

## **Patient Safety Indicator 04 (PSI 04)**

### **Death Rate among Surgical Inpatients with Serious Treatable Complications**

**July 2016**

**Provider-Level Indicator**

**Type of Score: Rate**

**Prepared by:**

Agency for Healthcare Research and Quality

U.S. Department of Health and Human Services

[www.qualityindicators.ahrq.gov](http://www.qualityindicators.ahrq.gov)

#### **DESCRIPTION**

In-hospital deaths per 1,000 surgical discharges, among patients ages 18 through 89 years or obstetric patients, with serious treatable complications (deep vein thrombosis/ pulmonary embolism, pneumonia, sepsis, shock/cardiac arrest, or gastrointestinal hemorrhage/acute ulcer). Includes metrics for the number of discharges for each type of complication. Excludes cases transferred to an acute care facility.

*[NOTE: The software provides the rate per hospital discharge. However, common practice reports the measure as per 1,000 discharges. The user must multiply the rate obtained from the software by 1,000 to report in-hospital deaths per 1,000 hospital discharges.]*

## **NUMERATOR**

### **Overall**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

### **STRATUM\_DVT: DEEP VEIN THROMBOSIS/PULMONARY EMBOLISM (DVT/PE)**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

### **STRATUM\_PNEUMONIA: PNEUMONIA**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

### **STRATUM\_SEPSIS: SEPSIS**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

### **STRATUM\_SHOCK: SHOCK/CARDIAC ARREST**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

### **STRATUM\_GI\_HEM: GASTROINTESTINAL (GI) HEMORRHAGE/ACUTE ULCER**

Number of deaths (DISP=20) among cases meeting the inclusion and exclusion rules for the denominator.

## **DENOMINATOR**

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- meet the inclusion and exclusion criteria for STRATUM\_DVT (deep vein thrombosis or pulmonary embolism), STRATUM\_PNEUMONIA (pneumonia), STRATUM\_SEPSIS (sepsis), STRATUM\_SHOCK (shock or cardiac arrest), or STRATUM\_GI\_HEM (gastrointestinal hemorrhage or acute ulcer).

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

[\*Appendix A – Operating Room Procedure Codes\*](#)

[\*Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)\*](#)

## **DENOMINATOR EXCLUSIONS**

Exclude cases:

- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

In the event that a discharge record meets the denominator criteria for several strata, the software assigns the record to the one (and only one) candidate stratum that has the highest risk of the outcome (i.e., observed mortality rate in the AHRQ QI POA reference population). In other words, if a record meets the criteria to be in the denominator for both STRATUM\_SEPSIS and STRATUM\_SHOCK, and if shock and cardiac arrest has a higher observed mortality rate in the reference population data, then the software would assign the record to STRATUM\_SHOCK, and would not assign it to STRATUM\_SEPSIS.

For PSI 04, prioritization to ensure mutual exclusivity for the strata is as follows:

STRATUM\_SHOCK

STRATUM\_SEPSIS

STRATUM\_PNEUMONIA

STRATUM\_DVT

STRATUM\_GI\_HEM

## DENOMINATOR STRATUM\_DVT

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- any secondary ICD-10-CM diagnosis codes for deep vein thrombosis or pulmonary embolism.

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

STRATUM\_GI\_HEM

[Appendix A – Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)](#)

*Pulmonary embolism or deep vein thrombosis diagnosis codes (for discharges on or after October 1, 2009): (FTR2DXB)*

I2602	Saddle embolus of pulmonary artery with acute cor pulmonale	I80291	Phlebitis and thrombophlebitis of other deep vessels of right lower extremity
I2609	Other pulmonary embolism with acute cor pulmonale	I80292	Phlebitis and thrombophlebitis of other deep vessels of left lower extremity
I2692	Saddle embolus of pulmonary artery without acute cor pulmonale	I80293	Phlebitis and thrombophlebitis of other deep vessels of lower extremity, bilateral
I2699	Other pulmonary embolism without acute cor pulmonale	I80299	Phlebitis and thrombophlebitis of other deep vessels of unspecified lower extremity
I8010	Phlebitis and thrombophlebitis of unspecified femoral vein	I82401	Acute embolism and thrombosis of unspecified deep veins of right lower extremity
I8011	Phlebitis and thrombophlebitis of right femoral vein	I82402	Acute embolism and thrombosis of unspecified deep veins of left lower extremity
I8012	Phlebitis and thrombophlebitis of left femoral vein	I82403	Acute embolism and thrombosis of unspecified deep veins of lower extremity, bilateral
I8013	Phlebitis and thrombophlebitis of femoral vein, bilateral	I82409	Acute embolism and thrombosis of unspecified deep veins of unspecified lower extremity
I80201	Phlebitis and thrombophlebitis of unspecified deep vessels of right lower extremity	I82411	Acute embolism and thrombosis of right femoral vein
I80202	Phlebitis and thrombophlebitis of unspecified deep vessels of left lower extremity	I82412	Acute embolism and thrombosis of left femoral vein
I80203	Phlebitis and thrombophlebitis of unspecified deep vessels of lower extremities, bilateral	I82413	Acute embolism and thrombosis of femoral vein, bilateral

I80209	Phlebitis and thrombophlebitis of unspecified deep vessels of unspecified lower extremity	I82419	Acute embolism and thrombosis of unspecified femoral vein
I80211	Phlebitis and thrombophlebitis of right iliac vein	I82421	Acute embolism and thrombosis of right iliac vein
I80212	Phlebitis and thrombophlebitis of left iliac vein	I82422	Acute embolism and thrombosis of left iliac vein
I80213	Phlebitis and thrombophlebitis of iliac vein, bilateral	I82423	Acute embolism and thrombosis of iliac vein, bilateral
I80219	Phlebitis and thrombophlebitis of unspecified iliac vein	I82429	Acute embolism and thrombosis of unspecified iliac vein
I80221	Phlebitis and thrombophlebitis of right popliteal vein	I82431	Acute embolism and thrombosis of right popliteal vein
I80222	Phlebitis and thrombophlebitis of left popliteal vein	I82432	Acute embolism and thrombosis of left popliteal vein
I80223	Phlebitis and thrombophlebitis of popliteal vein, bilateral	I82433	Acute embolism and thrombosis of popliteal vein, bilateral
I80229	Phlebitis and thrombophlebitis of unspecified popliteal vein	I82439	Acute embolism and thrombosis of unspecified popliteal vein
I80231	Phlebitis and thrombophlebitis of right tibial vein	I824Y1	Acute embolism and thrombosis of unspecified deep veins of right proximal lower extremity
I80232	Phlebitis and thrombophlebitis of left tibial vein	I824Y2	Acute embolism and thrombosis of unspecified deep veins of left proximal lower extremity
I80233	Phlebitis and thrombophlebitis of tibial vein, bilateral	I824Y3	Acute embolism and thrombosis of unspecified deep veins of proximal lower extremity, bilateral
I80239	Phlebitis and thrombophlebitis of unspecified tibial vein	I824Y9	Acute embolism and thrombosis of unspecified deep veins of unspecified proximal lower extremity

**DENOMINATOR EXCLUSIONS STRATUM\_DVT**

Exclude cases:

- with a principal ICD-10-CM diagnosis code for deep vein thrombosis or pulmonary embolism
- with a principal ICD-10-CM diagnosis code for abortion-related or postpartum obstetric pulmonary embolism
- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

***Abortion-related or postpartum obstetric pulmonary embolism diagnosis codes: (OBEMBOL)***

O032	Embolism following incomplete spontaneous abortion	O88212	Thromboembolism in pregnancy, second trimester
O037	Embolism following complete or unspecified spontaneous abortion	O88213	Thromboembolism in pregnancy, third trimester
O047	Embolism following (induced) termination of pregnancy	O88219	Thromboembolism in pregnancy, unspecified trimester
O072	Embolism following failed attempted termination of pregnancy	O8822	Thromboembolism in childbirth
O082	Embolism following ectopic and molar pregnancy	O8823	Thromboembolism in the puerperium
O88211	Thromboembolism in pregnancy, first trimester		

**DENOMINATOR STRATUM\_PNEUMONIA**

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- any secondary ICD-10-CM diagnosis codes for pneumonia.

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

[Appendix A – Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)](#)

***Pneumonia diagnosis codes: (FTR3DX)***

A481	Legionnaires disease	J155	Pneumonia due to Escherichia coli
J13	Pneumonia due to Streptococcus pneumoniae	J156	Pneumonia due to other aerobic Gram-negative bacteria
J14	Pneumonia due to Hemophilus influenzae	J158	Pneumonia due to other specified bacteria
J150	Pneumonia due to Klebsiella pneumoniae	J159	Unspecified bacterial pneumonia
J151	Pneumonia due to Pseudomonas	J180	Bronchopneumonia, unspecified organism
J1520	Pneumonia due to staphylococcus, unspecified	J181	Lobar pneumonia, unspecified organism
J15211	Pneumonia due to Methicillin susceptible Staphylococcus aureus	J182	Hypostatic pneumonia, unspecified organism
J15212	Pneumonia due to Methicillin resistant Staphylococcus aureus	J188	Other pneumonia, unspecified organism
J1529	Pneumonia due to other staphylococcus	J189	Pneumonia, unspecified organism
J153	Pneumonia due to streptococcus, group B	J690	Pneumonitis due to inhalation of food and vomit
J154	Pneumonia due to other streptococci	J811	Chronic pulmonary edema



## DENOMINATOR EXCLUSIONS STRATUM\_PNEUMONIA

Exclude cases:

- with a principal ICD-10-CM diagnosis code for pneumonia
- with a principal ICD-10-CM diagnosis code for respiratory complications
- with any-listed ICD-10-CM diagnosis codes for viral pneumonia or influenza
- with any-listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state
- with any-listed ICD-10-PCS procedure codes for lung cancer
- MDC 4 (diseases/disorders of respiratory system)
- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

### [Appendix I – Immunocompromised State Diagnosis and Procedure Codes](#)

#### ***Respiratory complications diagnosis codes: (FTR3EXA)***

J954	Chemical pneumonitis due to anesthesia	J9588	Other intraoperative complications of respiratory system, not elsewhere classified
J95851	Ventilator associated pneumonia	J9589	Other postprocedural complications and disorders of respiratory system, not elsewhere classified
J95859	Other complication of respirator [ventilator]		

#### ***Viral pneumonia or influenza diagnosis codes: (FTR3EXB)***

A221	Pulmonary anthrax	J1100	Influenza due to unidentified influenza virus with unspecified type of pneumonia
A3701	Whooping cough due to Bordetella pertussis with pneumonia	J1108	Influenza due to unidentified influenza virus with specified pneumonia
A3711	Whooping cough due to Bordetella parapertussis with pneumonia	J111	Influenza due to unidentified influenza virus with other respiratory manifestations
A3781	Whooping cough due to other Bordetella species with pneumonia	J112	Influenza due to unidentified influenza virus with gastrointestinal manifestations
A3791	Whooping cough, unspecified species with pneumonia	J1181	Influenza due to unidentified influenza virus with encephalopathy

B250	Cytomegaloviral pneumonitis	J1182	Influenza due to unidentified influenza virus with myocarditis
B440	Invasive pulmonary aspergillosis	J1183	Influenza due to unidentified influenza virus with otitis media
J09X1	Influenza due to identified novel influenza A virus with pneumonia	J1189	Influenza due to unidentified influenza virus with other manifestations
J09X2	Influenza due to identified novel influenza A virus with other respiratory manifestations	J120	Adenoviral pneumonia
J09X3	Influenza due to identified novel influenza A virus with gastrointestinal manifestations	J121	Respiratory syncytial virus pneumonia
J09X9	Influenza due to identified novel influenza A virus with other manifestations	J122	Parainfluenza virus pneumonia
J1000	Influenza due to other identified influenza virus with unspecified type of pneumonia	J123	Human metapneumovirus pneumonia
J1001	Influenza due to other identified influenza virus with the same other identified influenza virus pneumonia	J1281	Pneumonia due to SARS-associated coronavirus
J1008	Influenza due to other identified influenza virus with other specified pneumonia	J1289	Other viral pneumonia
J101	Influenza due to other identified influenza virus with other respiratory manifestations	J129	Viral pneumonia, unspecified
J102	Influenza due to other identified influenza virus with gastrointestinal manifestations	J157	Pneumonia due to Mycoplasma pneumoniae
J1081	Influenza due to other identified influenza virus with encephalopathy	J160	Chlamydial pneumonia
J1082	Influenza due to other identified influenza virus with myocarditis	J168	Pneumonia due to other specified infectious organisms
J1083	Influenza due to other identified influenza virus with otitis media	J17	Pneumonia in diseases classified elsewhere

J1089 Influenza due to other identified  
influenza virus with other  
manifestations

***Lung cancer procedure codes: (LUNGCIP)***

0BBC4ZZ	Excision of Right Upper Lung Lobe, Percutaneous Endoscopic Approach	0BTD0ZZ	Resection of Right Middle Lung Lobe, Open Approach
0BBD4ZZ	Excision of Right Middle Lung Lobe, Percutaneous Endoscopic Approach	0BTD4ZZ	Resection of Right Middle Lung Lobe, Percutaneous Endoscopic Approach
0BBF4ZZ	Excision of Right Lower Lung Lobe, Percutaneous Endoscopic Approach	0BTF0ZZ	Resection of Right Lower Lung Lobe, Open Approach
0BBG4ZZ	Excision of Left Upper Lung Lobe, Percutaneous Endoscopic Approach	0BTF4ZZ	Resection of Right Lower Lung Lobe, Percutaneous Endoscopic Approach
0BBH4ZZ	Excision of Lung Lingula, Percutaneous Endoscopic Approach	0BTG0ZZ	Resection of Left Upper Lung Lobe, Open Approach
0BBJ4ZZ	Excision of Left Lower Lung Lobe, Percutaneous Endoscopic Approach	0BTG4ZZ	Resection of Left Upper Lung Lobe, Percutaneous Endoscopic Approach
0BBK0ZZ	Excision of Right Lung, Open Approach	0BTH0ZZ	Resection of Lung Lingula, Open Approach
0BBK3ZZ	Excision of Right Lung, Percutaneous Approach	0BTH4ZZ	Resection of Lung Lingula, Percutaneous Endoscopic Approach
0BBK4ZZ	Excision of Right Lung, Percutaneous Endoscopic Approach	0BTJ0ZZ	Resection of Left Lower Lung Lobe, Open Approach
0BBK7ZZ	Excision of Right Lung, Via Natural or Artificial Opening	0BTJ4ZZ	Resection of Left Lower Lung Lobe, Percutaneous Endoscopic Approach
0BBL0ZZ	Excision of Left Lung, Open Approach	0BTK0ZZ	Resection of Right Lung, Open Approach
0BBL3ZZ	Excision of Left Lung, Percutaneous Approach	0BTK4ZZ	Resection of Right Lung, Percutaneous Endoscopic Approach
0BBL4ZZ	Excision of Left Lung, Percutaneous Endoscopic Approach	0BTL0ZZ	Resection of Left Lung, Open Approach
0BBL7ZZ	Excision of Left Lung, Via Natural or Artificial Opening	0BTL4ZZ	Resection of Left Lung, Percutaneous Endoscopic Approach

0BTC0ZZ    Resection of Right Upper Lung Lobe,  
Open Approach

0BTM0ZZ    Resection of Bilateral Lungs, Open  
Approach

0BTC4ZZ    Resection of Right Upper Lung Lobe,  
Percutaneous Endoscopic Approach

0BTM4ZZ    Resection of Bilateral Lungs, Percutaneous  
Endoscopic Approach

**DENOMINATOR STRATUM\_SEPSIS**

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- any secondary ICD-10-CM diagnosis codes for sepsis.

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

[Appendix A – Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)](#)

**Sepsis diagnosis codes: (FTR4DX)**

A021	Salmonella sepsis	A4150	Gram-negative sepsis, unspecified
A227	Anthrax sepsis	A4151	Sepsis due to Escherichia coli [E. coli]
A267	Erysipelothrix sepsis	A4152	Sepsis due to Pseudomonas
A327	Listerial sepsis	A4153	Sepsis due to Serratia
A400	Sepsis due to streptococcus, group A	A4159	Other Gram-negative sepsis
A401	Sepsis due to streptococcus, group B	A4181	Sepsis due to Enterococcus
A403	Sepsis due to Streptococcus pneumoniae	A4189	Other specified sepsis
A408	Other streptococcal sepsis	A419	Sepsis, unspecified organism
A409	Streptococcal sepsis, unspecified	A427	Actinomycotic sepsis
A4101	Sepsis due to Methicillin susceptible Staphylococcus aureus	A5486	Gonococcal sepsis
A4102	Sepsis due to Methicillin resistant Staphylococcus aureus	B377	Candidal sepsis

A411	Sepsis due to other specified staphylococcus	R6520	Severe sepsis without septic shock
A412	Sepsis due to unspecified staphylococcus	R6521	Severe sepsis with septic shock
A413	Sepsis due to Hemophilus influenzae	T8112XA	Postprocedural septic shock, initial encounter
A414	Sepsis due to anaerobes		

## **DENOMINATOR EXCLUSIONS STRATUM\_SEPSIS**

Exclude cases:

- with a principal ICD-10-CM diagnosis code for sepsis
- with a principal ICD-10-CM diagnosis code for infection
- with any-listed ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for immunocompromised state
- with a length of stay of less than 4 days
- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

[\*Appendix F – Infection Diagnosis Codes\*](#)

[\*Appendix I – Immunocompromised State Diagnosis and Procedure Codes\*](#)

**DENOMINATOR STRATUM\_SHOCK**

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- any secondary ICD-10-CM diagnosis codes or any-listed ICD-10-PCS procedure codes for shock or cardiac arrest

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

[Appendix A – Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)](#)

***Shock or cardiac arrest diagnosis codes: (FTR5DX)***

I462	Cardiac arrest due to underlying cardiac condition	R578	Other shock
I468	Cardiac arrest due to other underlying condition	R579	Shock, unspecified
I469	Cardiac arrest, cause unspecified	T782XXA	Anaphylactic shock, unspecified, initial encounter
O0331	Shock following incomplete spontaneous abortion	T8051XA	Anaphylactic reaction due to administration of blood and blood products, initial encounter
O0381	Shock following complete or unspecified spontaneous abortion	T8052XA	Anaphylactic reaction due to vaccination, initial encounter
O0481	Shock following (induced) termination of pregnancy	T8059XA	Anaphylactic reaction due to other serum, initial encounter
O0731	Shock following failed attempted termination of pregnancy	T8110XA	Postprocedural shock unspecified, initial encounter
O083	Shock following ectopic and molar pregnancy	T8111XA	Postprocedural cardiogenic shock, initial encounter
O751	Shock during or following labor and delivery	T8119XA	Other postprocedural shock, initial encounter



R092	Respiratory arrest	T882XXA	Shock due to anesthesia, initial encounter
R570	Cardiogenic shock	T886XXA	Anaphylactic reaction due to adverse effect of correct drug or medicament properly administered, initial encounter
R571	Hypovolemic shock		

***Shock or cardiac arrest (resuscitation) procedure codes: : (FTR5PR)***

5A12012	Performance of Cardiac Output, Single, Manual	5A19054	Respiratory Ventilation, Single, Nonmechanical
---------	---	---------	--

**DENOMINATOR EXCLUSIONS STRATUM\_SHOCK**

Exclude cases:

- with a principal ICD-10-CM diagnosis code for shock or cardiac arrest
- with a principal ICD-10-CM diagnosis code for trauma
- with a principal ICD-10-CM diagnosis code for hemorrhage
- with a principal ICD-10-CM diagnosis code for gastrointestinal hemorrhage
- with a principal ICD-10-CM diagnosis code for abortion-related shock
- MDC 4 (diseases/disorders of respiratory system)
- MDC 5 (diseases/disorders of circulatory system)
- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

**Appendix G – Trauma Diagnosis Codes*****Hemorrhage diagnosis codes: (HEMORID)***

D62	Acute posthemorrhagic anemia	I97410	Intraoperative hemorrhage and hematoma of a circulatory system organ or structure complicating a cardiac catheterization
D7801	Intraoperative hemorrhage and hematoma of the spleen complicating a procedure on the spleen	I97411	Intraoperative hemorrhage and hematoma of a circulatory system organ or structure complicating a cardiac bypass
D7802	Intraoperative hemorrhage and hematoma of the spleen complicating other procedure	I97418	Intraoperative hemorrhage and hematoma of a circulatory system organ or structure complicating other circulatory system procedure
D7821	Postprocedural hemorrhage and hematoma of the spleen following a procedure on the spleen	I9742	Intraoperative hemorrhage and hematoma of a circulatory system organ or structure complicating other procedure
D7822	Postprocedural hemorrhage and hematoma of the spleen following other procedure	I97610	Postprocedural hemorrhage and hematoma of a circulatory system organ or structure following a cardiac catheterization
E3601	Intraoperative hemorrhage and hematoma of an endocrine system organ or structure complicating an endocrine system procedure	I97611	Postprocedural hemorrhage and hematoma of a circulatory system organ or structure following cardiac bypass

E3602	Intraoperative hemorrhage and hematoma of an endocrine system organ or structure complicating other procedure	I97618	Postprocedural hemorrhage and hematoma of a circulatory system organ or structure following other circulatory system procedure
G9731	Intraoperative hemorrhage and hematoma of a nervous system organ or structure complicating a nervous system procedure	I9762	Postprocedural hemorrhage and hematoma of a circulatory system organ or structure following other procedure
G9732	Intraoperative hemorrhage and hematoma of a nervous system organ or structure complicating other procedure	J9561	Intraoperative hemorrhage and hematoma of a respiratory system organ or structure complicating a respiratory system procedure
G9751	Postprocedural hemorrhage and hematoma of a nervous system organ or structure following a nervous system procedure	J9562	Intraoperative hemorrhage and hematoma of a respiratory system organ or structure complicating other procedure
G9752	Postprocedural hemorrhage and hematoma of a nervous system organ or structure following other procedure	J95830	Postprocedural hemorrhage and hematoma of a respiratory system organ or structure following a respiratory system procedure
H59111	Intraoperative hemorrhage and hematoma of right eye and adnexa complicating an ophthalmic procedure	J95831	Postprocedural hemorrhage and hematoma of a respiratory system organ or structure following other procedure
H59112	Intraoperative hemorrhage and hematoma of left eye and adnexa complicating an ophthalmic procedure	K661	Hemoperitoneum
H59113	Intraoperative hemorrhage and hematoma of eye and adnexa complicating an ophthalmic procedure, bilateral	K9161	Intraoperative hemorrhage and hematoma of a digestive system organ or structure complicating a digestive system procedure
H59119	Intraoperative hemorrhage and hematoma of unspecified eye and adnexa complicating an ophthalmic procedure	K9162	Intraoperative hemorrhage and hematoma of a digestive system organ or structure complicating other procedure
H59121	Intraoperative hemorrhage and hematoma of right eye and adnexa complicating other procedure	K91840	Postprocedural hemorrhage and hematoma of a digestive system organ or structure following a digestive system procedure

H59122	Intraoperative hemorrhage and hematoma of left eye and adnexa complicating other procedure	K91841	Postprocedural hemorrhage and hematoma of a digestive system organ or structure following other procedure
H59123	Intraoperative hemorrhage and hematoma of eye and adnexa complicating other procedure, bilateral	L7601	Intraoperative hemorrhage and hematoma of skin and subcutaneous tissue complicating a dermatologic procedure
H59129	Intraoperative hemorrhage and hematoma of unspecified eye and adnexa complicating other procedure	L7602	Intraoperative hemorrhage and hematoma of skin and subcutaneous tissue complicating other procedure
H59311	Postprocedural hemorrhage and hematoma of right eye and adnexa following an ophthalmic procedure	L7621	Postprocedural hemorrhage and hematoma of skin and subcutaneous tissue following a dermatologic procedure
H59312	Postprocedural hemorrhage and hematoma of left eye and adnexa following an ophthalmic procedure	L7622	Postprocedural hemorrhage and hematoma of skin and subcutaneous tissue following other procedure
H59313	Postprocedural hemorrhage and hematoma of eye and adnexa following an ophthalmic procedure, bilateral	M96810	Intraoperative hemorrhage and hematoma of a musculoskeletal structure complicating a musculoskeletal system procedure
H59319	Postprocedural hemorrhage and hematoma of unspecified eye and adnexa following an ophthalmic procedure	M96811	Intraoperative hemorrhage and hematoma of a musculoskeletal structure complicating other procedure
H59321	Postprocedural hemorrhage and hematoma of right eye and adnexa following other procedure	M96830	Postprocedural hemorrhage and hematoma of a musculoskeletal structure following a musculoskeletal system procedure
H59322	Postprocedural hemorrhage and hematoma of left eye and adnexa following other procedure	M96831	Postprocedural hemorrhage and hematoma of a musculoskeletal structure following other procedure
H59323	Postprocedural hemorrhage and hematoma of eye and adnexa following other procedure, bilateral	N9961	Intraoperative hemorrhage and hematoma of a genitourinary system organ or structure complicating a genitourinary system procedure

H59329	Postprocedural hemorrhage and hematoma of unspecified eye and adnexa following other procedure	N9962	Intraoperative hemorrhage and hematoma of a genitourinary system organ or structure complicating other procedure
H9521	Intraoperative hemorrhage and hematoma of ear and mastoid process complicating a procedure on the ear and mastoid process	N99820	Postprocedural hemorrhage and hematoma of a genitourinary system organ or structure following a genitourinary system procedure
H9522	Intraoperative hemorrhage and hematoma of ear and mastoid process complicating other procedure	N99821	Postprocedural hemorrhage and hematoma of a genitourinary system organ or structure following other procedure
H9541	Postprocedural hemorrhage and hematoma of ear and mastoid process following a procedure on the ear and mastoid process	R58	Hemorrhage, not elsewhere classified
H9542	Postprocedural hemorrhage and hematoma of ear and mastoid process following other procedure	T792XXA	Traumatic secondary and recurrent hemorrhage and seroma, initial encounter

***Gastrointestinal hemorrhage diagnosis codes: (GASTRID)***

I8501	Esophageal varices with bleeding	K2961	Other gastritis with bleeding
I8511	Secondary esophageal varices with bleeding	K2971	Gastritis, unspecified, with bleeding
K2211	Ulcer of esophagus with bleeding	K2981	Duodenitis with bleeding
K226	Gastro-esophageal laceration-hemorrhage syndrome	K2991	Gastroduodenitis, unspecified, with bleeding
K250	Acute gastric ulcer with hemorrhage	K31811	Angiodysplasia of stomach and duodenum with bleeding
K252	Acute gastric ulcer with both hemorrhage and perforation	K3182	Dieulafoy lesion (hemorrhagic) of stomach and duodenum
K254	Chronic or unspecified gastric ulcer with hemorrhage	K5521	Angiodysplasia of colon with hemorrhage

K256	Chronic or unspecified gastric ulcer with both hemorrhage and perforation	K5701	Diverticulitis of small intestine with perforation and abscess with bleeding
K260	Acute duodenal ulcer with hemorrhage	K5711	Diverticulosis of small intestine without perforation or abscess with bleeding
K262	Acute duodenal ulcer with both hemorrhage and perforation	K5713	Diverticulitis of small intestine without perforation or abscess with bleeding
K264	Chronic or unspecified duodenal ulcer with hemorrhage	K5721	Diverticulitis of large intestine with perforation and abscess with bleeding
K266	Chronic or unspecified duodenal ulcer with both hemorrhage and perforation	K5731	Diverticulosis of large intestine without perforation or abscess with bleeding
K270	Acute peptic ulcer, site unspecified, with hemorrhage	K5733	Diverticulitis of large intestine without perforation or abscess with bleeding
K272	Acute peptic ulcer, site unspecified, with both hemorrhage and perforation	K5741	Diverticulitis of both small and large intestine with perforation and abscess with bleeding
K274	Chronic or unspecified peptic ulcer, site unspecified, with hemorrhage	K5751	Diverticulosis of both small and large intestine without perforation or abscess with bleeding
K276	Chronic or unspecified peptic ulcer, site unspecified, with both hemorrhage and perforation	K5753	Diverticulitis of both small and large intestine without perforation or abscess with bleeding
K280	Acute gastrojejunal ulcer with hemorrhage	K5781	Diverticulitis of intestine, part unspecified, with perforation and abscess with bleeding
K282	Acute gastrojejunal ulcer with both hemorrhage and perforation	K5791	Diverticulosis of intestine, part unspecified, without perforation or abscess with bleeding
K284	Chronic or unspecified gastrojejunal ulcer with hemorrhage	K5793	Diverticulitis of intestine, part unspecified, without perforation or abscess with bleeding
K286	Chronic or unspecified gastrojejunal ulcer with both hemorrhage and perforation	K625	Hemorrhage of anus and rectum
K2901	Acute gastritis with bleeding	K6381	Dieulafoy lesion of intestine
K2921	Alcoholic gastritis with bleeding	K920	Hematemesis

K2931	Chronic superficial gastritis with bleeding	K921	Melena
K2941	Chronic atrophic gastritis with bleeding	K922	Gastrointestinal hemorrhage, unspecified
K2951	Unspecified chronic gastritis with bleeding		

***Abortion-related shock diagnosis codes: (FTR5EX)***

O0331	Shock following incomplete spontaneous abortion	O0481	Shock following (induced) termination of pregnancy
O0381	Shock following complete or unspecified spontaneous abortion	O0731	Shock following failed attempted termination of pregnancy

**DENOMINATOR STRATUM\_GI\_HEM**

Surgical discharges, for patients ages 18 through 89 years or MDC 14 (pregnancy, childbirth, and puerperium), with all of the following:

- any-listed ICD-10-PCS procedure codes for an operating room procedure; and
- the principal procedure occurring within 2 days of admission or an admission type of elective (ATYPE=3); and
- any secondary ICD-10-CM diagnosis codes for gastrointestinal hemorrhage or acute ulcer.

Surgical discharges are defined by specific MS-DRG codes and ICD-10-PCS codes indicating “major operating room procedures.”

[Appendix A – Operating Room Procedure Codes](#)

[Appendix E - Surgical Discharge MS-DRGs \(for discharges on or after October 1, 2007\)](#)

***Gastrointestinal hemorrhage or acute ulcer diagnosis codes: (FTR6DX)***

I8501	Esophageal varices with bleeding	K2941	Chronic atrophic gastritis with bleeding
I8511	Secondary esophageal varices with bleeding	K2951	Unspecified chronic gastritis with bleeding
K226	Gastro-esophageal laceration-hemorrhage syndrome	K2961	Other gastritis with bleeding
K250	Acute gastric ulcer with hemorrhage	K2971	Gastritis, unspecified, with bleeding
K251	Acute gastric ulcer with perforation	K2981	Duodenitis with bleeding
K252	Acute gastric ulcer with both hemorrhage and perforation	K2991	Gastroduodenitis, unspecified, with bleeding
K253	Acute gastric ulcer without hemorrhage or perforation	K31811	Angiodysplasia of stomach and duodenum with bleeding
K259	Gastric ulcer, unspecified as acute or chronic, without hemorrhage or perforation	K3182	Dieulafoy lesion (hemorrhagic) of stomach and duodenum
K260	Acute duodenal ulcer with hemorrhage	K5521	Angiodysplasia of colon with hemorrhage



K261	Acute duodenal ulcer with perforation	K5701	Diverticulitis of small intestine with perforation and abscess with bleeding
K262	Acute duodenal ulcer with both hemorrhage and perforation	K5711	Diverticulosis of small intestine without perforation or abscess with bleeding
K263	Acute duodenal ulcer without hemorrhage or perforation	K5713	Diverticulitis of small intestine without perforation or abscess with bleeding
K269	Duodenal ulcer, unspecified as acute or chronic, without hemorrhage or perforation	K5721	Diverticulitis of large intestine with perforation and abscess with bleeding
K270	Acute peptic ulcer, site unspecified, with hemorrhage	K5731	Diverticulosis of large intestine without perforation or abscess with bleeding
K271	Acute peptic ulcer, site unspecified, with perforation	K5733	Diverticulitis of large intestine without perforation or abscess with bleeding
K272	Acute peptic ulcer, site unspecified, with both hemorrhage and perforation	K5741	Diverticulitis of both small and large intestine with perforation and abscess with bleeding
K273	Acute peptic ulcer, site unspecified, without hemorrhage or perforation	K5751	Diverticulosis of both small and large intestine without perforation or abscess with bleeding
K279	Peptic ulcer, site unspecified, unspecified as acute or chronic, without hemorrhage or perforation	K5753	Diverticulitis of both small and large intestine without perforation or abscess with bleeding
K280	Acute gastrojejunal ulcer with hemorrhage	K5781	Diverticulitis of intestine, part unspecified, with perforation and abscess with bleeding
K281	Acute gastrojejunal ulcer with perforation	K5791	Diverticulosis of intestine, part unspecified, without perforation or abscess with bleeding
K282	Acute gastrojejunal ulcer with both hemorrhage and perforation	K5793	Diverticulitis of intestine, part unspecified, without perforation or abscess with bleeding
K283	Acute gastrojejunal ulcer without hemorrhage or perforation	K625	Hemorrhage of anus and rectum
K289	Gastrojejunal ulcer, unspecified as acute or chronic, without hemorrhage or perforation	K6381	Dieulafoy lesion of intestine
K2901	Acute gastritis with bleeding	K920	Hematemesis

K2921      Alcoholic gastritis with bleeding

K921      Melena

K2931      Chronic superficial gastritis with  
bleeding

K922      Gastrointestinal hemorrhage, unspecified

## DENOMINATOR EXCLUSIONS STRATUM\_GI\_HEM

Exclude cases:

- with a principal ICD-10-CM diagnosis code for gastrointestinal hemorrhage or acute ulcer
- with a principal ICD-10-CM diagnosis code for trauma
- with a principal ICD-10-CM diagnosis code for alcoholism
- with a principal ICD-10-CM diagnosis code for anemia
- MDC 6 (diseases and disorders of the digestive system)
- MDC 7 (diseases and disorders of the hepatobiliary system and pancreas)
- transferred to an acute care facility (DISP = 2)
- with missing discharge disposition (DISP=missing), gender (SEX=missing), age (AGE=missing), quarter (DQTR=missing), year (YEAR=missing), or principal diagnosis (DX1=missing)

### [Appendix G – Trauma Diagnosis Codes](#)

#### *Alcoholism diagnosis codes: (ALCHLSM)*

F1010	Alcohol abuse, uncomplicated	F10921	Alcohol use, unspecified with intoxication delirium
F10120	Alcohol abuse with intoxication, uncomplicated	F10929	Alcohol use, unspecified with intoxication, unspecified
F10121	Alcohol abuse with intoxication delirium	F1094	Alcohol use, unspecified with alcohol-induced mood disorder
F10129	Alcohol abuse with intoxication, unspecified	F10950	Alcohol use, unspecified with alcohol-induced psychotic disorder with delusions
F1014	Alcohol abuse with alcohol-induced mood disorder	F10951	Alcohol use, unspecified with alcohol-induced psychotic disorder with hallucinations
F10150	Alcohol abuse with alcohol-induced psychotic disorder with delusions	F10959	Alcohol use, unspecified with alcohol-induced psychotic disorder, unspecified
F10151	Alcohol abuse with alcohol-induced psychotic disorder with hallucinations	F1096	Alcohol use, unspecified with alcohol-induced persisting amnestic disorder
F10159	Alcohol abuse with alcohol-induced psychotic disorder, unspecified	F1097	Alcohol use, unspecified with alcohol-induced persisting dementia
F10180	Alcohol abuse with alcohol-induced anxiety disorder	F10980	Alcohol use, unspecified with alcohol-induced anxiety disorder
F10181	Alcohol abuse with alcohol-induced sexual dysfunction	F10981	Alcohol use, unspecified with alcohol-induced sexual dysfunction

F10182	Alcohol abuse with alcohol-induced sleep disorder	F10982	Alcohol use, unspecified with alcohol-induced sleep disorder
F10188	Alcohol abuse with other alcohol-induced disorder	F10988	Alcohol use, unspecified with other alcohol-induced disorder
F1019	Alcohol abuse with unspecified alcohol-induced disorder	F1099	Alcohol use, unspecified with unspecified alcohol-induced disorder
F1020	Alcohol dependence, uncomplicated	I426	Alcoholic cardiomyopathy
F1021	Alcohol dependence, in remission	K2920	Alcoholic gastritis without bleeding
F10220	Alcohol dependence with intoxication, uncomplicated	K2921	Alcoholic gastritis with bleeding
F10221	Alcohol dependence with intoxication delirium	K700	Alcoholic fatty liver
F10229	Alcohol dependence with intoxication, unspecified	K7010	Alcoholic hepatitis without ascites
F10230	Alcohol dependence with withdrawal, uncomplicated	K7011	Alcoholic hepatitis with ascites
F10231	Alcohol dependence with withdrawal delirium	K702	Alcoholic fibrosis and sclerosis of liver
F10232	Alcohol dependence with withdrawal with perceptual disturbance	K7030	Alcoholic cirrhosis of liver without ascites
F10239	Alcohol dependence with withdrawal, unspecified	K7031	Alcoholic cirrhosis of liver with ascites
F1024	Alcohol dependence with alcohol-induced mood disorder	K7040	Alcoholic hepatic failure without coma
F10250	Alcohol dependence with alcohol-induced psychotic disorder with delusions	K7041	Alcoholic hepatic failure with coma
F10251	Alcohol dependence with alcohol-induced psychotic disorder with hallucinations	K709	Alcoholic liver disease, unspecified
F10259	Alcohol dependence with alcohol-induced psychotic disorder, unspecified	T510X1A	Toxic effect of ethanol, accidental (unintentional), initial encounter
F1026	Alcohol dependence with alcohol-induced persisting amnesic disorder	T510X2A	Toxic effect of ethanol, intentional self-harm, initial encounter

F1027	Alcohol dependence with alcohol-induced persisting dementia	T510X3A	Toxic effect of ethanol, assault, initial encounter
F10280	Alcohol dependence with alcohol-induced anxiety disorder	T510X4A	Toxic effect of ethanol, undetermined, initial encounter
F10281	Alcohol dependence with alcohol-induced sexual dysfunction	T5191XA	Toxic effect of unspecified alcohol, accidental (unintentional), initial encounter
F10282	Alcohol dependence with alcohol-induced sleep disorder	T5192XA	Toxic effect of unspecified alcohol, intentional self-harm, initial encounter
F10288	Alcohol dependence with other alcohol-induced disorder	T5193XA	Toxic effect of unspecified alcohol, assault, initial encounter
F1029	Alcohol dependence with unspecified alcohol-induced disorder	T5194XA	Toxic effect of unspecified alcohol, undetermined, initial encounter
F10920	Alcohol use, unspecified with intoxication, uncomplicated		

***Anemia diagnosis codes: (FTR6EX)***

D500	Iron deficiency anemia secondary to blood loss (chronic)	D62	Acute posthemorrhagic anemia
------	--	-----	------------------------------