

The Society of Thoracic Surgeons Expert Consensus Statement: A Tool Kit to Assist Thoracic Surgeons Seeking Privileging to Use New Technology and Perform Advanced Procedures in General Thoracic Surgery

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Preamble

In the United States, the Centers for Disease Control and Prevention estimates more than 50 million procedures are performed every year [1]. In the era of physician report cards, transparency, medical innovation, increased litigation, and hybridization or cross-disciplinary nature of surgery, privileging for new technology continues to lack a standardized process for implementation. With the absence of established national standards to direct granting of privileges for new technology, The Society of Thoracic Surgeons (STS) convened a task force to address this problem and create a pathway, checklist, and list of recommendations to guide the process.

This consensus statement reviews more than 19 new techniques or procedures that are direct extensions of thoracic surgery that a surgeon may not have trained to perform if he or she completed residency within the last 10 years and at least five new categories of techniques or procedures where surgeons are partnering with other specialties or are retraining to perform procedures that require a completely new skill set to perform. This void needs to be filled, and our task force set forth to begin the process.

Background

The purpose of privileging is to help ensure that clinicians provide high-quality and high-value health care in accordance with accepted standards of care and legal requirements. Ensuring appropriate privileging to use new technology or perform advanced procedures may be challenging because historical data are often unavailable to evaluate the relationship between the privileging process and the safety and quality of the health care services or patient outcomes. The main objective of The Society of Thoracic Surgeons (STS) Task Force on General Thoracic Surgery Privileging is to propose a consensus statement and, most importantly, a framework for thoracic surgery privileging as it pertains to new technology and advanced procedures. It is not the purpose or intent of this task force to mandate specific criteria for privileging surgeons with respect to these subject matters.

Although the details for adopting new technologies may vary depending on practice location and environment, this practical framework may serve as a reference (and not a mandate) for surgeons and hospitals as they plan for the safe introduction and implementation of new technologies and advanced procedures. The framework is intended to be sufficiently broad so that it is relevant to a range of

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institutional settings and scopes of practice. Purposefully, the task force based its proposals on published literature or expert consensus and avoided attaching a mandatory number of cases performed in the privileging process. The task force concluded that, in most instances, little or no quality data are available for most new technology and advanced procedures to support assigning a specific number of cases for privileging. Consequently, the task force determined that in this context, privileging should be based on evaluation and documentation of knowledge and skills, continuous clinical and quality outcomes assessment, use of optimal clinical and administrative care processes, and in the case of new privileges, a focused professional practice evaluation (FPPE).

Consensus statements are generally derived from a systematic approach and an extensive literature review where highest-quality evidence does not commonly exist. A modified Delphi approach was taken as each suggestion or topic was chosen.

We reviewed the literature to explore a standard certification guide that could be incorporated into hospital bylaws and policies for the use of new technology and advanced procedures and identified four common goals of privileging, these being to develop (1) clear lines of responsibility for the privileging process, (2) supportive governance structures, (3) accepted standards for privileging, and (4) a culture of continuous improvement and evaluation of privileging process outcomes [2-5].

In this consensus statement, the task force clarifies some of the terminology associated with the privileging process and provides a description of the proposed framework for new technology and advanced procedures. We also categorize a representative list of new technology and advanced procedures in general thoracic surgery to which a framework may be applied and present case studies to illustrate how a framework checklist can assist in privileging a surgeon or a surgical team, or both.

Terminology

To develop an effective framework for privileging, one must be familiar with the common language regarding several relevant processes, including certification, credentialing, and privileging.

Certification

Certification in thoracic surgery in the United States is under the auspices of the American Board of Thoracic Surgery (ABTS), whose primary purpose is to protect the public by establishing and maintaining high standards of care in thoracic surgery, much like certifying boards in other countries. To achieve these objectives, the ABTS has developed highly specific qualifications for examinations as well as procedures for certification and maintenance of certification [6]. The ABTS board certification, which is a minimum requirement for all thoracic surgeons at most institutions in the United States, does not currently include specific guidelines for credentialing or for privileging board-certified or board-eligible surgeons in the use of new technology or acquisition of new and

advanced skills. The American Board of Surgery also certifies general surgeons to perform procedures that are duplicated in ABTS certification. Individual hospitals then determine what level of certification is required for practice within their own institutions.

Credentialing and Privileging

Credentialing and privileging are institution-specific processes that culminate in recognizing and attesting that a thoracic surgeon is competent and qualified. Credentialing claims the thoracic surgeon meets universally recognized standards by verifying such items as the individual's education, license, training, experience, certification, malpractice history, adverse clinical reports, clinical judgment, and professionalism through investigational query, attestations, and observation.

Privileging defines the surgeon's scope of practice and the clinical services he or she may provide. Privileging should be based on competence, accompanied by a data-driven process, and centered on continuous quality improvement. The Joint Commission requires that physicians seeking new privileges undergo a defined FPPE [7]. The Joint Commission requirements for an FPPE are clear "criteria for conducting performance [evaluations, defined] methods for establishing a monitoring plan specific to the requested privilege [and] determining the duration of performance monitoring, [and documenting] the circumstances under which monitoring by external" individuals is necessary [7]. The FPPE can be set to occur after a set amount of time in practice or after a set amount of cases have been performed. An example of an FPPE form is shown in the [Appendix](#).

Historically, individual hospitals have determined the criteria for granting privileges within a specialty, an approach that may result in wide variability in training and expertise. A hospital that has granted privileges to a provider has a duty to terminate or limit those privileges once it is made aware of incompetence [8]. Furthermore, in most instances, the patient does not have access to the institutional criteria necessary for granting privileges, because they are not a matter of public record [9].

To be fair, "credentialing and privileging must be products of qualified and objective physician-controlled peer review using criteria that are established through common professional," administrative, and legal practices. These criteria should be "endorsed by a formal consensus process and be available to the public in the form of hospital bylaws, procedures, or other documentation." Importantly, these criteria should be related to the quality of patient care, documented physician outcomes, and performance that can be measured. "Peer review decisions must be performed in good faith (not unreasonable, capricious, or arbitrary), fair, include detailed documentation, be justifiable, and be equally applied to all practitioners without bias" in accordance with reasonable standards of care. "Peer review decisions should be confidential and protected. In cases of adverse peer review decisions, avenues of appeals using due process and the inclusion of fair hearings must be available to the" surgeon undergoing the evaluative process

[10]. Privileging criteria have historically been used to exclude potential competitors, and the task force strongly proscribes this practice.

In some hospitals, credentialing and the procedural list of privileges do not account for the introduction of new technology and advanced procedures. The responsibility for ensuring that a surgeon has acquired the appropriate training and mentorship in his or her use of a new technology and acquisition of new skills lies with the practitioner and the hospital where he or she practices. Privileging to perform a new procedure or to use a new technology ideally should not be based solely on the numbers of procedures performed but rather on evaluation of knowledge and skills and outcomes of surgical care. Often, training of the entire surgical team is essential and should be considered an important aspect of the privileging process. The entire educational experience should be transparent and include verification of knowledge acquisition, team training, safety climate, skill assessment, preceptorship or proctoring, monitoring of outcomes, and participation in a continuous quality improvement activity.

STS Task Force Privileging Framework

The key components in the framework for privileging the use of new technology and performance of advanced procedures in general thoracic surgery are described below.

Demonstration of Qualification, Competence, and Proficiency

Few validated models are currently available for the training on new technology or advanced procedures in general thoracic surgery. Surgeons wishing to learn a new technology or procedure often complete, at a minimum, a course or didactic session in the topic. The course instructor subsequently provides verification that the surgeon attended the course and is endorsed to introduce and implement the technology or procedure. Determining the exact number of cases required to achieve competency in a new technology or procedure is challenging because the learning curve for each individual may vary.

Because the safe implementation of new technology by an independent surgeon or as part of a clinical team often requires a basic surgical skill set, the task force

recommends that the surgeon be board-eligible or certified in thoracic surgery and complete a course or didactic session in the new technology. The degree of training should be adjusted to the complexity of the technology or procedure in reference to the surgeon's training. For example, a thoracic surgeon learning to perform endobronchial ultrasound would require far less training and safety monitoring than if he or she were to begin to perform percutaneous lung ablation. Because of the varying complexity of new technology and procedures, it would not be prudent to dictate a specific training pathway, but rather, to emphasize the importance of defining the preparation needed to align the complexity of the procedure with the surgeon's existing skill set.

On the basis of the expert opinion of the task force, five levels of supervision for privileging for use of new technology and advanced procedures are proposed (Table 1). Level 1, the lowest level, is confirmation that the learner attended a lecture or completed a lecture format course (no verification of skills). Level 5 is the highest level of validation of learning outside of a formal training or mentorship program. Level 5 training, however, is not always practical or affordable, and lower levels may be appropriate for some new technology and advanced procedures.

These levels of verification serve as a guide for hospitals, trainees, and instructors by using appropriate nomenclature when classifying the level of training for a particular skill. Such phrasing should be incorporated into training certificates in a standard fashion to enhance accuracy of evaluation; for example, "The clinician learned the principles of VATS (video-assisted thoracic surgery) lobectomy at our course, completing an animal model skills assessment and achieving level 3 skills verification." Level 5 training, however, may be achieved during a mini-fellowship in which a surgeon travels to a high-volume center and acquires the skills under direct supervision. Accreditation or management of courses through national societal organizations may provide an additional layer of quality assurance, and such organizations may provide suggestions regarding what level of training is recommended for specific technology.

Although the medical industry (ie, manufacturers of pharmaceuticals, medical devices, and biologics) may provide valuable education opportunities, the industry should not set credentialing or privileging standards for clinicians. In addition, the relationship of the clinician

Table 1. Five Levels of Supervision When Training for New Technology and Advanced Procedures

Level 1	Certifies the learner attended a lecture or completed a lecture format course (no verification of skills).
Level 2	Certifies the learner completed a course and was assessed with a test or other evaluation of training and was provided feedback regarding their assessment score (a better model incorporates a minimum pass rate).
Level 3	Certifies the instructor observed the learner perform a skill and verified completion of task(s). Alternatively, the learner completed a course and participated in a lecture and skills lab, allowing assessment of the skills on a synthetic or tissue-based model.
Level 4	Certifies the learner performed the procedure on a patient in a clinical setting with supervision (proctor or preceptor).
Level 5	Certifies the learner performed a series of clinical cases, the outcomes of which have been reviewed and verified. An example of level 5 learning may be submitting a series of video-recorded cases with outcomes to a review committee for verification.

adopting the new technology or advanced procedure with a specific company or organization should be transparent with the appropriate public disclosure. The limitations inherent in certificates of training provided by industry should also be recognized. One way to mitigate these limitations may be to direct more funding in the form of grants from industry toward societal or vendor-neutral courses (eg, STS University).

Team Management

To effectively introduce new technology and advanced procedures, clear communication among colleagues, hospital administrative personnel, and allied health professionals is critical. The plan to implement new technology and advanced procedures should be designed with patient safety as the main priority. An implementation program should be drafted to include information on patient selection and consent, availability and cost of specialized equipment, an education plan for team members, clinical outcome data gathering and reporting, and, if applicable, development of a perioperative crisis management plan. This should also be connected to a plan for monitoring and oversight.

Institutional Collaboration

Although the details for adopting new technology may vary depending on the local health care facility, approval from the institutional innovative care/new technology committee (or equivalent) is recommended. Accreditation by a specialty committee may be necessary in some cases. For example, the introduction and use of laser bronchoscopy may require approval by the institution's laser committee, and such approval will likely require documentation of training and may require a period of proctorship. Institutions lacking such a committee or resources may solicit help from outside their institution on a consulting basis.

If the intent of the surgeon is to participate in research on the comparative effectiveness of new technology or involves the use of a technology granted an investigational device exemption by the United States Food and Drug Administration (FDA), appropriate Institutional Review Board (IRB) approval must be obtained. In emergency situations, the use of a device/technology under an investigational device exemption is allowed under discrete specifications outlined by the FDA; in nonemergency situations, FDA approval for compassionate use is required [11]. Off-label use of an FDA-approved device does not require IRB approval, although IRB involvement, informed consent, and disclosure to the patient of off-label use is appropriate in certain circumstances—particularly when use of the device is novel or when risks are unknown. Technology that has been granted a humanitarian device exemption by the FDA may be used only after the IRB has approved such use to treat a specific condition.

Monitoring of Outcomes

Privileging surgeons to use new technology and ensuring clinicians provide high-quality health care services can be

challenging. In most cases, no previous data are available to evaluate the relationship between quality and value as it relates to the privileging process. Although capturing patient outcomes data can be difficult and onerous, monitoring of outcomes is essential to any technology and procedure adoption, providing a means to compare outcomes for new technology or advanced procedure to the outcomes for the previously or currently accepted standard of care.

Developing metrics of the effectiveness of new technology privileging processes represents an area for further research, particularly in the optimal design and use of databases [12]. If an institution adopts a structured privileging process or modifies an existing one, the date of adoption or modification should be recorded to facilitate future assessments of its utility and effectiveness.

Participation in the STS National Database or an equivalent regional, statewide, or local clinical outcomes registry (eg, American College of Surgeons National Surgical Quality Improvement Program, Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative, the STS/American College of Cardiology Transcatheter Valve Therapy Registry, or local hospital reviewable database) to allow for continuous assessment of outcomes and quality is recommended for privileging to use new technology and advanced procedures. These databases provide important information that can be used to assess the acquisition of new technical skills and ongoing skills development. Individual outcomes can be benchmarked against other institutions for comparison. As an example, surgeons who demonstrate participation in the STS database as a reference can track their outcomes in a comparative fashion and provide confirmation of skills that were privileged. Similarly, hospitals that follow the recommendations for privileging may attest to participating in registry-based continuous quality improvement.

Patient-Centered Transparency

The primary focus of the new technology and advanced procedures privileging process is to ensure patient advocacy, health care quality, and patient safety. This approach includes clear communication with full disclosure to the patient that a new technology or advanced procedure is being considered as a part of his or her clinical care. These discussions should include the known risks and benefits of the new technology or advanced procedure as well as the costs and comparative effectiveness of such an approach relative to the existing treatment options. Consent forms should be carefully reviewed with the patient along with information, if requested, regarding the surgeon's training and experience to date. Disclosure of current results with the technology or procedure, including morbidity, expected functional outcomes, and mortality data, is recommended. An example of this would be educating patients about the LINX antireflux device (Torax Medical, Inc, St. Paul, MN), where there are variable risks in regards to magnetic resonance imaging compatibility, lack of

Table 2. Classification of New Technology or Advanced Procedures

Examples of new general thoracic technology or advanced procedures that are considered extensions of a thoracic surgeon's skill set

- Advanced bronchoscopic procedures such as endobronchial ultrasound-transbronchial needle aspiration, navigational bronchoscopy, and ablation of tumors with laser, placement of airway valves and stents, treatment of the airway for asthma, argon plasma coagulation, cryotherapy, RFA of the airway, microwave ablation of tumors, and placement of brachytherapy catheter or seeds for radiation therapy
- Advanced foregut interventional endoscopic procedures such as endoscopic ultrasound, endoscopic mucosal resection, RFA, and peroral endoluminal myotomy
- Minimally invasive esophagectomy and foregut surgery, including the LINX reflux management system (Torax Medical, Inc, St. Paul, MN)
- Video-assisted thoracic surgery (eg, anatomic lung resections, mediastinal surgical procedures)
- Robotic-assisted thoracic surgery (eg, anatomic lung resections, esophagectomy, mediastinal surgical procedures)

Examples of new general thoracic technology or advanced procedures where the thoracic surgeon may play a clinical leadership role as part of a team but is not logically considered an extrapolation of ABTS-eligible or ABTS-qualified skill set

- Stereotactic radiotherapy
- Computed tomography-guided percutaneous RFA and microwave ablation and percutaneous cryotherapy to the lung
- Intensity modulated radiation therapy mapping of a tumor (such as mesothelioma) for radiation treatment

ABTS = American Board of Thoracic Surgery; RFA = radiofrequency ablation.

long-term results data, and possible difficulties with reoperations. As noted, clinician relationships with any medical industry sponsoring the new technology or advanced procedure must be disclosed. Efforts should also be made to ensure the surgeon does not overstate the potential benefits of the new technology or allow bias to influence his or her discussion with the patient. Balancing the bioethical principles of nonmaleficence with beneficence while taking into consideration a

provider's obligation to the patient or the provider's organization are integral parts of privileging and consent.

New Technology and Advanced Procedures in General Thoracic Surgery

In developing the framework for privileging, the task force first identified a representative list of new diagnostic

Table 3. Checklist for Privileging

- Verification of knowledge and skills assessment
 - ABTS-eligible or ABTS-certified surgeon
 - Documented completion of a course or didactic session
 - For recent graduates of an accredited program, case logs and a program director letter attesting to competence
- Team management
 - Draft of implementation program complete
 - Education plan for team members complete
 - Crisis management plan complete
- Institutional collaboration
 - IRB and/or institutional innovative care/new technology committee approval
- Monitoring of outcomes
 - Participation in a continuous quality improvement committee and/or morbidity/mortality conference
 - Participation in an auditable database (eg, National Surgical Quality Improvement Program, STS National Database, Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative) or registry or shared database that is accessible by the host institution
 - Demonstration of ability to present accurate and detailed morbidity and mortality rates to administration upon request
- Patient-centered transparency
 - Provide appropriate consent forms for IRB and/or innovative committee approval
 - Provide the patient information on the risks and benefits of the new procedure, alternative treatments, general costs (ie, to the patient or payer, or both), and comparative effectiveness of the new technology vs existing treatment options
 - Provide the patient with information on the surgeons training and experience to date

ABTS = American Board of Thoracic Surgery; IRB = Institutional Review Board; STS = The Society of Thoracic Surgeons.

and therapeutic procedures used in general thoracic surgery to treat disease processes such as benign and malignant airway, as well as chest wall, mediastinal, and esophageal disorders. These new technologies and advanced procedures are often not delineated in the privileging lists of most hospitals. A detailed review of the minimum requirements in methodology, logistics, and training was performed with a specific focus on new technology and advanced procedures beyond residency training. Next, the task force separated new technologies or advanced procedures into two broad categories based on the most appropriate pathway for (1) privileging for a thoracic surgeon expanding an existing skill set and (2) privileging for a thoracic surgeon to perform a new procedure that is largely outside the traditional boundaries of thoracic surgery.

Privileging for a thoracic surgeon expanding an existing skill set refers to privileging for a new technology or procedure to which the surgeon was not exposed during training but that logically can be considered an extrapolation or derivative of ABTS-eligible or ABTS-qualified skill set. Privileging for a thoracic surgeon as part of a

clinical team to perform a new procedure refers to privileging for a new technology or procedure that is not logically considered an extrapolation or derivative of an ABTS-eligible or ABTS-qualified skill set but for which a thoracic surgeon may play a clinical leadership role in its use. Examples for both categories are listed in [Table 2](#). Once these “new” privileges are incorporated into ABTS core procedural lists and surgeons are trained to perform the procedures in residency, the techniques or procedures may no longer be considered “new.”

Privileging Checklist

Regarding new technology or advanced procedures that the surgeon was not exposed to during residency training, a stepwise approach using a checklist based on the above framework can be used for the privileging process ([Table 3](#)). The ABTS-eligible or ABTS-qualified surgeon first completes a course, preferably with instructional, didactic, and hands-on components. In adopting the technology or advanced procedure, the surgeon drafts an implementation plan that includes

Table 4. Case Studies Using the Privileging Pathway

Case Study 1

New technology or advanced procedure that is an extension of a thoracic surgeon’s ABTS-eligible or ABTS-qualified skill set

Peroral endoluminal myotomy is an advanced procedure to endoscopically treat achalasia by an endoluminal myotomy. Working together, the gastroenterologists and surgeons at Mayo Clinic began a process to become privileged. This process was initiated by several of the gastroenterologists and surgeons taking formal courses and completing mini-fellowships. After taking didactic courses and then practicing in the skills laboratory, consultants were prepared to present the new technology to the clinical practice committee. This committee reviews preparedness and training, balanced with need and a desire to offer safe implementation of new technology, and regularly reviews privileging within the main hospital and its affiliates. A database was established to prospectively monitor patient outcomes. This technology is now offered to patients that are deemed acceptable candidates. Clinical trials that require IRB approval have been initiated to monitor patients undergoing this procedure in a prospective manner to allow the teams to compare the outcomes against other standard procedures (eg, laparoscopic modified Heller myotomy).

Case Study 2

New technology or advanced procedure where the thoracic surgeon may play a clinical leadership role as part of a team but is not logically considered an extension of ABTS-eligible or ABTS-qualified skill set

RFA is considered an advanced procedure. Using computed tomography guidance, the clinician inserts a probe into a solid tumor, and heat is generated from a high-frequency alternating current to ablate or destroy the solid tumor tissue. Thoracic surgeons at Massachusetts General Hospital collaborated with thoracic radiologists to develop a multidisciplinary approach to the RFA treatment of primary and secondary lung tumors. An implementation plan was developed confirming equipment, number of ablations, patient care, observation on the thoracic surgery service, and cancer surveillance. The thoracic surgeons were instructed on the steps of the procedure by thoracic radiologists. IRB approval was not necessary because the technology is United States Food and Drug Administration approved. All patients were presented in a thoracic surgery conference on morbidity and mortality. A prospective database tracked all patients treated with RFA. Comparative modalities, such as stereotactic body radiation therapy, were discussed with the patient and the treatment team, and the specific case-by-case role of RFA was determined in a multidisciplinary manner.

Case Study 3

Blended example: A new technology or advanced procedure based on general thoracic surgery techniques is adopted by an adult cardiac surgeon

The minimally invasive VATS maze procedure is considered a new technology and advanced procedure. The adult cardiac surgeons at the University of California, Davis developed a VATS maze program by first determining the local need and level of interest with potential clinical collaborators, including thoracic surgeons and cardiologists. Based on their clinical experience and ABTS certification, the adult cardiac surgeons are experts in the open or traditional approach to the maze procedure. The surgeons and their team visited other programs as a group to learn their clinical care processes and techniques regarding VATS maze. Through these site visits, the surgeons identified an external proctor to oversee the first five cases. The core operating room team, including nurses and anesthesiologists, was the same team for thoracic surgical cases, so they were familiar with VATS equipment. The surgeons informed the patients that the VATS maze program was a new technology/procedure. The comparative effectiveness of the different approaches to the maze procedure is discussed with the patients. All cases are discussed in the Cardiothoracic Surgery Division Continuous Quality Improvement meeting. Cases are recorded as maze procedures in The Society of Thoracic Surgeons Adult Cardiac Surgery Database and are immediately available for quality review.

information on the risks and benefits of the new procedure as well as the costs and comparative effectiveness of the new technology. The implementation document includes details pertaining to the training of allied health professionals, including practice cases and a crisis management plan, if necessary. The proposed consent form and patient information packet are attached to the document, which is then submitted for approval by the institutional innovative care/new technology committee, or equivalent.

For the implementation of the new technology or advanced procedures, the degree of training is adjusted to the complexity of the technology or procedure in reference to the surgeon's training. For instance, with VATS lobectomy, one can use a stepwise approach with a systematic adoption of necessary techniques transitioning from a traditionally open to completely minimally invasive approach, augmented by an instructional course, and followed by committed proctorship. A detailed case log with operative details, complications, length of stay, and mortality rate should be kept by the surgeon and available for review. After being privileged, the thoracic surgeon should demonstrate satisfactory independent performance of the new technology or advanced procedure with participation in an outcomes database for continuous quality improvement.

Table 4 provides illustrative case studies of the privileging pathway for (1) an advanced procedure that the task force considers an expansion of a thoracic surgeon's expected skill set (eg, peroral endoluminal myotomy [Table 4, Case Study 1]); (2) a new technology or advanced procedure where the thoracic surgeon is part of a clinical team but the procedure is not logically considered an extrapolation of an ABTS-eligible or ABTS-qualified skill set (eg, percutaneous radiofrequency ablation of a lung tumor for secondary metastasis [Table 4, Case Study 2]); and (3) a new procedure that can be considered "blended" (eg, VATS maze procedure by a primarily adult cardiac surgeon using techniques grounded in general thoracic surgery [Table 4, Case Study 3]).

Future Directions in Privileging

It has been proposed that the creation of an interstate medical license would be ideal in facilitating the education and skills training for privileging surgeons to acquire new technology or procedures [13]. The interstate medical license would allow instructors to travel outside their immediate institution and state to mentor and assist surgeons in the operating rooms of the United States. The learner or trainee would in turn be permitted to travel to other institutions for training in advanced procedures and new technologies. The license potentially could be expanded to a world medical license allowing international mentorship and training.

These expanded licenses would not be intended to allow routine clinical practice in a state where the instructor does not have a license or in a health care facility where he or she does not have privileges; instead, it would allow instructors to assist in the education of

surgeons in advanced and emergency procedures, even expanding their capacity to participate in telemedicine. In these situations, although it is still necessary for the hospital to credential and grant clinical privileges, a standardized privileging process can guide hospitals to facilitate the education and acquisition of new technology and advanced procedures in a safe manner with more hands-on experience.

The task force acknowledged the lack of scientific rigor when determining what works best for privileging for new technology. Future funding, research, and reporting on the effectiveness of particular privileging pathways would certainly be welcomed. Balancing the importance of innovation, discovery, and new technology with optimal methods of adoption and privileging should be based not only on consensus but also on scientific research.

Conclusions

The privileging process associated with new technology and advanced procedures in general thoracic surgery is an undefined path. To date, there is no standardized process for thoracic surgery privileging with specific regard to implementation of new technology and advanced procedures [14]. This report proposes a framework that hospitals and surgeons can use as a guide in the privileging process for current and future advanced procedures and new technology. For the safe implementation of new technology, surgeons need to ensure that patients make informed decisions regarding their treatment and participate in their perioperative care. Incorporation of outcomes into a quality-driven thoracic surgery database is important to facilitate ongoing monitoring of outcomes and continuous quality improvement as well as assess new technology and advanced procedures.

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References

1. Centers for Disease Control and Prevention. Inpatient surgery. Available at <http://www.cdc.gov/nchs/fastats/inpatient-surgery.htm>. Accessed November 3, 2015.
2. Norcini JJ, Lipner RS, Grosso LJ. Assessment in the context of licensure and certification. *Teach Learn Med* 2013;25(Suppl 1):S62-7.
3. Vassiliou MC, Feldman LS. Objective assessment, selection, and certification in surgery. *Surg Oncol* 2011;20:140-5.
4. Bal BS, Brenner LH. Medicolegal sidebar: physician competence and skill part II: hospital corporate responsibility and new technologies. *Clin Orthop Relat Res* 2014;472:2023-7.
5. Bass BL, Polk HC, Jones RS, et al. Surgical privileging and credentialing: a report of a discussion and study group of the American Surgical Association. *J Am Col Surg* 2009;209:396-404.

6. Rusch VW, Calhoon JH, Allen MS, Baumgartner W. The American Board of Thoracic Surgery: update. *J Thorac Cardiovasc Surg* 2012;143:519-21.
7. The Joint Commission. Standards FAQ details. Focused professional practice evaluation. Available at http://www.jointcommission.org/mobile/standards_information/jcfaqdetails.aspx?StandardsFAQId=467&StandardsFAQChapterId=74. Accessed April 3, 2015.
8. Darling v. Charleston Cmty. Memorial Hospital, 211 N.E.2d 253 (I11.1965).
9. Cooke DT, Gelfand GA, Broghammer JA. Billing, coding, and credentialing in the thoracic surgery practice. *Thorac Surg Clin* 2011;21:349-58.
10. American College of Medical Quality. Policy 21. Physician credentialing and privileging. Available at <http://www.acmq.org/policies/policy21.pdf>. Accessed August 21, 2015.
11. U.S. Food and Drug Administration. Information sheet guidance for IRBs, clinical investigators, and sponsors. Frequently asked questions about medical devices. Available at <http://www.fda.gov/downloads/RegulatoryInformation/Guidances/UCM127067.pdf>. Accessed September 12, 2014.
12. Gurgacz SL, Smith JA, Truskett PG, Babidge WJ, Maddern GJ. Credentialing of surgeons: a systematic review across a number of jurisdictions. *ANZ J Surg* 2012;82:492-8.
13. Steinbrook R. Interstate medical licensure: major reform of licensing to encourage medical practice in multiple states. *JAMA* 2014;312:695-6.
14. Rocco G, Internullo E, Cassivi SD, Raemdonck DV, Ferguson MK. The variability of practice in minimally invasive thoracic surgery for pulmonary resections. *Thorac Surg Clin* 2008;18:235-7.