

STS General Thoracic Surgery Executive Summary
Jan 2002 – June 2017 Procedures
All Patients

Table 1: Number of Operations submitted, Discharge Mortality, Operative Mortality, by year

Table 2: Operative Mortality, by Primary Procedure





**STS General Thoracic Surgery Database
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**Executive Summary
STS Period Ending 06/30/2017**



Table 1: Number of Operations submitted, discharge mortality, and operative mortality, by year

	Last Year Jul 2016 - Jun 2017	STS Last 3 Years Jul 2014 - Jun 2017	All Years Jan 2002 - Jun 2017
Number of Operations	41,431	126,647	524,332
Discharge Mortality			
Number of Mortalities	584	1,934	9,594
Number Eligible	41,431	126,647	470,002
Mortality Percent	1.4%	1.5%	2.0%
Operative Mortality			
Number of Mortalities	820	2,665	13,113
Number Eligible	39,679	121,051	419,811
Mortality Percent	2.1%	2.2%	3.1%



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Table 2: Primary Procedures Operative Mortality, All Available Records, Jan 2002 - Jun 2017

Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
		# / Eligible	%
PRIMARY PROCEDURES			
CHEST WALL (v2.07)			
Chest Wall Biopsy	342	3/223	1.3%
Rib Resection (single)	462	5/335	1.5%
First/Cervical Rib Resection	165	0/126	0.0%
Chest Wall Resection	1,121	14/811	1.7%
Chest Wall Reconstruction	182	0/155	0.0%
Thoracoplasty	46	2/26	7.7%
Pectus Repair	182	0/127	0.0%
Sternectomy, complete	27	1/19	5.3%
Sternectomy, partial	110	1/78	1.3%
Muscle Flap	112	5/61	8.2%
Other Chest Wall Repair	1,534	14/996	1.4%
MEDIASTINUM/NECK (v2.07)			
Mediastinal LN Biopsy	2,480	18/1,481	1.2%
Mediastinoscopy	9,965	73/7,454	1.0%
Anterior Mediastinotomy	577	5/458	1.1%
Extended Cervical Mediastinoscopy	78	0/62	0.0%
Mediastinal Lymph Node Dissection	489	2/231	0.9%
Mediastinal Lymph Node Sampling	854	5/595	0.8%
Biopsy, Mediastinal Mass	849	10/586	1.7%
Resection, Mediastinal Mass	1,842	9/1,409	0.6%
Thymectomy	1,409	0/1,101	0.0%
Sympathectomy	1,857	3/1,279	0.2%
Thoracic duct ligation	258	4/188	2.1%
Other Mediastinal/Neck procedure	2,060	41/1,456	2.8%
TRACHEOBRONCHIAL (v2.07)			
Flexible Bronchoscopy	6,416	124/4,231	2.9%
Rigid Bronchoscopy	1,442	34/1,378	2.5%
Removal of Foreign Body (Tracheobronchial)	197	4/176	2.3%
Endobronchial ablation, Laser / PDT	1,424	35/1,335	2.6%
Endobronchial Ablation, Mechanical	348	7/334	2.1%
Tracheal/Bronchial Stent	1,091	54/1,027	5.3%



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TRACHEOBRONCHIAL (v2.07) - continued			
Tracheostomy	3,210	344/2,595	13.3%
Tracheal Repair	107	7/98	7.1%
Tracheal Stricture Resection	378	2/356	0.6%
Tracheal Tumor Resection	116	0/104	0.0%
Carinal Resection (no lung resection)	11	0/10	0.0%
Bronchotomy	10	0/8	0.0%
Bronchial Repair	121	8/106	7.5%
Bronchoplasty	49	1/43	2.3%
Sleeve Bronchial Resection			
TE Fistula Repair	91	5/80	6.3%
Other Tracheobronchial procedure	1,962	42/1,705	2.5%
PULMONARY (v2.07)			
Wedge Resection, single	12,723	243/9,038	2.7%
Wedge Resection, multiple	7,970	290/5,972	4.9%
Segmentectomy	1,850	27/1,374	2.0%
Lobectomy	18,952	264/13,892	1.9%
Sleeve Lobectomy	382	7/352	2.0%
Bilobectomy	1,013	32/703	4.6%
Pneumonectomy, standard	1,129	48/815	5.9%
Pneumonectomy, Carinal	41	1/32	3.1%
Completion pneumonectomy	245	19/173	11.0%
Extrapleural pneumonectomy	211	14/142	9.9%
Pneumonectomy, intrapericardial	322	10/239	4.2%
Lung Volume Reduction	325	18/231	7.8%
Bullectomy / repair	1,043	15/799	1.9%
Hydatid Cyst Resection	2	0/2	0.0%
Single Lung Transplant	370	20/344	5.8%
Double Lung Transplant	629	32/588	5.4%
Lung Donor Harvest	16	4/14	28.6%
Other Lung procedure	1,416	52/962	5.4%
ESOPHAGOGASTRIC (v2.07)			
Esophagoscopy, flexible	4,256	39/3,258	1.2%
Esophagoscopy, rigid	91	3/84	3.6%



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ESOPHAGOGASTRIC (v2.07) - continued			
Removal of Foreign Body (Esophagogastric)	163	4/132	3.0%
Dilation of Esophagus	3,523	36/3,301	1.1%
Esophageal Tumor Ablation, Laser / PDT	235	4/202	2.0%
Stent Placement	554	45/505	8.9%
Cervical esophagostomy	81	7/60	11.7%
Anterior Thoracic Esophagostomy	10	0/5	0.0%
Zenker's Diverticulum Repair	231	1/205	0.5%
Myotomy, cricopharyngeal	66	0/51	0.0%
Myotomy, esophageal (long)	209	0/156	0.0%
Myotomy, cardia (short)	494	1/439	0.2%
Resection, intrathoracic diverticulum	85	0/68	0.0%
Resection, esophagus (esophagectomy)	4,393	127/3,638	3.5%
Resection, esophageal wall lesion	102	0/86	0.0%
Repair, perforation of esophagus - Iatrogenic	146	8/120	6.7%
Repair, perforation of esophagus - Malignant	5	0/4	0.0%
Repair, perforation of esophagus - Other	255	20/215	9.3%
Fundoplication, circumferentia	1,448	8/1,104	0.7%
Fundoplication, partial	418	3/364	0.8%
Gastroplasty	162	1/149	0.7%
Pyloroplasty	18	0/16	0.0%
Pyloromyotomy	8	0/8	0.0%
Gastrectomy	209	7/172	4.1%
Gastrostomy	381	32/339	9.4%
Jejunostomy	363	20/292	6.8%
Conduit, gastric	34	2/27	7.4%
Conduit, colon	26	0/20	0.0%
Conduit, jejunum	4	0/3	0.0%
Conduit, other	2	0/2	0.0%
Anastomosis, neck	16	2/13	15.4%
Anastomosis, Chest	7	0/5	0.0%
Other Esophageal procedure	692	19/544	3.5%
Other GI procedure	785	23/602	3.8%
CARDIAC/PERICARDIUM/GREAT VESSELS (v2.07)			
Pericardial Window	2,735	190/1,706	11.1%



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CARDIAC/PERICARDIUM/GREAT VESSELS (v2.07) - continued			
Pericardiectomy	209	9/150	6.0%
Repair Cardiac Laceration	33	5/27	18.5%
Other Pericardial Procedure	356	12/302	4.0%
Repair / Reconstruction, thoracic aorta	142	7/102	6.9%
Repair / Reconstruction, abd aorta	371	4/40	10.0%
Repair / Reconstruction, SVC	16	0/12	0.0%
Repair / Reconstruction, IVC	16	3/16	18.8%
Repair / Reconstruction, pulmonary artery	26	6/26	23.1%
Repair / Reconstruction, pulmonary vein(s)	5	1/5	20.0%
Repair / Reconstruction, left atrium	6	1/6	16.7%
Repair / Reconstruction, Subclavian Artery	20	2/16	12.5%
Cardiopulmonary Bypass	15	0/7	0.0%
Other Cardiac procedure	917	23/460	5.0%
DIAPHRAGM (v2.07)			
Plication of Diaphragm	191	2/162	1.2%
Diaphragmatic Hernia Repair, acute	122	4/90	4.4%
Diaphragmatic Hernia Repair, chronic	456	2/371	0.5%
Resection of Diaphragm	50	2/35	5.7%
Reconstruction of Diaphragm	43	0/28	0.0%
Other Diaphragm procedure	107	1/65	1.5%
PLEURA (v2.07)			
Pleural Drainage Procedure - Open	2,946	195/2,128	9.2%
Pleural Drainage Procedure - Closed	2,314	223/1,600	13.9%
Pleural Biopsy	2,022	74/1,436	5.2%
Pleurodesis	4,014	275/2,975	9.2%
Pleurectomy	506	13/372	3.5%
Decortication	5,692	230/4,205	5.5%
Clagett Procedure	140	7/126	5.6%
Other Pleural procedure	964	41/752	5.5%
AIR LEAK CONTROL MEASURES (v2.07)			
Fibrin Glue	16	0/15	0.0%
Pericardial Strips	13	0/5	0.0%



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AIR LEAK CONTROL MEASURES (v2.07) - continued			
Lung Sealant	15	0/10	0.0%
Pleural Tent	16	0/10	0.0%
Other Air Leak Control Measures	79	2/53	3.8%
TRACHEA, BRONCHI AND LARYNX (v2.081, v2.2 and v2.3)			
Tracheostomy, planned (31600) v2.2, v2.3	38	2/38	5.3%
Rigid Stent Removal v2.3	3	0/3	0.0%
Tracheostomy replacement (tube change) prior to est. of fistula tract (31502) v2.3	4	2/4	50.0%
Unlisted procedure, trachea, bronchi (31899) v2.081	2,443	243/1,976	12.3%
Tracheostomy revision simple, w/without flap (31613) v2.3			
Bronchogenic cyst removal v2.3	10	0/8	0.0%
Tracheal stenosis excision and anastomosis; cervicothoracic (31781)	139	2/133	1.5%
Bronchial laceration suture v2.3	3	0/3	0.0%
Tracheal tumor or carcinoma excision; cervical (31785)	136	2/125	1.6%
Bronchial sleeve resection v2.3	31	0/30	0.0%
Tracheal tumor or carcinoma excision; thoracic (31786)	140	3/130	2.3%
Bronchoplasty, graft repair (31770) v2.3	9	1/9	11.1%
Tracheal wound or injury suture repair; cervical (31800)	50	2/44	4.5%
Bronchoplasty; excision stenosis and anastomosis (31775)	82	3/61	4.9%
Tracheal wound or injury suture repair; intrathoracic (31805)	80	6/71	8.5%
Bronchopleural fistula closure (32906) v2.3	82	4/81	4.9%
Tracheoplasty; cervical (31750)	233	12/127	9.4%
Carinal reconstruction (31766)	24	1/22	4.5%
Tracheoplasty; intrathoracic (31760)	262	7/258	2.7%
Laryngectomy, partial (31370) v2.2, v2.3	5	0/4	0.0%
Tracheostomy revision complex, with flap (31614) v2.3	11	2/11	18.2%
Tracheal stenosis excision and anastomosis; cervical (31780)	771	6/750	0.8%
Tracheostomy mediastinal v2.3	7	0/6	0.0%
BRONCHOSCOPY (v2.081, v2.2, v2.3)			
Bronchoscopy, diagnostic, with or without cell washing (31622)	4,659	124/2,243	5.5%
Bronchoscopy, each additional major bronchus stented (31637)	13	1/8	12.5%
Bronchoscopy, navigational (31627) v2.2, v2.3	30	3/26	11.5%
Bronchoscopy, with bronchial alveolar lavage (BAL) (31624)	905	40/531	7.5%



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BRONCHOSCOPY (v2.081, v2.2, v2.3) - continued			
Bronchoscopy, w ith bronchial or endobronchial biopsy(s), single or multiple sites (31625)	1,582	33/404	8.2%
Bronchoscopy, w ith brushing or protected brushings (31623)	329	3/89	3.4%
Bronchoscopy, w ith destruction of tumor or relief of stenosis by any method other than excision (e.g., laser therapy) (31641)	1,737	71/850	8.4%
Bronchoscopy, w ith excision of tumor (31640)	444	23/228	10.1%
Bronchoscopy, w ith placement of bronchial stent(s) (includes tracheal/bronchial dilation as required), initial bronchus (31636)	529	37/314	11.8%
Bronchoscopy, w ith placement of catheter(s) for intracavitary radioelement application (31643)	64	1/13	7.7%
Bronchoscopy, w ith placement of Fiducial markers (31626) v2.2, v2.3	1	0/1	0.0%
Bronchoscopy, w ith placement of tracheal stent(s) (includes tracheal/bronchial dilation as required) (31631)	643	33/370	8.9%
Bronchoscopy, w ith removal of foreign body (31635)	379	15/214	7.0%
Bronchoscopy, w ith revision of tracheal or bronchial stent inserted at previous session (31638)	266	5/147	3.4%
Bronchoscopy, w ith therapeutic aspiration of tracheobronchial tree, initial (drainage of lung abscess) (31645)	162	4/103	3.9%
Bronchoscopy, w ith therapeutic aspiration of tracheobronchial tree, subsequent (31646)	43	1/36	2.8%
Bronchoscopy, w ith tracheal/bronchial dilation or closed reduction of fracture (31630)	1,568	14/509	2.8%
Bronchoscopy, w ith transbronchial lung biopsy(s), each additional lobe (31632)	55	1/16	6.3%
Bronchoscopy, w ith transbronchial lung biopsy(s), single lobe (31628)	598	8/129	6.2%
Bronchoscopy, w ith transbronchial needle aspiration biopsy(s) (31629)	1,362	7/191	3.7%
Bronchoscopy, w ith transbronchial needle aspiration biopsy(s), each additional lobe (31633)	161	1/20	5.0%
Endobronchial ultrasound (EBUS) during bronchoscopy diagnostic or therapeutic intervention(s) (31620)	1,510	10/189	5.3%
Tracheobronchoscopy through established tracheostomy incision (31615)	128	5/76	6.6%
PLEURAL SPACE AND LUNG (v2.081, v2.2 and v2.3)			
Thoracoscopy, diagnostic lungs and pleural space, w ithout biopsy (32601)	1,552	85/1,305	6.5%
Thoracoscopy, surgical; w ith pleurodesis (e.g., mechanical or chemical) (32650)	6,614	479/5,327	9.0%



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PLEURAL SPACE AND LUNG (v2.081, v2.2 and v2.3) - continued			
Thoracoscopy, surgical; w ith removal of intrapleural foreign body or fibrin deposit (32653)	846	39/727	5.4%
Thoracoscopy, diagnostic: w ith biopsy(ies) of lung infiltrate(s) (eg w edge), unilateral (32607) v2.2, v2.3	533	15/466	3.2%
Thoracoscopy, diagnostic: w ith biopsy(ies) of lung nodule(s) or mass(es) (eg incisional), unilateral (32608) v2.2, v2.3	353	6/336	1.8%
Thoracoscopy, diagnostic: w ith biopsy(ies) of pleura (32609) v2.2, v2.3	168	7/152	4.6%
Thoracostomy; w ith rib resection for empyema (32035)	210	20/182	11.0%
Thoracostomy; w ith open flap drainage for empyema (32036)	391	26/330	7.9%
Thoracotomy w ith biopsy(ies) lung infiltrate(s) (eg w edge), unilateral (32096)	136	10/120	8.3%
Thoracotomy w ith biopsy(ies) lung nodule(s) or masses (eg incisional), unilateral (32097)	89	3/81	3.7%
Thoracotomy w ith biopsy(ies) of pleura (32098)	64	3/59	5.1%
Thoracotomy w ith cardiac massage (32160)	11	6/10	60.0%
Pleural scarification for repeat pneumothorax (32215)	98	4/64	6.3%
Insertion indwelling tunneled pleural catheter (32550)	3,081	357/2,236	16.0%
Repair lung hernia through chest w all (32800)	103	0/92	0.0%
Closure of chest w all follow ing open flap drainage for empyema (Clagett type procedure) (32810)	126	3/103	2.9%
Total lung lavage (for alveolar proteinosis) (32997)	65	1/51	2.0%
Radio-frequency ablation (RFA) lung tumor (32998)	115	1/87	1.1%
Unlisted procedure, lung (32999)	750	32/427	7.5%
Thoracoscopy, surgical; w ith partial pulmonary decortication (32651)	7,592	390/6,834	5.7%
Thoracoscopy, surgical; w ith total pulmonary decortication (32652)	13,809	560/12,871	4.4%
Thoracoscopy, surgical; w ith control of traumatic hemorrhage (32654)	1,072	53/982	5.4%
Thoracoscopy, surgical; w ith excision-plication of bullae, including any pleural procedure (32655)	7,669	76/7,195	1.1%
Thoracoscopy, surgical; w ith parietal pleurectomy (32656)	1,940	71/1,824	3.9%
Thoracoscopy, surgical; w ith lobectomy (32663)	47,122	404/44,060	0.9%
Thoracoscopy w ith therapeutic w edge resection (eg mass or nodule, initial, unilateral (32666) v2.2, v2.3	28,623	212/26,815	0.8%
Thoracoscopy w ith therapeutic w edge resection(eg mass or nodule) each additional resection, ipsilateral (32667) v2.2, v2.3	1,480	21/1,348	1.6%
Thoracoscopy w ith diagnostic w edge resection follow ed by anatomic lung resection (32668) v2.2, v2.3	759	13/701	1.9%



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PLEURAL SPACE AND LUNG - continued			
Thoracoscopy with removal of a single lung segment (segmentectomy) (32669) v2.2, v2.3	4,974	31/4,760	0.7%
Thoracoscopy with removal of two lobes (bilobectomy) (32670) v2.2, v2.3	831	14/786	1.8%
Thoracoscopy with removal of lung, pneumonectomy (32671) v2.2, v2.3	276	15/258	5.8%
Thoracoscopy with resection-plication for emphysematous lung (bullous or non-bullous) for lung volume reduction- LVRS, unilateral including any pleural procedure (32672) v2.2, v2.3	598	14/571	2.5%
Thoracotomy with therapeutic wedge resection (eg mass nodule) initial (32505) v2.2, v2.3	4,763	70/4,564	1.5%
Thoracotomy with therapeutic wedge resection (eg mass nodule) each additional resection, ipsilateral (+32506) v2.2, v2.3	616	14/566	2.5%
Thoracotomy with diagnostic wedge resection followed by anatomic lung resection (+32507) v2.2, v2.3	222	5/211	2.4%
Thoracotomy, limited, for biopsy of lung or pleura (i.e.; open lung biopsy) (32095) v2.081	867	95/607	15.7%
Thoracotomy, with exploration (32100)	2,882	152/2,461	6.2%
Thoracotomy, major; with control of traumatic hemorrhage and/or repair of lung tear (32110)	981	156/903	17.3%
Thoracotomy, major; for postoperative complications (32120)	1,486	46/1,369	3.4%
Thoracotomy, major; with cyst(s) removal, with or without a pleural procedure (32140)	261	1/225	0.4%
Thoracotomy, major; with excision-plication of bullae, with or without any pleural procedure (32141)	671	23/616	3.7%
Thoracotomy, major; with removal of intrapleural foreign body or hematoma (32150)	1,094	77/989	7.8%
Thoracotomy with open intrapleural pneumolysis (32124) v2.3	98	4/92	4.3%
Decortication, pulmonary, total (32220)	8,643	386/7,654	5.0%
Decortication, pulmonary, partial (32225)	2,466	121/2,168	5.6%
Pleurectomy, parietal (32310)	435	14/407	3.4%
Decortication and parietal pleurectomy (32320)	1,846	85/1,701	5.0%
Thoracotomy, with biopsy of pleura (32098) (v2.081, v2.2)	126	9/87	10.3%
Removal of lung, total pneumonectomy; (32440)	3,770	199/3,487	5.7%
Removal of lung, sleeve (carinal) pneumonectomy (32442)	130	8/118	6.8%
Removal of lung, total pneumonectomy; extrapleural (32445)	595	46/552	8.3%
Removal of lung, single lobe (lobectomy) (32480)	31,175	606/28,336	2.1%



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PLEURAL SPACE AND LUNG - continued			
Removal of lung, two lobes (bilobectomy) (32482)	2,872	97/2,630	3.7%
Removal of lung, single segment (segmentectomy) (32484)	2,832	47/2,644	1.8%
Removal of lung, sleeve lobectomy (32486)	1,554	22/1,470	1.5%
Removal of lung, completion pneumonectomy (32488)	731	58/674	8.6%
Removal of lung, excision-plication of emphysematous lung(s) for lung volume reduction (LVRS) (32491)	397	17/372	4.6%
Resection and repair of portion of bronchus (bronchoplasty) when performed at time of lobectomy or segmentectomy (32501)	54	1/54	1.9%
Resection of apical lung tumor (e.g., Pancoast tumor), including chest wall resection, without chest wall reconstruction(s) (32503)	431	14/400	3.5%
Resection of apical lung tumor (e.g., Pancoast tumor), including chest wall resection, with chest wall reconstruction (32504)	301	7/283	2.5%
Removal of lung, wedge resection, single or multiple(32500) v2.081	4,256	131/3,511	3.7%
Extrapleural enucleation of empyema(empyemectomy) (32540) v2.081	129	5/114	4.4%
Thoracoscopy, diagnostic lungs and pleural space, with biopsy (32602) v2.081	4,674	212/3,619	5.9%
Thoracoscopy, diagnostic pericardial sac, without biopsy (32603) v2.081	23	0/15	0.0%
Thoracoscopy, surgical; with wedge resection of lung, single or multiple (32657) v2.081	17,875	362/15,096	2.4%
LUNG OTHER (v2.081, v2.2 and v2.3)			
Open closure of major bronchial fistula (32815)	444	31/415	7.5%
Thoracoplasty with closure of bronchopleural fistula (32906)	193	14/177	7.9%
Single lung transplant (32851)	1,160	54/1,143	4.7%
Single lung transplant with CPB (32852)	437	33/437	7.6%
Double lung transplant (32853)	1,810	53/1,774	3.0%
Double lung transplant with CPB (32854)	2,381	151/2,367	6.4%
MEDIASTINUM AND DIAPHRAGM (v2.081, v2.2 and v2.3)			
Thoracoscopy, diagnostic; mediastinal space, with biopsy (32606)	886	14/677	2.1%
Mediastinotomy with exploration or biopsy; cervical approach (39000)	1,121	8/260	3.1%
Mediastinotomy with exploration or biopsy; transthoracic approach (39010)	785	11/460	2.4%
Mediastinoscopy, with or without biopsy (39400)	10,537	64/2,007	3.2%
Unlisted procedure, mediastinum (39499)	568	10/252	4.0%
Unlisted procedure, diaphragm (39599)	742	12/712	1.7%



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MEDIASTINUM AND DIAPHRAGM (v2.081, v2.2 and v2.3) - continued			
Thoracoscopy, surgical; w ith excision of mediastinal cyst, tumor, or mass (32662)	4,520	17/4,166	0.4%
Thoracoscopy, diagnostic mediastinal space, w ithout biopsy (32605) v2.081	74	2/63	3.2%
Thoracoscopy w ith mediastinal and regional lymphadectomy (+32674) v2.2, v2.3	377	0/346	0.0%
Thoracic lymphadenectomy, regional, including mediastinal and peritracheal nodes (38746)	936	4/591	0.7%
Mediastinal cyst, excision, open, Transthoracic approach (39200)	582	6/501	1.2%
Mediastinal tumor, excision, open, Transthoracic approach (39220)	3,012	24/2,726	0.9%
Thoracoscopy w ith resection of thymus, unilateral or bilateral (32673) v2.2, v2.3	1,710	5/1,643	0.3%
Thymectomy, transcervical approach (60520)	468	3/400	0.8%
Thymectomy, transthoracic approach (60521)	2,656	8/2,444	0.3%
Thymectomy, transthoracic approach, w ith radical mediastinal dissection (60522)	1,317	9/1,240	0.7%
VATS thymectomy (605XX) v2.081	402	0/361	0.0%
Diaphragm, laceration repair, any approach (39501)	161	12/155	7.7%
Repair of paraesophageal hiatus hernia, transabdominal w ith or w ithout fundoplasty (39502) v2.081	1,019	17/935	1.8%
Diaphragmatic hernia repair (other than neonatal), traumatic; acute (39540)	381	6/354	1.7%
Diaphragmatic hernia repair (other than neonatal), traumatic; chronic (39541)	983	10/935	1.1%
Diaphragm Imbrication (i.e., plication) (39545)	1,648	14/1,562	0.9%
Diaphragm; resection w ith simple repair (e.g., primary suture) (39560)	274	5/259	1.9%
Diaphragm; resection w ith complex repair (e.g., prosthetic material, local muscle flap) (39561)	279	3/268	1.1%
ESOPHAGOSCOPY (v2.081, v2.2, v2.3)			
Esophagoscopy (43200)	1,140	24/523	4.6%
Esophagoscopy w ith biopsy (43202)	645	9/107	8.4%
Esophagoscopy w ith removal of foreign body (43215)	378	13/211	6.2%
Esophagoscopy w ith insertion of stent (43219)	811	52/511	10.2%
Esophagoscopy w ith balloon dilation (43220)	704	2/111	1.8%
Esophagoscopy w ith insertion of guide wire follow ed by dilation over guide wire (43226)	1,903	10/344	2.9%
Esophagoscopy w ith ablation of tumor (43228)	379	2/96	2.1%



Table 2: Primary Procedures Operative Mortality, All Available Records, Jan 2002 - Jun 2017 - continued

Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
		# / Eligible	%
ESOPHAGOSCOPY (v2.081, v2.2, v2.3) - continued			
Esophagoscopy with endoscopic ultrasound examination (EUS) (43231)	62	1/5	20.0%
Esophagoscopy with transendoscopic ultrasound-guided fine needle aspiration (43232)	26	0/4	0.0%
Upper gastrointestinal endoscopy, diagnostic (43235)	1,515	22/456	4.8%
Upper gastrointestinal endoscopy with endoscopic ultrasound examination limited to the esophagus (43237)	90	0/3	0.0%
Upper gastrointestinal endoscopy with transendoscopic ultrasound-guided FNA (43238)	43	0/5	0.0%
Upper gastrointestinal endoscopy with biopsy (43239)	2,583	3/135	2.2%
Upper gastrointestinal endoscopy with dilation of gastric outlet for obstruction (43245)	326	4/104	3.8%
Upper gastrointestinal endoscopy with directed placement of percutaneous gastrostomy tube (43246)	636	47/535	8.8%
Upper gastrointestinal endoscopy with removal of foreign body (43247)	312	6/163	3.7%
Upper gastrointestinal endoscopy with insertion of guide wire followed by dilation of esophagus (43248)	3,324	16/527	3.0%
Upper gastrointestinal endoscopy with balloon dilation of esophagus (43249)	726	3/91	3.3%
Upper gastrointestinal endoscopy with transendoscopic stent placement (43256)	626	46/405	11.4%
Upper gastrointestinal endoscopy with ablation of tumor (43258)	360	4/94	4.3%
ESOPHAGUS RESECTION (v2.081, v2.2 and v2.3)			
Transhiatal-Total esophagectomy, without thoracotomy, with cervical esophagogastrostomy (43107)	3,527	101/3,424	2.9%
Three hole-Total esophagectomy with thoracotomy; with cervical esophagogastrostomy (43112)	1,658	74/1,554	4.8%
Ivor Lewis-Partial esophagectomy, distal two-thirds, with thoracotomy and separate abdominal incision (43117)	5,520	193/5,267	3.7%
Thoracoabdominal-Partial esophagectomy, thoracoabdominal approach (43122)	533	18/501	3.6%
Minimally invasive three hole esophagectomy v2.2, v2.3	906	26/870	3.0%
Minimally invasive esophagectomy, Ivor Lewis approach	3,361	72/3,284	2.2%
Minimally invasive esophagectomy, Abdominal and neck approach	657	24/598	4.0%
Total esophagectomy without thoracotomy; with colon interposition or small intestine reconstruction (43108)	83	7/83	8.4%



Table 2: Primary Procedures Operative Mortality, All Available Records, Jan 2002 - Jun 2017 - continued

Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
		# / Eligible	%
ESOPHAGUS RESECTION (v2.081, v2.2 and v2.3) - continued			
Total esophagectomy w ith thoracotomy; w ith colon interposition or small intestine reconstruction (43113)	76	5/72	6.9%
Partial esophagectomy, cervical, w ith free intestinal graft, including microvascular anastomosis (43116)	18	2/16	12.5%
Partial esophagectomy, w ith thoracotomy and separate abdominal incision w ith colon interposition or small intestine (43118)	74	4/66	6.1%
Partial esophagectomy, distal tw o-thirds, w ith thoracotomy only (43121)	126	7/114	6.1%
Partial esophagectomy, thoracoabdominal w ith colon interposition or small intestine (43123)	76	2/71	2.8%
Total or partial esophagectomy, w ithout reconstruction w ith cervical esophagostomy (43124)	408	33/377	8.8%
Conduit revision s/p esophagectomy v2.3	53	3/51	5.9%
ESOPHAGUS OTHER PROCEDURES (v2.081, v2.2 and v2.3)			
Cricopharyngeal myotomy (43030)	157	0/119	0.0%
Diverticulectomy of hypopharynx or esophagus, w ith or w ithout myotomy; cervical approach (43130)	277	6/246	2.4%
Esophagostomy, fistulization of esophagus, external; cervical approach (43352)	103	8/93	8.6%
Closure of esophagostomy or fistula; cervical approach (43420)	60	2/46	4.3%
Excision esophageal lesion w ith primary repair, cervical approach (43100) v2.2, v2.3	4	0/3	0.0%
Trans oral fundoplication v2.3			
Unlisted laparoscopy, esophagus (43289) v2.2, v2.3	161	2/149	1.3%
Unlisted procedure, esophagus (43499)	1,199	19/954	2.0%
Per oral endoscopic myotomy (POEM) v2.3	357	0/324	0.0%
Laparoscopy, surgical w ith repair of paraesophageal hernia (fundoplasty) w ithout mesh (43281) v2.2, v2.3	5,779	47/5,169	0.9%
Laparoscopy, surgical w ith repair of paraesophageal hernia (fundoplasty) w ith mesh (43282) v2.2, v2.3	2,925	21/2,616	0.8%
Laparoscopy, surgical, esophageal lengthening procedure (Collis) (43283) Secondary Procedure code v2.2, v2.3	17	0/16	0.0%
Laparoscopy, surgical, esophagogastric fundoplasty (e.g., Nissen, Toupet procedures) (43280)	6,851	19/6,031	0.3%



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Table 2: Primary Procedures Operative Mortality, All Available Records, Jan 2002 - Jun 2017 - continued

Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
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ESOPHAGUS OTHER PROCEDURES (v2.081, v2.2 and v2.3) - continued			
Laparoscopic esophageal myotomy (Heller Myotomy, with or without fundoplication) (43279) v2.2, v2.3	3,634	6/3,349	0.2%
Thoracoscopy, surgical; with esophagomyotomy (Heller type) (32665) -v2.081	235	4/208	1.9%
Nissen fundoplasty- laparotomy (includes partial fundoplication/ w rap) (43327) v2.2, v2.3	253	2/230	0.9%
Transthoracic Fundoplication- open thoracotomy (includes Belsey/ Nissen) (43328) v2.2, v2.3	415	5/404	1.2%
Repair, paraesophageal hiatal hernia via laparotomy without mesh (43332) v2.2, v2.3	785	12/773	1.6%
Repair, paraesophageal hiatal hernia via laparotomy with mesh (43333) v2.2, v2.3	175	3/169	1.8%
Repair, paraesophageal hiatal hernia via thoracotomy without mesh (43334) v2.2, v2.3	798	12/789	1.5%
Repair, paraesophageal hiatal hernia via thoracotomy with mesh (43335) v2.2, v2.3	185	0/182	0.0%
Repair, paraesophageal hiatal hernia via thoracoabdominal approach without mesh (43336) v2.2, v2.3	119	3/118	2.5%
Repair, paraesophageal hiatal hernia via thoracoabdominal approach with mesh (43337) v2.2, v2.3	45	0/45	0.0%
Esophageal lengthening procedure - open (Collis) Secondary Procedure code (43338) v2.2, v2.3	15	0/15	0.0%
Diverticulectomy of esophagus, with or without myotomy; thoracic approach (43135)	538	9/505	1.8%
Excision Esophageal lesion with primary repair, thoracic approach (eg: leiomyoma) (43101) v2.2, v2.3	295	0/283	0.0%
Esophagoplasty with repair of TEF, cervical approach (43305) v2.2, v2.3	57	5/55	9.1%
Esophagoplasty with repair TEF, thoracic approach (43312) v2.2, v2.3	113	4/110	3.6%
Esophagomyotomy (Heller type); thoracic approach (43331) v2.2, v2.3	155	2/147	1.4%
Esophagogastric fundoplasty (e.g., Nissen, Belsey IV, Hill procedures) (43324) v2.081	694	3/544	0.6%
Esophagogastric fundoplasty; with gastroplasty (e.g., Collis) (43326) v2.081	569	5/513	1.0%
Esophagomyotomy (Heller type); thoracic approach (43331) v2.081	284	6/243	2.5%
Gastrointestinal reconstruction for previous esophagectomy with stomach (43360)	210	2/203	1.0%
Gastrointestinal reconstruction for previous esophagectomy with colon interposition or small intestine (43361)	215	9/204	4.4%



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Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
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ESOPHAGUS OTHER PROCEDURES (v2.081, v2.2 and v2.3) - continued			
Ligation or stapling at gastroesophageal junction for esophageal perforation (43405)	154	13/150	8.7%
Suture of esophageal wound or injury; cervical approach (43410)	185	12/177	6.8%
Suture of esophageal wound or injury; transthoracic or transabdominal approach (43415)	988	66/929	7.1%
Free jejunum transfer with microvascular anastomosis (43496)	11	0/11	0.0%
Total gastrectomy with esophagoenterostomy (43620)	60	6/53	11.3%
Total gastrectomy with Roux-en-Y reconstruction (43621)	597	12/588	2.0%
CHEST WALL AND NECK (v2.081, v2.2 and v2.3)			
Excision tumor, soft tissue of neck or thorax; subcutaneous (21555)	238	2/70	2.9%
Excision tumor, soft tissue of neck or thorax; deep, subfascial, intramuscular (21556)	401	6/214	2.8%
Excision of rib, partial (21600)	382	5/284	1.8%
Excision first and/or cervical rib (21615)	318	0/232	0.0%
Excision first and/or cervical rib; with sympathectomy (21616)	21	0/19	0.0%
Division of scalenus anticus; without resection of cervical rib (21700)	7	0/6	0.0%
Division of scalenus anticus; with resection of cervical rib (21705)	31	0/28	0.0%
Open treatment of sternum fracture with or without skeletal fixation (21825)	95	0/73	0.0%
Hyoid myotomy and suspension (21685) secondary procedure code	1	0/1	0.0%
Removal of sternal wire(s) v2.3	4	0/2	0.0%
Unlisted procedure, neck or thorax (21899)	2,901	54/1,551	3.5%
Major reconstruction, chest wall (posttraumatic) (32820)	295	2/275	0.7%
Muscle flap, neck (15732)	42	4/35	11.4%
Muscle flap; trunk (i.e., intercostal, pectoralis or serratus muscle) (15734)	377	9/340	2.6%
Excision of chest wall tumor including ribs (19260)	1,006	10/863	1.2%
Excision of chest wall tumor involving ribs, with reconstruction (19271)	1,784	15/1,677	0.9%
Radical resection of tumor (e.g., malignant neoplasm), soft tissue of neck or thorax (21557)	270	7/234	3.0%
Radical resection of sternum (21630)	237	10/220	4.5%
Radical resection of sternum; with mediastinal lymphadenectomy (21632)	40	1/38	2.6%
Reconstructive repair of pectus excavatum or carinatum; open (21740)	803	3/735	0.4%
Reconstructive repair of pectus, minimally invasive approach (Nuss procedure), without thoracoscopy (21742)	118	0/85	0.0%



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Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
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CHEST WALL AND NECK (v2.081, v2,2 and v2.3) - continued Reconstructive repair of pectus, minimally invasive approach (Nuss procedure), with thoracoscopy (21743)	785	1/764	0.1%
MISCELLANEOUS (v2.081, v2,2 and v2.3) Thoracoscopy, diagnostic pericardial sac, with biopsy (32604)	88	2/71	2.8%
Thoracoscopy, surgical; with removal of clot or foreign body from pericardial sac (32658)	83	1/70	1.4%
Thoracoscopy, surgical; with creation of pericardial window or partial resection of pericardial sac for drainage (32659)	699	49/589	8.3%
Tube pericardiostomy (33015)	91	8/60	13.3%
Pericardial window (33025)	3,268	287/2,496	11.5%
Thoracoscopy, surgical; with thoracic sympathectomy (32664)	988	1/228	0.4%
Removal substernal thyroid, cervical approach (60271)	106	0/83	0.0%
Application of wound vac (97605, 97606) v2.2, v2.3	25	0/24	0.0%
Stereotactic radiosurgery (SRS) and stereotactic body radiotherapy (SBRT) surgeon participation (32701) v2.2, v2.3			
Other Minor Procedure v2.2, v2.3	37	2/33	6.1%
Thoracoscopy, surgical; with total pericardiectomy (32660)	102	6/94	6.4%
Thoracoscopy, surgical; with excision of pericardial cyst, tumor, or mass (32661)	387	1/351	0.3%
Ligation thoracic duct (38381)	927	14/846	1.7%
Intraoperative jejunostomy (44015)	1,301	89/1,188	7.5%
Omental flap (49904)	58	7/52	13.5%
Transthoracic thyroidectomy (60270)	198	3/181	1.7%
SVC resection and reconstruction (34502)	29	0/26	0.0%
Other	7,092	197/5,262	3.7%
MISSING DATA [Missing data]	3,800	34/1,467	2.3%