **Commentary:** Going beyond the volume–outcomes concept: The case for regionalization in thoracic surgery
Yaron Shargall, MD, Hamilton, Ontario, Canada
- Regionalization in thoracic surgery seems to be associated with better patient outcomes, unrelated to increase in surgeon/hospital volumes.

Thoracic: Education: Expert Opinion



- 333** **Cardiothoracic surgery wellness: Now and the formidable road ahead**
Romulo Fajardo, MD, Ara Vaporciyan, MD, Sandra Starnes, MD, and Cherie P. Erkmen, MD, Philadelphia, Pa; Houston, Tex; and Cincinnati, Ohio
- Our goals are to promote a cultural shift toward wellness, emphasize the need for wellness education, and highlight how we can promote wellness in the field of cardiothoracic surgery.
- 338** **Commentary:** A call-to-arms: Shifting culture in cardiothoracic surgery
Brian Mitzman, MD, New York, NY
- Wellness is poorly defined and often misinterpreted as physical health. We must first understand wellness as a concept and then develop an action plan to prevent burnout of our trainees.
- 339** **Commentary:** Burning bright without burning out: Protecting the spirit of cardiothoracic surgery
Jason J. Han, MD, John J. Kelly, MD, and Rita Karianna Milewski, MD, PhD, Philadelphia, Pa
- Reducing burnout and promoting wellness among surgeons and trainees in cardiothoracic surgery should be a systemwide priority and requires a centralized solution.

Notice of Corrections

- 341** Bolourani S, Tayebi MA, Diao L, Wang P, Patel V, Manetta F, Lee PC, entitled, Using machine learning to predict early readmission following esophagectomy. *J Thorac Cardiovasc Surg.* (May 29, 2020 [Epub ahead of print])
- 341** Pawale A, McCarthy PM, entitled, Commentary: Residual mitral regurgitation: The fork in the road. *J Thorac Cardiovasc Surg.* (2020;160:1193-4)

Announcements



- The American Association for Thoracic Surgery
- 342** **AATS 100th Annual Meeting: A Virtual Learning Experience**
- 342** ***View Updated Content on AATS Online***
- 342** ***Update Your AATS Profile***

The AATS Foundation



342 *Supporting the Future*

The Western Thoracic Surgical Association



343 *Save the Date*

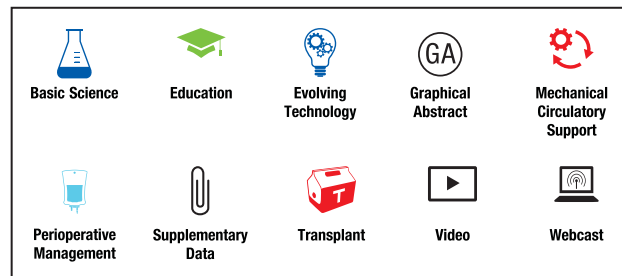
343 *Applications for WTSA Membership*

The American Board of Thoracic Surgery



344 *ABTS Announcement*

344 *ABTS Requirements for the 10-Year Milestone for Maintenance of Certification*



The Journal of Thoracic and Cardiovascular Surgery online is sponsored by St. Jude Medical.

Cover Photographs

Left (Adult): From Advanced Experience Allows Robotic Mitral Valve Repair in the Presence of Extensive Mitral Annular Calcification. Posterior MAC extension to the anterior PM via a calcified muscle band is seen intraoperatively in an 18-year-old woman. It is identified on the left and resected from the trunk of the PM on the right.

Center (Congenital): From Revisiting Prosthesis Choice in Mitral Valve Replacement in Children: Durable Alternatives to Traditional Bioprostheses. Mechanical valve cohort was associated with increased freedoms from re-replacement and death or transplant compared to traditional bioprosthetic alternatives. Although associated with significantly smaller prosthesis size (median 14 mm

vs 21-23 mm), Melody valve cohort was also associated with improved prosthetic durability compared with bioprosthetic alternatives.

Right (Thoracic): From Long-Term Survival Outcome After Lobectomy in Patients With Clinical T1 No Lung Cancer. Long-term survival outcome after lobectomy in patients with clinical T1 No lung cancer. The 10-year overall survival of group A, tumor size ≤ 2 cm, and consolidation tumor ratio (CTR) < 0.25 and group B, tumor size ≤ 3 cm, and CTR < 0.5 showed excellent prognosis. For tumors with CTR > 0.5 , larger size > 2 cm showed worse outcome than < 2 cm. OS, Overall survival.