



The Society of Thoracic Surgeons General Thoracic Surgery Database: 2016 Update on Research

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The Society of Thoracic Surgeons General Thoracic Surgery Database has grown to more than 500,000 case records. Clinical research supported by the database is increasingly used to advance patient outcomes. This research review from the General Thoracic Surgery Database in 2014 and 2015 discusses 6 recent publications and an ongoing study on longitudinal outcomes in lung cancer surgery from The Society of Thoracic Surgeons Task Force

for Linked Registries and Longitudinal Follow-up. A lack of database variables specific for certain uncommon procedures limits the ability to study these operations; inclusion of clinical descriptors for selected infrequent but clinically important thoracic disorders is suggested.

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This update is one in a series of publications on The Society of Thoracic Surgeons (STS) National Databases after last year's introductory report by Jacobs and associates [1]. Their purpose is to inform the thoracic surgical community and the STS membership about the current state of each of the three databases.

The 14-year-old General Thoracic Surgery Database (GTSD) is the youngest STS database and currently comprises approximately 500,000 procedure records. Among the three STS Databases, the GTSD is somewhat unique given the many different thoracic disorders, the continued year-to-year growth of database records with an untapped potential for future expansion, and low morbidity and mortality event rates. Thus, thoracic research funded by the Society faces certain limitations at present while holding great promise for the future. A detailed comparison of the status of the three national databases is provided in the Jacobs report (Table 1) [1].

Like the other two STS national databases, the GTSD is representative of the practice of participating board-certified thoracic surgeons. However, unlike the cardiac and congenital heart databases, and despite a rising

United States share of general thoracic surgeon participants, the database does not yet reflect national thoracic surgical practice. Nonparticipating thoracic and general surgeons generate a case volume substantial in number and unknown in quality. Because the GTSD aspires to reflect national practice and has documented the superior clinical outcome of surgical care delivered by database participants compared with other nonselective databases [2, 3], the STS welcomes as a participant in the database every surgeon with a practice in general thoracic surgery, regardless of board certification in thoracic surgery or STS membership. Growing participation strengthens the role of the general thoracic database as a quality improvement tool. Clinical research supported by the database demonstrates the commitment of participating STS member surgeons to the advancement of their own specialty.

In a further distinction from its companion databases, the thoracic database collects surgical data on multiple organ systems, each with separate diseases or procedures that have specific and essential clinical variables. Many of these are still not included in the GTSD. The additions of variables during previous database updates had as their main purpose the creation of risk models for lung and esophageal resections to enable early participation in

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Abbreviations and Acronyms

A&P	=	Access and Publications
ARDS	=	adult respiratory distress syndrome
CMS	=	Centers for Medicare and Medicaid Services
DLCO	=	diffusion capacity for carbon monoxide
DVT	=	deep venous thrombosis
EPP	=	extrapleural pneumonectomy
FEV ₁	=	forced expired volume in the first second
GTSD	=	General Thoracic Surgery Database
MI	=	myocardial infarction
PE	=	pulmonary embolus
PD	=	pleural decortication
STS	=	Society of Thoracic Surgeons
ThRCRI	=	Thoracic Revised Cardiac Risk Index
VATS	=	video-assisted thoracic surgery

national quality initiatives. As a result, the number of primary database variables rose from 154 in 2006 to 245 in 2015, and the number of individual diagnoses and procedures codes also markedly increased. These database revisions, as initiated by the national database leadership, have consistently improved the information available to STS-sponsored investigators.

To date, 22 publications have resulted from clinical, STS-funded research based on the GTSD. Two common high-volume diseases, lung and esophageal cancer, were the primary subject matter of early clinical papers and continue to dominate current studies: lung cancer is the subject in 5 of the 6 papers discussed in this update. Unfortunately, the Access & Publications (A&P) Task Force currently reviews and rejects other excellent proposals because central questions relating to the study cannot be answered with currently available data in the GTSD. Table 1 lists selected variables that are presently missing from the GTSD.

The GTSD at present includes many procedures but does not have enough variables specific to low-volume thoracic diseases and procedures; this deficit reduces our capacity to answer relevant clinical questions. Delaying clinical research analyses with the hope of improving case numbers has been the approach used with success for high-volume procedures. In uncommon operations, however, case numbers may rise while accumulated cases still do not enable relevant research studies if disease-specific variables are not collected now. The General Thoracic Proposal Review Subcommittee continues to defer STS-sponsored clinical research of important proposals related to uncommon diseases, a disappointing development to investigators with particular research interests in these areas.

A thoughtful programmatic growth of the database requires a balance among diverse aims. Neglecting low-volume but important operations relevant to thoracic surgical practice would diminish the GTSD as a unique national repository of our specialty. By committing to a

Table 1. Information Presently Not Provided by the Thoracic Database^a

Category	Missing Information
Organ system	
Thymus	Myasthenia gravis: presence and severity Thymic tumors: staging and pathology Myasthenic crisis: postoperative event Preoperative drugs/preparation
Chest wall	Tumor types: benign or malignant Extent of resection Type of reconstruction
Esophagus	Categories of disease for resection other than cancer
Diaphragm	Category of disease: diaphragmatic paralysis Preoperative evaluation of paralysis
Trachea	Tumor types: benign or malignant Type of benign stricture Length of resection Approach: cervical, cervical-mediastinal, thoracic
Malignant mesothelioma	Disease-specific staging
Procedure	
Pleural decortication	Category of disease Indication
Phase of care	
Readmission	Cause or relation to operation

^a A selection of variables from this list may be considered for inclusion in the next database collection form.

goal of capturing all thoracic surgical operations in the GTSD, thus affording access to detailed research, STS will assert and retain its dominance in this domain of professional competence. Conversely, we risk losing diseases or procedures that are not detailed in the database and available for research. The STS goals of advancing patient safety and quality of care cannot be limited to resections of lung and esophageal cancer. A commitment to dedicate additional resources to uncommon procedures, however, will require practical compromises between a desirable database expansion and the concerns of participant surgeons over rising database complexity, data collection burden, and cost.

Where appropriate, thoracic investigators have been encouraged to pursue cooperative, multiinstitutional research not anticipated in the submitted proposal. Some inclusive research cooperations have improved research projects, enlarged investigator participation, and enhanced the critical discussion of ongoing projects. As examples, a shared discussion of clinical T2 N0 esophageal cancer highlighted problems in the accuracy of preoperative staging and patient selection for neoadjuvant therapy [4]. The cooperation of 3, counting the STS mentor's institution, 4 academic centers of excellence on the surgical treatment of malignant mesothelioma extracted the most detailed information under

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