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The Thoracic Surgery Residents Association: Past contributions, current efforts, and future directions

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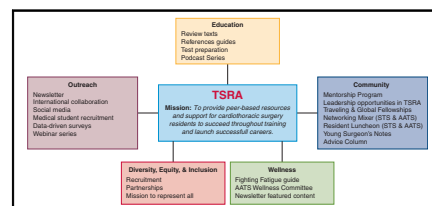
ABSTRACT

Objective: The Thoracic Surgery Residents Association (TSRA) is a resident-led organization established in 1997 under the guidance of the Thoracic Surgery Directors Association to represent the interests and educational needs of cardiothoracic surgery residents. We aim to describe the past contributions, current efforts, and future directions of the TSRA within a conceptual framework of the TSRA mission.

Methods: Primary review of educational resources was performed to report goals and content of past contributions. TSRA Executive Committee input was used to describe current resources and activities, as well as the future goals of the TSRA. Podcast analytics were performed to report national and global usage.

Results: Since 2011, the TSRA has published 3 review textbooks, 5 reference guides, 3 test-preparation textbooks, 1 supplementary publication, and 1 multiple-choice question bank and mobile application, all written and developed by cardiothoracic surgery trainees. In total 108 podcasts have been recorded by mentored trainees, with more than 175,000 unique listens. Most recently, the TSRA has begun facilitating trainee submissions to Young Surgeon's Notes, fostered a trainee mentorship program, developed the monthly TSRA Newsletter, and established a wide-reaching presence on Facebook, Twitter, and Instagram to help disseminate educational resources and opportunities for trainees.

Conclusions: The TSRA continues to be the leading cardiothoracic surgery resident organization in North America, providing educational resources and networking opportunities for all trainees. Future directions include development of an integrated disease-based resource and continued collaboration within and beyond our specialty to enhance the educational opportunities and career development of cardiothoracic trainees. (*J Thorac Cardiovasc Surg* 2020; ■:1-11)



Thoracic Surgery Residents Association mission and conceptual framework.

CENTRAL MESSAGE

The TSRA remains the leading cardiothoracic surgery resident organization in North America, providing educational resources and networking opportunities for trainees past, present, and future.

PERSPECTIVE

The TSRA has made substantial contributions to CT resident training through published and electronic resources, networking events, and more recently, establishing a social media presence. Looking ahead, we aim to continue to impact trainees from medical students to advanced fellows by enhancing our educational resources, events, and collaborations to ultimately benefit our specialty and patient care.

See Commentary on page XXX.

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*The 2019-2020 TSRA Executive Committee includes Xiaoying Lou, MD, Justin J. Watson, MD, Alexander A. Brescia, MD, MSc, Heidi J. Reich, MD, J. Hunter Mehaffey, MD, MSc, Clauden Louis, MD, MS, Garrett N. Coynan, MD, MS, Jordan P. Bloom, MD, Jason J. Han, MD, David Blitzter, MD, and Anthony B. Mozer, MD. Received for publication April 17, 2020; revisions received Aug 9, 2020; accepted for publication Aug 23, 2020.

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Abbreviations and Acronyms

AATS	= American Association for Thoracic Surgery
ABTS	= American Board of Thoracic Surgery
COVID-19	= coronavirus disease 2019
CT	= cardiothoracic
EC	= Executive Committee
STS	= Society of Thoracic Surgeons
TSDA	= Thoracic Surgery Directors Association
TSRA	= Thoracic Surgery Residents Association
TSSMN	= Thoracic Surgery Social Media Network
WTS	= Women in Thoracic Surgery

 Scanning this QR code will take you to the article title page to access supplementary information.

The Thoracic Surgery Residents Association (TSRA) is a trainee-led organization established in 1997 under the guidance of the Thoracic Surgery Directors Association (TSDA) to represent the interests and needs of cardiothoracic surgery residents. Dr Mark B. Orringer, former President of the Society of Thoracic Surgeons (STS) in 2001-2002 and President of the TSDA in 1997, was instrumental in forming the TSRA in coordination with its first President, Dr Michael S. Mulligan, then a thoracic surgery resident at the University of Michigan (Table 1). A governing infrastructure and method of representation through the TSDA were established in addition to monthly phone meetings and in-person meetings initiated in conjunction with the annual meetings of the STS, American Association for Thoracic Surgery (AATS), and the American College of Surgeons.

Over the past 23 years, the TSRA has remained steadfast to its original mission of supporting the education of cardiothoracic surgery trainees while also significantly evolving as an organization. A small group that began through a conversation between an academic leader and his trainee has expanded into an organization with international reach. The TSRA is led by a 12-person Executive Committee (EC), headed by officer positions including President, Vice President, Secretary, Treasurer, and Immediate Past President, as well as committee Chair positions for each of its Projects, Education, Membership, and Communications committees. The scope of TSRA activities, which are generally collaborative, have also grown, involving

the promotion of trainee advocacy, networking, wellness, and career advancement as well as providing educational resources with ongoing impact.

In this report, we aim to describe the past contributions, current efforts, and future directions of the TSRA. We review the TSRA's past productivity and propose how these accomplishments inform the current activities and future plans for the organization within a conceptual framework centered around the TSRA mission.

METHODS

This report did not involve any human subjects research and therefore did not undergo review by a regulatory body.

Educational Resources

TSRA educational resources typically undergo multiple rounds of peer review as well as faculty review before publication (Table E1). Our current standard process includes each chapter to be written by a mentee (trainee) and mentor (faculty) tandem, followed by peer review by members of the TSRA EC at 3 levels: a section editor, primary editor, and copy editor for each educational resource. Primary review of educational resources to provide data used in writing this manuscript was performed by all manuscript authors.

Details regarding sales of educational resources and publication dates were gathered from organizational records on Amazon (Amazon.com, Inc, Seattle, Wash) and iTunes (Apple, Cupertino, Calif). Published resources were divided into 3 categories: review texts, reference guides, and test preparation.

Activities and Events

Input from current and past members of the TSRA EC was compiled to describe TSRA resources and activities. Future directions and goals of the TSRA were collected by members of the current TSRA EC and described in detail here by the authors.

Podcast Statistical Analysis

Web-based podcast analytics were used to collect usage statistics from SoundCloud (SoundCloud Limited, Berlin, Germany). Individual podcast usage was quantified on a per-listen basis and reported from series inception (August 2016) through December of 2019. Geographical location of podcast listens was obtained via Internet Protocol address tracking performed by SoundCloud.

RESULTS

The efforts undertaken by the TSRA center around our mission and can be broadly classified into the 5 domains: education, outreach, community, DEI (ie, diversity, equity, and inclusion), and wellness (Figure 1).

Educational Resources

Since 2011, the TSRA has published 3 review textbooks, 5 reference guides, 3 test preparation textbooks, 1 multiple-choice question bank and mobile application, and 1 supplementary publication (Figure 2 and Table 2).

Review textbooks. The TSRA Review of Cardiothoracic Surgery was developed by Joseph Turek and Carlos Mery to provide cardiothoracic trainees with a concise analysis of the field. The material is authored by more than 50

TABLE 1. Thoracic Surgery Residents Association (TSRA) Presidents (1997-2020)

Number	Name	Academic year	Institution
1	Michael Mulligan, MD	1997-1998	University of Michigan
2	W. Scott Arnold, MD	1998-1999	University of Virginia
3	Antonio Laudito, MD	1999-2001	Jackson Memorial Hospital
4	Jorge D. Salazar, MD	2001-2002	Johns Hopkins Hospital
5	Richard Lee, MD, MBA	2002-2003	Washington University in St Louis
6	Grayson H. Wheatley III, MD	2003-2004	University of Texas Southwestern
7	John R. Mehall, MD	2004-2005	University of Cincinnati
8	D. Michael McMullan, MD	2005-2006	University of Washington
9	Daniel J. Boffa, MD	2006-2007	Cleveland Clinic
10	Faraz Kerendi, MD	2007-2008	Emory University
11	Bret A. Mettler, MD	2008-2009	University of Virginia
12	Joseph W. Turek, MD, PhD	2009-2010	Duke University
13	Carlos M. Mery, MD, MPH	2010-2011	University of Virginia
14	Jason A. Williams, MD	2011-2012	Duke University
15	Tom C. Nguyen, MD	2012-2013	New York Presbyterian Hospital-Columbia
16	David D. Odell, MD, MMSc	2013-2014	University of Minnesota
17	Damien J. LaPar, MD, MSc	2014-2015	University of Virginia
18	Dustin M. Walters, MD	2015-2016	University of Washington
19	Elizabeth H. Stephens, MD, PhD	2016-2017	New York Presbyterian Hospital-Columbia
20	Andrew B. Goldstone, MD, PhD	2017-2018	University of Pennsylvania
21	Peter Chen, MD	2018-2019	University of Texas-Houston
22	Xiaoying Lou, MD, MS	2019-2020	Emory University
23	Alexander A. Brescia, MD, MSc	2020-2021	University of Michigan

residents and organized into 4 sections: General Thoracic, Adult Cardiac, Congenital Cardiac, and Cardiothoracic Trauma and Critical Care. The first edition was published in August 2011 and was a popular study resource for residents preparing for rotations. Damien LaPar later led an update to the text and published its second edition in January 2016. Both editions remain available in print, e-book, or PDF versions on Amazon.

The *TSRA Primer of Cardiothoracic Surgery* is an integrated educational resource that is designed to illustrate fundamental concepts for new learners. This resource was designed by Samuel Youssef and Jason Williams to establish a foundation for students in the early stages of learning to build upon as they progress in their careers—hence, “a primer.” The *Primer* is divided into 4 broad subjects (cardiac, congenital, thoracic, esophageal, and critical care) and numerous topics within each subject that were selected by the TSRA EC and Projects Committee. The content supplements the “prerequisite” curriculum of the TSDA and parallels some of the Level 1 “Milestones” of the ACGME guidelines.¹ The *Primer* serves as a field-guide manual, with illustrations, outlines, and technical pearls that can be brought to the first encounter. The *Primer* was first

published in July 2013 and is available as an e-book from the Apple bookstore.

Reference guides. *TSRA Decision Algorithms in Cardiothoracic Surgery* is a unique text and application, developed by residents and faculty mentors. Published in 2019, it is the most recent TSRA review text. This resource was written under the leadership of Xiaoying Lou by lead editor Clauden Louis and TSRA Past Presidents Peter Chen and Elizabeth Stephens. Each of more than 100 chapters includes an individual algorithm and provides a foundation and framework for approaching important cardiothoracic surgical decisions. This text focuses on the key clinical decisions, diagnostics, and interventions. This 4-year project was aimed at providing algorithmic pathways representing safe solutions to common diagnoses that could be used by caregivers of cardiothoracic patients. As of May 2020, 293 print and 152 Kindle e-book copies had been sold through Amazon.

The *TSRA Operative Dictations in Cardiothoracic Surgery*, published in 2014 and edited by Damien LaPar and David Odell, is a resource for daily surgical practice that reviews the main steps of major cardiothoracic surgical operations and guides their appropriate dictation and

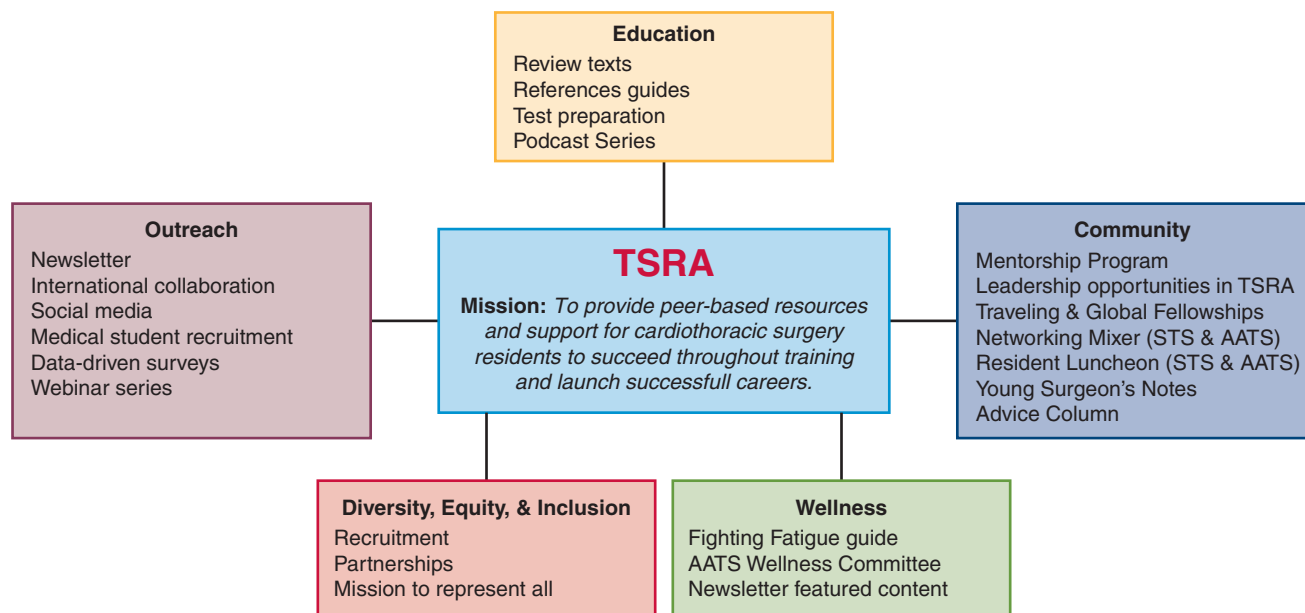


FIGURE 1. Conceptual framework for the Thoracic Surgery Residents Association (TSRA) organizational structure and efforts to support cardiothoracic trainees. STS, Society of Thoracic Surgeons; AATS, American Association for Thoracic Surgery.

documentation. This text has been useful for both practicing surgeons and residents in training, as it provides descriptions of the most representative approach to each operation.

The *TSRA Pocket Mentor*, published in 2017, serves as a guide for navigating the daily residency experience. Embarking on a residency program initiates what will be a

lifelong journey to master the clinical knowledge, technical skills, and surgical decision-making necessary for a successful career in cardiothoracic surgery. The *Pocket Mentor* is supplemented with advice from current residents, faculty, and program directors and is available online as a free PDF.

TSRA Published Resources (2011-2019)

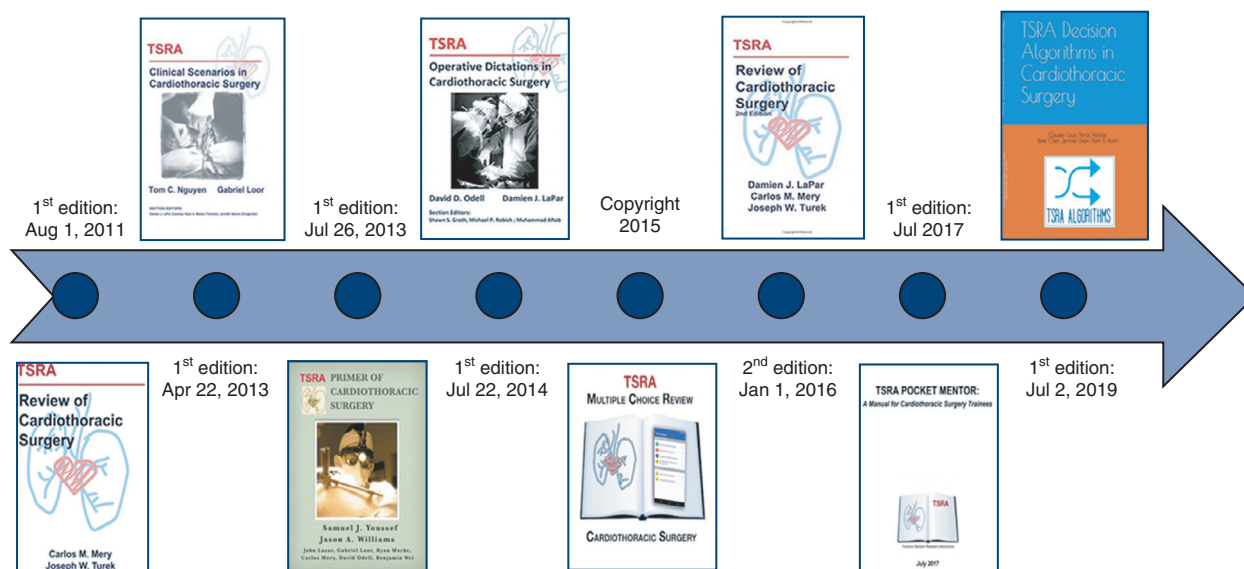


FIGURE 2. Book covers and timeline of educational resources published by the Thoracic Surgery Residents Association (TSRA) between 2011 and 2019. Dates of publication correspond to images of book covers directly above or below each publication image.

TABLE 2. Thoracic Surgery Residents Association (TSRA) published resources (2011-2019)

Name of resource	Editors	Edition	Release date	Format
<i>TSRA Review of Cardiothoracic Surgery</i>	Carlos M. Mery Joseph W. Turek	1st	August 1, 2011	Print PDF
<i>TSRA Clinical Scenarios in Cardiothoracic Surgery</i>	Tom C. Nguyen Gabriel Loor Damien J. LaPar Ryan A. Macke Jennifer Nelson	1st	April 22, 2013	Print E-book Phone app
<i>TSRA Primer of Cardiothoracic Surgery</i>	Samuel J. Youssef Jason A. Williams	1st	July 26, 2013	Print
<i>TSRA Operative Dictations in Cardiothoracic Surgery</i>	David D. Odell Damien J. LaPar Shawn S. Groth Michael P. Robich Muhammad Aftab	1st	July 22, 2014	Print E-book
TSRA Multiple Choice Review of Cardiothoracic Surgery	Clauden Louis	Iterative	Version 2.0 for iOS 11.0 or later, 2015	iOS and Android app
<i>TSRA Review of Cardiothoracic Surgery</i>	Damien J. LaPar Carlos M. Mery Joseph W. Turek	2nd	January 1, 2016	Print E-book
TSRA Intern Survival Guide	Xiaoying Lou Elizabeth H. Stephens Kevin Beers Brendan Dewan Vakhtang Tchanchaleishvili Panos Vardas	1st	Academic year 2016-2017	Free PDF
<i>TSRA Pocket Mentor</i>	Xiaoying Lou Elizabeth H. Stephens	1st	July 2017	Free PDF
<i>TSRA Decision Algorithms in Cardiothoracic Surgery</i>	Clauden Louis Panos Vardas Peter Chen Jennifer Dixon Parth B. Amin	1st	July 2, 2019	Print E-book
TSRA Literature Review	Clauden Louis David Blitzer Ernest G. Chan Daniel R. Ziazadeh	Iterative		Web-based
TSRA Blog and Advice Column	Jason J. Han	Iterative		Web-based
TSRA Newsletter	Alexander A. Brescia	Monthly	January 22, 2020	Print (biannual) E-newsletter (monthly)
<i>TSRA Clinical Scenarios in Cardiothoracic Surgery</i>	Justin J. Watson Xiaoying Lou Garrett N. Coyan Alexander A. Brescia Jordan P. Bloom Clauden Louis	2nd	Summer 2020	Print E-book

TSRA, Thoracic Surgery Residents Association.

The *Intern Survival Guide* was published in 2017 and is available as a free PDF. While all of our resources provide a knowledge base for all learners, the *TSRA Primer of Cardiothoracic Surgery* and the *TSRA Intern Survival*

Guide were written specifically for junior cardiothoracic surgery residents.

Finally, in addressing the domain of wellness in the TSRA mission, the TSRA and TSDA jointly released a

free PDF titled, “Fighting Fatigue: A Guide for Cardiothoracic Surgery Residents.” This guide is intended to provide simple advice on how to prepare to work extended periods of time during the day and overnight, as well as how to recover from working nights in the most efficient and effective way.

Test-preparation resources. The *TSRA Clinical Scenarios in Cardiothoracic Surgery* is a collection of common high-yield scenarios within the areas of General Thoracic, Adult Cardiac, and Congenital Cardiac Surgery. The resource was originally published in April 2013 under the leadership of Tom Nguyen and Gabriel Loo. Each scenario in the book was authored by a resident and reviewed by a faculty mentor. The scenarios are based on cases trainees are likely to encounter in the clinical environment and describe initial differential diagnosis, management options, operative decision-making, and postoperative care. This resource is intended to improve clinical decision-making, detail case-based surgical technique, increase medical knowledge, and promote critical thinking. The first edition review is currently available in print or as an e-book on Amazon or through iTunes as an application.

The TSRA Multiple Choice Review mobile application allows users to test their knowledge by answering multiple-choice questions spanning adult cardiac, congenital, and general thoracic surgery, as well as trauma/critical care. Each of these sections is subdivided into categories with approximately 10 questions per subject with 588 questions total. Questions can be reset to allow the user to repeat the questions as needed. More recently, the online TSRA Question Bank was developed by Clauden Louis as an update to the existing mobile application. This resource uses FRED software simulation,² which closely mimics the format of professional standardized questions banks.³ Available on both computer and mobile browsers, the questions have been recently updated by peer-to-peer submissions and allows for continued future updates for quality

and accuracy. The question bank is currently available to all trainees free of charge, and more 200 medical students, trainees, and faculty are members of the TSRA Question Bank.

TSRA podcast series. The TSRA Podcast Series is a collection of digital audio episodes produced and recorded by cardiothoracic surgery residents collaborating with faculty mentors covering a broad range of topics within cardiothoracic surgery. The series was initially launched in August of 2016 under the leadership of Elizabeth Stephens. Each episode is based on a specific topic following the format of TSRA Clinical Scenarios and features a resident interviewing expert faculty about case management within the given topical area. The TSRA currently houses the free podcast library on Soundcloud (<https://soundcloud.com/tsrapodcast>). The account consists of 108 unique podcasts (Table E2) with 175,359 all-time listens as of July 15, 2020 (Figure 3). This resource has been used by trainees spanning 50 countries ranging from 65 listens in Romania and Iran to 134,478 in the United States as of July 15, 2020 (Figure 4).

Young Surgeon’s Notes. Young Surgeon’s Notes was originally developed as a section of the *Journal of Thoracic and Cardiovascular Surgery* (JTCVS), specifically written for and by young surgeons on topics salient to their early experiences. In 2018, under the leadership of Richard D. Weisel, editor-in-chief, and JTCVS education editors, James I. Fann, Ara A. Vaporciyan, and Stephen C. Yang, the *Journal* expanded the definition of young surgeons to include cardiothoracic trainees. The TSRA became a collaborator in both soliciting submissions for and promoting articles published in this section. The first article, titled, “See One—Practice—Do One—Practice—Teach One—Practice: The Importance of Practicing Outside of the Operating Room in Surgical Training,” by Han and colleagues was published in 2018,⁴ followed by 2 more trainee-focused articles in its first year.^{5,6} Following up on its initial successes,

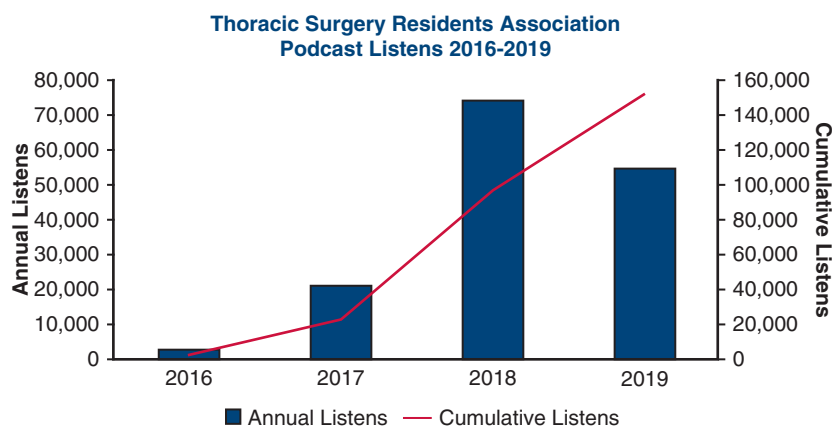


FIGURE 3. Thoracic Surgery Residents Association podcast listens over time (2016-2019). Blue columns indicate annual podcast listens each year (left-sided y-axis) and the red line indicates cumulative podcast listens over time (right-sided y-axis).

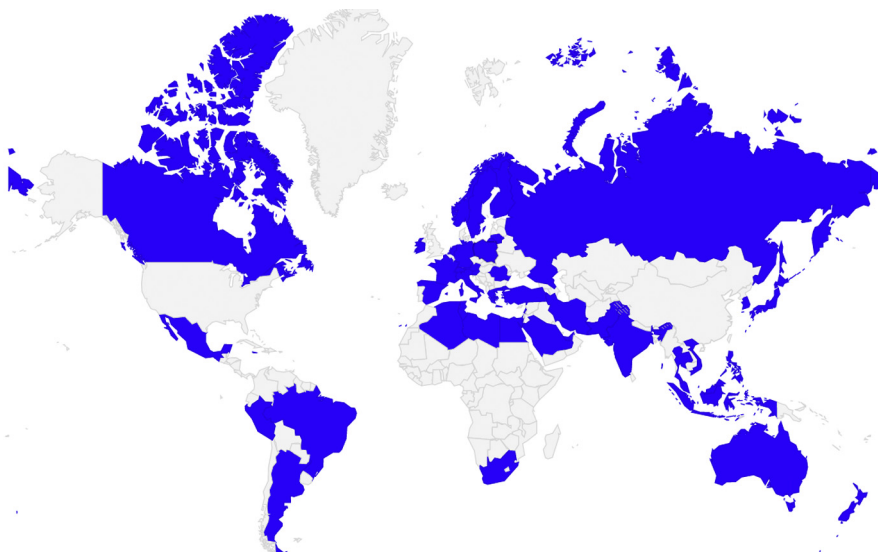


FIGURE 4. Global map showing countries with at least 1 Thoracic Surgery Residents Association podcast stream (blue). Range 174-123,339 (Finland-United States). Data as of March 29, 2020.

the TSRA website created its own Young Surgeon's Notes section in 2019, as a forum for publication of various types of articles pertinent to trainees' experiences. This initial Young Surgeon's Note entry⁴ and a subsequent TSRA survey on barriers to technical skills training have enhanced TSRA efforts to inform and improve simulation efforts in our specialty.

The tradition of publishing an annual Presidential Address began with Xiaoying Lou in 2019, with her address titled, "Preserving the Passion in Cardiothoracic Surgery Training."⁷ The Advice Column series was also developed in 2019, as a place where trainees can seek advice from a committee of established surgeons and mentors.⁸ The first topic of the series, "How should trainees prepare for each case to perform well and also to get as much as we can out of it?" compiled advice from 4 faculty surgeons at various stages of their careers, and was widely publicized.

Activities and Events

The TSRA Mentorship Program was created in 2015 to promote peer-to-peer mentorship. In 2017 under the leadership of Andrew Goldstone, the TSRA Membership Committee increased efforts through e-mail and social media communication to enhance participation among trainees of all levels: from first-year medical students to advanced fellows. Participants were encouraged to serve as both mentors and mentees at different stages of the pathway to becoming a cardiothoracic surgeon. The revamped Mentorship Program increased its participation from 38 trainees in 2017-2018 to 81 trainees in 2018-2019.

At the annual STS and AATS national meeting, the TSRA hosts its signature TSRA Resident Mixer. This 2-hour event is typically held on a Monday afternoon

and takes place at an outside venue within walking distance from the convention center. The Mixer provides an important networking opportunity for trainees outside of the more formal, structured conference sessions. This networking forum not only strengthens collaborative efforts among trainees but also engages and recruits medical students and general surgery residents interested in the field. Attendance for this event has doubled yearly with the 2020 STS TSRA Mixer, including more than 100 trainees.

For nearly 2 decades, the TSRA has collaborated with both the STS and AATS to co-host resident luncheons at their respective annual meetings. The STS/TSRA Resident Luncheon is traditionally held on the Sunday of the annual STS conference and is headlined by a faculty keynote speaker voted on by the TSRA EC, most recently Dr Gorav Ailawadi, who delivered "Surgical Mentorship" at the 67th Annual STS meeting in New Orleans. Trainee luncheon attendees are joined by approximately 30 to 40 faculty from adult cardiac, general thoracic, and congenital subspecialties to participate in themed discussion topics relating to cardiothoracic trainee education in conjunction with the keynote address. The TSRA has also co-hosted a luncheon during the AATS, typically on the Sunday or Monday of the annual AATS conference. The most recent iteration of this luncheon at the 99th Annual AATS meeting in Toronto was titled, "AATS/TSRA Preparing Yourself for an Academic Career Luncheon Session" and included a series of speakers and panel discussions about early career decisions.

Since the emergence of coronavirus disease 2019 (COVID-19) in March 2020, the TSRA has initiated 2 virtual events for students and trainees. In April 2020, the

TSRA EC hosted an informal teleconference of all students and trainees to discuss the impact of COVID-19 at their respective institutions, which resulted in an insightful discussion with international participation. In addition, TSRA leadership in May 2020 organized and took part in an STS Webinar “Cardiothoracic Surgery in the COVID Crisis: Impact on Residency and Training,” which included a panel of trainees, program directors, and leadership from the American Board of Thoracic Surgery (ABTS) and TSDA.

Social Media

The TSRA first extended beyond website and e-mail communication and into social media by establishing a Facebook page in 2012. As the primary avenue of communication with international trainees, the Facebook page has since accumulated more than 2300 followers and 2300 “likes.” The Facebook page has been an important medium to attract and support international trainees to take part in TSRA activities at national meetings and download or purchase TSRA educational resources. During the 2017-2018 academic year, the Communications Committee prioritized establishing a presence on Twitter (@TSRA_official) and has increased its following to more than 1700 people. Most recently, the TSRA has also added an Instagram account (tsra_official), LinkedIn account, and YouTube channel in an effort to build its network and reach the widest audience possible. These social media tools are used to disseminate TSRA announcements, advertise educational resources, promote resident events and achievements, as well as interact with the broader cardiothoracic surgery community.

In January 2020, the TSRA published the inaugural issue of a monthly TSRA Newsletter, both electronically and in print (Figure 5). Newsletter content includes rotating TSRA announcements, trainee opportunities, and featured content sections, as well as standard sections including Key Abstract Submission Deadlines & Conference Dates, Manuscript of the Month with author interviews, a Diagnostic/Board Prep challenge with sample questions from the TSRA Question Bank, an updated TSRA Educational Resources index, TSRA Advice/Young Surgeon’s Notes column, and Featured Podcast. Leads for each section collaborate with the Editor and TSRA EC to produce content. A wellness-themed issue in May 2020 included a letter to trainees, featured podcast, and Manuscript of the Month all addressing the topic of wellness in cardiothoracic surgical training. Under the leadership of Xiaoying Lou, Alex Brescia began as the first Editor of the Newsletter.

These recent developments through the TSRA Mentorship Program, Newsletter content highlighting base knowledge and opportunities for growth, and social media presence on Twitter, Facebook, and Instagram have been instituted to better meet the needs of younger cardiothoracic trainees, who

incorporate a large proportion of our membership since the establishment of integrated pathway programs. As cardiothoracic surgery training has undergone a paradigm shift with the introduction of the integrated pathway, the TSRA Executive Committee leadership has also undergone a paradigm shift, with representation of both junior and senior trainees from both integrated and traditional pathways.

DISCUSSION


Over the past decade, the TSRA has made substantial contributions to the cardiothoracic surgery community by publishing educational resources, hosting networking activities and events, as well as building a social media presence as a representative organization for cardiothoracic (CT) surgery trainees. The TSRA is committed to updating and maintaining these resources and opportunities while integrating our educational material to ease use for trainees, and enhancing collaboration with other leading organizations in our specialty.

Updates, Evaluation, and Integration of Educational Resources

Currently, the TSRA EC is working on the second edition of TSRA Clinical Scenarios in Cardiothoracic Surgery, given its immense popularity among trainees. The second edition will feature updated scenarios, as well as several new topics to provide a more comprehensive and contemporary selection of scenarios for review. The second edition is currently undergoing copy editing and is projected for publication in August 2020. In addition, the TSRA has expanded the TSRA Literature Review website with a blog-style review of the seminal work published in the field of cardiothoracic surgery and its subspecialties. The purpose of this work is to effectively summarize previous studies in the field that guide today’s perioperative decision-making, as well as stay abreast of the newest and most exciting literature as it is released.

In addition to published textbooks, the TSRA continues to administer trainee-created surveys. The system of survey submission recently was modified to occur on a rolling basis, instead of an annual survey during the TSDA in-training examination. These survey ideas are elicited and administered approximately quarterly to continue to enhance the body of literature on resident training stemming from TSRA surveys.⁹⁻²⁶

The TSRA Podcast Series continues to expand and recruit new contributors through the Projects Committee. Career development, ethics, and adjunct practice areas are currently being incorporated into the series to expand the scope of topics relevant to current trainees. Future developments within the TSRA Podcast Series include the addition of debate-style podcasts, addition of video and media content to the series, and restructuring the storage of the current podcast library to contain cohesive playlists for topical



TSRA

Newsletter

Thoracic Surgery Residents Association

TSRA Announcements and Deadlines


All students and trainees welcome at TSRA events at STS
Medical students, residents, fellows, and super fellows attending the STS Annual Meeting are encouraged to attend all STS and TSRA Resident events listed in this Newsletter!

Get involved!
To get involved with a TSRA Committee, contact Chairs for more details:

Projects: Clauden Louis at clauden_louis@urmc.rochester.edu
Education: Hunter Mehaffey at JHM9T@hscmail.mcc.virginia.edu
Membership: Jordan Bloom at jpbloom@partners.org
Communications: Alex Brescia at abrescia@med.umich.edu

Find us on social media
Connect with the TSRA through Facebook, Instagram ([tsra_official](#)), and Twitter ([@TSRA_official](#)) and highlight trainee excellence at [#STS2020!](#)


January 2020 — Volume 1, Issue 1 (Print)



Resident Events at STS

Inaugural TSRA Presidential Address: Preserving the Passion in Cardiothoracic Surgery Training

By: Xiaoying Lou, 2019-2020 TSRA President



I remember the awe of feeling the human heart beating in my palm for the first time. I was in high school — impressionable, mesmerized by its beauty, its persistent drumming, and the sense of purpose and commitment of the team around me working towards a common goal. I knew then that cardiothoracic surgery was what I wanted to do with my life.

Continue reading on Page 3...

**STS Residents Symposium:
Transition from Training to Practice**
Sunday, Jan 26th 10:00am-12:00pm in Rivergate Room

STS Residents Luncheon
Sunday, Jan 26th 12:00-12:45pm in Mosaic Lounge

Jeopardy World Championship
Sunday, Jan 26th 4:45pm in the Exhibit Hall

TSRA Resident Luncheon
Monday, Jan 27th 12:15-1:15pm in Rivergate Room
Keynote: Gorav Ailawadi, MD: "Surgical Mentorship"

TSRA Resident Mixer
Monday, Jan 27th 4:30-6:30pm
Cochon Restaurant
930 Tchoupitoulas St., Suite A
New Orleans, LA, 70130

TSRA Awards Presentation
Tuesday, Jan 28th 9:30-9:45am in Great Hall A-D
TSRA Socrates Award
TSRA McGoan Award
TSRA/STS Traveling Fellowship
TSRA/STS Global Outreach Fellowship

Beyond Burnout: What You Should Know and Do Going Forward
Tuesday, Jan 28th 1:00-3:00pm in Room 208

TSRA Advice Column

By: Jason Han

Each month, we will pose a question on the minds of trainees to some of our favorite faculty mentors. Our inaugural Advice Column includes mentor responses to the following question:

How should trainees prepare for each case to perform well and also to get as much as we can out of it?

Continue reading on Page 4...

Manuscript of the Month

By: Jordan Bloom

Objective Measure of Learning Curves for Trainees in Cardiac Surgery via Cumulative Sum Failure Analysis

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Read about this manuscript and an author interview on Page 4...

FIGURE 5. Cover page of the inaugural Thoracic Surgery Residents Association (TSRA) Newsletter released in print on January 27, 2020, at the TSRA Resident Luncheon at the Society of Thoracic Surgeons (STS) 56th Annual Meeting. An electronic version was also disseminated to TSRA membership on January 22, 2020 via e-mail.

areas that would make searching the TSRA podcast library easier. The Podcast Series is also transitioning from a paradigm of on-site recording with individual smartphones to an online podcast audio recording platform that will improve audio quality and allow for residents to conduct interviews with multiple faculty members at distant institutions, expanding opportunities for involvement and collaboration.

Importantly, the organization will focus on evaluating the impact of specific TSRA resources. Data from our most

recently publication (Decision Algorithms) indicate that there is substantial interest in TSRA content, and perhaps counterintuitively, nearly double the number of print copies compared with Kindle e-book copies has been bought. While metrics including book and mobile application sales and podcast listens are available, these data do not specifically address which resources trainees find most beneficial and the impact of using specific resources on the in-training examination, ABTS Board examination pass rates, job

placement and type, and perceived deficiencies in these resources. These data will be a focus of future TSRA efforts.

The TSRA plans to develop an integrated disease-based educational resource, which may include linking existing resources such as the Review and Clinical Scenarios with TSRA Podcasts, Decision Algorithms, Literature Review, and Question Bank. This major effort will be driven primarily through data provided by current trainees and recent graduates to identify the highest yield existing resources and modes of dissemination which will inform the development of an integrated resource, with web, mobile, and print versions to accommodate all types of learners. Throughout all projects involving updating existing or creating new resources, the TSRA is dedicated to a framework of trainee authorship under the mentorship of board-certified faculty for the purposes of fostering a mentor-mentee relationship and assuring quality.

Expansion of Activities and Events

With 2 years of survey data from the TSRA Mentorship Program thus far, the EC will continue to collect responses for 3 more years before reporting a 5-year experience of this program. A separate survey of nationwide trainees addressing attitudes toward mentorship administered by the TSRA was presented at the 67th STS Annual Meeting and accepted for publication by *The Annals of Thoracic Surgery*. These data will be used to expand and improve the Mentorship Program moving forward.

The TSRA is committed to continued expansion of the TSRA Resident Mixer at the STS and AATS annual meetings. This networking event has evolved to now more frequently include engaged medical students and general surgery residents, in addition to current cardiothoracic residents. These efforts have been made deliberately by collaborating with the Looking to the Future Program at the STS and the Member for a Day Program at the AATS, both attracting top medical students, general surgery residents, and junior cardiothoracic residents. In addition, planning for the Mixer now explicitly includes coordination with Women in Thoracic Surgery (WTS) to assure that all students and trainees have the opportunity to attend both networking events. These collaborative efforts will not only benefit TSRA membership and involvement, but will help promote and strengthen our specialty.

Social Media Growth, Partnerships, and Diversity

The impact of social media on the cardiothoracic surgery community has increased precipitously over the past 2 to 4 years through initiatives and organizations including the Cardiothoracic Surgery Network (CTSNet, @ctsnetorg) and the Thoracic Surgery Social Media Network (TSSMN, @TSSMN). The profound impact of the TSSMN including use of its hashtag #TSSMN, moderated TweetChats, and

TSSMN Tweeter iTunes App has included millions of Twitter impressions and thousands of application downloads as a collaborative effort through *The Annals of Thoracic Surgery* and *The Journal of Thoracic and Cardiovascular Surgery*.²⁷ The impact and importance of social media and virtual engagement has increased substantially as a result of the COVID-19 pandemic, as cardiothoracic trainees have been forced to pursue virtual platforms for some elements of training.²⁸⁻³⁰ The TSRA plans to develop a series of simulation videos to be potentially featured in collaboration with AATS Online or on the TSRA YouTube channel. In addition, the TSRA will specifically be hosting 3 Webinars in the summer and fall of 2020, focused on (1) the virtual application process for medical students (August), (2) navigating the job search during a pandemic for senior trainees (September), and (3) the virtual application process for general surgery residents (October). These webinars will feature participation from medical students, cardiothoracic trainees, faculty leaders from academic and private practices, and program directors and be subsequently posted on the TSRA YouTube channel.

TSRA collaboration is not limited to the cardiothoracic surgery specialty. While the organization has existing relationships with Chest and the American College of Cardiology, future goals include developing sustainable relationships and pathways for CT trainees to join the American College of Cardiology Fellows-in-Training program and encourage more robust dialogue between cardiac surgery and cardiology at the trainee level. Similarly, the TSRA will be focused on increasing in-person and digital interactions with Chest and the American College of Surgeons. Within our specialty, the TSRA remains committed to continued collaboration with its parent organization the TSDA and the 2 major North American societies, the STS and AATS. The TSRA will aim to collaborate with the TSDA, STS, and AATS to enhance cardiothoracic trainee educational tools, with a focus on user-friendly convenience and adaptability to keep pace with our evolving field.

Diversity, equity, and inclusion is an important focus of our organization, which we incorporate into all of our activities and operations. We specifically aim to promote diversity by focusing on recruitment and partnerships. Recruiting diversity not only applies to the TSRA EC leadership but to the applicants entering cardiothoracic surgery through medical student outreach. In addition, we plan to amplify our informal collaboration with the WTS by establishing an ex officio position on our EC for a WTS member each year to maintain regular communication and collaboration. We are dedicated to promoting diversity in all initiatives and look forward to additional recruitment and partnerships in the future.

CONCLUSIONS

The TSRA has made substantial contributions to the education of CT surgery trainees through published resources, sponsored activities and events, and establishing a social media presence. Over the next decade, we aim to impact a broad range of trainees from medical students to advanced fellows by enhancing our educational resources, events, and collaborations to ultimately improve our specialty and cardiothoracic surgical patient care while fulfilling our mission.

Disclosures

TSRA resources are provided as a basic guideline for the study of cardiothoracic surgery and should be used in conjunction with other educational references and resources. As stated within each resource, these tools should not be construed as definitive study guides for either the TSDA In-Training Exam or the ABTS Part I (written) and Part II (oral) Certification Examinations. The TSRA makes no claims regarding any education resource's value in preparing for, or its contribution toward performance on, either the TSDA In-Training Exam or the ABTS Certification Exams. TSRA resources are educational tools only and any medical decisions should be made only after discussions with appropriate health-care providers.

Conflict of Interest Statement

The authors reported no conflicts of interest.

The *Journal* policy requires editors and reviewers to disclose conflicts of interest and to decline handling or reviewing manuscripts for which they may have a conflict of interest. The editors and reviewers of this article have no conflicts of interest.

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Key Words: education, training, residents, fellows, cardiothoracic surgery education

TABLE E1. Authorship and editorial review process statistics for recent Thoracic Surgery Residents Association published educational resources (2011-2019)

Name of resource	Edition	Release date	No. of trainee editors	No. of faculty editors	Rounds of editorial review	No. of trainee authors	No. of faculty authors
<i>TSRA Review of Cardiothoracic Surgery</i>	1st	August 1, 2011	2	0	3	93	13
<i>TSRA Clinical Scenarios in Cardiothoracic Surgery</i>	1st	April 22, 2013	6	0	3	77	74
<i>TSRA Primer of Cardiothoracic Surgery</i>	1st	July 26, 2013	7	8	2	94	0
<i>TSRA Operative Dictations in Cardiothoracic Surgery</i>	1st	July 22, 2014	6	0	3	103	113
<i>TSRA Review of Cardiothoracic Surgery</i>	2nd	January 1, 2016	6	2	3	62	0
<i>TSRA Intern Survival Guide</i>	1st	Academic Year 2016-2017	6	0	2	6	0
<i>TSRA Pocket Mentor</i>	1st	July 2017	2	0	2	11	4
<i>TSRA Decision Algorithms in Cardiothoracic Surgery</i>	1st	July 2, 2019	5	0	3	98	103
<i>TSRA Clinical Scenarios in Cardiothoracic Surgery</i>	2nd	August, 2020	5	0	3	100	95

The TSRA Blog and Advice Column, Newsletter, Multiple Choice Review, and Literature Review were omitted. The Blog and Advice Column entries are written by both trainees and faculty, depending on the month, and are edited by the Blog and Advice Column section editor and primary Newsletter editor. The TSRA Newsletter is organized and reviewed by a 9-person trainee Editorial Board but has a variable number of trainee and faculty authors each month and is reviewed and approved by the 9-person TSRA Executive Committee of faculty leaders before publication each month. The TSRA Multiple Choice Review of Cardiothoracic Surgery and TSRA Literature Review are both iterative resources that are published online and have a variable number of authors and reviewers as updates and enhancements are instituted. Number of authors pertains to authorship of each chapter or section within the publication. *TSRA*, Thoracic Surgery Residents Association.

TABLE E2. Thoracic Surgery Residents Association recorded podcasts recorded by faculty and trainee tandems from August 15, 2016, through July 15, 2020

Name of podcast	Trainee author	Faculty author	Institution	Date
Type A dissection	Gregory Pattakos	Joseph Coselli	Baylor/Texas Heart	August 15, 2016
Transposition of great arteries	Peter Chen	Charles Fraser	Baylor/Texas Heart	August 15, 2016
Aortic arch aneurysm	Melissa Levack	Eric Roselli	Cleveland Clinic	September 23, 2016
Tracheal stenosis	Amy Fiedler	Douglas Mathisen	Massachusetts General Hospital	September 23, 2016
Pericardial disease	Sahar Saddoughi	Hartzell Schaff	Mayo Clinic	September 23, 2016
Total artificial heart	Vakhtang Tchanchaleishvili	Lyle Joyce	Mayo Clinic	September 23, 2016
Hypertrophic obstructive cardiomyopathy	Bobby Steffen	Nicholas Smedira	Cleveland Clinic	September 24, 2016
Ischemic mitral regurgitation	Sarah Schubert	Irving Kron	University of Virginia	September 28, 2016
Surgical treatment of Afib	Matthew Schill	Ralph Damiano	Washington University in St Louis	October 4, 2016
Degenerative mitral valve	Sarah Ward	Steven Bolling	University of Michigan	October 12, 2016
IAA/VSD	Josh Rosenblum	Kirk Kanter	Emory University	October 12, 2016
Transcatheter AVR	Josh Rosenblum	Vinod Thourani	Emory University	October 22, 2016
Ascending aortic aneurysm	Michael Kayatta	Ed Chen	Emory University	October 23, 2016
Complete AV canal	Luis Velasco	Richard Jonas	Children's National Medical Center	October 23, 2016
Transcatheter AVR	Michael Kayatta	Vinod Thourani	Emory University	October 25, 2016
Heart failure/transplant	Castigliano Bhamidipati	Jonathan Chen	University of Washington	October 25, 2016
Coronary artery bypass graft	Arman Arghami	John Stulak	Mayo Clinic	November 4, 2016
Pulmonary Thromboendarterectomy	Trevor Upham	Michael Madani	University of California San Diego	November 4, 2016
Ventricular septal defect	David Blitzler	John Brown	Indiana University	November 21, 2016
Paraesophageal hernia	Lucia Madaraiaga	Christopher Morse	Massachusetts General Hospital	December 13, 2016
Coarctation of aorta	Corinne Tan	Carlos Mery	Baylor/Texas Children's	December 13, 2016
Tetralogy of Fallot	Elizabeth Stephens	Emile Bacha	Columbia	December 19, 2016
Aortic valve stenosis	Brendan Dewan	David Fullerton	University of Colorado	December 22, 2016
Anterior mediastinal tumors	Panos Vardas	Ken Kesler	Indiana University	December 22, 2016
Endocarditis	Amy Fiedler	Thoralf Sundt	Massachusetts General Hospital	December 23, 2016
Truncus arteriosus	Peter Sassalos	Edward Bove	University of Michigan	December 27, 2016
Esophageal diverticulum	Monisha Sudarshan	Shanda Blackmon	Mayo Clinic	December 28, 2016
Left ventricular assist device	Arman Kilic	Michael Acker	University of Pennsylvania	January 3, 2017
Surgical treatment of TB	Jordan Hoffman	John Mitchell	University of Colorado	January 18, 2017
Creativity and innovation surgery	Elizabeth Stephens	Tirone David	University of Toronto	January 25, 2017
Ebstein anomaly	Hampton Gray	Vaughn Starnes	University of Southern California	February 6, 2017
History of ECMO	K. Candis Jones	Robert Bartlett	University of Michigan	February 10, 2017
History of ECMO 2	K. Candis Jones	Robert Bartlett	University of Michigan	February 12, 2017
Pulmonary atresia w/VSD and MAPCAs	Michael Ma	Frank Hanley	Stanford University	February 12, 2017
Hypoplastic left heart syndrome	Eric Feins	Pedro del Nido	Boston Children's Hospital	February 12, 2017

(Continued)

TABLE E2. Continued

Name of podcast	Trainee author	Faculty author	Institution	Date
Treatment of mycobacterial lung infections	Jordan Hoffman	John Mitchell	University of Colorado	February 14, 2017
Aortic root aneurysm	Melissa Levack	Lars Svensson	Cleveland Clinic	March 15, 2017
Atrial fibrillation and Cox maze	Danielle Smith	Jim Cox	Northwestern University	March 15, 2017
LVOT obstruction	Charles Cole	Jim Jagers	University of Colorado	March 16, 2017
Aortic regurgitation	Lori Soni	Duke Cameron	Johns Hopkins	April 4, 2017
Type B dissection	Colleen Pietras	Alberto Pochettino	Mayo Clinic	May 4, 2017
Thoracoabdominal aneurysms	David Blitzer	Joel Corvera	Indiana University	June 26, 2017
Esophageal cancer	Doug Liou	Mark Berry	Stanford University	July 17, 2017
Complex benign esophageal disease	Stephanie Worrell	Mark Orringer	University of Michigan	July 20, 2017
Total anomalous pulmonary venous return	Rachel Vanderlaan	Chris Calderone	Hospital for Sick Children	July 30, 2017
Esophageal perforation	Kevin Graham	Mimi Ceppa	Indiana University	August 7, 2017
Ex vivo lung perfusion	Colleen Pietras	Edward Cantu	University of Pennsylvania	October 15, 2017
Patent ductus arteriosus	Justin Watson	Irving Shen	Oregon Health and Sciences University	October 15, 2017
Diaphragmatic plication	Nkem Aziken	Rafael Andrade	University of Minnesota	October 29, 2017
Chylothorax	Justin Watson	Paul Schipper	Oregon Health and Sciences University	October 30, 2017
Vascular Rings and Slings	Constatine Mavroudis	J. William Gaynor	University of Pennsylvania	December 4, 2017
Pediatric airway reconstruction	Jacob Miller	Peter Manning	Washington University in St. Louis	December 14, 2017
ALCAPA	David Lehenbauer	Marshall Jacobs	Cincinnati Children's/Johns Hopkins	December 14, 2017
History cardiopulmonary bypass	Paul Linsky	William Holman	University of Alabama Birmingham	December 14, 2017
ASD/PAPVR	Laura Seese	Victor Morell	University of Pittsburgh	December 14, 2017
HLHS/single-ventricle palliation	Claude Beaty	Richard Ohy	University of Michigan	December 21, 2017
Ebstein anomaly cone procedure	Garrett Coyan	Jose Da Silva	University of Pittsburgh	January 1, 2018
Lung volume reduction surgery	Ruben Nava	Bryan Meyers	Washington University in St. Louis	February 12, 2018
Chest wall tumor	Robert Van Haren	Ara Vaporciyan	University of Texas MD Anderson	February 25, 2018
Non-small cell lung cancer	Chris Holley	Michael Weyant	University of Colorado	February 25, 2018
Lung transplant	Corinne Tan	Gabriel Loor	Baylor College of Medicine	March 18, 2018
Mitral valve repair vs replacement	Daniel Enter	Patrick McCarthy	Northwestern University	March 25, 2018
ECMO placement and management	Amber Melvin	Sunil Prasad	University of Rochester	March 25, 2018
Pediatric lung transplant	Brandi Scully	Jeffrey Heinle	Baylor College of Medicine	April 11, 2018
ECMO/LVAD management in pediatric patient	Jacob Miller	Pirooz Eghtsady	Washington University in St. Louis	April 28, 2018

(Continued)

TABLE E2. Continued

Name of podcast	Trainee author	Faculty author	Institution	Date
Surgical Scientist Career and Mentorship	Elizabeth Stephens	Irving Kron	University of Arizona	May 5, 2018
Early career development	Panos Vardas	Vinay Badhwar	Indiana University/West Virginia University	May 16, 2018
Technical esophagectomy	Llitch Diaz-Gutierrez	Daniela Molena	University of Minnesota/Memorial Sloan Kettering	May 18, 2018
Porcelain aorta	Jordan Bloom	Tom MacGillivray	Houston Methodist	August 23, 2018
ECMO cardiogenic shock	Amber Melvin	Sunil Prasad	University of Rochester	August 23, 2018
Post-infarct VSD	Daniel Weber	Scot Merrick	University of California San Francisco	August 23, 2018
Mini mitral	Robert Hawkins	Gorav Ailawadi	University of Virginia	October 24, 2018
Myocardial protection	Bill Regalie	Richard Shemin	University of California Los Angeles	October 24, 2018
Working with industry	Garrett Coyan	Robert Kormos	University of Pittsburgh	October 31, 2018
Pneumonectomy	Abdulahman Elnaggar	Daniel Raymond	Cleveland Clinic	November 11, 2018
AVR root	Jordan Bloom	George Tolis	Massachusetts General Hospital	November 20, 2018
Iatrogenic dissection	Matt Byler	Curtis Tribble	University of Virginia	November 20, 2018
Heart transplant	Michael Salna	Yoshifumi Naka	Columbia University	November 20, 2018
Tricuspid regurgitation	Zach Chancellor	Irving Kron	University of Arizona	November 20, 2018
Ethics: CT shortage and specialization	Omar Almoghrabi	Emmanuel Daon	University of Kansas	December 4, 2018
VATS anatomical resection	Sara Najmeh	Thomas D'Amico	Duke University	January 21, 2019
Double outlet right ventricle	Awais Ashfaq	Ashok Muralidaran	Oregon Health and Science University	January 26, 2019
Off-pump coronary artery bypass	Safi Haq	Tomas Salerno	University of Miami	February 12, 2019
How to publish	Michael Salna	Paul Kurlansky	Columbia University	February 12, 2019
Surgeon scientist	Eric Charles	Irving Kron	University of Arizona	February 12, 2019
Social media in CT	Jessica Luc	Mara Antonoff	University of British Columbia/MD Anderson	March 14, 2019
Hemi-arch vs total arch	Laura Seese	Thomas Gleason	University of Pittsburgh	April 14, 2019
Aortic arch aneurysm	Philip Spencer	Arminder Jassar	Massachusetts General Hospital	April 24, 2019
Society involvement	Josh Boys	Christine Lau	University of Virginia	May 11, 2019
Crashing on pump	Even Rotar	Curtis Tribble	University of Virginia	May 11, 2019
SAVR vs TAVR	Hunter Mehaffey	Vinod Thourani and Kevin Accola	Washington Hospital Center and AdventHealth	May 11, 2019
Past presidents	John Trahanas	Sundt, Cameron and Mathisen	Massachusetts General Hospital	May 11, 2019
Wellness in training	Jessica Luc	Mara Antonoff	University of British Columbia/MD Anderson	May 23, 2019
Pleural effusion/empyema	Dongning Zhang	Jonathan D'Cunha	University of Pittsburgh	May 31, 2019
Norwood vs hybrid	Garrett Coyan	Mahesh Sharma And Richard Ohye	University of Pittsburgh, University of North Carolina, and University of Michigan	June 5, 2019

(Continued)

TABLE E2. Continued

Name of podcast	Trainee author	Faculty author	Institution	Date
RV failure with LVAD	Jared Beller	Leora Yaboro	University of Virginia	June 13, 2019
CT surgery ethics forum	Jason Han	Robert Sade	University of Pennsylvania/ Medical University of South Carolina	July 10, 2019
AF ablation	Jason Han	Armin Kiankhooy	University of Pennsylvania/ University of Southern California	September 18, 2019
Superior sulcus tumor	Miro Peev	Jessica Donington	University of Chicago	November 5, 2019
Re-do antireflux surgery	Chigozirim Ekeke	James Luketich	University of Pittsburgh	November 9, 2019
Robotic cardiac surgery	Osman Hashmi	Clifton Lewis	University of Alabama Birmingham	November 15, 2019
CABG conduits	Tomi Obafemi	Jack Boyd	Stanford University	March 11, 2020
Achalasia	Andrew Feczko	Siva Raja	Cleveland Clinic	March 29, 2020
Myxoma	Simran Randhawa	Puja Kachroo	Washington University	April 9, 2020
Pandemic ethics	David Blitzer	Robert Sade	Medical University of South Carolina	April 26, 2020
COVID-19 training	Ben Smood	Ara Vaporciyan	University of Texas MD Anderson	April 26, 2020
Mediastinal staging	Mujtaba Mubashir	Monisha Sudarshan	Cleveland Clinic	June 22, 2020
VV ECMO	Ankit Dhamija	J.W. Awori Hayanga	West Virginia University	July 2, 2020
Sleeve lobectomy	Phil Moonsamy	Doug Mathisen	Massachusetts General Hospital	July 3, 2020
Minimally invasive congenital heart surgery	Clauden Louis	Joseph Turek	Duke University	July 9, 2020

Afib, Atrial fibrillation; *IAA/VSD*, interrupted aortic arch/ventricular septal defect; *AVR*, aortic valve replacement; *AV*, aortic valve; *TB*, tuberculosis; *ECMO*, extracorporeal membrane oxygenation; *MAPCAs*, major aortopulmonary collateral arteries; *LVOT*, left ventricular outflow tract; *ALCAPA*, anomalous left coronary artery from the pulmonary artery; *ASD*, atrial septal defect; *PAPVR*, partial anomalous pulmonary venous return; *HLHS*, hypoplastic left heart syndrome; *LVAD*, left ventricular assist device; *CT*, cardiothoracic; *VATS*, video-assisted thoracoscopic surgery; *SAVR*, surgical aortic valve replacement; *TAVR*, transcatheter aortic valve replacement; *RV*, right ventricle; *AF*, atrial fibrillation; *CABG*, coronary artery bypass grafting; *COVID-19*, coronavirus disease 2019; *VV*, venovenous.

000 The Thoracic Surgery Residents Association: Past contributions, current efforts, and future directions

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The TSRA remains the leading cardiothoracic surgery resident organization in North America, providing educational resources and networking opportunities for trainees past, present, and future.