



Patient Safety Indicator 22 (PSI 22) Iatrogenic Pneumothorax Rate

June 2017

Area-Level Indicator

Type of Score: Rate

Prepared by:

Agency for Healthcare Research and Quality

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DESCRIPTION

Iatrogenic pneumothorax cases per 100,000 population, ages 18 years and older. Excludes obstetric cases and cases with chest trauma, pleural effusion, thoracic surgery, lung or pleural biopsy, diaphragmatic surgery repair, or cardiac procedures.

[NOTE: The software provides the rate per population. However, common practice reports the measure as per 100,000 population. The user must multiply the rate obtained from the software by 100,000 to report events per 100,000 population.]

NUMERATOR

Surgical and medical discharges, for patients ages 18 years and older, with any-listed ICD-9-CM diagnosis codes for iatrogenic pneumothorax. Surgical and medical discharges are defined by specific MS-DRG codes.

[Appendix C – Medical Discharge MS-DRGs](#)

[Appendix E – Surgical Discharge MS-DRGs](#)

Iatrogenic pneumothorax diagnosis codes: (IATROID)

5121 Iatrogenic pneumothorax

NUMERATOR EXCLUSIONS

Exclude cases:

- with any-listed ICD-9-CM diagnosis codes for pleural effusion
- with any-listed ICD-9-CM diagnosis codes for specified chest trauma
- with any-listed ICD-9-CM procedure codes for thoracic surgery
- with any-listed ICD-9-CM procedure codes for lung or pleural biopsy
- with any-listed ICD-9-CM procedure codes for diaphragmatic surgery repair
- with any-listed ICD-9-CM procedure codes for cardiac procedure
- MDC 14 (pregnancy, childbirth, and puerperium)
- with missing gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), principal diagnosis (DX1=missing), or county (PSTCO=missing)

Pleural effusion diagnosis codes: (PLEURAD)

0101	Tuberculous pleurisy in primary progressive tuberculosis	01176	Tpneu, tubercle bacili not found by bacteriological or histological but confirmed other methods
01010	Tuberculous pleurisy in primary progressive tuberculosis, unspecified	0120	Tuberculous pleurisy
01011	Tpippt, bacterial or histological exam not done	01200	Tuberculous pleurisy, unspecified
01012	Tpippt, bacterial or histological exam unknown	01201	Tp, bacterial or histological exam not done
01013	Tpippt, tubercle bacili found by microscopy	01202	Tp, bacterial or histological exam unknown
01014	Tpippt, tubercle bacili not found by microscopy but by bacterial culture	01203	Tp, tubercle bacili found by microscopy
01015	Tpippt, tubercle bacili not found by bacteriological but confirmed histologically	01204	Tp, tubercle bacili not found by microscopy but by bacterial culture
01016	Tpippt, tubercle bacili not found by bacteriological or histological but confirmed other methods	01205	Tp, tubercle bacili not found by bacteriological but confirmed histologically
0117	Tubrculous pneumothorax	01206	Tp, tubercle bacili not found by bacteriological or histological but confirmed other methods
01170	Tubrculous pneumothorax, unspecified	1972	Second malig neo pleura
01171	Tpneu, bacterial or histological exam not done	5111	With efusion, with mention of a bacterial cause other than tuberculosis
01172	Tpneu, bacterial or histological exam unknown	5118	Other specified form of effusion, except tuberculous
01173	Tpneu, tubercle bacili found by microscopy	51181	Malignant pleural effusn

01174	Tpneu, tubercle bacili not found by microscopy but by bacterial culture	51189	Effusion nec exc tb
01175	Tpneu, tubercle bacili not found by bacteriological but confirmed histologically	5119	Unspecified pleural effusion

Chest trauma diagnosis codes: (CTRAUMD)

80700	Closed fracture of rib(s), unspecified	86111	Contusion of heart with open wound into thorax
80701	Closed fracture of one rib	86112	Laceration of heart without penetration of heart chambers, with open wound into thorax
80702	Closed fracture of two ribs	86113	Laceration of heart with penetration of heart chambers with open wound into thorax
80703	Closed fracture of three ribs	86120	Unspecified injury of lung without mention of open wound into thorax
80704	Closed fracture of four ribs	86122	Laceration of lung without mention of open wound into thorax
80705	Closed fracture of five ribs	86130	Unspecified injury of lung with open wound into thorax
80706	Closed fracture of six ribs	86131	Contusion of lung with open wound into thorax
80707	Closed fracture of seven ribs	86132	Laceration of lung with open wound into thorax
80708	Closed fracture of eight or more ribs	8620	Injury to diaphragm, without mention of open wound into cavity
80709	Closed fracture of multiple ribs, unspecified	8621	Injury to diaphragm, with open wound into cavity
80710	Open fracture of rib(s), unspecified	86221	Injury to bronchus without mention of open wound into cavity
80711	Open fracture of one rib	86222	Injury to esophagus without mention of open wound into cavity
80712	Open fracture of two ribs	86229	Injury to other specified intrathoracic organs without mention of open wound into cavity
80713	Open fracture of three ribs	86231	Injury to bronchus with open wound into cavity
80714	Open fracture of four ribs	86232	Injury to esophagus with open wound into cavity
80715	Open fracture of five ribs	86239	Injury to other specified intrathoracic organs with open wound into cavity
80716	Open fracture of six ribs	8628	Injury to multiple and unspecified intrathoracic organs, without mention of open wound into cavity

80717	Open fracture of seven ribs	8629	Injury to multiple and unspecified intrathoracic organs, with open wound into cavity
80718	Open fracture of eight or more ribs	8750	Open wound of chest (wall), without mention of complication
80719	Open fracture of multiple ribs, unspecified	8751	Open wound of chest (wall), complicated
8072	Closed fracture of sternum	8760	Open wound of back, without mention of complication
8073	Open fracture of sternum	8761	Open wound of back, complicated
8074	Flail chest	9010	Injury to thoracic aorta
8075	Closed fracture of larynx and trachea	9011	Injury to innominate and subclavian arteries
8076	Open fracture of larynx and trachea	9012	Injury to superior vena cava
8600	Traumatic pneumothorax without mention of open wound into thorax	9013	Injury to innominate and subclavian veins
8601	Traumatic pneumothorax with open wound into thorax	90140	Injury to pulmonary vessel(s), unspecified
8602	Traumatic hemothorax without mention of open wound into thorax	90141	Injury to pulmonary artery
8603	Traumatic hemothorax with open wound into thorax	90142	Injury to pulmonary vein
8604	Traumatic pneumohemothorax without mention of open wound into thorax	90181	Injury to intercostal artery or vein
8605	Traumatic pneumohemothorax with open wound into thorax	90182	Injury to internal mammary artery or vein
86100	Unspecified injury of heart without mention of open wound into thorax	90183	Injury to multiple blood vessels of thorax
86102	Laceration of heart without penetration of heart chambers or without mention of open wound into thorax	90189	Injury to other specified blood vessels of thorax
86103	Laceration of heart with penetration of heart chambers without mention of open wound into thorax	9019	Injury to unspecified blood vessel of thorax
86110	Unspecified injury of heart with open wound into thorax		

Thoracic surgery procedure codes: (THORAIP)

0522	Cervical sympathectomy	3428	Other diagnostic procedures on chest wall, pleura, and diaphragm
0523	Lumbar sympathectomy	3429	Other diagnostic procedures on mediastinum
0529	Other sympathectomy	343	Excision or destruction of lesion or tissue of mediastinum

0780	Thymectomy nos	344	Excision or destruction of lesion of chest wall
0781	Oth part excision thymus	3451	Decortication of lung
0782	Oth totl excision thymus	3452	Thorascopsc decort lung
0783	Thorac part exisn thymus	3459	Other excision of pleura
0784	Thorac total exc thymus	3471	Suture of laceration of chest wall
3121	Mediastinal tracheostomy	3472	Closure of thoracostomy
3145	Open biopsy of larynx or trachea	3473	Closure of other fistula of thorax
3173	Closure of other fistula of trachea	3474	Repair of pectus deformity
3179	Other repair and plastic operations on trachea	3479	Other repair of chest wall
3199	Other operations on trachea	3481	Excision of lesion or tissue of diaphragm
3209	Other local excision or destruction of lesion or tissue of bronchus	3482	Suture of laceration of diaphragm
321	Other excision of bronchus	3483	Closure of fistula of diaphragm
3220	Thorac exc lung lesion	3484	Other repair of diaphragm
3221	Plication of emphysematious bleb	3485	Implantation of diaphragmatic pacemaker
3222	Lung volume reduction surgery	3489	Other operations on diaphragm
3223	Open abltn lung les/tiss	3493	Repair of pleura
3224	Perc abltn lung les/tiss	3499	Other
3225	Thor abltn lung les/tiss	4061	Cannulation of thoracic duct
3226	Abltn lung tiss nec/nos	4062	Fistulization of thoracic duct
3227	Brnc thrmplsty, ablt mscl	4063	Closure of fistula of thoracic duct
3228	Endoscopic excision or detruction of lesion or tissue of lung	4064	Ligation of thoracic duct
3229	Other local excision or destruction of lesion or tissue of lung	4069	Other operations on thoracic duct
323	Segmental resection of lung	4201	Incision of esophageal web
3230	Thorac seg lung resect	4209	Other incision of exophagus
3239	Oth seg lung resect nos	4210	Esophagostomy, nos
324	Lobectomy of lung	4211	Cervical esophagostomy
3241	Thorac lobectomy lung	4212	Exteriorization of esophageal pouch
3249	Lobectomy of lung nec	4219	Other external fistulization of esophagus
325	Complete pneumonectomy	4221	Operative esophagoscopy by incision
3250	Thorascopsc pneumonectomy	4225	Open biopsy of esophagus
3259	Other pneumonectomy nos	4231	Local excision of esophageal diverticulum
326	Radical dissection of thoracic structures	4232	Local excision of other lesion or tissue of esophagus
329	Other excision of lung	4239	Other destruction of lesion or tissue of esophagus
330	Incision of bronchus	4240	Esophagectomy, nos
331	Incision of lung	4241	Partial esophagectomy
3320	Thorascopsc lung biopsy	4242	Total esophagectomy

3325	Open biopsy of bronchus	4251	Intrathoracic esophagoesophagostomy
3327	Closed endoscopic biopsy of lung	4252	Intrathoracic esophagogastrostomy
3331	Destruction of phrenic nerve for collapse of lung (no longer performed)	4253	Intrathoracic esophageal anastomosis with interposition of small bowel
3332	Artificial pneumothorax for collapse of lung	4254	Other intrathoracic esophagoenterostomy
3334	Thoracoplasty	4255	Intrathoracic esophageal anastomosis with interposition of colon
3339	Other surgical collapse of lung	4256	Other intrathoracic esophagocolostomy
3341	Suture of laceration of bronchus	4258	Intrathoracic esophageal anastomosis with other interposition
3342	Closure of bronchial fistula	4259	Other intrathoracic anastomosis of esophagus
3343	Closure of laceration of lung	4261	Antesternal esophagoesophagostomy
3348	Other repair and plastic operations on bronchus	4262	Antesternal esophagogastrostomy
3349	Other repair and plastic operations on lung	4263	Antesternal esophageal anastomosis with interposition of small bowel
335	Lung transplantation	4264	Other antesternal esophagoenterostomy
3350	Lung transplantation, nos	4265	Antesternal esophageal anastomosis with interposition of colon
3351	Unilateral lung transplantation	4266	Other antesternal esophagocolostomy
3352	Bilateral lung transplantation	4268	Other antesternal esophageal anastomosis with interposition
336	Combined heart-lung transplantation	4269	Other antesternal anastomosis of esophagus
3392	Ligation of bronchus	427	Esophagomyotomy
3393	Puncture of lung	4281	Insertion of permanent tube into esophagus
3398	Other operations on bronchus	4282	Suture of laceration of esophagus
3399	Other operations on lung	4283	Closure of esophagostomy
3329	Other diagnostic procedure on lung and bronchus	4284	Repair of esophageal fistula, nec
3333	Pneumoperitoneum for collapse of lung	4285	Repair of esophageal stricture
3401	Incision of chest wall	4286	Production of subcutaneous tunnel without esophageal anastomosis
3402	Exploratory thoracotomy	4287	Other graft of esophagus
3403	Reopening of recent thoracotomy site	4289	Other repair of esophagus
3405	Creation of pleuroperitoneal shunt	435	Proximal gastrectomy
3409	Other incision of pleura	4399	Total gastrectomy nec
341	Incision of mediastinum	4465	Esophagogastroplasty
3420	Thoracoscopic pleural bx	4466	Other procedures for creation of esophagogastric sphincteric competence
3421	Transpleural thoracoscopy	4467	Lap creat esoph sphinct
3422	Mediastinoscopy	7781	Oth chest cage ostectomy
3423	Biopsy of chest wall	7791	Tot chest cage ostectomy

3425	Closed [percutaneous][needle] biopsy of mediastinum	8104	Dorsal and dorso-lumbar fusion, anterior technique
3426	Open biopsy of mediastinum	8134	Refusion of dorsal and dorsolumbar spine, anterior technique
3427	Biopsy of diaphragm		

Lung or pleural biopsy procedure codes: (LUNGBIP)

3326	Closed [percutaneous] [needle] biopsy of lung	3424	Pleural biopsy
3328	Open biopsy of lung		

Diaphragmatic surgery repair procedure codes: (DIAPHRP)

537	Abd repair-diaphr hernia	5381	Diaphragmatic plication
5371	Lap abd rep-diaphr hern	5382	Parastern hernia repair
5372	Opn abd diaphrm hern nec	5383	Lap thorc app-diaph hern
5375	Abd rep-diaphr hern nos	5384	Opn thorc diaph hern nec
5380	Thor rep-diaph hern nos		

Cardiac procedure codes: (CARDSIP)

3506	Transapical replacement of aortic valve	3613	(Aorto)coronary bypass of three coronary arteries
3508	Transapical replacement of pulmonary valve	3614	(Aorto)coronary bypass of four or more coronary arteries
3510	Open heart valvuloplasty without replacement, unspecified valve	3615	Single internal mammary-coronary artery bypass
3511	Open heart valvuloplasty of aortic valve without replacement	3616	Double internal mammary-coronary artery bypass
3512	Open heart valvuloplasty of mitral valve without replacement	3617	Abdominal -coronary artery bypass
3513	Open heart valvuloplasty of pulmonary valve without replacement	3619	Other bypass anastomosis for heart revascularization
3514	Open heart valvuloplasty of tricuspid valve without replacement	362	Heart revascularization by arterial implant
3520	Replacement of unspecified heart valve	3631	Open chest transmyocardial revascularization
3521	Replacement of aortic valve with tissue graft	3632	Other transmyocardial revascularization
3522	Other replacement of aortic valve	3639	Other heart revascularization
3523	Replacement of mitral valve with tissue graft	3691	Repair of aneurysm of coronary vessel
3524	Other replacement of mitral valve	3699	Other operations on vessels of heart
3525	Replacement of pulmonary valve with tissue graft	370	Pericardiocentesis

3526	Other replacement of pulmonary valve	3710	Incision of heart, not otherwise specified
3527	Replacement of tricuspid valve with tissue graft	3711	Cardiotomy
3528	Other replacement of tricuspid valve	3712	Pericardiectomy
3531	Operations on papillary muscle	3731	Pericardiectomy
3532	Operations on chordae tendineae	3732	Excision of aneurysm of heart
3533	Annuloplasty	3733	Excision or destruction of other lesion or tissue of heart, open approach
3534	Infundibulectomy	3735	Partial ventriculectomy
3535	Operations on trabeculae carneae cordis	3736	EXC LEFT ATRIAL APPENDAG
3539	Operations on other structures adjacent to valves of heart	3737	EXC/DEST HRT LES, THRSPC
3550	Repair of unspecified septal defect of heart with prosthesis	3741	Implantation of prosthetic cardiac support device around the heart
3551	Repair of atrial septal defect with prosthesis, open technique	3749	Other repair of heart and pericardium
3553	Repair of ventricular septal defect with prosthesis, open technique	3751	Heart transplantation
3554	Repair of endocardial cushion defect with prosthesis	3752	Implantation of total replacement heart system
3560	Repair of unspecified septal defect of heart with tissue graft	3753	Replacement of repair of thoracic unit of total replacement heart system
3561	Repair of atrial septal defect with tissue graft	3754	Replacement or repair of other implantable component of total replacement heart system
3562	Repair of ventricular septal defect with tissue graft	3755	REM INT BIVENT HRT SYS
3563	Repair of endocardial cushion defect with tissue graft	3760	IMP BIVN EXT HRT AST SYS
3570	Other and unspecified repair of unspecified septal defect of heart	3761	Implant of pulsation balloon
3571	Other and unspecified repair of atrial septal defect	3762	Insertion of non-implantable heart assist system
3572	Other and unspecified repair of ventricular septal defect	3763	Repair of heart assist system
3573	Other and unspecified repair of endocardial cushion defect	3764	Removal of heart assist system
3581	Total repair of tetralogy of Fallot	3765	Implant of external heart assist system
3582	Total repair of total anomalous pulmonary venous connection	3766	Insertion of implantable heart assist system
3583	Total repair of truncus arteriosus	3767	Implantation of cardiomyostimulation system
3584	Total correction of transposition of great vessels, not elsewhere classified	3791	Open chest cardiac massage

3591	Interatrial transposition of venous return	3804	Incision of vessel, aorta
3592	Creation of conduit between right ventricle and pulmonary artery	3805	Incision of vessel, other thoracic
3593	Creation of conduit between left ventricle and aorta	3844	Resection of abdominal aorta with graft replacement
3594	Creation of conduit between atrium and pulmonary artery	3845	Resection of thoracic vessel with graft replacement
3595	Revision of corrective procedure on heart	3864	Excision of lesion of aorta
3597	PERC MTRL VLV REPR W IMP	3865	Excision of lesion other thoracic vessel
3598	Other operations on septa of heart	3884	Ligation , division of aorta
3599	Other operations on valves of heart	3885	Ligation, division of other thoracic vessels
3603	Open chest coronary artery angioplasty	390	Systemic to pulmonary artery shunt
3610	Aortocoronary bypass for heart revascularization, not otherwise specified	3921	Caval-pulmonary artery anastomosis
3611	(Aorto)coronary bypass of one coronary artery	3922	Aorta-subclavian-carotid bypass
3612	(Aorto)coronary bypass of two coronary arteries	3923	Other intrathoracic vascular shunt or bypass

DENOMINATOR

Population ages 18 years and older in metropolitan area† or county. Discharges in the numerator are assigned to the denominator based on the metropolitan area or county of the patient residence, not the metropolitan area or county of the hospital where the discharge occurred.

† The term “metropolitan area” (MA) was adopted by the U.S. Census in 1990 and referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs) and primary metropolitan statistical areas (PMSAs). In addition, “area” could refer to either 1) FIPS county, 2) modified FIPS county, 3) 1999 OMB Metropolitan Statistical Area or 4) 2003 OMB Metropolitan Statistical Area. Micropolitan Statistical Areas are not used in the QI software.