

STS General Thoracic Surgery Executive Summary
Jan 2002 – June 2018 Procedures
All Patients

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

Table 2: Operative Mortality, by Primary Procedure





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

	Last Year Jul 2017 - Jun 2018	STS Last 3 Years Jul 2015 - Jun 2018	All Years Jan 2002 - Jun 2018
Number of Operations	42,486	134,235	572,790
Discharge Mortality			
Number of Mortalities	559	1,932	10,141
Number Eligible	42,486	134,235	515,054
Mortality Percent	1.3%	1.4%	2.0%
Operative Mortality			
Number of Mortalities	872	2,780	14,045
Number Eligible	40,976	128,977	463,972
Mortality Percent	2.1%	2.2%	3.0%



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Table 2: Primary Procedures Operative Mortality, All Available Records, Jan 2002 - Jun 2018

Primary Procedure by Organ System	Incidence #	STS Operative Mortality	
		# / Eligible	%
PRIMARY PROCEDURES			
CHEST WALL (v2.07)			
Chest Wall Biopsy	342	3/224	1.3%
Rib Resection (single)	462	5/339	1.5%
First/Cervical Rib Resection	165	0/126	0.0%
Chest Wall Resection	1,121	14/808	1.7%
Chest Wall Reconstruction	182	0/154	0.0%
Thoracoplasty	46	2/25	8.0%
Pectus Repair	182	0/130	0.0%
Sternectomy, complete	27	1/19	5.3%
Sternectomy, partial	110	1/77	1.3%
Muscle Flap	112	5/61	8.2%
Other Chest Wall Repair	1,534	15/998	1.5%
MEDIASTINUM/NECK (v2.07)			
Mediastinal LN Biopsy	2,480	23/1,597	1.4%
Mediastinoscopy	9,965	73/7,406	1.0%
Anterior Mediastinotomy	577	5/449	1.1%
Extended Cervical Mediastinoscopy	78	0/62	0.0%
Mediastinal Lymph Node Dissection	489	2/240	0.8%
Mediastinal Lymph Node Sampling	854	5/598	0.8%
Biopsy, Mediastinal Mass	849	10/601	1.7%
Resection, Mediastinal Mass	1,842	9/1,410	0.6%
Thymectomy	1,409	0/1,090	0.0%
Sympathectomy	1,857	3/1,297	0.2%
Thoracic duct ligation	258	4/195	2.1%
Other Mediastinal/Neck procedure	2,060	41/1,459	2.8%
TRACHEOBRONCHIAL (v2.07)			
Flexible Bronchoscopy	6,416	125/4,208	3.0%
Rigid Bronchoscopy	1,442	35/1,380	2.6%
Removal of Foreign Body (Tracheobronchial)	197	4/176	2.3%
Endobronchial ablation, Laser / PDT	1,424	35/1,334	2.6%
Endobronchial Ablation, Mechanical	348	7/334	2.1%
Tracheal/Bronchial Stent	1,091	55/1,027	5.4%



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TRACHEOBRONCHIAL (v2.07) - continued			
Tracheostomy	3,210	344/2,592	13.3%
Tracheal Repair	107	7/96	7.3%
Tracheal Stricture Resection	378	2/352	0.6%
Tracheal Tumor Resection	116	0/105	0.0%
Carinal Resection (no lung resection)	11	0/10	0.0%
Bronchotomy	10	0/7	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	41/1,705	2.5%
PULMONARY (v2.07)			
Wedge Resection, single	12,723	241/9,068	2.7%
Wedge Resection, multiple	7,970	293/5,956	4.9%
Segmentectomy	1,850	27/1,371	2.0%
Lobectomy	18,952	275/13,938	2.0%
Sleeve Lobectomy	382	7/354	2.0%
Bilobectomy	1,013	32/703	4.6%
Pneumonectomy, standard	1,129	50/826	6.1%
Pneumonectomy, Carinal	41	1/31	3.2%
Completion pneumonectomy	245	19/175	10.9%
Extrapleural pneumonectomy	211	13/134	9.7%
Pneumonectomy, intrapericardial	322	10/239	4.2%
Lung Volume Reduction	325	18/217	8.3%
Bullectomy / repair	1,043	14/820	1.7%
Hydatid Cyst Resection	2	0/2	0.0%
Single Lung Transplant	370	20/339	5.9%
Double Lung Transplant	629	30/581	5.2%
Lung Donor Harvest	16	4/16	25.0%
Other Lung procedure	1,416	57/982	5.8%
ESOPHAGOGASTRIC (v2.07)			
Esophagoscopy, flexible	4,256	38/3,254	1.2%
Esophagoscopy, rigid	91	3/82	3.7%



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ESOPHAGOGASTRIC (v2.07) - continued			
Removal of Foreign Body (Esophagogastric)	163	4/131	3.1%
Dilation of Esophagus	3,523	36/3,301	1.1%
Esophageal Tumor Ablation, Laser / PDT	235	4/201	2.0%
Stent Placement	554	45/502	9.0%
Cervical esophagostomy	81	7/60	11.7%
Anterior Thoracic Esophagostomy	10	0/5	0.0%
Zenker's Diverticulum Repair	231	1/207	0.5%
Myotomy, cricopharyngeal	66	0/51	0.0%
Myotomy, esophageal (long)	209	0/153	0.0%
Myotomy, cardia (short)	494	1/439	0.2%
Resection, intrathoracic diverticulum	85	0/70	0.0%
Resection, esophagus (esophagectomy)	4,393	126/3,624	3.5%
Resection, esophageal wall lesion	102	0/84	0.0%
Repair, perforation of esophagus - Iatrogenic	146	8/122	6.6%
Repair, perforation of esophagus - Malignant	5	0/4	0.0%
Repair, perforation of esophagus - Other	255	20/215	9.3%
Fundoplication, circumferentia	1,448	8/1,094	0.7%
Fundoplication, partial	418	3/361	0.8%
Gastroplasty	162	1/149	0.7%
Pyloroplasty	18	0/16	0.0%
Pyloromyotomy	8	0/8	0.0%
Gastrectomy	209	7/176	4.0%
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	19/542	3.5%
Other GI procedure	785	23/602	3.8%
CARDIAC/PERICARDIUM/GREAT VESSELS (v2.07)			
Pericardial Window	2,735	193/1,720	11.2%



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CARDIAC/PERICARDIUM/GREAT VESSELS (v2.07) - continued			
Pericardiectomy	209	9/152	5.9%
Repair Cardiac Laceration	33	5/27	18.5%
Other Pericardial Procedure	356	12/303	4.0%
Repair / Reconstruction, thoracic aorta	142	7/101	6.9%
Repair / Reconstruction, abd aorta	371	4/31	12.9%
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	1/12	8.3%
Other Cardiac procedure	917	25/461	5.4%
DIAPHRAGM (v2.07)			
Plication of Diaphragm	191	2/160	1.3%
Diaphragmatic Hernia Repair, acute	122	4/90	4.4%
Diaphragmatic Hernia Repair, chronic	456	2/370	0.5%
Resection of Diaphragm	50	2/35	5.7%
Reconstruction of Diaphragm	43	0/29	0.0%
Other Diaphragm procedure	107	1/64	1.6%
PLEURA (v2.07)			
Pleural Drainage Procedure - Open	2,946	193/2,129	9.1%
Pleural Drainage Procedure - Closed	2,314	223/1,599	13.9%
Pleural Biopsy	2,022	73/1,444	5.1%
Pleurodesis	4,014	274/2,971	9.2%
Pleurectomy	506	14/385	3.6%
Decortication	5,692	239/4,317	5.5%
Clagett Procedure	140	7/125	5.6%
Other Pleural procedure	964	41/749	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	0/9	0.0%
Other Air Leak Control Measures	79	2/55	3.6%
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	5	2/5	40.0%
Unlisted procedure, trachea, bronchi (31899) v2.081	2,445	242/1,957	12.4%
Tracheostomy revision simple, without flap (31613) v2.3			
Bronchogenic cyst removal v2.3	14	0/12	0.0%
Tracheal stenosis excision and anastomosis; cervicothoracic (31781)	158	2/140	1.4%
Bronchial laceration suture v2.3	3	0/3	0.0%
Tracheal tumor or carcinoma excision; cervical (31785)	146	2/135	1.5%
Bronchial sleeve resection v2.3	43	0/42	0.0%
Tracheal tumor or carcinoma excision; thoracic (31786)	158	4/146	2.7%
Bronchoplasty, graft repair (31770) v2.3	11	1/11	9.1%
Tracheal wound or injury suture repair; cervical (31800)	57	3/52	5.8%
Bronchoplasty; excision stenosis and anastomosis (31775)	86	4/65	6.2%
Tracheal wound or injury suture repair; intrathoracic (31805)	94	8/85	9.4%
Bronchopleural fistula closure (32906) v2.3	99	5/96	5.2%
Tracheoplasty; cervical (31750)	241	12/133	9.0%
Carinal reconstruction (31766)	26	1/23	4.3%
Tracheoplasty; intrathoracic (31760)	321	8/311	2.6%
Laryngectomy, partial (31370) v2.2, v2.3	5	0/4	0.0%
Tracheostomy revision complex, with flap (31614) v2.3	16	2/15	13.3%
Tracheal stenosis excision and anastomosis; cervical (31780)	838	6/812	0.7%
Tracheostomy mediastinal v2.3	9	0/8	0.0%
BRONCHOSCOPY (v2.081, v2.2, v2.3)			
Bronchoscopy, diagnostic, with or without cell washing (31622)	4,975	137/2,540	5.4%
Bronchoscopy, each additional major bronchus stented (31637)	13	1/8	12.5%
Bronchoscopy, navigational (31627) v2.2, v2.3	30	3/27	11.1%
Bronchoscopy, with bronchial alveolar lavage (BAL) (31624)	912	39/536	7.3%



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BRONCHOSCOPY (v2.081, v2.2, v2.3) - continued			
Bronchoscopy, with bronchial or endobronchial biopsy(s), single or multiple sites (31625)	1,583	33/402	8.2%
Bronchoscopy, with brushing or protected brushings (31623)	329	3/86	3.5%
Bronchoscopy, with 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, with excision of tumor (31640)	444	23/227	10.1%
Bronchoscopy, with placement of bronchial stent(s) (includes tracheal/bronchial dilation as required), initial bronchus (31636)	529	38/318	11.9%
Bronchoscopy, with placement of catheter(s) for intracavitary radioelement application (31643)	64	1/13	7.7%
Bronchoscopy, with placement of Fiducial markers (31626) v2.2, v2.3	1	0/1	0.0%
Bronchoscopy, with placement of tracheal stent(s) (includes tracheal/bronchial dilation as required) (31631)	643	33/371	8.9%
Bronchoscopy, with removal of foreign body (31635)	379	15/212	7.1%
Bronchoscopy, with revision of tracheal or bronchial stent inserted at previous session (31638)	267	5/152	3.3%
Bronchoscopy, with therapeutic aspiration of tracheobronchial tree, initial (drainage of lung abscess) (31645)	163	4/104	3.8%
Bronchoscopy, with therapeutic aspiration of tracheobronchial tree, subsequent (31646)	43	1/36	2.8%
Bronchoscopy, with tracheal/bronchial dilation or closed reduction of fracture (31630)	1,569	14/509	2.8%
Bronchoscopy, with transbronchial lung biopsy(s), each additional lobe (31632)	56	1/17	5.9%
Bronchoscopy, with transbronchial lung biopsy(s), single lobe (31628)	599	8/130	6.2%
Bronchoscopy, with transbronchial needle aspiration biopsy(s) (31629)	1,363	7/192	3.6%
Bronchoscopy, with transbronchial needle aspiration biopsy(s), each additional lobe (31633)	162	1/22	4.5%
Endobronchial ultrasound (EBUS) during bronchoscopy diagnostic or therapeutic intervention(s) (31620)	1,511	10/202	5.0%
Tracheobronchoscopy through established tracheostomy incision (31615)	128	5/71	7.0%
PLEURAL SPACE AND LUNG (v2.081, v2.2 and v2.3)			
Thoracoscopy, diagnostic lungs and pleural space, without biopsy (32601)	1,580	85/1,250	6.8%
Thoracoscopy, surgical; with pleurodesis (e.g., mechanical or chemical) (32650)	6,703	472/5,352	8.8%



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PLEURAL SPACE AND LUNG (v2.081, v2.2 and v2.3) - continued			
Thoracoscopy, surgical; with removal of intrapleural foreign body or fibrin deposit (32653)	866	41/733	5.6%
Thoracoscopy, diagnostic: with biopsy(ies) of lung infiltrate(s) (eg wedge), unilateral (32607) v2.2, v2.3	618	16/548	2.9%
Thoracoscopy, diagnostic: with biopsy(ies) of lung nodule(s) or mass(es) (eg incisional), unilateral (32608) v2.2, v2.3	420	6/398	1.5%
Thoracoscopy, diagnostic: with biopsy(ies) of pleura (32609) v2.2, v2.3	198	10/180	5.6%
Thoracostomy; with rib resection for empyema (32035)	212	18/178	10.1%
Thoracostomy; with open flap drainage for empyema (32036)	393	26/325	8.0%
Thoracotomy with biopsy(ies) lung infiltrate(s) (eg wedge), unilateral (32096)	151	10/131	7.6%
Thoracotomy with biopsy(ies) lung nodule(s) or masses (eg incisional), unilateral (32097)	94	2/83	2.4%
Thoracotomy with biopsy(ies) of pleura (32098)	73	3/65	4.6%
Thoracotomy with cardiac massage (32160)	11	6/10	60.0%
Pleural scarification for repeat pneumothorax (32215)	102	4/67	6.0%
Insertion indwelling tunneled pleural catheter (32550)	3,083	345/2,180	15.8%
Repair lung hernia through chest wall (32800)	109	0/97	0.0%
Closure of chest wall following open flap drainage for empyema (Clagett type procedure) (32810)	130	3/105	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)	753	31/425	7.3%
Thoracoscopy, surgical; with partial pulmonary decortication (32651)	8,818	485/8,018	6.0%
Thoracoscopy, surgical; with total pulmonary decortication (32652)	16,577	684/15,536	4.4%
Thoracoscopy, surgical; with control of traumatic hemorrhage (32654)	1,195	58/1,099	5.3%
Thoracoscopy, surgical; with excision-plication of bullae, including any pleural procedure (32655)	9,005	86/8,489	1.0%
Thoracoscopy, surgical; with parietal pleurectomy (32656)	2,207	79/2,098	3.8%
Thoracoscopy, surgical; with lobectomy (32663)	56,924	487/53,803	0.9%
Thoracoscopy with therapeutic wedge resection (eg mass or nodule, initial, unilateral (32666) v2.2, v2.3	35,009	263/32,836	0.8%
Thoracoscopy with therapeutic wedge resection(eg mass or nodule) each additional resection, ipsilateral (32667) v2.2, v2.3	1,607	21/1,456	1.4%
Thoracoscopy with diagnostic wedge resection followed by anatomic lung resection (32668) v2.2, v2.3	887	15/831	1.8%



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PLEURAL SPACE AND LUNG - continued			
Thoracoscopy with removal of a single lung segment (segmentectomy) (32669) v2.2, v2.3	6,448	40/6,184	0.6%
Thoracoscopy with removal of two lobes (bilobectomy) (32670) v2.2, v2.3	1,032	18/989	1.8%
Thoracoscopy with removal of lung, pneumonectomy (32671) v2.2, v2.3	363	19/345	5.5%
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	757	19/721	2.6%
Thoracotomy with therapeutic wedge resection (eg mass nodule) initial (32505) v2.2, v2.3	5,548	74/5,299	1.4%
Thoracotomy with therapeutic wedge resection (eg mass nodule) each additional resection, ipsilateral (+32506) v2.2, v2.3	644	11/537	2.0%
Thoracotomy with diagnostic wedge resection followed by anatomic lung resection (+32507) v2.2, v2.3	243	5/222	2.3%
Thoracotomy, limited, for biopsy of lung or pleura (i.e.; open lung4 biopsy) (32095) v2.081	867	91/582	15.6%
Thoracotomy, with exploration (32100)	3,176	167/2,691	6.2%
Thoracotomy, major; with control of traumatic hemorrhage and/or repair of lung tear (32110)	1,090	177/1,001	17.7%
Thoracotomy, major; for postoperative complications (32120)	1,661	49/1,518	3.2%
Thoracotomy, major; with cyst(s) removal, with or without a pleural procedure (32140)	276	2/234	0.9%
Thoracotomy, major; with excision-plication of bullae, with or without any pleural procedure (32141)	743	26/676	3.8%
Thoracotomy, major; with removal of intrapleural foreign body or hematoma (32150)	1,230	87/1,117	7.8%
Thoracotomy with open intrapleural pneumolysis (32124) v2.3	138	6/136	4.4%
Decortication, pulmonary, total (32220)	9,761	441/8,734	5.0%
Decortication, pulmonary, partial (32225)	2,752	137/2,419	5.7%
Pleurectomy, parietal (32310)	489	16/461	3.5%
Decortication and parietal pleurectomy (32320)	2,102	98/1,943	5.0%
Thoracotomy, with biopsy of pleura (32098) (v2.081, v2.2)	126	8/82	9.8%
Removal of lung, total pneumonectomy; (32440)	4,197	240/3,872	6.2%
Removal of lung, sleeve (carinal) pneumonectomy (32442)	154	8/139	5.8%
Removal of lung, total pneumonectomy; extrapleural (32445)	654	51/602	8.5%
Removal of lung, single lobe (lobectomy) (32480)	34,628	653/31,475	2.1%



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PLEURAL SPACE AND LUNG - continued			
Removal of lung, two lobes (bilobectomy) (32482)	3,200	110/2,940	3.7%
Removal of lung, single segment (segmentectomy) (32484)	3,101	53/2,874	1.8%
Removal of lung, sleeve lobectomy (32486)	1,748	29/1,656	1.8%
Removal of lung, completion pneumonectomy (32488)	798	59/730	8.1%
Removal of lung, excision-plication of emphysematous lung(s) for lung volume reduction (LVRS) (32491)	432	16/392	4.3%
Resection and repair of portion of bronchus (bronchoplasty) when performed at time of lobectomy or segmentectomy (32501)	55	2/51	4.1%
Resection of apical lung tumor (e.g., Pancoast tumor), including chest wall resection, without chest wall reconstruction(s) (32503)	477	14/448	3.9%
Resection of apical lung tumor (e.g., Pancoast tumor), including chest wall resection, with chest wall reconstruction (32504)	331	8/312	2.6%
Removal of lung, wedge resection, single or multiple(32500) v2.081	4,256	130/3,417	3.8%
Extrapleural enucleation of empyema(empyemectomy) (32540) v2.081	129	5/117	4.3%
Thoracoscopy, diagnostic lungs and pleural space, with biopsy (32602) v2.081	4,675	211/3,581	5.9%
Thoracoscopy, diagnostic pericardial sac, without biopsy (32603) v2.081	23	0/13	0.0%
Thoracoscopy, surgical; with wedge resection of lung, single or multiple (32657) v2.081	17,871	354/14,809	2.4%
LUNG OTHER (v2.081, v2.2 and v2.3)			
Open closure of major bronchial fistula (32815)	492	39/456	8.6%
Thoracoplasty with closure of bronchopleural fistula (32906)	216	14/200	7.0%
Single lung transplant (32851)	1,359	63/1,328	4.7%
Single lung transplant with CPB (32852)	496	35/496	7.1%
Double lung transplant (32853)	2,105	60/2,048	2.9%
Double lung transplant with CPB (32854)	2,805	173/2,773	6.2%
MEDIASTINUM AND DIAPHRAGM (v2.081, v2.2 and v2.3)			
Thoracoscopy, diagnostic; mediastinal space, with biopsy (32606)	899	13/682	1.9%
Mediastinotomy with exploration or biopsy; cervical approach (39000)	1,118	7/250	2.8%
Mediastinotomy with exploration or biopsy; transthoracic approach (39010)	792	11/457	2.4%
Mediastinoscopy, with or without biopsy (39400)	10,550	58/1,987	2.9%
Unlisted procedure, mediastinum (39499)	571	11/253	4.3%
Unlisted procedure, diaphragm (39599)	727	12/695	1.7%



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		# / Eligible	Operative Mortality %
MEDIASTINUM AND DIAPHRAGM (v2.081, v2.2 and v2.3) - continued			
Thoracoscopy, surgical; with excision of mediastinal cyst, tumor, or mass (32662)	5,450	22/5,007	0.4%
Thoracoscopy, diagnostic mediastinal space, without biopsy (32605) v2.081	74	2/60	3.3%
Thoracoscopy with mediastinal and regional lymphadenectomy (+32674) v2.2, v2.3	444	0/400	0.0%
Thoracic lymphadenectomy, regional, including mediastinal and peritracheal nodes (38746)	986	5/633	0.8%
Mediastinal cyst, excision, open, Transthoracic approach (39200)	642	6/551	1.1%
Mediastinal tumor, excision, open, Transthoracic approach (39220)	3,473	34/3,148	1.1%
Thoracoscopy with resection of thymus, unilateral or bilateral (32673) v2.2, v2.3	2,301	7/2,208	0.3%
Thymectomy, transcervical approach (60520)	509	3/425	0.7%
Thymectomy, transthoracic approach (60521)	3,081	12/2,829	0.4%
Thymectomy, transthoracic approach, with radical mediastinal dissection (60522)	1,530	10/1,442	0.7%
VATS thymectomy (605XX) v2.081	402	0/360	0.0%
Diaphragm, laceration repair, any approach (39501)	184	14/176	8.0%
Repair of paraesophageal hiatus hernia, transabdominal with or without fundoplasty (39502) v2.081	1,019	17/934	1.8%
Diaphragmatic hernia repair (other than neonatal), traumatic; acute (39540)	435	7/402	1.7%
Diaphragmatic hernia repair (other than neonatal), traumatic; chronic (39541)	1,141	11/1,086	1.0%
Diaphragm Imbrication (i.e., plication) (39545)	2,013	15/1,903	0.8%
Diaphragm; resection with simple repair (e.g., primary suture) (39560)	342	7/324	2.2%
Diaphragm; resection with complex repair (e.g., prosthetic material, local muscle flap) (39561)	312	3/299	1.0%
ESOPHAGOSCOPY (v2.081, v2.2, v2.3)			
Esophagoscopy (43200)	1,156	25/528	4.7%
Esophagoscopy with biopsy (43202)	646	9/108	8.3%
Esophagoscopy with removal of foreign body (43215)	379	13/210	6.2%
Esophagoscopy with insertion of stent (43219)	817	52/513	10.1%
Esophagoscopy with balloon dilation (43220)	704	2/110	1.8%
Esophagoscopy with insertion of guide wire followed by dilation over guide wire (43226)	1,905	10/342	2.9%
Esophagoscopy with ablation of tumor (43228)	379	2/96	2.1%



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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)	1,527	22/462	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)	2,585	3/136	2.2%
Upper gastrointestinal endoscopy with dilation of gastric outlet for obstruction (43245)	326	4/103	3.9%
Upper gastrointestinal endoscopy with directed placement of percutaneous gastrostomy tube (43246)	637	46/532	8.6%
Upper gastrointestinal endoscopy with removal of foreign body (43247)	315	6/166	3.6%
Upper gastrointestinal endoscopy with insertion of guide wire followed by dilation of esophagus (43248)	3,331	16/526	3.0%
Upper gastrointestinal endoscopy with balloon dilation of esophagus (43249)	727	3/90	3.3%
Upper gastrointestinal endoscopy with transendoscopic stent placement (43256)	627	47/406	11.6%
Upper gastrointestinal endoscopy with ablation of tumor (43258)	361	4/94	4.3%
ESOPHAGUS RESECTION (v2.081, v2.2 and v2.3)			
Transhiatal-Total esophagectomy, without thoracotomy, with cervical esophagogastrostomy (43107)	3,839	106/3,719	2.9%
Three hole-Total esophagectomy with thoracotomy; with cervical esophagogastrostomy (43112)	1,882	84/1,771	4.7%
Ivor Lewis-Partial esophagectomy, distal two-thirds, with thoracotomy and separate abdominal incision (43117)	6,371	218/6,061	3.6%
Thoracoabdominal-Partial esophagectomy, thoracoabdominal approach (43122)	615	23/583	3.9%
Minimally invasive three hole esophagectomy v2.2, v2.3	1,142	33/1,108	3.0%
Minimally invasive esophagectomy, Ivor Lewis approach	4,095	87/3,986	2.2%
Minimally invasive esophagectomy, Abdominal and neck approach	766	29/707	4.1%
Total esophagectomy without thoracotomy; with colon interposition or small intestine reconstruction (43108)	90	8/89	9.0%



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ESOPHAGUS RESECTION (v2.081, v2.2 and v2.3) - continued			
Total esophagectomy with thoracotomy; with colon interposition or small intestine reconstruction (43113)	90	8/83	9.6%
Partial esophagectomy, cervical, with free intestinal graft, including microvascular anastomosis (43116)	17	1/13	7.7%
Partial esophagectomy, with thoracotomy and separate abdominal incision with colon interposition or small intestine (43118)	92	5/84	6.0%
Partial esophagectomy, distal two-thirds, with thoracotomy only (43121)	137	8/124	6.5%
Partial esophagectomy, thoracoabdominal with colon interposition or small intestine (43123)	95	3/89	3.4%
Total or partial esophagectomy, without reconstruction with cervical esophagostomy (43124)	471	41/438	9.4%
Conduit revision s/p esophagectomy v2.3	88	4/86	4.7%
ESOPHAGUS OTHER PROCEDURES (v2.081, v2.2 and v2.3)			
Cricopharyngeal myotomy (43030)	157	0/117	0.0%
Diverticulectomy of hypopharynx or esophagus, with or without myotomy; cervical approach (43130)	279	6/246	2.4%
Esophagostomy, fistulization of esophagus, external; cervical approach (43352)	109	8/96	8.3%
Closure of esophagostomy or fistula; cervical approach (43420)	63	3/49	6.1%
Excision esophageal lesion with 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	200	3/184	1.6%
Unlisted procedure, esophagus (43499)	1,214	19/965	2.0%
Per oral endoscopic myotomy (POEM) v2.3	571	2/526	0.4%
Laparoscopy, surgical with repair of paraesophageal hernia (fundoplasty) without mesh (43281) v2.2, v2.3	7,935	65/6,943	0.9%
Laparoscopy, surgical with repair of paraesophageal hernia (fundoplasty) with mesh (43282) v2.2, v2.3	3,651	26/3,204	0.8%
Laparoscopy, surgical, esophageal lengthening procedure (Collis) (43283) Secondary Procedure code v2.2, v2.3	20	0/19	0.0%
Laparoscopy, surgical, esophagogastric fundoplasty (e.g., Nissen, Toupet procedures) (43280)	7,675	20/6,602	0.3%



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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	4,337	8/3,978	0.2%
Thoracoscopy, surgical; with esophagomyotomy (Heller type) (32665) - v2.081	278	4/245	1.6%
Nissen fundoplasty- laparotomy (includes partial fundoplication/ wrap) (43327) v2.2, v2.3	303	2/275	0.7%
Transthoracic Fundoplication- open thoracotomy (includes Belsey/ Nissen) (43328) v2.2, v2.3	486	6/475	1.3%
Repair, paraesophageal hiatal hernia via laparotomy without mesh (43332) v2.2, v2.3	965	16/950	1.7%
Repair, paraesophageal hiatal hernia via laparotomy with mesh (43333) v2.2, v2.3	223	6/216	2.8%
Repair, paraesophageal hiatal hernia via thoracotomy without mesh (43334) v2.2, v2.3	969	15/958	1.6%
Repair, paraesophageal hiatal hernia via thoracotomy with mesh (43335) v2.2, v2.3	225	1/221	0.5%
Repair, paraesophageal hiatal hernia via thoracoabdominal approach without mesh (43336) v2.2, v2.3	225	1/221	0.5%
Repair, paraesophageal hiatal hernia via thoracoabdominal approach with mesh (43337) v2.2, v2.3	155	4/153	2.6%
Esophageal lengthening procedure - open (Collis) Secondary Procedure code (43338) v2.2, v2.3	70	0/67	0.0%
Diverticulectomy of esophagus, with or without myotomy; thoracic approach (43135)	18	0/17	0.0%
Excision Esophageal lesion with primary repair, thoracic approach (eg: leiomyoma) (43101) v2.2, v2.3	624	10/587	1.7%
Esophagoplasty with repair of TEF, cervical approach (43305) v2.2, v2.3	361	0/345	0.0%
Esophagoplasty with repair TEF, thoracic approach (43312) v2.2, v2.3	65	5/63	7.9%
Esophagomyotomy (Heller type); thoracic approach (43331) v2.2, v2.3	139	6/136	4.4%
Esophagogastric fundoplasty (e.g., Nissen, Belsey IV, Hill procedures) (43324) v2.081	190	2/179	1.1%
Esophagogastric fundoplasty; with gastroplasty (e.g., Collis) (43326) v2.081	694	3/537	0.6%
Esophagomyotomy (Heller type); thoracic approach (43331) v2.081	569	5/513	1.0%
Gastrointestinal reconstruction for previous esophagectomy with stomach (43360)	284	5/235	2.1%
Gastrointestinal reconstruction for previous esophagectomy with colon interposition or small intestine (43361)	248	3/241	1.2%
	247	11/235	4.7%



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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)	182	16/175	9.1%
Suture of esophageal wound or injury; cervical approach (43410)	208	11/196	5.6%
Suture of esophageal wound or injury; transthoracic or transabdominal approach (43415)	1,112	75/1,046	7.2%
Free jejunum transfer with microvascular anastomosis (43496)	16	0/16	0.0%
Total gastrectomy with esophagoenterostomy (43620)	69	6/62	9.7%
Total gastrectomy with Roux-en-Y reconstruction (43621)	676	14/666	2.1%
CHEST WALL AND NECK (v2.081, v2.2 and v2.3)			
Excision tumor, soft tissue of neck or thorax; subcutaneous (21555)	239	2/69	2.9%
Excision tumor, soft tissue of neck or thorax; deep, subfascial, intramuscular (21556)	403	6/213	2.8%
Excision of rib, partial (21600)	389	5/285	1.8%
Excision first and/or cervical rib (21615)	320	0/229	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)	96	0/69	0.0%
Hyoid myotomy and suspension (21685) secondary procedure code	1	0/1	0.0%
Removal of sternal wire(s) v2.3	5	0/3	0.0%
Unlisted procedure, neck or thorax (21899)	2,909	52/1,543	3.4%
Major reconstruction, chest wall (posttraumatic) (32820)	367	3/347	0.9%
Muscle flap, neck (15732)	45	4/38	10.5%
Muscle flap; trunk (i.e., intercostal, pectoralis or serratus muscle) (15734)	437	10/400	2.5%
Excision of chest wall tumor including ribs (19260)	1,140	10/968	1.0%
Excision of chest wall tumor involving ribs, with reconstruction (19271)	1,994	17/1,865	0.9%
Radical resection of tumor (e.g., malignant neoplasm), soft tissue of neck or thorax (21557)	314	8/268	3.0%
Radical resection of sternum (21630)	271	10/252	4.0%
Radical resection of sternum; with mediastinal lymphadenectomy (21632)	42	2/38	5.3%
Reconstructive repair of pectus excavatum or carinatum; open (21740)	891	3/796	0.4%
Reconstructive repair of pectus, minimally invasive approach (Nuss procedure), without thoracoscopy (21742)	131	0/95	0.0%



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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)	930	0/907	0.0%
MISCELLANEOUS (v2.081, v2.2 and v2.3)			
Thoracoscopy, diagnostic pericardial sac, with biopsy (32604)	89	2/70	2.9%
Thoracoscopy, surgical; with removal of clot or foreign body from pericardial sac (32658)	85	1/71	1.4%
Thoracoscopy, surgical; with creation of pericardial window or partial resection of pericardial sac for drainage (32659)	709	49/593	8.3%
Tube pericardiostomy (33015)	91	8/60	13.3%
Pericardial window (33025)	3,297	287/2,449	11.7%
Thoracoscopy, surgical; with thoracic sympathectomy (32664)	995	1/230	0.4%
Removal substernal thyroid, cervical approach (60271)	107	0/82	0.0%
Application of wound vac (97605, 97606) v2.2, v2.3	26	0/25	0.0%
Stereotactic radiosurgery (SRS) and stereotactic body radiotherapy (SBRT) surgeon participation (32701) v2.2, v2.3			
Other Minor Procedure v2.2, v2.3	42	2/38	5.3%
Thoracoscopy, surgical; with total pericardiectomy (32660)	121	7/112	6.3%
Thoracoscopy, surgical; with excision of pericardial cyst, tumor, or mass (32661)	460	1/413	0.2%
Ligation thoracic duct (38381)	1,035	17/944	1.8%
Intraoperative jejunostomy (44015)	1,417	96/1,298	7.4%
Omental flap (49904)	73	7/67	10.4%
Transthoracic thyroidectomy (60270)	228	3/207	1.4%
SVC resection and reconstruction (34502)	31	0/27	0.0%
Other	7,609	218/5,659	3.9%
MISSING DATA			
[Missing data]	3,846	28/1,128	2.5%