The STS GTSD Audit Process and 2018 Audit Final Report

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Disclosures:
Clinical databases are voluntary registries

Confirming integrity requires **external validation**

Audit validates the data

- Accurate
- Consistent
- Comprehensive

Accepted as reliable trusted information source
STS GTSD Audit Process

Initial audits limited to **Lobectomy**  
**Esophagectomy** added in 2013  
Specific data elements audited based on:  
- Defined **quality** metrics  
- Variables essential to **risk algorithm**  
- Variables important to **data collection** processes
Audits validate GTSD integrity through 5 processes:

- Review Data Collection Questionnaire by data manager
- Compare lobectomy & esophagectomy submitted with OR logs
- Re-abstraction of 20 cases (15 lobectomy, 5 esophagectomy): agreement rate calculations
- Summary conference of observations and trends identified
- Submission of a Review Summary report
29 sites randomly selected

- Criteria for selection/exclusion?

Comprehensiveness Evaluated

Lobectomy and esophagectomy cases submitted to DCRI COMPARED
OR logs of lobectomy and esophagectomy cases performed during 2017

Cases randomly selected at each site Jan. 2017- Dec. 2017

- 15/25 lobectomy cases selected, re-abstracted
- 5 esophagectomy cases selected, re-abstracted

*All audits were completed August 2018 - January 2019
Variables Evaluated (Version 2.3)

- 39 data elements for lung cancer
- 33 data elements for esophageal cancer

Variables abstracted from medical records for each case

Compared/adjudicated with data submitted by site

Agreement rates were calculated:

- Overall
- Each Variable Category
- Each Individual variable
47 total data variables abstracted for audit

The same variables evaluated as 2017 audit

**PLUS** 8 additional variables:

1) **DLCO performed**
2) **Lung Cancer: total number of nodal stations**
3) **Lung Cancer: pathology margins**
4) **Atrial arrhythmia requiring treatment**
5) **Unexpected admission to ICU**
6) **Discharge location**
7) **Discharge with chest tube**
8) **Smoking cessation counseling**
**RESULTS:** Hospital Procedure Log Compared to Cases Submitted

**Comprehensive:**

3143 procedures submitted compared to O.R. logs at each site: range of cases per site: 47-281

Determine if all eligible cases were submitted

345 cases required research
- clarify primary procedure code
- cancelled case
- no cancer diagnosis

Mismatch per site: range= 0-135
Completeness of Data Submitted
O.R. Log Comparison with Cases Submitted

55 total cases omitted (1.8%)

*16/29 sites omitted NO cases
13 sites omitted 1-22 cases (median=2)

All sites had processes in place to assure that eligible lobectomy cases were submitted

- Daily, weekly, monthly, review of OR logs
- Daily electronic reports of OR procedures or hospital billing reports
- Communication with surgeons and comparison of surgical OR logs with surgeon’s office schedule
Lung Cancer Cases Audit Results
AGREEMENT RATES FOR LUNG CANCER BY CATEGORY

Post-Operative Events: 98.8%
Discharge: 95.8%
Diagnosis and Procedures: 93.8%
Pre-Operative Events: 92.5%
### INDIVIDUAL VARIABLE AGREEMENT RATES FOR LUNG CANCER
#### CATEGORY: PRE-OPERATIVE EVENTS

<table>
<thead>
<tr>
<th>Variable</th>
<th>Agreement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung Cancer</td>
<td>100.0%</td>
</tr>
<tr>
<td>Admission Date</td>
<td>99.5%</td>
</tr>
<tr>
<td>Pulmonary Function Tests Performed</td>
<td>99.3%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>98.9%</td>
</tr>
<tr>
<td>Preoperative Chemotherapy</td>
<td>98.6%</td>
</tr>
<tr>
<td>Preoperative Thoracic Radiation Therapy</td>
<td>97.0%</td>
</tr>
<tr>
<td>DLCO Test Performed</td>
<td>96.8%</td>
</tr>
<tr>
<td>Diabetes Therapy/Control</td>
<td>96.3%</td>
</tr>
<tr>
<td>Cigarette Smoking</td>
<td>94.9%</td>
</tr>
<tr>
<td>Prior Cardiothoracic Surgery</td>
<td>94.5%</td>
</tr>
<tr>
<td>Clinical Staging Done: PET or PET/CT</td>
<td>90.3%</td>
</tr>
<tr>
<td>Clinical Staging Done: EBUS</td>
<td>90.1%</td>
</tr>
<tr>
<td>Clinical Staging: Lung CA Nodes</td>
<td>87.4%</td>
</tr>
<tr>
<td>Zubrod Score</td>
<td>82.1%</td>
</tr>
<tr>
<td>Clinical Staging: Lung CA Tumor Size</td>
<td>81.1%</td>
</tr>
<tr>
<td>If yes, FEV % predicted</td>
<td>73.6%</td>
</tr>
</tbody>
</table>
Clinical Staging: Lung CA Nodes

Mismatches occurred when the documentation provided did not support the diagnosis of nodal involvement (clinical signs N0, N1, N2 or N3 involvement)

Zubrod Score

Mismatches occurred when sites reported a patient had symptoms, fully ambulatory when there was normal activity, no symptoms (or vice versa) listed in the Admission History & Physical
Clinical Staging: Lung CA Tumor Size

Mismatches occurred when the documentation provided did not support the tumor clinical stage submitted.

FEV1 % predicted

Mismatches occurred when sites submitted the pre-bronchodilator %Predicted FEV1 value, and not the highest value reported as defined in the GTSD Training Manual.
## Individual Variable Agreement Rates by Category Diagnosis and Procedures for Lung Cancer

![Image with bar charts showing agreement rates for various categories.](image-url)

- **Date of Surgery**: 99.5%
- **Pathologic Staging: Lung Cancer Nodes**: 98.9%
- **Procedure Start Time**: 98.6%
- **Primary Procedure Performed**: 98.4%
- **Procedure End Time**: 97.7%
- **Pathologic Staging: Lung Cancer Tumor**: 97.0%
- **Patient Disposition**: 96.8%
- **Lung Cancer - Pathology Margins**: 96.3%
- **Category of Disease (Primary only)**: 95.9%
- **Pathologic Staging: Total # of Lung Lymph Nodes Sampled/Harvested**: 88.5%
- **Total Number Of Nodal Stations**: 63.9%
Pathological Staging: Total # of Lung Lymph Nodes Sampled/Harvested

Mismatches occurred when the number of nodes submitted did not match the number indicated in the detailed pathology report.

Total Number of Nodal Stations

Mismatches occurred when the number of nodal stations documented did not match the total number of nodal stations indicated in the final pathology report found by the auditors.
## INDIVIDUAL VARIABLE AGREEMENT RATES FOR LUNG CANCER
### CATEGORY: POST-OPERATIVE EVENTS

<table>
<thead>
<tr>
<th>Condition</th>
<th>Agreement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Vent Support &gt;48 Hour</td>
<td>99.8%</td>
</tr>
<tr>
<td>Unexpected Return To The OR</td>
<td>99.1%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>98.9%</td>
</tr>
<tr>
<td>Unexpected Admission To ICU</td>
<td>98.4%</td>
</tr>
<tr>
<td>Atrial Arrhythmia Requiring Treatment</td>
<td>97.7%</td>
</tr>
</tbody>
</table>
INDIVIDUAL VARIABLE AGREEMENT RATES FOR LUNG CANCER
CATEGORY: DISCHARGE

Discharge Status: 100.0%
Status at 30 day after surgery: 99.3%
Discharge Location: 98.6%
Date of Discharge: 97.9%
Discharged With Chest Tube: 97.0%
Readmit to any hospital w/in 30 days of discharge: 94.3%
Smoking Cessation Counseling: 83.2%
Smoking Cessation Counseling

Mismatches occurred when a site recorded “yes” when a patient was a “nonsmoker” and vice versa.
Esophageal Cancer Cases Audit Results
AGREEMENT RATES BY FOR ESOPHAGEAL CANCER BY CATEGORY

- Post-Operative Events: 96.7%
- Discharge: 95.1%
- Diagnosis and Procedures: 93.2%
- Pre-Operative Events: 92.9%
### INDIVIDUAL VARIABLE AGREEMENT RATES FOR ESOPHAGEAL CANCER

**CATEGORY: PRE-OPERATIVE EVENTS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Esophageal Cancer</td>
<td>100.0%</td>
</tr>
<tr>
<td>Admission Date</td>
<td>99.3%</td>
</tr>
<tr>
<td>Cigarette Smoking</td>
<td>96.6%</td>
</tr>
<tr>
<td>DLCO Test Performed</td>
<td>94.5%</td>
</tr>
<tr>
<td>Prior Cardiothoracic Surgery</td>
<td>93.8%</td>
</tr>
<tr>
<td>Preoperative Chemotherapy</td>
<td>93.1%</td>
</tr>
<tr>
<td>Clinical Diagnosis of Nodal Involvement</td>
<td>91.7%</td>
</tr>
<tr>
<td>Clinical Staging: EUS</td>
<td>91.0%</td>
</tr>
<tr>
<td>Preoperative Thoracic Radiation Therapy</td>
<td>90.3%</td>
</tr>
<tr>
<td>Zubrod Score</td>
<td>87.6%</td>
</tr>
<tr>
<td>Clinical Staging: Esophageal Tumor</td>
<td>84.1%</td>
</tr>
</tbody>
</table>
Zubrod Score

Mismatches occurred when sites reported a patient had symptoms, fully ambulatory when there was normal activity, no symptoms (or vice versa) listed in the Admission History and & Physical

Clinical Staging: Esophageal Tumor

Mismatches occurred when the pre-treatment staging workup documentation provided did not support the tumor clinical stage that was submitted
Individual Variable Agreement Rates for Esophageal Cancer

Category: Diagnosis and Procedures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Agreement Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date of Surgery</td>
<td>100.0%</td>
</tr>
<tr>
<td>Procedure Start Time</td>
<td>98.6%</td>
</tr>
<tr>
<td>Patient Disposition</td>
<td>97.2%</td>
</tr>
<tr>
<td>Procedure End Time</td>
<td>96.6%</td>
</tr>
<tr>
<td>Esophageal CA Nodes</td>
<td>96.6%</td>
</tr>
<tr>
<td>Esophageal Cancer - Pathology Margins</td>
<td>94.5%</td>
</tr>
<tr>
<td>Esophageal Tumor</td>
<td>93.8%</td>
</tr>
<tr>
<td>Category of Disease (Primary only)</td>
<td>87.6%</td>
</tr>
<tr>
<td>Primary Procedure Performed</td>
<td>87.6%</td>
</tr>
<tr>
<td>Total # of Lymph Nodes sampled/harvested</td>
<td>79.3%</td>
</tr>
</tbody>
</table>
Category of Disease (Primary Only)

Mismatches occurred when the category of disease (primary only) diagnosis was not based on the final pathology report.

Primary Procedure Performed

Mismatches occurred when the documented primary procedure performed did not match the procedure listed in the OP Report.

Pathological Staging: Total # Lymph Nodes Sampled/Harvested

Mismatches occurred when the number of nodes submitted did not match the number indicated in the detailed pathology report.
INDIVIDUAL VARIABLE AGREEMENT RATES FOR ESOPHAGEAL CANCER
CATEGORY: POST-OPERATIVE EVENTS

- **Initial Vent Support >48 Hour**: 98.6%
- **Pneumonia**: 97.9%
- **Unexpected Return To The OR**: 96.6%
- **Unexpected Admission To ICU**: 96.6%
- **Atrial Arrhythmia Requiring Treatment**: 93.8%
## INDIVIDUAL VARIABLE AGREEMENT RATES FOR ESOPHAGEAL CANCER

**CATEGORY: DISCHARGE**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge Status</td>
<td>100.0%</td>
</tr>
<tr>
<td>Discharge Location</td>
<td>97.9%</td>
</tr>
<tr>
<td>Status at 30 day after surgery</td>
<td>97.9%</td>
</tr>
<tr>
<td>Date of Discharge</td>
<td>97.2%</td>
</tr>
<tr>
<td>Discharged With Chest Tube</td>
<td>92.4%</td>
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<tr>
<td>Readmit to any hospital w/in 30 days of discharge</td>
<td>91.0%</td>
</tr>
<tr>
<td>Smoking Cessation Counseling</td>
<td>89.0%</td>
</tr>
</tbody>
</table>
ESOPHAGEAL CANCER CATEGORY: DISCHARGE
INDIVIDUAL VARIABLE AGREEMENT RATES < 90%

Smoking Cessation Counseling

Mismatches occurred when a site recorded “yes” when a patient was a “nonsmoker” and vice versa
2018 Audit Results demonstrate consistent high quality reporting comparable to prior years audits

95.0% in 2014
97.0% in 2015
96.8% in 2016
94.4% in 2017

2018 Audit overall agreement rate = 94%
The overall high agreement rate provides assurance that the data contained in the Database are reliable

- 94.3% for lung cancer cases
- 93.9% for esophageal cancer cases

✧ Audits are essential to validate data in GTSD
✧ No evidence of intentional under-reporting
✧ Surgeons and staff that perform data collection and submission to the GTSD are committed to the STS goal of collecting quality data