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STS Expert Consensus on Framework for a Standardized National Robotic Curriculum for Thoracic Surgery Trainees

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Introduction

- The majority of lobectomy is performed using the robotic platform in US . (Servias et al. Ann Thorac Surg 2023)
- Cardiothoracic surgical trainees perceive a need for more instruction and exposure to robotic surgery during their training. (Chu D, et al. Ann Thorac Surg 2016)
- Some trainees may rely on industry-sponsored courses/curricula for proficiency, which poses a significant conflict of interest.

Assessment of Training Programs

Robotic Surgery in Thoracic Training Programs: A National Needs Assessment

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- A voluntary electronic survey of 10 questions was sent to 76 CT training programs in the US.
- 69 (90%) programs responded.

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Do You have Robotic Curriculum?

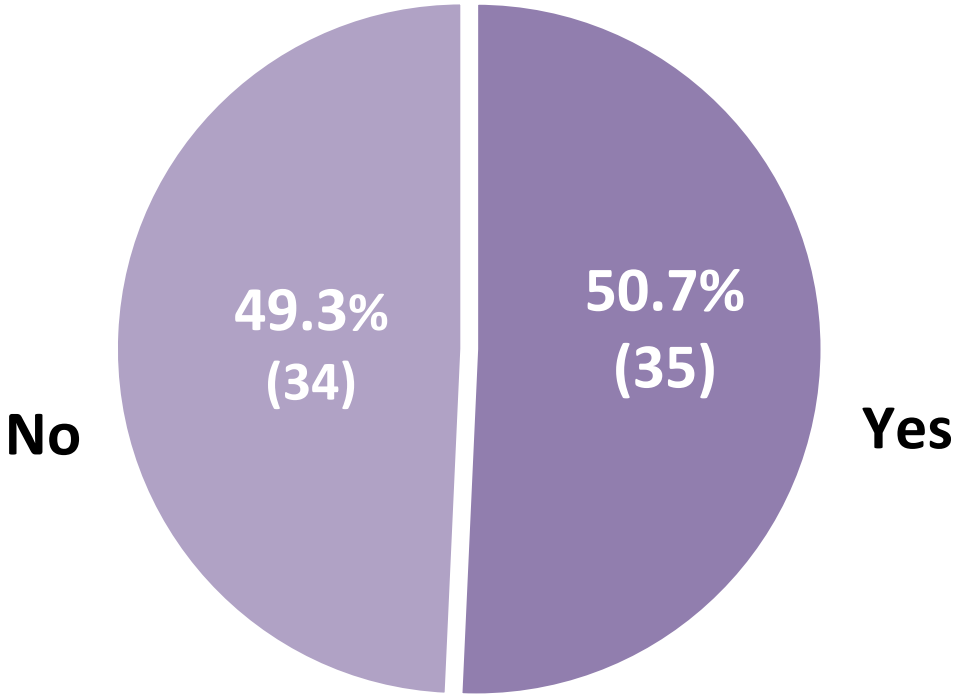

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TABLE 4. Multivariable logistic regression evaluating the association between surgeon use of robotic-assisted operative approach after graduation and training program characteristics

	Use of Robotic-Assisted Operative Approach After Graduation		
Program Characteristics	Odds Ratio	95% Confidence Interval	P Value
Dedicated Robotic OR+ (each additional 0.5 day per week)	0.83	0.47-1.48	0.53
Established Robotic Curriculum (yes/no)	5.82	1.32-25.68	0.02
Proportion of Cases Using Robotic Assistance (each additional %)	0.98	0.96-1.01	0.19
Program Size (each additional graduate per year)	3.78	1.34-10.62	0.01

Objective

- To ameliorate educational gaps affecting thoracic surgical graduates and abridge disparity among programs, consensus statements were formulated to provide a framework for a standardized national robotic curriculum for thoracic surgery trainees.

Methodology

- The STS Task Force on Robotic Thoracic Surgery and Workforce on E-learning and Educational Innovation assembled an expert group with the input of the Thoracic Surgery Director's Association (TSDA).
- Consensus statements were developed using a modified Delphi process to address three major themes:
  - (1) Program expectations
  - (2) Components of training
  - (3) Assessment and feedback
- A consensus was reached on 12 recommendations

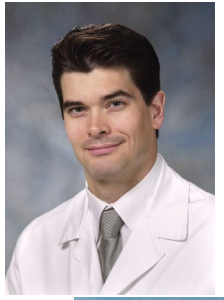
Specific Areas of Focus	Expert Identified Statements
Program Expectations	1. The ACGME-accredited thoracic training programs should have a standardized robotic thoracic curriculum and a common evaluation platform.
	2. The training programs are strongly encouraged to provide a dual console for many, if not all, cases with the trainee.
	3. It is ideal for the training program to provide a trained bedside assistant during teaching cases with trainees.
Components of Training	4. The trainee must complete the online modules to learn about the robot's components and complete hands-on in-service before operating as the console surgeon
	5. Achieving proficiency with a 90% or higher score in digital/virtual reality (VR) simulation modules, such as camera control, energy use, "tissue and object" manipulation, and needle driving, should be prerequisites before operating as the console surgeon.
	6. The training programs are strongly encouraged to provide the trainees with wet labs at a minimum of once per year. This includes various programs/fellowships provided through the thoracic surgical societies (ex. STS Bootcamp, American Association for Thoracic Surgery (AATS) Robotic Fellowship, STS robotic courses).
	7. Emergency conversion simulation must be part of the curriculum and should be performed with the trainees and OR team at least once a year.
Bedside Assisting and Operation	8. The trainee must perform at least 10 bedside robotic assists during the course of the training. Five of those cases must be thoracic surgery cases. The trainee should be able to demonstrate competency in bedside assisting, which includes docking, arm manipulation, avoiding arm collisions, instrument insertion/withdrawal, and troubleshooting.
	9. The trainee should review educational videos of anatomic resection before performing a case on the robotic console.
	10. The curriculum should have case-specific milestones for robotic anatomic lung resection, with a graduated responsibility given to the resident to operate at the attending surgeon's discretion. Competency should be demonstrated in each milestone. The steps of the operation include but are not limited to: Identify appropriate port placement/ placement of the port, dissection of mediastinal lymph nodes (levels 9,8,7,4,5) and hilar nodes, opening mediastinal pleura and exposing the hilar structures, pulmonary vein mobilization/ division, bronchus mobilization/division, fissure dissection/division, PA mobilization/division
Assessment and Feedback	11. Objective-validated assessment tools such as Global Evaluative Assessment of Robotic Skills (GEARS) should be used to assess the technical competency, and ultimately, Entrusted Professional Activity (EPA) should be developed for pulmonary resection.
	12. Where feasible, objective evaluators should perform a video review and analysis of the trainee's robotic anatomical pulmonary resection at least once a year.

Conclusion

- Only half the training programs in the United States have a dedicated curriculum, and disparity in robotic training may exist among residencies of different sizes.
- A standardized national competency-based curriculum is being developed based on these recommendations to ensure optimal preparation for future graduates.
- The new curriculum will need validation to assess the impact on resident education and encourage future educational research endeavors.

Co-Authors

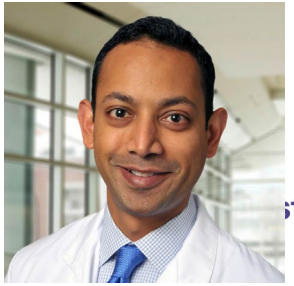




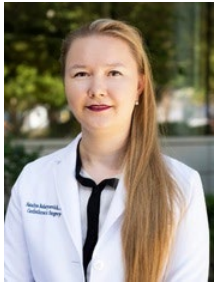













Questions?