AHRQ

AHRQ QUALITY INDICATORS

Guide to Patient Safety Indicators

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Department of Health and Human Services
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Preface

In health care as in other arenas, that which cannot be measured is difficult to improve. Providers, consumers, policy makers, and others seeking to improve the quality of health care need accessible, reliable indicators of quality that they can use to flag potential problems or successes; follow trends over time; and identify disparities across regions, communities, and providers. As noted in a 2001 Institute of Medicine study, *Envisioning the National Health Care Quality Report*, it is important that such measures cover not just acute care but multiple dimensions of care: staying healthy, getting better, living with illness or disability, and coping with the end of life.

The Agency for Healthcare Research and Quality (AHRQ) Quality Indicators (QIs) are one Agency response to this need for multidimensional, accessible quality indicators. They include a family of measures that providers, policy makers, and researchers can use with inpatient data to identify apparent variations in the quality of inpatient or outpatient care. AHRQ's Evidence-Based Practice Center (EPC) at the University of California San Francisco (UCSF) and Stanford University adapted, expanded, and refined these indicators based on the original Healthcare Cost and Utilization Project (HCUP) Quality Indicators developed in the early 1990s.

The new AHRQ QIs are organized into three modules: **Prevention Quality Indicators**, **Inpatient Quality Indicators**, and **Patient Safety Indicators**. AHRQ has published the three modules as a series. The first module – Prevention Quality Indicators – was released in 2001 and the second module – Inpatient Quality Indicators – was released in 2002. Both are available at AHRQ's Quality Indicators Web site at http://www.qualityindicators.ahrq.gov.

This third module focuses on potentially preventable complications and iatrogenic events for patients treated in hospitals. The Patient Safety Indicators (PSIs) are measures that screen for adverse events that patients experience as a result of exposure to the health care system; these events are likely amenable to prevention by changes at the system or provider level. The PSIs were initially released in March 2003. With this update (revision 2), the PSIs now include 23 Provider-level and 6 Area-level Indicators.

Full technical information on the first two modules can be found in *Evidence Report for Refinement of the HCUP Quality Indicators*, prepared by the UCSF-Stanford EPC. It can be accessed at AHRQ's Quality Indicators Web site (http://www.qualityindicators.ahrq.gov). The technical report for the third module, entitled *Evidence Report for Measures of Patient Safety Based on Hospital Administrative Data—The Patient Safety Indicators*, is also available on AHRQ's Quality Indicators Web site.

Improving patient safety is a critical part of efforts to provide high quality health care in the United States. This guide is intended to facilitate such efforts. As always, we would appreciate hearing from those who use our measures and tools so that we can identify how they are used, how they can be refined, and how we can measure and improve the quality of the tools themselves. You may contact us by sending an e-mail to support@qualityindicators.ahrq.gov.

Irene Fraser, Ph.D., Director
Center for Organization and Delivery Studies

The programs for the Patient Safety Indicators (PSIs) can be downloaded from **http://www.qualityindicators.ahrq.gov/psi_download.htm**.

Instructions on how to use the programs to calculate the PSI rates are contained in the companion text, *Patient Safety Indicators: Software Documentation (both SAS and SPSS).*

Acknowledgments

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Core Project Team
Kathryn M. McDonald, M.M. (Stanford), *principal investigator*
Sheryl M. Davies, M.A. (Stanford)
Bradford W. Duncan, M.D. (Stanford)
Kaveh G. Shojania, M.D. (UCSF)

Investigators
Patrick S. Romano, M.D., M.P.H. (UC-Davis)
Jeffrey Geppert, J.D. (Stanford)
Angela Hansen, B.A. (Stanford), *EPC Research Assistant*

The following staff from **Social & Scientific Systems**, **Inc.**, developed this software product, documentation, and guide:

Programmers
Leif Karell
Kathy McMillan
Fred Rohde

Technical Writer
Patricia Burgess

Graphics Designer
Laura Spofford

Contributors from the **Agency for Healthcare Research and Quality**:

Anne Elixhauser, Ph.D.
Denise Remus, Ph.D., R.N.
H. Joanna Jiang, Ph.D.
Marlene Miller, M.D., M.Sc.
Margaret Coopey, R.N., M.G.A, M.P.S.

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Sheryl M. Davies, M.A.
Bruce Ellis, M.S.
Jeffrey Geppert, J.D.
Mark Gritz, Ph.D.
Greg Hubert, B.S.
Elaine Keller, M.Ed.
Rajin Mangru, B.S.
Kathryn M. McDonald, M.M.
Patrick Romano, M.D., M.P.H

The **Agency for Healthcare Research and Quality** Support for Quality Indicators team includes:

Denise Remus, Ph.D., R.N., Project Officer
Mary B. Haines, Contract Officer

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Introduction to the AHRQ Patient Safety Indicators

Hospitals in the United States provide the setting for some of life's most pivotal events—the birth of a child, major surgery, treatment for otherwise fatal illnesses. These hospitals house the most sophisticated medical technology in the world and provide state-of-the-art diagnostic and therapeutic services. But access to these services comes with certain costs. About 36% of personal health care expenditures in the United States go towards hospital care,[1] and the rate of growth in spending for hospital services has begun to increase following a half a decade of declining growth.[2] Simultaneously, concerns about the quality of health care services have reached a crescendo with the Institute of Medicine's series of reports describing the problem of medical errors[3] and the need for a complete restructuring of the health care system to improve the quality of care.[4] Policymakers, employers, and consumers have made the quality of care in U.S. hospitals a top priority and have voiced the need to assess, monitor, track, and improve the quality of inpatient care.

Hospital administrative data offer a window into the medical care delivered in our nation's hospitals. These data, which are collected as a routine step in the delivery of hospital services, provide information on diagnoses, procedures, age, gender, admission source, and discharge status. From these data elements, it is possible to construct a picture of the quality of medical care. Although quality assessments based on administrative data cannot be definitive, they can be used to flag potential quality problems and success stories, which can then be further investigated and studied. Hospital associations, individual hospitals, purchasers, regulators, and policymakers at the local, State, and Federal levels can use readily available hospital administrative data to begin the assessment of quality of care. In 2003, the Agency for Healthcare Research and Quality published the *National Healthcare Quality Report*[5] (NHQR) and *National Healthcare Disparities Report*[6] (NHDR) which provide a comprehensive picture of the level and variation of quality within four components of health care quality—effectiveness, safety, timeliness, and patient centeredness. These reports incorporated many Prevention Quality Indicators and Patient Safety Indicators (selected Inpatient Quality Indicators (IQIs) are under evaluation for inclusion in the next reports).

The AHRQ Quality Indicators are now being used for applications beyond quality improvement. Some organizations have used the AHRQ Quality Indicators to produce web based, comparative reports on hospital quality, such as the Texas Heath Care Information Council[7] and the Niagara Coalition[8]. These organizations also supplied users with guidance on indicator interpretation. Other organizations have incorporated selected AHRQ QIs into pay for performance demonstration projects or similar programs, such as the Centers for Medicare and Medicaid Services (CMS)[9] and Anthem Blue Cross Blue Shield of Virginia[10] where hospitals would be financially rewarded for performance. Guidance on these

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[1] .http://www.cms.hhs.gov/statistics/nhe/projections-2002/t2.asp: Table 2: National Health Expenditure Amounts, and Average Annual Percent Change by Type of Expenditure: Selected Calendar Years 1980-2012.
[2] Strunk BC, Ginsburg PB, Gabel JR. Tracking Health Care Costs. Health Affairs, 26 September 2001 (Web exclusive).
[3] Institute of Medicine. To Err is Human: Building a Safer Health System. Kohn LT, Corrigan JM, Donaldson MS (eds.) Washington DC: National Academy Press, 2000.
[4] Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Committee of Quality of Care in America. Washington DC: National Academy Press, 2001.
[5] Agency for Healthcare Research and Quality. *National Healthcare Quality Report*. Rockville, MD, U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, December 2003.
[6] Agency for Healthcare Research and Quality. *National Healthcare Disparities Report*. Rockville, MD, U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, July 2003.
[7] Texas Health Care Information Council. *Indicators of Inpatient Care in Texas Hospitals, 1999-2001*. http://www.thcic.state.tx.us/IQIReport2001/IQIReport2001.htm. Accessed February 2004.
[8] Niagara Health Quality Coalition. *Alliance for Healthcare Quality: Indicators of Inpatient Care in New York Hospitals, 2001*. http://www.myhealthfinder.com/iqi2001/index.php. Accessed February 2004.
[9] Centers for Medicare & Medicaid Services. *The Premier Hospital Quality Incentive Demonstration*. http://www.cms.hhs.gov/quality/hospital/PremierFactSheet.pdf. Accessed February 2004.
[10] Grinnan, R and Shan, Y. (2003). *Anthem Blue Cross and Blue Shield of Virginia. A Pay for Performance Initiative:*

alternative uses of the AHRQ QIs is summarized in the AHRQ publication G*uidance for Using the AHRQ Quality Indicators for Hospital-Level Public Reporting or Payment*[11].

The Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators (PSIs) are a tool that takes advantage of hospital administrative data. The PSIs represent the current state-of-the-art in measuring the safety of hospital care through analysis of inpatient discharge data.

This update of the AHRQ Patient Safety Indictors (PSIs) (Revision 2) incorporates changes to the specifications to improve the specificity of the indicators (i.e. remove "false-positives") and incorporates three new indicators based on user feedback. As organizations have increasingly adopted the standard measures for quality of care, users requested convergence of actual operationalization of measures. For instance, PSIs #18, #19, and #20 (Obstetric Trauma) were defined slightly differently than the new core measure for the same condition adopted by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO). Both definitions have advantages and disadvantages, and users desired to look at OB Trauma in both manners. As a result both definitions are now included in the software. The new PSIs #27, #28, and #29 include 3rd degree lacerations in addition to 4th degree lacerations in the numerator definition of obstetric trauma.

What Are the Patient Safety Indicators?

The PSIs are a set of measures that can be used with hospital inpatient discharge data to provide a perspective on patient safety. Specifically, PSIs screen for problems that patients experience as a result of exposure to the healthcare system and that are likely amenable to prevention by changes at the system or provider level. These are referred to as complications or adverse events. PSIs are defined on two levels: the provider level and the area level.

- *Provider-level Indicators* provide a measure of the potentially preventable complication for patients who received their initial care and the complication of care within the same hospitalization. Provider-level Indicators include only those cases where a secondary diagnosis code flags a potentially preventable complication.

- *Area-level Indicators* capture all cases of the potentially preventable complication that occur in a given area (e.g., metropolitan service area or county) either during hospitalization or resulting in subsequent hospitalization. Area-level Indicators are specified to include principal diagnosis, as well as secondary diagnoses, for the complications of care. This specification adds cases where a patient's risk of the complication occurred in a separate hospitalization.

Quality-In-Sights Hospital Incentive Program. Unpublished document provided to AHRQ on September 4, 2003.

[11] Remus D, Fraser I. Guidance for Using the AHRQ Quality Indicators for Hospital-level Public Reporting or Payment. Rockville, MD: Department of Health and Human Services, Agency for Healthcare Research and Quality; 2004. AHRQ Pub. No. 04-0086-EF. The document and appendices can be downloaded from AHRQ's Quality Indicators Web site (http://www.qualityindicators.ahrq.gov/documentation.htm).

The PSIs include the following Provider-level Indicators:

Patient Safety Indicators - Provider	PSI Number
Complications of anesthesia	1
Death in low mortality DRGs	2
Decubitus ulcer*	3
Failure to rescue	4
Foreign body left during procedure*	5
Iatrogenic pneumothorax*	6
Selected infections due to medical care*	7
Postoperative hip fracture*	8
Postoperative hemorrhage or hematoma*	9
Postoperative physiologic and metabolic derangements*	10
Postoperative respiratory failure*	11
Postoperative pulmonary embolism or deep vein thrombosis*	12
Postoperative sepsis*	13
Postoperative wound dehiscence*	14
Accidental puncture or laceration*	15
Transfusion reaction*	16
Birth trauma – injury to neonate	17
Obstetric trauma – vaginal with instrument	18
Obstetric trauma – vaginal without instrument	19
Obstetric trauma – cesarean section	20
Obstetric trauma with 3rd degree – vaginal with instrument*	27
Obstetric trauma with 3rd degree – vaginal without instrument*	28
Obstetric trauma with 3rd degree – cesarean section*	29

In addition, the following PSIs were modified into Area-level Indicators to assess the total incidence of the adverse event within geographic areas:

Patient Safety Indicators - Area	PSI Number
Foreign body left during procedure	21
Iatrogenic pneumothorax	22
Selected infections due to medical care	23
Postoperative wound dehiscence	24
Accidental puncture or laceration	25
Transfusion reaction	26

* These PSI were modified (PSIs 1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16) or added (PSIs 27, 28, 29) in version 2.1, revision 2.

How Can the PSIs Be Used to Assess Patient Safety?

Widespread consensus exists that health care organizations can reduce patient injuries by improving the environment for safety—from implementing technical changes, such as electronic medical record systems, to improving staff awareness of patient safety risks. Clinical process interventions also have strong evidence for reducing the risk of adverse events related to a patient's exposure to hospital care.[2] PSIs, which are based on computerized hospital discharge abstracts from the AHRQ's Healthcare Cost and Utilization Project (HCUP), can be used to better prioritize and evaluate local and national initiatives. Analyses of these and similar inexpensive, readily available administrative data sets may provide a screen for potential medical errors and a method for monitoring trends over time. The following scenario illustrates one potential application of the PSIs.

Evaluating and Improving Quality of Care

A hospital association recognizes its member hospitals' need for information that can help them evaluate the quality of care they provide. There is significant interest in assessing, monitoring, and improving the safety of inpatient care. After learning about the AHRQ PSIs, the association decides to apply the indicators to the discharge abstract data submitted by individual hospitals. For each hospital, the association develops a report with graphic presentation of the risk-adjusted data to show how the hospital performs on each indicator compared to its peer group, the State as a whole, and other comparable States. National and regional averages from the AHRQ Healthcare Cost and Utilization Project (HCUP) database are also provided as additional external benchmarks. Three years of trend data are included to allow the hospital to examine any changing patterns in its performance.

One member hospital, upon receiving the report, convenes an internal work group comprised of clinicians and quality improvement professionals to review the information and identify potential areas for improvement. The hospital leadership is committed to performance excellence and providing a culture supportive of systems evaluation and redesign. To begin their evaluation, they apply the AHRQ software to their internal administrative data to distinguish those patients who experienced the complication or adverse event from those who did not. This step establishes the focus for chart review.

After the initial analysis of the administrative and clinical data, the work group meets with clinical departments involved in care of these patients. They begin an in-depth analysis of the system and processes of care. Through application of process improvement concepts, they begin to identify opportunities for improvement. After selection of their priority area (for example, reduction of postoperative complications), they begin work, including:

- Review and synthesize the evidence base and best practices from scientific literature.
- Work with the multiple disciplines and departments involved in care of surgical patients to redesign care based on best practices with an emphasis on coordination and collaboration.
- Evaluate information technology solutions.
- Implement performance measurements for improvement and accountability.
- Incorporate monitoring of performance measurements in the departmental and senior leadership meetings and include in the Board quality improvement reports.

What Does this Guide Contain?

This guide provides information that hospitals, State data organizations, hospital associations, and others can use to decide how to use the PSIs. First, it describes the origin of the entire family of AHRQ Quality Indicators. Second, it provides an overview of the methods used to identify, select, and evaluate the AHRQ PSIs. Third, the guide summarizes the PSIs specifically, describes strengths and limitations of the indicators, documents the evidence that links the PSIs to the quality of health care services, and then provides in-depth two-page descriptions of each PSI. Finally, two appendices present additional technical background information. Appendix A outlines the specific definitions of each PSI, with complete ICD-9-CM coding specifications. Appendix B provides the details of the empirical methods used to explore the PSIs. Appendix C is a list of the Operating Room Procedure codes. Appendix D summarizes all the revisions of the PSI Documentation, and Appendix E lists the changes in the ICD-9-CM codes specific to this update, PSI version 2.1, revision 2.

Support for Potential and Current Users of the AHRQ QIs

Technical assistance is available, through an electronic user support system monitored by the QI support team, to support users in their application of the PSI software. The same e-mail address may be used to communicate to AHRQ any suggestions for PSI enhancements, general questions, and any QI related comments you may have. AHRQ welcomes your feedback. The Internet address for user support and feedback is: support@qualityindicators.ahrq.gov. AHRQ also offers a listserv to keep you informed on the Quality Indicators (QIs). The listserv is used to announce any QI changes or updates, new tools and resources, and to distribute other QI related information. This is a free service. Sign-up information is available at the QI website at http://www.qualityindicators.ahrq.gov/signup.htm.

Origins and Background of the Quality Indicators

In the early 1990s, in response to requests for assistance from State-level data organizations and hospital associations with inpatient data collection systems, AHRQ developed a set of quality measures that required only the type of information found in routine hospital administrative data—diagnoses and major procedures, along with information on patient's age, gender, source of admission, and discharge status. These States were part of the Healthcare Cost and Utilization Project, an ongoing Federal-State-private sector collaboration to build uniform databases from administrative hospital-based data.

AHRQ developed these measures, called the HCUP Quality Indicators, to take advantage of a readily available data source—administrative data based on hospital claims—and quality measures that had been reported elsewhere.[12] The 33 HCUP QIs included measures for avoidable adverse outcomes, such as in-hospital mortality and complications of procedures; use of specific inpatient procedures thought to be overused, underused, or misused; and ambulatory care sensitive conditions.

Although administrative data cannot provide definitive measures of health care quality, they can be used to provide *indicators* of health care quality that can serve as the starting point for further investigation. The HCUP QIs have been used to assess potential quality-of-care problems and to delineate approaches for dealing with those problems. Hospitals with high rates of poor outcomes on the HCUP QIs have reviewed medical records to verify the presence of those outcomes and to investigate potential quality-of-care problems.[13] For example, one hospital that detected high utilization rates for certain procedures refined patient selection criteria for these procedures to improve appropriate utilization.

Development of the AHRQ Quality Indicators

Since the original development of the HCUP QIs, the knowledge base on quality indicators has increased significantly. Risk-adjustment methods have become more readily available, new measures have been developed, and analytic capacity at the State level has expanded considerably. Based on input from current users and advances to the scientific base for specific indicators, AHRQ funded a project to refine and further develop the original QIs. The project was conducted by the UCSF-Stanford EPC.

The major constraint placed on the UCSF-Stanford EPC was that the measures could require only the type of information found in hospital discharge abstract data. Further, the data elements required by the measures had to be available from most inpatient administrative data systems. Some State data systems contain innovative data elements, often based on additional information from the medical record. Despite the value of these record-based data elements, the intent of this project was to create measures that were based on a *common denominator discharge data set*, without the need for additional data collection. This was critical for two reasons. First, this constraint would result in a tool that could be used with any inpatient administrative data, thus making it useful to most data systems. Second, this would enable national and regional benchmark rates to be provided using HCUP data, since these benchmark rates would need to be calculated using the universe of data available from the States.

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[12] Ball JK, Elixhauser A, Johantgen M, et al. *HCUP Quality Indicators, Methods, Version 1.1: Outcome, Utilization, and Access Measures for Quality Improvement*. (AHCPR Publication No. 98-0035). Healthcare Cost and Utilization project (HCUP-3) Research notes: Rockville, MD: Agency for Health Care Policy and Research, 1998.

[13] *Impact: Case Studies Notebook – Documented Impact and Use of AHRQ's Research*. Compiled by Division of Public Affairs, Office of Health Care Information, Agency for Healthcare Research and Quality.

AHRQ Quality Indicator Modules

The work of the UCSF-Stanford EPC resulted in the *AHRQ Quality Indicators*, which are distributed as three separate modules:

- **Prevention Quality Indicators**. These indicators consist of "ambulatory care sensitive conditions," hospital admissions that evidence suggests could have been avoided through high-quality outpatient care or that reflect conditions that could be less severe, if treated early and appropriately.

- **Inpatient Quality Indicators**. These indicators reflect quality of care inside hospitals and include inpatient mortality; utilization of procedures for which there are questions of overuse, underuse, or misuse; and volume of procedures for which there is evidence that a higher volume of procedures is associated with lower mortality.

- **Patient Safety Indicators**. These indicators focus on potentially preventable instances of complications and other iatrogenic events resulting from exposure to the health care system.

Methods of Identifying, Selecting, and Evaluating the Quality Indicators

Since the literature surrounding PSIs is sparse, the project team used a variety of additional techniques to identify, select, and evaluate each indicator, including clinician panels, expert coders, and empirical analyses.

Step 1: Define the Concepts and the Evaluation Framework

In approaching the task of evaluating patient safety indicators based on administrative data, the project team developed a conceptual framework and standardized definitions of commonly used terms.

Standardized Definitions

In the literature, the distinctions between medical error, adverse events, complications of care, and other terms pertinent to patient safety are not well established and are often used interchangeably. In this report, the terms medical error, adverse events or complications, and similar concepts are defined as follows:

Case finding indicators. Indicators for which the primary purpose is to identify specific cases in which a medical error *may* have occurred, for further investigation.

Complication or adverse event. "An injury caused by medical management rather than by the underlying disease or condition of the patient."[14] In general, adverse events prolong the hospitalization, produce a disability at the time of discharge, or both. Used in this report, complication does not refer to the sequelae of diseases, such as neuropathy as a "complication" of diabetes. Throughout the report, "sequelae" is used to refer to these conditions.

Medical error. "The failure of a planned action to be completed as intended (i.e., error of execution) or the use of a wrong plan to achieve an aim (i.e., error of planning)." The definition includes errors committed by any individual, or set of individuals, working in a health care organization.[15]

Patient safety. "Freedom from accidental injury," or "avoiding injuries or harm to patients from care that is intended to help them." Ensuring patient safety "involves the establishment of operational systems and processes that minimize the likelihood of errors and maximizes the likelihood of intercepting them when they occur."[16]

Patient safety indicators. Specific quality indicators which also reflect the quality of care inside hospitals, but focus on aspects of patient safety. Specifically, PSIs screen for problems that patients experience as a result of exposure to the healthcare system, and that are likely amenable to prevention by changes at the system or provider level.

Preventable adverse event. An adverse event attributable to error is a "preventable adverse

[14] Brennan TA, Leape LL, Laird NM, Hebert L, Localio AR, Lawthers AG, et al. Incidence of adverse events and negligence in hospitalized patients. Results of the Harvard Medical Practice Study I. N Engl J Med 1991;324(6):370-6.

[15] Institute of Medicine, 2000.

[16] Envisioning the National Health Care Quality Report. Washington, DC: Institute of Medicine; 2001.

event."[17] A condition for which reasonable steps may reduce (but not necessarily eliminate) the risk of that complication occurring.

Quality. "Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge." In this definition, "the term *health services* refers to a wide array of services that affect health…(and) applies to many types of health care practitioners (physicians, nurses, and various other health professionals) and to all settings of care…"[18]

Quality indicators. Screening tools for the purpose of identifying potential areas of concern regarding the quality of clinical care. For the purpose of this report, we focus on indicators that reflect the quality of care inside hospitals. Quality indicators may assess any of the four system components of health care quality, including patient safety (see below), effectiveness (i.e., "providing services based on scientific knowledge to all who could benefit, and refraining from providing services to those not likely to benefit), patient centeredness, and timeliness (i.e., "minimizing unnecessary delays").[19]

Rate based indicators. Indicators for which the primary purpose is to identify the rate of a complication rather than to identify specific cases.

While the definitions above are intended to distinguish events that are less preventable from those that are more preventable, the difference is best described as a spectrum. To conceptualize this spectrum, the project team developed the following three categories of conditions:

1. **Conditions that could be either a comorbidity or a complication.** Conditions considered comorbidities (for example, congestive heart failure) are present on admission and are not caused by medical management; rather, they are due to the patient's underlying disease. It is extremely difficult to distinguish complications from comorbidities for these conditions using administrative data. As a result, these conditions were not considered in this report.

2. **Conditions that are likely to reflect medical error.** These conditions (for example, foreign body accidentally left during a procedure) are likely to have been caused by medical error. Most of these conditions appear infrequently in administrative data, and thus rates of events lack the precision to allow for comparisons between providers. However, these conditions may be the subject of case-finding indicators.

3. **Conditions that conceivably, but not definitively reflect medical error.** These conditions (for example, postoperative DVT or PE) represent a spectrum of preventability between the previous two categories—from those that are mostly unpreventable to those that are mostly preventable. Because of the uncertainty regarding the preventability of these conditions and the likely heterogeneity of cases with the condition, indicators using these conditions are less useful as case-finding indicators. However, examining the rate of these conditions may highlight potential areas of concern.

[17] Brennan et al., 1991.

[18] Measuring the Quality of Health Care: A statement of the National Roundtable on Healthcare Quality Division of Healthcare Services: National Academy Press; 1999.

[19] National Roundtable on Healthcare Quality, 1999.

Evaluation Framework

To evaluate the soundness of each indicator, the project team applied the same framework as was applied in the technical report[20] for the Prevention Quality Indicators (PQIs) and Inpatient Quality Indicators (IQIs). This included six areas of evidence:

- **Face validity.** Does the indicator capture an aspect of quality that is widely regarded as important and subject to provider or public health system control? Consensual validity expands face validity beyond one person to the opinion of a panel of experts.

- **Precision.** Is there a substantial amount of provider- or community-level variation that is not attributable to random variation?

- **Minimum bias.** Is there either little effect on the indicator of variations in patient disease severity and comorbidities, or is it possible to apply risk adjustment and statistical methods to remove most or all bias?

- **Construct validity.** Does the indicator perform well in identifying true (or actual) quality of care problems?

- **Fosters real quality improvement.** Is the indicator insulated from perverse incentives for providers to improve their reported performance by avoiding difficult or complex cases, or by other responses that do not improve quality of care?

- **Application.** Has the measure been used effectively in practice? Does it have potential for working well with other indicators?

Face validity (consensual validity) was evaluated using a structured panel review, minimum bias was explored empirically and briefly during the panel review, and construct validity was evaluated using the limited literature available. A full discussion of this framework is available in the Stanford Technical report.[21]

The relative importance of each of these evaluation areas may differ by individual PSIs. Precision and minimum bias may be less important for indicators that are primarily designed to screen only for medical error, since these events are relatively rare. In general, these indicators are better used as case-finding indicators. For these indicators, comparisons between rates are less relevant. However, for rate-based indicators, concerns of precision and minimum bias remain if indicators are used in any comparison of rates (comparison to national averages, peer group, etc.).

Step 2: Search the Literature to Identify Potential PSIs

The literature searches performed in connection with assessing potential AHRQ QIs[22] identified many references relevant to potential PSIs. In addition, the project team performed electronic searches for articles published before February 2002 followed by hand searching the bibliographies of identified references. Members of the project team were queried to supplement this list, based on their personal

[20] Davies S, Geppert J, McClellan M, McDonald KM, Romano PS, Shojania KG. Refinement of the HCUP Quality Indicators. Technical Review Number 4. Rockville, MD: (Prepared by UCSF-Stanford Evidence-based Practice Center under Contract No. 290-97-0013) Agency for Healthcare Research and Quality; 2001. Report No.: 01-0035.

[21] Davies et al., 2001.

[22] Davies et al., 2001.

knowledge of recent work in the field. Because Iezzoni et al.'s Complications Screening Program (CSP)[23] included numerous candidate indicators, the team also performed an author search using her name. Forthcoming articles and Federal reports in press, but not published, were also included when identified through personal contacts.

The project team identified 326 articles from the Medline search. Articles were screened using both the titles and abstracts. To qualify for abstraction, an article must have described, evaluated, or validated a potential indicator of medical errors, patient safety, or potentially preventable complications based on International Classification for Diseases - Ninth Revision - Clinical Modifications (ICD-9-CM) coded administrative (hospital discharge or claims) data. Some indicators were also considered if they appeared to be readily translated into ICD-9-CM, even if the original authors did not use ICD-9-CM codes.

This search was adapted slightly and repeated using the OVID interface with EMBASE[24], limited to articles published from January 1990 through the end of first quarter 2002. The EMBASE search identified 463 references, and these articles were screened in the same manner. After elimination of articles that had already been identified using Medline[25] and the other approaches described above, only nine additional articles met the criteria for abstraction.

Step 3: Develop a Candidate List of PSIs

The project team developed a candidate list of PSIs by first reviewing the literature, then selecting a subset of indicators to undergo face validity testing by clinician panels.

Candidate List of PSIs

The literature search located relatively few patient safety indicators that could be defined using unlinked administrative data. The majority of these indicators were from the Complications Screening Program (CSP),[26] which was developed to identify potentially preventable complications of adult medical and surgical hospital care using commonly available administrative data. The algorithm uses discharge abstract data—specifically ICD-9-CM diagnosis and procedure codes, patient age, sex, diagnosis-related group (DRG), and date of procedure—to identify 28 complications that raise concern about the quality of care based on the rate of such occurrences at individual hospitals. Each of the complications is applied to some or all of the following specified "risk pools" separately: major surgery, minor surgery, invasive cardiac procedure, endoscopy, medical patients, and all patients. In addition, specified inclusion and exclusion criteria are applied to each complication to ensure that the complication developed in-hospital, as opposed to being present on admission, and that the complication was potentially preventable.

[23] Iezzoni LI, Foley SM, Heeren T, Daley J, Duncan CC, Fisher ES, et al. A method for screening the quality of hospital care using administrative data: preliminary validation results. QRB Qual Rev Bull 1992;18(11):361-71.

[24] EMBASE. In. The Netherlands: Elsevier Science Publishers B.V.

[25] MEDLINE [database online]. In. Bethesda (MD): National Library of Medicine.

[26] Iezzoni et al., 1992.

Four later studies were designed to test criterion and construct validity by validating the data used to construct CSP screens, validating the screens as a flag for actual quality problems, and validating the replicability of hospital-level results using different data sources.[27] [28] [29] [30] These studies raised concerns about the validity of the CSP, because flagged cases for most indicators were no more likely than unflagged controls to have suffered explicit process failures.

The project team also reviewed all ICD-9-CM codes implemented in or before 1999 that were identified by AHRQ as possibly describing medical errors or reflecting the consequences of such errors.[31] (This initial set of indicators is referred to as the Miller et al. indicators.) The project team added relevant codes from the 2000 and 2001 revisions of ICD-9-CM and selected codes from the CSP, such as those not clearly reflective of medical error, but representing a potentially preventable complication. This process was guided principally by conceptual considerations. For example, codes for postoperative AMI (an evaluated indicator that was not included in the final indicator set) were included in the evaluation set since recent evidence suggests that AMI is a potentially preventable complication.[32] A few codes were also deleted from the initial list based on a review of ICD-9-CM coding guidelines, described in *Coding Clinics for ICD-9-CM* and the *American Hospital Association's ICD-9-CM Coding Handbook*. For example, the code 2593 for hypoglycemic coma specifically excludes patients with diabetes mellitus, the population for which this complication is most preventable. This process of updating the Miller et al. PSIs resulted in a list of over 200 ICD-9-CM codes (valid in 2001) potentially related to medical error.

Codes identified in the CSP and updated from the Miller et. al. PSIs were then grouped into indicators. Where feasible, codes were compiled as they were in the CSP, or in some cases the Miller et al. PSIs, depending on which grouping yielded more clinically homogeneous groups. In most cases the resulting indicators were not identical to the CSP indicators, although they were closely related, as some of the specific codes included in the original CSP had been eliminated after the team's review of coding guidelines. The remaining codes were then incorporated into the most appropriate CSP-based indicator, or were grouped into clinically meaningful concepts to define novel indicators. Exclusion criteria were added based on CSP methods and clinical judgment. As a result, over 40 patient safety indicators were defined that, while building on prior work, reflected significantly changed measures to focus more narrowly on the most preventable complications.

Indicators were defined with both a numerator (complication of interest) and a denominator (population at risk). Different patient subpopulations have inherently different risks for developing a complication, with some patients having almost no risk. Thus, the denominator for each indicator represents the specific population at risk. The intention was to restrict the complication (and

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[27] Lawthers A, McCarthy E, Davis R, Peterson L, Palmer R, Iezzoni L. Identification of in-hospital complications from claims data: is it valid? Medical Care 2000;38(8):785-795.

[28] McCarthy EP, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamael MB, et al. Does clinical evidence support ICD-9-CM diagnosis coding of complications? Med Care 2000;38(8);868-876.

[29] Weingart SN, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, et al. Use of administrative data to find substandard care: validation of th complications screening program Med Care 2000;38(8):796-806.

[30] Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, Mukamal K, et al. Does the Complications Screening Program flag cases with process of care problems? Using explicit criteria to judge processes. Int J Qual Health Care 1999;11(2):107-18.

[31] Miller M, Elixhauser A, Zhan C, Meyer G. Patient Safety Indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

[32] Shojania KG, Duncan BW, MdDonald KM, Wachter RM. Making health care safer: A critical analysis of patient safety practices. Evidence Report/Technology Assessment No. 43 (Prepared by the University of California at San Francisco-Stanford Evidence-based Practice Center under Contract No. 290-97-0013). Rockville, MD: Agency for Healthcare Research and Quality; 2001. Report No.: AHRQ Publication No. 01-E058.

consequently the rate) to a more homogeneous population who are actually at risk for that complication. In general, the population at risk corresponded to one risk pool (e.g., major surgery) from the CSP, if applicable, or was defined more narrowly.

Subset Selection

After the project team developed a list of potential indicators, they selected a subset of indicators to undergo face validity testing by clinician panels, as described in Step 4. Two sources of information guided the selection process.

First, validation data from previous studies were reviewed and thresholds were set for retaining CSP-based indicators. Four studies were identified that evaluated the CSP indicators. Three of these studies, examined the predictive value of each indicator in identifying a complication that occurred in-hospital, regardless of whether this complication was due to medical error or was preventable. [33] [34] [35] In a fourth study, nurses identified specific process failures that may have contributed to complications. In order to be retained as a potential PSI, at least one of the first three studies needed to demonstrate a positive predictive value of at least 75%, meaning that 3 out of 4 patients identified by the measure did indeed have the complication of interest.[36] In addition, the positive predictive value of a "process failure" identified in the fourth study needed to reach or exceed 46%, which was the average rate for surgical cases that were not flagged by any of the CSP indicators. As a result, only CSP-derived indicators that were at least somewhat predictive of objectively defined process failures or medical errors were retained.

Second, specific changes to previous definitions or constructs of indicators fell into the following general categories:

- Changes to the denominator definitions (inclusion or exclusion criteria), intended to reduce bias due to the inclusion of atypical patients or to improve generalizability to a broader set of patients at risk.
- Elimination of selected ICD-9-CM codes from numerator definitions, intended to focus attention on more clinically significant complications or complications more likely to result from medical errors.
- Addition of selected ICD-9-CM codes to numerator definitions, intended to capture related complications that could result from the same or similar medical errors.
- Division of a single indicator into two or more related indicators, intended to create more clinically meaningful and conceptually coherent indicators.
- Stratification or adjustment by relevant patient characteristics, intended to reflect fundamental clinical differences among procedures (e.g., vaginal delivery with or without instrumentation) and the complications that result from them, or fundamental differences in patient risk (e.g., decubitus ulcer in lower-risk versus high-risk patients).

A total of 34 indicators, intended to be applied to all age groups, were retained for face validity testing by clinician panels. Because the primary intent in developing these indicators was to detect potentially preventable complications related to health care exposure, the final definitions for this set of indicators represented mostly new measures that built upon previous work.

[33] Lawthers, et al., 2000.

[34] McCarthy, et al., 2000.

[35] Weingart et al., 2000.

[36] Iezzoni et al., 1999.

Coding Review

Experts in ICD-9-CM codes reviewed each code for accuracy of capturing the complication and population at risk. In some cases, additional codes or other refinements to the indicators were suggested based on current coding guidelines.

Step 4: Review the PSIs

The project team conducted a structured review of each indicator to evaluate the face validity (from a clinical perspective) of the indicators. The methodology for the structured review was adapted from the RAND/UCLA Appropriateness Method[37] and consisted of an initial independent assessment of each indicator by clinician panelists using an initial questionnaire, a conference call among all panelists, followed by a final independent assessment by clinician panelists using the same questionnaire. The review sought to establish *consensual validity,* which "extends face validity from one expert to a panel of experts who examine and rate the appropriateness of each item…."[38] The panel process served to refine definitions of some indicators, add new measures, and dismiss indicators with major concerns from further consideration.

Eight panels were formed: two panels examined complications of medical care indicators, three panels examined surgical complications indicators, one panel assessed indicators related to procedural complications, and two panels examined obstetric complications indicators.

Fifteen professional clinical organizations nominated a total of 162 clinicians to be panelists. To be eligible to participate, nominees were required to spend at least 30% of their work time on patient care, including hospitalized patients. Nominees were asked to provide information regarding their practice characteristics, including specialty, subspecialty, and setting. Fifty-seven panelists were selected to ensure that each panel had diverse membership in terms of practice characteristics and setting.

Initial Assessment of the Indicators

Panelists were presented with four or five indicators, including the standardized text used to describe each ICD-9-CM code, the specific numeric code, exclusion and inclusion criteria, the clinical rationale for the indicator, and the specification criteria. For each indicator, panelists completed a 10-item questionnaire that evaluated the ability of the indicator to screen out conditions present on admission, the potential preventability of the complication, and the ability of the indicator to identify medical error. In addition, the questionnaire asked panelists to consider potential bias, reporting or charting problems, potential for gaming the indicator, and adverse effects of implementing the indicator. Finally, the questionnaire provided an opportunity for panelists to suggest changes to the indicator.

Conference Call Participation

After the panelists submitted the initial evaluation questionnaires, they participated in a 90-minute conference call for their panel to discuss the indicators. In general, agenda items for the conference call focused on points of disagreement among panelists. However, panelists were explicitly told that consensus was not the goal of discussion. In some cases, panelists agreed on proposed changes to the indicator definitions, and such consensus was noted and the definition was modified accordingly before the final round of rating.

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[37] Fitch K, Bernstein J, Aguilar MD, Burnand B, LaCalle JR, Lazaro P, et al. the RAND/UCLA Appropriateness Method User's Manual: RAND; 2001.

[38] Green L, Lewis F. measurement and Evaluation in Health Education and Health Promotion. Mountain View, CA: Mayfield Publishing Company; 1998.

Panelists were prompted throughout the process to consider the appropriate population at risk for each indicator (specifically inclusion and exclusion criteria) in addition to the complication of interest. However, if panelists wished to discuss other aspects of the indicator, this discussion was allowed within the time allotted for that indicator (approximately 15 minutes). If time remained at the end of a call, topics that were not fully addressed previously were revisited.

Final Evaluation and Tabulation of Results

Following each conference call, the project team made changes to each indicator suggested by panelists for changes that reached near consensus of the panelists. The indicators were then redistributed to panelists with the questionnaires used in the initial evaluation. The reason for all each indicator definition change was included, and panelists were asked to re-rate the indicator based on their current opinion. They were asked to keep in mind the discussion during the conference call.

Results from the final evaluation questionnaire were used to calculate median scores from the 9-point scale for each question and to categorize the degree of agreement among panelists. Median scores determined the level of acceptability of the indicator, and dispersion of ratings across the panel for each applicable question determined the agreement status. Therefore the median and agreement status were independent measurements for each question. Six criteria were used to identify the panel opinions (i.e., median, agreement status category) on the following aspects of the indicator:

- Overall usefulness of the indicator.
- Likelihood that the indicator measures a complication and not a comorbidity (specifically, present on admission).
- Preventability of the complication.
- Extent to which the complication is due to medical error.
- Likelihood that the complication is charted given that it occurs.
- Extent that the indicator is subject to bias (systematic differences, such as case mix that could affect the indicator, in a way not related to quality of care).

The project team used the ratings of the overall appropriateness of each indicator to assess its overall usefulness as a screen for potential patient safety problems. Indicators were triaged into three sets: Accepted Indicators (described in this guide), Experimental Indicators, and Rejected Indicators.

Step 5: Evaluate the PSIs Using Empirical Analysis

The project team conducted empirical analyses to explore the frequency and variation of the indicators, the potential bias, based on limited risk adjustment, and the relationship between indicators. The data sources used in the empirical analyses were the 1997 Florida State Inpatient Database (SID) for initial testing and development and the 1997 HCUP State Inpatient Database for 19 States (referred to in this guide as the HCUP SID) for the final empirical analyses. The rates presented in the Detailed Evidence Section of this guide, as well as the means and parameter reference files used by the PSI software, reflect analyses of the 2000 HCUP SID for 27 states[39].

[39] The state data organizations included in the 2000 HCUP SID were: Arizona Department of Health Services; California Office of Statewide Health Planning & Development; Colorado Health & Hospital Association; Connecticut - Chime, Inc.; Florida Agency for Health Care Administration; Georgia: An Association of Hospitals & Health Systems; Hawaii Health Information Corporation; Illinois Health Care Cost Containment Council; Iowa Hospital Association; Kansas Hospital Association; Kentucky Department for Public Health; Maine Health Data Organization; Massachusetts Division of Health Care Finance and Policy; Michigan Health & Hospital Association; Missouri Hospital Industry Data Institute; New Jersey Department of Health & Senior Services; New York State Department of Health; North Carolina Department of Health and Human Services; Oregon Association of Hospitals & Health Systems; Pennsylvania Health Care Cost Containment Council; South Carolina State Budget & Control Board; Tennessee Hospital Association; Texas Health Care Information Council; Utah Department of Health; Virginia Health Information; Washington State Department of Health; West Virginia Health Care Authority; Wisconsin Department of Health & Family Services

All potential indicators were examined empirically by developing and conducting statistical tests for precision, bias, and relatedness of indicators. Three different estimates of hospital performance were calculated for each indicator:

1. The raw indicator rate was calculated using the number of adverse events in the numerator divided by the number of discharges in the population at risk by hospital.

2. The raw indicator was adjusted to account for differences among hospitals in age, gender, modified DRG, and comorbidities.

    - Adjacent DRG categories that were separated by the presence or absence of comorbidities or complications were collapsed to avoid adjusting for the complication being measured. Most of the super-Major Diagnostic Category (MDC) DRG categories were excluded for the same reason.

    - APR-DRG risk adjustment was not implemented because removing applicable complications from each indicator was beyond the scope of this project.

    - The ICD-9-CM codes used to define comorbidity categories were modified to exclude conditions likely to represent potentially preventable complications in certain settings.

    - "Acute on chronic" comorbidities were captured so that some patients with especially severe comorbidities would not be mislabeled as not having conditions of interest.

    - Comorbidities in obstetric patients were added.

3. Multivariate signal extraction methods were applied to adjust for reliability by estimating the amount of "noise" (i.e., variation due to random error) relative to the amount of "signal" (i.e., systematic variation in hospital performance or reliability) for each indicator.

Similar reliability adjustment has been used in the literature for similar purposes.[40] [41] The project team constructed a set of statistical tests to examine precision, bias, and relatedness of indicators for all accepted Provider-level Indicators, and precision and bias for all accepted Area-level Indicators. It should be noted that rates based on fewer than 30 cases in the numerator or the denominator are not reported. This exclusion rule serves two purposes:

- It eliminates unstable estimates based on too few cases.
- It helps protect the identities of hospitals and patients.

A detailed description of the methodology is included in Appendix B.

[40] Hofer TP, Hayward RA, Greenfield S, Wagner EH, Kaplan SH, Manning WG. The unreliability of individual physician "report cards" for assessing the costs and quality of care of a chronic disease JAMA 1999;281(22):2098-105.

[41] Christiansen CL, Morris CN. Improving the statistical approach to health care provider profiling. Ann Intern Med 1997;127(8 Pt 2):764-8.

Summary Evidence on the Patient Safety Indicators

This project took a four-pronged approach to the identification, development, and evaluation of PSIs that included use of literature, clinician panels, expert coders, and empirical analyses. The literature review and the findings from the clinical panels combined with data analysis provide evidence to suggest that a number of discharge-based PSIs may be useful screens for organizations, purchasers, and policymakers to identify safety problems at the provider level, as well as to document systematic area-level differences in patient safety problems.

Most adverse events identified by the PSIs have a variety of causes in addition to potential medical error leading to the adverse event, including underlying patient health and factors that do not vary systematically. Clinician panelists rated only two of the accepted indicators as very likely to reflect medical error: (1) transfusion reaction and (2) foreign body left in during a procedure. These indicators proved to be very rare, with less than 1 per 10,000 cases at risk.

Table 1 summarizes the results of the literature review, clinician panels, and empirical analyses on the provider-level PSIs. Table 2 provides the same information for the area-level PSIs. The tables list each indicator, provide its definition, identify any concerns about its validity based on the clinician panels, and summarize the strength of evidence in the literature for each indicator.

The following notes about some of the terms in the table are intended to help the reader understand the context in which they are used.

Validity Concerns. The following concerns, raised during our panel review, are listed if they affect the validity of the particular indicator:

- **Rare** — This indicator is relatively rare and may not have adequate statistical power for some providers.
- **Condition definition varies**—This indicator includes conditions for which diagnosis may be subjective, depending on the threshold of the physician, and patients with the same clinical state may not have the same diagnosis.
- **Underreporting or screening**—Conditions included in this indicator may not be systematically reported (leading to an artificially low rate) or may be routinely screened for (leading to a higher rate in facilities that screen).
- **Adverse consequences**—Use of this indicator may have undesirable effects, such as increasing inappropriate antibiotic use.
- **Stratification suggested**—This indicator includes some high risk patient groups and stratification is recommended when examining rates,
- **Unclear preventability**—As compared to other PSIs, the conditions included in this indicator may be less preventable by the health system.
- **Heterogeneous severity**—This indicator includes codes that encompass several levels of severity of a condition that cannot be ascertained by the codes.
- **Case mix bias**—This indicator was felt to be particularly subject to systematic bias, and DRG and comorbidity risk adjustment may not adequately address the concern.
- **Denominator unspecific**—The denominator for this indicator is less than ideal, because the true population at risk could not be identified using ICD-9-CM codes. Some patients are likely included who are not truly at risk, or some patients who are at risk are not included.

Empirical Performance. The performance of each indicator is measured for the following:

- **Rate**—The rate measures the number of adverse events per 1,000 population at risk. Rates represent the average rate of the indicator for a nationwide sample of hospitals.
- **Deviation**—Standard deviation is an estimate of systematic variation. For the PSIs, standard deviation is reported between providers.
- **Bias**—Bias represents the degree to which the results may be influenced by outside factors. Bias ratings are based on a series of tests of bias using DRG and comorbidity risk adjustment. Those

indicators flagged with **X+** demonstrated substantial bias and should be risk adjusted. Those indicators flagged with **X** also demonstrated some bias. Those without a flag did not demonstrate substantial bias in empirical tests, but may nonetheless be substantially biased in a manner not detectable by the bias tests. Those marked with **N/A** did not undergo empirical testing of bias due to lack of systematic variation.

Strength of Evidence. The following key findings represent a review of the limited literature assessing the validity of the indicators:

Coding—Sensitivity is the proportion of patients who suffered an adverse event, based on detailed chart review or prospective data collection, for whom that event was coded on a discharge abstract or Medicare claim. Predictive value is the proportion of patients with a coded adverse event who were confirmed as having suffered that event, based on detailed chart review or prospective data collection.

Construct, explicit process—Adherence to specific, evidence-based or expert-endorsed processes of care, such as appropriate use of diagnostic modalities and effective therapies. The construct is that hospitals that provide better processes of care should experience fewer adverse events.

Construct, implicit process—Adherence to the "standard of care" for similar patients, based on global assessment of quality by physician chart reviewers. The construct is that hospitals that provide better overall care should experience fewer adverse events.

Construct, staffing—The construct is that hospitals that offer more nursing hours per patient day, better nursing skill mix, better physician skill mix, or more experienced physicians should have fewer adverse events.

The following distinctions were used to summarize the strength of the published evidence for each indicator:

- Published evidence suggests that the indicator lacks validity in this domain (i.e., less than 50% sensitivity or predictive value; explicit or implicit process failure rates no more frequent than among control patients).

0 No published evidence regarding this domain of validity.

± Published evidence suggests that the indicator may be valid in this domain, but different studies offer conflicting results (although study quality may account for these conflicts).

+ Published evidence suggests that the indicator is valid, or is likely to be valid, in this domain (i.e., one favorable study).

++ There is strong evidence supporting the validity of this indicator in this domain (i.e., multiple studies with consistent results, or studies showing both high sensitivity and high predictive value). When content validity is exceptionally high, as for transfusion reaction or iatrogenic pneumothorax, construct validity becomes less important.

A complete description of each PSI is included later in the guide under "Detailed Evidence for Patient Safety Indicators" and in Appendix A. Details on the empirical methods can be found in Appendix B.

Table 1: AHRQ Provider-Level Patient Safety Indicators

PSI Name	Definition	Validity Concerns	Empirical Performance[b]	Strength of Evidence
Complications of Anesthesia (PSI 1)	Cases of anesthetic overdose, reaction, or endotrachial tube misplacement per 1,000 surgery discharges. Excludes codes for drug use and self-inflicted injury.	Condition definition varies Underreporting or screening Denominator unspecific	Provider Rate = 0.61 Provider SD = 1.74 Pop. Rate = 0.56 Bias = Not detected [c]	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Death in Low Mortality DRGs (PSI 2)	In-hospital deaths per 1,000 patients in DRGs with less than 0.5% mortality.[a] Excludes trauma, immuno-compromised, and cancer patients.	Heterogeneous severity	Provider Rate = 2.44 Provider SD = 30.60 Pop. Rate = 0.66 Bias = X+	+ Coding 0 Explicit Process + Implicit Process 0 Staffing
Decubitus Ulcer (PSI 3)	Cases of decubitus ulcer per 1,000 discharges with a length of stay of 5 or more days. Excludes patients with paralysis or in MDC 9, obstetrical patients in MDC 14, and patients admitted from a long-term care facility.	Underreporting or screening Heterogeneous severity Case mix bias	Provider Rate = 23.91 Provider SD = 21.61 Pop. Rate = 22.71 Bias = X+	– Coding 0 Explicit Process 0 Implicit Process ± Staffing
Failure to Rescue (PSI 4)	Deaths per 1,000 patients having developed specified complications of care during hospitalization. Excludes patients age 75 and older, neonates in MDC 15, patients admitted from long-term care facility and patients transferred to or from other acute care facility.	Adverse consequences Stratification suggested Unclear preventability Heterogeneous severity	Provider Rate = 125.89 Provider SD = 83.97 Pop. Rate = 144.98 Bias = X+	+ Coding 0 Explicit Process 0 Implicit Process ++ Staffing
Foreign Body Left During Procedure (PSI 5)	Discharges with foreign body accidentally left in during procedure per 1,000 discharges	Rare Stratification suggested Denominator unspecific	Provider Rate = 0.06 Provider SD = 0.17 Pop. Rate = 0.08 Bias = N/A	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Iatrogenic Pneumothorax (PSI 6)	Cases of iatrogenic pneumothorax per 1,000 discharges. Excludes trauma, thoracic surgery, lung or pleural biopsy, or cardiac surgery patients, and obstetrical patients in MDC 14.	Denominator unspecific	Provider Rate = 0.63 Provider SD = 0.71 Pop. Rate = 0.83 Bias = X	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing

PSI Name	Definition	Validity Concerns	Empirical Performance[b]	Strength of Evidence
Selected Infections Due to Medical Care (PSI 7)	Cases of secondary ICD-9-CM codes 9993 or 00662 per 1,000 discharges. Excludes patients with immunocompromised state or cancer.	Underreporting or screening Adverse consequences	Provider Rate = 1.51 Provider SD = 3.31 Pop. Rate = 1.99 Bias = X	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Postoperative Hip Fracture (PSI 8)	Cases of in-hospital hip fracture per 1,000 surgical discharges. Excludes patients in MDC 8, with conditions suggesting fracture present on admission and obstetrical patients in MDC 14.	Case mix bias Denominator unspecific	Provider Rate = 0.52 Provider SD = 5.93 Pop. Rate = 0.30 Bias = X	+ Coding + Explicit Process + Implicit Process 0 Staffing
Postoperative Hemorrhage or Hematoma (PSI 9)	Cases of hematoma or hemorrhage requiring a procedure per 1,000 surgical discharges. Excludes obstetrical patients in MDC 14.	Stratification suggested Case mix bias Denominator unspecific	Provider Rate = 1.59 Provider SD = 2.25 Pop. Rate = 2.03 Bias = Not detected	± Coding ± Explicit Process + Implicit Process 0 Staffing
Postoperative Physiologic and Metabolic Derangement (PSI 10)	Cases of specified physiological or metabolic derangement per 1,000 elective surgical discharges. Excludes patients with principal diagnosis of diabetes and with diagnoses suggesting increased susceptibility to derangement. Excludes obstetric admissions.	Condition definition varies	Provider Rate = 0.78 Provider SD = 20.13 Pop. Rate = 0.54 Bias = X	– Coding 0 Explicit Process 0 Implicit Process – Staffing
Postoperative Respiratory Failure (PSI 11)	Cases of acute respiratory failure per 1,000 elective surgical discharges. Excludes MDC 4 and 5 and obstetric admissions.	Unclear preventability Case mix bias	Provider Rate = 3.18 Provider SD = 10.14 Pop. Rate = 3.44 Bias = X+	+ Coding ± Explicit Process + Implicit Process ± Staffing
Postoperative PE or DVT (PSI 12)	Cases of deep vein thrombosis or pulmonary embolism per 1,000 surgical discharges. Excludes obstetric patients.	Underreporting or screening Stratification suggested	Provider Rate = 6.28 Provider SD = 20.14 Pop. Rate = 7.08 Bias = X+	+ Coding + Explicit Process + Implicit Process ± Staffing
Postoperative Sepsis (PSI 13)	Cases of sepsis per 1,000 elective surgery patients, with length of stay more than 3 days. Excludes principal diagnosis of infection, or any diagnosis of immunocompromised state or cancer, and obstetric admissions.	Condition definition varies Adverse consequences	Provider Rate = 11.48 Provider SD = 39.57 Pop. Rate = 9.75 Bias = X+	± Coding 0 Explicit Process 0 Implicit Process – Staffing

PSI Name	Definition	Validity Concerns	Empirical Performance[b]	Strength of Evidence
Postoperative Wound Dehiscence (PSI 14)	Cases of reclosure of postoperative disruption of abdominal wall per 1,000 cases of abdominopelvic surgery. Excludes obstetric admissions.	Case mix bias	Provider Rate = 1.47 Provider SD = 4.57 Pop. Rate = 1.41 Bias = X	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Accidental Puncture or Laceration (PSI 15)	Cases of technical difficulty (e.g., accidental cut or laceration during procedure) per 1,000 discharges. Excludes obstetric admissions.	Underreporting or screening Unclear preventability	Provider Rate = 2.38 Provider SD = 2.55 Pop. Rate = 3.22 Bias = X+	± Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Transfusion Reaction (PSI 16)	Cases of transfusion reaction per 1,000 discharges.	Rare Stratification suggested	Provider Rate = 0.005 Provider SD = 0.106 Pop. Rate = 0.005 Bias = N/A	0 Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Birth Trauma—Injury to Neonate (PSI 17)	Cases of birth trauma, injury to neonate, per 1,000 liveborn births. Excludes some preterm infants and infants with osteogenic imperfecta.	Condition definition varies Unclear preventability Heterogeneous severity	Provider Rate = 5.62 Provider SD = 19.86 Pop. Rate = 6.34 Bias = N/A	– Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Obstetric Trauma—Vaginal Delivery with Instrument (PSI 18)	Cases of obstetric trauma (4^{th} degree lacerations, other obstetric lacerations) per 1,000 instrument-assisted vaginal deliveries.	Unclear preventability Case mix bias	Provider Rate = 200.38 Provider SD = 141.66 Pop. Rate = 217.09 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Obstetric Trauma—Vaginal Delivery without Instrument (PSI 19)	Cases of obstetric trauma (4^{th} degree lacerations, other obstetric lacerations) per 1,000 vaginal deliveries without instrument assistance.	Unclear preventability Case mix bias	Provider Rate = 77.96 Provider SD = 57.60 Pop. Rate = 81.98 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Obstetric Trauma—Cesarean Delivery (PSI 20)	Cases of obstetric trauma (4^{th} degree lacerations, other obstetric lacerations) per 1,000 Cesarean deliveries.	Unclear preventability Case mix bias	Provider Rate = 5.60 Provider SD = 9.99 Pop. Rate = 5.93 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Obstetric Trauma with 3^{rd} Degree —Vaginal Delivery with Instrument (PSI 27)	Cases of obstetric trauma (3^{rd} and 4^{th} degree lacerations, other obstetric lacerations) per 1,000 instrument-assisted vaginal deliveries.	Unclear preventability Case mix bias	Provider Rate = 238.68 Provider SD = 152.02 Pop. Rate = 246.00 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing

PSI Name	Definition	Validity Concerns	Empirical Performance[b]	Strength of Evidence
Obstetric Trauma with 3rd Degree —Vaginal Delivery without Instrument (PSI 28)	Cases of obstetric trauma (3rd and 4th degree lacerations, other obstetric lacerations) per 1,000 vaginal deliveries without instrument assistance.	Unclear preventability Case mix bias	Provider Rate = 86.83 Provider SD = 59.32 Pop. Rate = 88.74 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing
Obstetric Trauma with 3rd Degree — Cesarean Delivery (PSI 29)	Cases of obstetric trauma (3rd and 4th degree lacerations, other obstetric lacerations) per 1,000 Cesarean deliveries.	Unclear preventability Case mix bias	Provider Rate = 5.84 Provider SD = 10.09 Pop. Rate = 6.20 Bias = N/A	+ Coding 0 Explicit Process 0 Implicit Process 0 Staffing

[a] DRGs that are divided into "with complications and comorbidities" and "without complications and comorbidities" are only included if both divisions have mortality rates below 0.5%.

[b] Notes under **Empirical Performance**:
Provider Rates - Observed (unadjusted) and unweighted rates for providers (hospitals) and their standard deviations (SD) were calculated using the HCUP Year 2000 SID from 27states. Provider rates are per 1,000.
Population Rates - The population rates are weighted provider rates (weighted by the number of discharges for each indicator).

Table 2. AHRQ Area Level Patient Safety Indicators

PSI Name	Definition	Validity Concerns	Empirical Performance[a]	Strength of Evidence
Foreign Body Left During Procedure (PSI 21)	Discharges with foreign body accidentally left in during procedure per 100,000 population		Area Rate = 7.70 Area SD = 21.71 Pop. Rate = 10.25	
Iatrogenic Pneumothorax (PSI 22)	Cases of iatrogenic pneumothorax per 100,000 population. Excludes trauma, thoracic surgery, lung or pleural biopsy, or cardiac surgery patients, and obstetrical patients in MDC 14.		Area Rate = 70.98 Area SD = 72.65 Pop. Rate = 102.26	
Selected Infections Due to Medical Care (PSI 23)	Cases of secondary ICD-9-CM codes 999.3 or 996.62 per 100,000 population. Excludes patients with immunocompromised state or cancer.		Area Rate = 177.99 Area SD = 199.59 Pop. Rate = 382.86	
Postoperative Wound Dehiscence (PSI 24)	Cases of reclosure of postoperative disruption of abdominal wall per 100,000 population. Excludes obstetric admissions.		Area Rate = 18.60 Area SD = 35.50 Pop. Rate = 20.13	

PSI Name	Definition	Validity Concerns	Empirical Performance[a]	Strength of Evidence
Accidental Puncture or Laceration (PSI 25)	Cases of technical difficulty (e.g., accidental cut or laceration during procedure) per 100,000 population. Excludes obstetric admissions.		Area Rate = 245.58 Area SD = 239.04 Pop. Rate = 354.08	
Transfusion Reaction (PSI 26)	Cases of transfusion reaction per 100,000 population.		Area Rate = 0.47 Area SD = 4.72 Pop. Rate = 0.52	

[a] Notes under **Empirical Performance**:
Area Rates - Observed (unadjusted) and unweighted rates for areas (counties) and their standard deviations (SD) were based on 1371 geographic areas (counties) in the HCUP Year 2000 SID from 27 states. Area rates are per 100,000.
Population Rates - The population rates are weighted area rates (weighted by the area populations).

Limitations in Using the PSIs

Many important concerns cannot currently be monitored well using administrative data, such as adverse drug events, and using these data tends to favor specific types of indicators. For example, the PSIs evaluated in this report contain a large proportion of surgical indicators, rather than medical or psychiatric, because medical complications are often difficult to distinguish from comorbidities that are present on admission. In addition, medical populations tend to be more heterogeneous than surgical, especially elective surgical populations, making it difficult to account for case-mix. Panelists often expressed that indicators were more applicable to patient safety when limited to elective surgical admissions. However, the careful use of administrative data holds promise for screening to target further data collection and analysis. The ability to assess all patients at risk for a particular patient safety problem, along with the relative low cost, are particular strengths of these data sets.

Two broad areas of concern also hold true for these data sets.

1. Questions about the clinical accuracy of discharge-based diagnosis coding lead to concerns about the interpretation of reported diagnoses that may represent safety problems. Specifically:

    - Administrative data are unlikely to capture all cases of a complication, regardless of the preventability, without false positives and false negatives (sensitivity and specificity).

    - When the codes are accurate in defining an event, the clinical vagueness inherent in the description of the code itself (e.g., “hypotension”), may lead to a highly heterogeneous pool of clinical states represented by that code.

    - Incomplete reporting is an issue in the accuracy of any data source used for identifying patient safety problems, as medical providers might fear adverse consequences as a result of “full disclosure” in potentially public records such as discharge abstracts.

2. The information about the ability of these data to distinguish adverse events in which no error occurred from true medical errors is limited. A number of factors—such as the heterogeneity of clinical conditions included in some codes, lack of information about event timing available in these data sets, and limited clinical detail for risk adjustment—contribute to the difficulty in identifying complications that represent medical error or may be at least in some part preventable.

These factors may exist for other sources of patient safety data as well. For example, they have been raised in the context of the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) implementation of a "sentinel event" program geared at identifying serious adverse events that may be related to underlying safety problems.

Further Research on PSIs

The initial validation evaluations reviewed and performed for the PSIs leave substantial room for further research with detailed chart data and other data sources. Future validation work should focus on the following:

- The sensitivity and specificity of these indicators in detecting the occurrence of a complication.
- The extent to which failures in processes of care at the system or individual level are detected using these indicators.
- The relationship of these indicators with other measures of quality, such as mortality.
- Further explorations of bias and risk adjustment.

Enhancements to administrative data are worth exploring in the context of further validation studies that use data from other sources. For example, as with other quality indicators, the addition of timing variables may prove particularly useful in identifying whether a complication was present on admission, or whether it occurred during the hospitalization. While some of the complications that are present on admission may indeed reflect adverse events of care in a previous hospitalization or outpatient care, many may reflect comorbidities instead of complications. A second example area—linking hospital data over time and with outpatient data and other hospitalizations—would allow inclusion of complications that occur after discharge and likely would increase the sensitivity of the PSIs.

Use of External Cause-of-Injury Codes

Several of the PSIs are based on capturing external cause-of-injury (e-code) data. These codes are used to classify environmental events, circumstances, and conditions as the cause of injury, poisoning, or other adverse events. External cause-of-injury codes are critical to evaluate population-based, cause-specific data on nonfatal injuries at the state and local levels. However, not all states collect this information in their hospital discharge data programs nor do all state uniform billing committees require use of e-codes. Users of the PSIs should be knowledgeable of the e-code requirements and practices of hospitals represented in the input data file.

Table 3 provides a summary of the PSIs that are dependent on e-codes for their definition (required), the PSIs that use e-codes within their definition, and the PSIs that do not use any e-codes in their definition. If use of e-codes is not mandated or coding may be highly variable across hospitals, the PSIs that are dependent upon e-codes should not be used and the PSIs that include e-codes in their definition should be used with caution.

Table 3: Indicators and Use of External Cause-of-Injury Codes

Indicator Number (used in software)	Indicator Name	Use of External Cause-of-Injury Codes
15 & 25	Accidental puncture or laceration	Required. Used in both the numerator and denominator definitions.
17	Birth trauma	Not used.
1	Complications of anesthesia	Required. Used in the numerator definition.
2	Death in low mortality DRGs	Not used.
3	Decubitus ulcer	Not used.
4	Failure to rescue	Not used.
5 & 21	Foreign body left during procedure	Required. Used in the numerator definition although the other ICD-9 CM codes may capture the same information.
6 & 22	Iatrogenic pneumothorax	Not used.
20 & 29	Obstetric trauma – cesarean section	Not used.
18 & 27	Obstetric trauma – vaginal with instrument	Not used.
19 & 28	Obstetric trauma – vaginal without instrument	Not used.
9	Postoperative hemorrhage or hematoma	Not used.
8	Postoperative hip fracture	Used as exclusion criteria in denominator population.
10	Postoperative physiologic and metabolic derangements	Not used.
12	Postoperative pulmonary embolism or deep vein thrombosis	Not used.
11	Postoperative respiratory failure	Not used.
13	Postoperative sepsis	Not used.
14 & 24	Postoperative wound dehiscence	Not used.
7 & 23	Selected infections due to medical care	Not used.
16 & 26	Transfusion reaction	Required. Used in the numerator definition although the other ICD-9 CM codes may capture the same information.

Detailed Evidence for Patient Safety Indicators

This section provides an abbreviated presentation of the details of the literature review and the empirical evaluation for each PSI, including:

- The definition of the indicator
- The outcome of interest (or numerator)
- The population at risk (or denominator)
- The type of indicator
- The measures of empirical performance. Rates are population rates as reported in Table 1 (PSI – Provider) and Table 2 (PSI – Area). Provider rates are per 1,000 qualifying discharges and Area rates are per 100,000 population.

The two-page descriptions for each indicator also include a more detailed discussion of the panel review, the literature review, the source of the indicator, and the results of the empirical analysis, including information related to adjustments to increase the robustness of the rates:

- Reliability. Statistics on the signal standard deviation, signal share, and signal ratio were used to examine the effect of the reliability adjustment. Multivariate methods were applied to most of the indicators, and overall the reliability adjustment reduced the provider-level variation dramatically. In general, indicators with higher rates tend to perform better on tests of reliability; as a result, obstetric indicators with high rates tend to do very well relative to other indicators.

- Bias. The effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals — compared to no risk adjustment —was assessed, if applicable. The presence of high bias suggests that risk adjustment, using administrative data elements, is necessary to interpret provider-level differences in the rates of these indicators.

A full report on the literature review and empirical evaluation can be found in *Evidence Report for Measures of patient Safety Based on Hospital Administrative Data — The Patient Safety Indicators* by the UCSF-Stanford EPC, available at http://www.qualityindicators.ahrq.gov. Detailed coding information for each PSI is provided in Appendix A.

The software manual *Patient Safety Indicators: SAS Software Documentation, Version 2.1* (also available at http://www.qualityindicators.ahrq.gov) provides detailed instructions on how to use the PSI software including data preparation, calculation of the PSI rates, and interpretation of output. All provider level indicators are expressed as rates per 1,000 discharges. To obtain the standardized rate for each provider level PSIs, the output of the software should be multiplied by 1,000. The area level indicators are expressed as rates per 100,000 population. To obtain the standardized area rate for each area level PSIs, the output of the software should be multiplied by 100,000.

Complications of Anesthesia (PSI 1)

Definition	Cases of anesthetic overdose, reaction, or endotrachial tube misplacement per 1,000 surgery discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM diagnosis codes for anesthesia complications in any secondary diagnosis field.
Denominator	All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. Exclude patients with ICD-9-CM diagnosis codes for anesthesia complications in the principal diagnosis field Exclude patients with codes for poisoning due to anesthetics (E8551, 9681-4, 9687) **and** any diagnosis code for active drug dependence, active non-dependent abuse of drugs, or self-inflicted injury.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.56 per 1,000 population at risk Bias: Not detected, but may be biased in a way undetectable by empirical tests
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to capture cases flagged by external cause-of-injury codes (e-codes) and complications codes for adverse effects from the administration of therapeutic drugs, as well as the overdose of anesthetic agents used primarily in therapeutic settings.

Panel Review

Panelists had concerns about the frequency of coding of these complications, especially since the use of e-codes is considered voluntary and appears to vary widely among providers. Plausibly, a "reaction" may be described without attributing it to anesthetic. Another concern is that some of these cases would be present on admission (e.g., due to recreational drug use).

Panelists expressed concern about the events that would be assigned to the code for incorrect placement of endotrachial tube. They noted that true misplacement does represent medical error, but they were skeptical about whether this code would be limited to those situations.

Ideally, this indicator would be used with a coding designation that distinguishes conditions present on admission from those that develop in-hospital. However, this is not available in the administrative data used to define this indicator, and so this concern was addressed by eliminating codes for drugs that are commonly used as recreational drugs. While this does not eliminate the chance that these codes represent intentional or accidental overdose on the part of the patient, it should eliminate many of these cases.

Literature Review

The literature review focused on the validity of complication indicators based on ICD-9-CM diagnosis or procedure codes. Results of the literature review indicate no published evidence for the sensitivity or predictive value of this indicator based on detailed chart review or prospective data collection. Sensitivity is the proportion of the patients who suffered an adverse event for whom that event was coded on a discharge abstract or Medicare claim. Predictive value is the proportion of patients with a coded adverse event who were confirmed as having suffered that event.

The project team found no published evidence for this indicator that supports the following constructs: (1) that hospitals that provide better processes of care experience fewer adverse events; (2) that hospitals that provide better overall care experience fewer adverse events; and (3) that hospitals that offer more nursing

hours per patient day, better nursing skill mix, better physician skill mix, or more experienced physicians have fewer adverse events.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Complications of Anesthesia generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is 75.7%, suggesting that observed differences in risk-adjusted rates likely reflect true differences across hospitals.

The signal standard deviation for this indicator is 0.00187, indicating that the systematic differences (signal) among hospitals is lower than many indicators and less likely associated with hospital characteristics. The signal share is 0.00563, and is also lower than many indicators. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Complications of Anesthesia is low, indicating that the measures are likely not biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.)

Source

A subset of this indicator was originally proposed by Iezzoni et al.[42] as part of Complications Screening Program (CSP) (CSP 21, "Complications relating to anesthetic agents and other CNS depressants") Their definition also includes poisoning due to centrally acting muscle relaxants and accidental poisoning by nitrogen oxides, which were omitted from this PSI. Their definition excludes other codes included in the PSI, namely, poisoning by other and unspecified general anesthetics and external cause of injury codes for "endotracheal tube wrongly place during anesthetic procedure" and adverse effects of anesthetics in therapeutic use.

[42] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

Death in Low-Mortality DRGs (PSI 2)

Definition	In-hospital deaths per 1,000 patients in DRGs with less than 0.5% mortality.
Numerator	Discharges with disposition of "deceased".
Denominator	Patients in DRGs with less than 0.5% mortality rate, based on NIS 1997 low-mortality DRG. If a DRG is divided into "without/with complications," both DRGs must have mortality rates below 0.5% to qualify for inclusion. Exclude patients with any code for trauma, immunocompromised state, or cancer.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.66 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to identify in-hospital deaths in patients unlikely to die during hospitalization. The underlying assumption is that when patients admitted for an extremely low-mortality condition or procedure die, a health care error is more likely to be responsible. Patients experiencing trauma or having an immunocompromised state or cancer are excluded, as these patients have higher non-preventable mortality.

Panel Review

This indicator should be evaluated separately by type of DRG when used as an indicator of quality. For example, the PSI Software reports the low-mortality DRG rate for all the included DRGs and separately by DRG type: adult medical, adult surgical (with and without an operating room procedure), pediatric medical, pediatric surgical (with and without an operating room procedure), and obstetric and psychiatric. The overall usefulness of this indicator was rated as favorable by panelists. Because the denominator includes many heterogeneous patients cared for by different services, this indicator should be stratified by DRG type (i.e., medical, surgical, psychiatric, obstetric, pediatric) when used as an indicator of quality.

Panelists noted that hospital case-mix may affect the rate of death in low mortality DRGs, and patients referred from skilled nursing facilities, those with certain comorbidities, and older patients may be at higher risk of dying. They advocated risk adjustment for comorbidities and age.

Panelists advocated that this indicator not be subject to public reporting because of the potential bias and questions about the extent of preventability.

Literature Review

Based on two-stage implicit review of randomly selected deaths, Hannan et al. found that patients in low-mortality DRGs (<0.5%) were 5.2 times more likely than all other patients who died (9.8% versus 1.7%) to have received "care that departed from professionally recognized standards," after adjusting for patient demographic, geographic, and hospital characteristics.[43] In 15 of these 26 cases (58%) of substandard care, the patient's death was attributed at least partially to that care. The association with substandard care was stronger for the DRG-based definition of this indicator than for the procedure-based definition (5.7% versus 1.7%, OR=3.2). The project team was unable to find other evidence on the validity of this indicator.

[43] Hannan EL, Bernard HR, O'Donnell JF, Kilburn H, Jr. A methodology for targeting hospital cases for quality of care record reviews. Am J Public Health 1989;79(4):430-6.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Death in Low-mortality DRGs generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is high, relative to other indicators, at 94.2%, suggesting that observed differences in risk-adjusted rates likely reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00439, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is high, relative to other indicators, at 0.04237. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Death in Low-mortality DRGs is high, indicating that the measures are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Hannan et al. as a criterion for targeting "cases that would have a higher percentage of quality of care problems than cases without the criterion, as judged by medical record review."[44] An alternative form of this indicator focused on "primary surgical procedures," rather than DRGs, with less than 0.5% inpatient mortality.

[44] Hannan et al. 1989.

Decubitus Ulcer (PSI 3)

Definition	Cases of decubitus ulcer per 1,000 discharges with a length of stay greater than 4 days.
Numerator	Discharges with ICD-9-CM code of 7070 in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Include only patients with a length of stay of 5 or more days. Exclude patients with ICD-9-CM code of 7070 in the principal diagnosis field. Exclude patients in MDC-9 or patients with any diagnosis of hemiplegia, paraplegia, or quadriplegia. Exclude obstetrical patients in MDC 14. Exclude patients admitted from a long-term care facility.
Type of Indicator	Provider level
Empirical Performance	Rate: 22.71 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to flag cases of in-hospital decubitus ulcers. Its definition is limited to decubitus ulcer as a secondary diagnosis to better screen out cases that may be present on admission. In addition, this indicator excludes patients who have a length of stay of 4 days or less, as it is unlikely that a decubitus ulcer would develop within this period of time. Finally, this indicator excludes patients who are particularly susceptible to decubitus ulcer, namely patients with major skin disorders (MDC 9) and paralysis.

Panel Review

The overall usefulness of this indicator was rated as very favorable by panelists. Concerns regarding the systematic screening for ulcers and reliability of coding, especially for early stage ulcers, brought into question that assertion. Therefore, this indicator appears to be best used as a rate-based indicator. Panelists suggested that patients admitted from a long-term care facility be excluded, as these patients may have an increased risk of having decubiti present on admission.

Panelists noted that hospitals that routinely screen for decubitus ulcers as part of a quality improvement program might have an artificially high rate of ulcers compared to other hospitals, which may cause this indicator to be somewhat biased.

This indicator includes pediatric patients. Pressure sores are very unusual in children, except among the most critically ill children (who may be paralyzed to improve ventilator management) and children with chronic neurological problems. Age stratification is recommended.

Literature Review

Coding validity. No evidence on validity is available from CSP studies. Geraci et al. confirmed only 2 of 9 episodes of pressure ulcers reported on discharge abstracts of Veterans Affairs (VA) patients hospitalized in 1987-89 for congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), or diabetes.[45] The sensitivity for a nosocomial ulcer was 40%. Among Medicare hip fracture patients, Keeler et al. confirmed 6 of 9 reported pressure ulcers, but failed to ascertain 89

[45] Geraci JM, Ashton CM, Kuykendall DH, Johnson ML, Wu L. International Classification of Diseases, 9th Revision, Clinical Modification codes in discharge abstracts are poor measures of complication occurrence in medical inpatients. Med Care 1997;35(6):589-602.

additional cases (6% sensitivity) using ICD-9-CM codes.[46] In the largest study to date, Berlowitz et al. found that the sensitivity of a discharge diagnosis of pressure ulcer among all patients transferred from VA hospitals to VA nursing homes in 1996 was 31% overall, or 54% for stage IV (deep) ulcers.[47] The overall sensitivity increased modestly since 1992 (26.0%), and was slightly but statistically significantly better among medical patients than among surgical patients (33% versus 26%).

Construct validity. Needleman and Buerhaus found that nurse staffing was inconsistently associated with the occurrence of pressure ulcers among medical patients, and was independent of pressure ulcers among major surgery patients.[48] As was expected, nursing skill mix (RN hours/licensed nurse hours) was significantly associated with the pressure ulcer rate.[49] Total licensed nurse hours per acuity-adjusted patient day were inconsistently associated with the rate of pressure ulcers.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Decubitus Ulcer generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is high, relative to other indicators, at 85.6%, suggesting that observed differences in risk-adjusted rates likely reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.0147, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.01067. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Decubitus Ulcer is high, indicating that the measure is biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Iezzoni et al.[50] as part of the Complications Screening Program (CSP 6, "cellulitis or decubitus ulcer"). Needleman and Buerhaus identified decubitus ulcer as an "outcome potentially sensitive to nursing"[51] The American Nurses Association, its State associations, and the California Nursing Outcomes Coalition have identified the total prevalence of inpatients with Stage I, II, III, or IV pressure ulcers as a "nursing-sensitive quality indicator for acute care settings."[52]

[46] Keeler E, Kahn K, Bentow S. Assessing quality of care for hospitalized Medicare patients with hip fracture using coded diagnoses from the Medicare Provider Analysis and Review file. Springfield, VA: NTIS; 1991.

[47] Berlowitz D, Brand H, Perkins C. Geriatric syndromes as outcome measures of hospital care: Can administrative data be used? JAGS 1999;47:692-696.

[48] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston, MA: Health Resources Services Administration; 2001 February 28. Report No.: 230-88-0021.

[49] Lichtig LK, Knauf RA, Hilholland DK. Some impacts of nursing on acute care hospital outcomes. J Nurs Adm 1999;29(2):25-33.

[50] Iezzoni LI, Daley J, Heeren T, Foley SM, Risher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[51] Needleman et al. 2001.

[52] Nursing-Sensitive Quality Indicators for Acute Care Settings and ANA's Safety & Quality Initiative. In: American Nurses Association; 1999.

Failure to Rescue (PSI 4)

Definition	Deaths per 1,000 patients having developed specified complications of care during hospitalization.
Numerator	Discharges with a disposition of "deceased".
Denominator	Discharges with potential complications of care listed in failure to rescue definition (i.e., pneumonia, DVT/PE, sepsis, acute renal failure, shock/cardiac arrest, or GI hemorrhage/acute ulcer). Exclusion criteria specific to each diagnosis. Exclude patients age 75 years and older. Exclude neonatal patients in MDC 15. Exclude patients transferred to an acute care facility. Exclude patients transferred from an acute care facility. Exclude patients admitted from a long-term care facility.
Type of Indicator	Provider level
Empirical Performance	Rate: 144.98 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to identify patients who die following the development of a complication. The underlying assumption is that good hospitals identify these complications quickly and treat them aggressively.

Failure to Rescue may be fundamentally different than other indicators reviewed in this report, as it may reflect different aspects of quality of care (effectiveness in rescuing a patient from a complication versus preventing a complication). This indicator includes pediatric patients. It is important to note that children beyond the neonatal period inherently recover better from physiological stress and thus may have a higher rescue rate.

Panel Review

Panelists expressed concern regarding patients with "do not resuscitate" (DNR) status. In cases where this DNR status is not a direct result of poor quality of care, it would be contrary to patient desire and poor quality of care to rescue a patient. In addition, very old patients—or patients with advanced cancer or HIV—may not desire or may be particularly difficult to rescue from these complications. As a result, this indicator definition was modified to exclude those patients age 75 years and older. In addition, panelists suggested the exclusion of patients admitted from long-term care facilities.

Panelists noted that several adverse incentives may be introduced by implementing this indicator. In particular, since some type of adjustment may be desirable, this indicator may encourage the upcoding of complications and comorbidities to inflate the denominator or manipulate risk adjustment. Others noted that this indicator could encourage irresponsible resource use and allocation, although this is likely to be a controversial idea. Finally, panelists emphasized that this indicator should be used internally by hospitals, as it is not validated for public reporting.

Literature Review

Construct validity. Silber and colleagues have published a series of studies establishing the construct validity of failure-to-rescue rates through their associations with hospital characteristics and other measures of hospital performance. Among patients admitted for cholecystectomy and transurethral

prostatectomy, failure to rescue was independent of severity of illness at admission, but was significantly associated with the presence of surgical house staff and a lower percentage of board-certified anesthesiologists.[53] The adverse occurrence rate was independent of this hospital characteristic. In a larger sample of patients who underwent general surgical procedures, lower failure-to-rescue rates were found at hospitals with high ratios of registered nurses to beds.[54] Failure rates were strongly associated with risk-adjusted mortality rates, as expected, but not with complication rates.[55]

More recently, Needleman and Buerhaus confirmed that higher registered nurse staffing (RN hours/adjusted patient day) and better nursing skill mix (RN hours/licensed nurse hours) were consistently associated with lower failure-to-rescue rates, even using administrative data to define complications.[56]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Failure to Rescue generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 66.6%, suggesting that observed differences in risk-adjusted rates may reflect true differences across hospitals.

The signal standard deviation for this indicator is also high, relative to other indicators, at 0.04617, indicating that the systematic differences (signal) among hospitals is high and more likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.01450. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Failure to Rescue is high, indicating that the measures are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Silber et al. as a more powerful tool than the risk-adjusted mortality rate to detect true differences in patient outcomes across hospitals.[57] The underlying premise was that better hospitals are distinguished not by having fewer adverse occurrences but by more successfully averting death among (i.e., rescuing) patients who experience such complications. More recently, Needleman and Buerhaus adapted Failure to Rescue to administrative data sets, hypothesizing that this outcome might be sensitive to nurse staffing.[58]

[53] Silber JH, Williams SV, Krakauer H, Schwartz JS. Hospital and patient characteristics associated with death after surgery. A study of adverse occurrence and failure to rescue. Med Care 1992;30(7):615-29.

[54] Silber J, Rosenbaum P, Ross R. Comparing the contributions of groups of predictors: Which outcomes vary with hospital rather than patient characteristics? J Am Stat Assoc 1995;90:7-18.

[55] Silber JH, Rosenbaum PR, Williams SV, Ross RN, Schwartz JS. The relationship between choice of outcome measure and hospital rank in general surgical procedures: Implications for quality assessment. Int J Qual Health Care 1997;9(3):193-200.

[56] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston MA: Health Resources and Services Administration; 2001 February 28. Report No.:230-99-0021.

[57] Silber et al. 1992.

[58] Needleman et al. 2001.

Foreign Body Left During Procedure (PSI 5)

Provider Level Definition (only secondary diagnosis)

Definition	Discharges with foreign body accidentally left in during procedure per 1,000 discharges.
Numerator	Discharges with ICD-9-CM codes for foreign body left in during procedure in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Exclude patients with ICD-9-CM codes for foreign body left in during procedure in the principal diagnosis field
Type of Indicator	Provider level
Empirical Performance	Rate: 0.08 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age, sex, DRG, comorbidity categories

Foreign Body Left During Procedure (PSI 21)

Area Level Definition (principal or secondary diagnosis)

Definition	Discharges with foreign body accidentally left in during procedure per 100,000 population.
Numerator	Discharges with ICD-9-CM codes for foreign body left in during procedure in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific DRGs.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 10.25 per 100,000 population
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of a foreign body accidentally left in a patient during a procedure. This indicator is defined on both a provider level (by restricting cases to those flagged by a secondary diagnosis or procedure code) and an area level (by including all cases).

Panel Review

Panelists believed that this indicator was useful in identifying cases of a foreign body left in during a procedure. However, they suggested that each case identified be examined carefully by the hospital, because this indicator was likely to yield few cases and some automated systems report this complication when a foreign body is left in intentionally.

Panelists also noted that the population at risk included both medical and surgical patients, but not all of these patients are at risk. The panelists felt that limiting the population at risk to surgical patients would decrease the sensitivity of this indicator substantially. Since not all patients in the denominator are actually at risk, some hospitals may appear to have a lower rate if they have fewer medical patients who have undergone invasive procedures.

Literature Review

The literature review focused on the validity of complication indicators based on ICD-9-CM diagnosis or procedure codes. Results of the literature review indicate no published evidence for the sensitivity or predictive value of this indicator based on detailed chart review or prospective data collection. Sensitivity is the proportion of the patients who suffered an adverse event for whom that event was coded on a discharge abstract or Medicare claim. Predictive value is the proportion of patients with a coded adverse event who were confirmed as having suffered that event.

The project team found no published evidence for this indicator that supports the following constructs: (1) that hospitals that provide better processes of care experience fewer adverse events; (2) that hospitals that provide better overall care experience fewer adverse events; and (3) that hospitals that offer more nursing hours per patient day, better nursing skill mix, better physician skill mix, or more experienced physicians have fewer adverse events.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Foreign Body Left During Procedure generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time. Due to the rarity of this diagnosis, reliability and bias were not assessed.

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP "sentinel events").[59] It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in AHRQ's original HCUP Quality Indicators.[60] It was proposed by Miller et al. in the "Patient Safety Indicator Algorithms and Groupings."[61] Based on expert consensus panels, McKesson Health Solutions included this indicator in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module.

[59] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[60] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: state and national applications. Jt Comm J Qual Improv 1998;24(2):88-105.

[61] Miller M, Elixhauser A, Zhan C, Meyer G. Patient safety indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Iatrogenic Pneumothorax (PSI 6)

Provider Level Definition (only secondary diagnosis)

Definition	Cases of iatrogenic pneumothorax per 1,000 discharges.
Numerator	Discharges with ICD-9-CM code of 512.1 in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Excluded patients with ICD-9-CM code of 512.1 in the principal diagnosis field. Exclude patients with any diagnosis of trauma. Exclude patients with any code indicating thoracic surgery or lung or pleural biopsy or assigned to cardiac surgery DRGs. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.83 per 1,000 population at risk Bias: Some bias demonstrated
Risk Adjustment	Age, sex, DRG, comorbidity categories

Iatrogenic Pneumothorax (PSI 22)

Area Level Definition (principal or secondary diagnosis)

Definition	Cases of iatrogenic pneumothorax per 100,000 population.
Numerator	Discharges with ICD-9-CM code of 512.1 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific DRGs. Exclude patients with any diagnosis of trauma. Exclude patients with any code indicating thoracic surgery or lung or pleural biopsy or assigned to cardiac surgery DRGs. Exclude obstetrical patients in MDC 14.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 102.26 per 100,000 population
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of pneumothorax caused by medical care. This indicator is defined on both a provider level (by including cases of iatrogenic pneumothorax occurring as a secondary diagnosis during hospitalization) and on an area level (by including all cases of iatrogenic pneumothorax).

Iatrogenic pneumothorax excludes all trauma patients because these patients may be more susceptible to non-preventable iatrogenic pneumothorax or may be miscoded for traumatic pneumothorax. The smaller anatomy of children, especially neonates, may increase the technical complexity of these procedures in this population (however, these procedures are less likely to be performed in unmonitored settings).

Panel Review

Panelists rated the overall usefulness of this indicator favorably. The denominator of the

definition that the panelists rated was limited to patients receiving a central line, Swan-Ganz catheter, or thorocentesis. However, exploratory empirical analyses found that this definition could not be operationalized using administrative data, as these procedures appeared to be under-reported. Although the panelists noted that this complication, given the definition rated, reflected medical error, the actual final definition of this indicator includes cases that may be less reflective of medical error. Specifically, this indicator includes patients in whom a pneumothorax resulted from barotrauma, including patients with acute respiratory distress syndrome.

Panelists expressed concern that some approaches of placing a central line (e.g., subclavian) may be more likely to result in pneumothorax than other approaches (e.g., internal jugular). However, other complications—such as complications of the carotid artery—would be more common with internal jugular approaches. Thus, if providers simply change approach, they may have a decrease in pneumothorax but an increase in other unmeasured complications.

Literature Review

The literature review focused on the validity of complication indicators based on ICD-9-CM diagnosis or procedure codes. Results of the literature review indicate no published evidence for the sensitivity or predictive value of this indicator based on detailed chart review or prospective data collection. Sensitivity is the proportion of the patients who suffered an adverse event for whom that event was coded on a discharge abstract or Medicare claim. Predictive value is the proportion of patients with a coded adverse event who were confirmed as having suffered that event.

The project team found no published evidence for this indicator that supports the following constructs: (1) that hospitals that provide better processes of care experience fewer adverse events; (2) that hospitals that provide better overall care experience fewer adverse events; and (3) that hospitals that offer more nursing hours per patient day, better nursing skill mix, better physician skill mix, or more experienced physicians have fewer adverse events.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Iatrogenic Pneumothorax generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 79.9%, suggesting that observed differences in risk-adjusted rates may reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00143, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00183. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Iatrogenic Pneumothorax is moderate, indicating that the measures may or may not be substantially biased based on the characteristics observed.

Source

This diagnosis code was proposed by Miller et al. as one component of a broader indicator ("iatrogenic conditions") in the "Patient Safety Indicator Algorithms and Groupings."[62] It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in AHRQ's Version 1.3 HCUP Quality Indicators.

[62] Miller M, Elixhauser A, Zhan C, Meyer G. Patient safety indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Selected Infections Due to Medical Care (PSI 7)

Provider Level Definition (only secondary diagnosis)

Definition	Cases of ICD-9-CM codes 9993 or 99662 per 1,000 discharges.
Numerator	Discharges with ICD-9-CM code of 9993 or 99662 in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Exclude patients with ICD-9-CM code of 9993 or 99662 in the principal diagnosis field. Exclude patients with any diagnosis code for immunocompromised state or cancer.
Type of Indicator	Provider level
Empirical Performance	Rate: 1.99 per 1,000 population at risk Bias: Some bias demonstrated
Risk Adjustment	Age, sex, DRG, comorbidity categories

Selected Infections Due to Medical Care (PSI 23)

Area Level Definition (principal or secondary diagnosis)

Definition	Cases of ICD-9-CM codes 9993 or 99662 per 100,000 population.
Numerator	Discharges with ICD-9-CM code of 9993 or 99662 in any diagnosis field (principal or secondary) of medical and surgical discharges defined by specific DRGs. Exclude patients with any diagnosis code for immunocompromised state or cancer.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 382.86 per 100,000 population
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of infection due to medical care, primarily those related to intravenous (IV) lines and catheters. This indicator is defined both on a provider level (by including cases based on secondary diagnosis associated with the same hospitalization) and on an area level (by including all cases of such infection). Patients with potential immunocompromised states (e.g., AIDS, cancer, transplant) are excluded, as they may be more susceptible to such infection. This indicator includes children and neonates. It should be noted that high-risk neonates are at particularly high risk for catheter-related infections.

Panel Review

Panelists expressed particular interest in tracking IV and catheter-related infections, despite the potential for bias due to charting or under-reporting. For the most part, they felt that these complications were important to track. As with other indicators tracking infections, concern

regarding the potential overuse of prophylactic antibiotics remains.

Literature Review

The literature review focused on the validity of complication indicators based on ICD-9-CM diagnosis or procedure codes. Results of the literature review indicate no published evidence for the sensitivity or predictive value of this indicator based on detailed chart review or prospective data collection. Sensitivity is the proportion of the patients who suffered an adverse event for whom that event was coded on a discharge abstract or Medicare claim. Predictive value is the proportion of patients with a coded adverse event who were confirmed as having suffered that event.

The project team found no published evidence for this indicator that supports the following constructs: (1) that hospitals that provide better processes of care experience fewer adverse events; (2) that hospitals that provide better overall care experience fewer adverse events; and (3) that hospitals that offer more nursing hours per patient day, better nursing skill mix, better physician skill mix, or more experienced physicians have fewer adverse events.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Selected Infections Due to Medical Care generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 70.8%, suggesting that observed differences in risk-adjusted rates may reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00134, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00095. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Selected Infections Due to Medical Care is moderate, indicating that the measures may or may not be substantially biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.)

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP 11, "miscellaneous complications").[63] The University HealthSystem Consortium adopted the CSP indicator for major (#2933) and minor (#2961) surgery patients. A much narrower definition, including only 9993 ("other infection after infusion, injection, transfusion, vaccination"), was proposed by Miller et al. in the "Patient Safety Indicator Algorithms and Groupings."[64] The American Nurses Association and its State associations have identified the number of laboratory-confirmed bacteremic episodes associated with central lines per critical care patient day as a "nursing-sensitive quality indicator for acute care settings."[65]

[63] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[64] Miller M, Elixhauser A, Zhan C, Meyer G. Patient safety indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

[65] Nursing-Sensitive Quality Indicators for Acute Care Settings and ANA's Safety and Quality Initiative. In: American Nurses Association; 1999.

Postoperative Hip Fracture (PSI 8)

Definition	Cases of in-hospital hip fracture per 1,000 surgical discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM code for hip fracture in any secondary diagnosis field.
Denominator	All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. Exclude patients with ICD-9-CM code for hip fracture in the principal diagnosis field, cases where the only operating room procedure is hip fracture repair, or where a procedure for hip fracture repair occurs before the first operating room procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude all patients with diseases and disorders of the musculoskeletal system and connective tissue (MDC 8); patients with principal diagnosis codes for seizure, syncope, stroke, coma, cardiac arrest, anoxic brain injury, poisoning, delirium or other psychoses, or trauma; with any diagnosis of metastatic cancer, lymphoid malignancy, bone malignancy or self-inflicted injury; obstetrical patients in MDC 14; or patients 17 years of age or younger.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.30 per 1,000 population at risk Bias: Some bias demonstrated
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to capture cases of in-hospital fracture—specifically, hip fractures. This indicator limits diagnosis codes to secondary diagnosis codes to eliminate fractures that were present on admission. It further excludes patients in MDC 8 (musculoskeletal disorders) and patients with indications for trauma or cancer, or principal diagnoses of seizure, syncope, stroke, coma, cardiac arrest, or poisoning, as these patients may have a fracture present on admission. This indicator is limited to surgical cases since previous research suggested that these codes in medical patients often represent conditions present on admission (see Literature Review).

Panel Review

Although this indicator was initially presented as "In-hospital hip fracture and fall," panelists unanimously suggested that falls should be eliminated from this indicator and that all in-hospital fractures should be included. The resulting indicator was termed "In-hospital fracture possibly related to falls." Children were excluded after empirical analysis revealed that they did not have a substantial number of cases in the numerator.

Panelists noted that this indicator may be slightly biased for hospitals that care for more of the elderly and frail, because they have weaker bones and are more susceptible to falls.

Panelists were interested in capturing all fractures occurring in-hospital, although it was not possible to operationalize this suggestion.

Literature Review

Coding validity. The original CSP definition had an adequate confirmation rate among major surgical cases in Medicare inpatient claims files (57% by coders' review, 71% by physicians' review), but a very poor confirmation rate among medical cases (11% by both coders' and

physicians' review).[66] [67] This problem was attributable to the fact that most hip fractures among medical inpatients were actually comorbid diagnoses present at admission rather than complications of hospital care. Nurse reviews were not performed.

Construct validity. Explicit process of care failures in the CSP validation study were relatively frequent among cases with CSP 25 (76% of major surgery patients, 54% of medical patients), after excluding patients who had hip fractures at admission, but unflagged controls were not evaluated on the same criteria.[68] Physician reviewers identified potential quality problems in 24% of major surgery patients and 5% of medical patients with CSP 25 (versus 2% of unflagged controls for each risk group).[69]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative Hip Fracture generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 67.1%, suggesting that observed differences in risk-adjusted rates may reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00184, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00403. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Hip Fracture is moderate, indicating that the measures may or may not be substantially biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.)

Source

This indicator was originally proposed by Iezzoni et al.[70] as part of the Complications Screening Program (CSP 25, "in-hospital hip fracture or fall"). Their definition also includes any documented fall, based on external cause of injury codes. Needleman and Buerhaus considered in-hospital hip fracture as an "Outcome Potentially Sensitive to Nursing," but discarded it because the "event rate was too low to be useful."[71] The American Nurses Association, its State associations, and the California Nursing Outcomes Coalition have identified the number of patient falls leading to injury per 1,000 patient days (based on clinical data collection) as a "nursing-sensitive quality indicator for acute care settings."[72]

[66] Lawthers A, McCarthy E, Davis R, Peterson L, Palmer R, Iezzoni L. Identification of in-hospital complications from claims data: Is it valid? Med Care 2000;38(8):785-795.

[67] Weingart SN, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, et al. Use of administrative data to find substandard care: Validation of the Complications Screening Program. Med Care 2000;38(8):796-806.

[68] Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, Mukamal K, et al. Does the Complications Screening Program flag cases with process of care problems: Using explicit criteria to judge processes. Int J Qual Health Care 1999;11(2):107-18.

[69] Weingart et al. 2000.

[70] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[71] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston, MA: Health Resources Services Administration; 2001 February 28. Report No.: 230-99-0021.

[72] Nursing-Sensitive Quality Indicators for Acute Care Settings and ANA's Safety & Quality Initiative. In: American Nurses Association; 1999.

Postoperative Hemorrhage or Hematoma (PSI 9)

Definition	Cases of hematoma or hemorrhage requiring a procedure per 1,000 surgical discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM codes for postoperative hemorrhage or postoperative hematoma in any secondary diagnosis field and code for postoperative control of hemorrhage or drainage of hematoma (respectively) in any procedure code field.
Denominator	All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. Exclude patients with ICD-9-CM codes for postoperative hemorrhage or postoperative hematoma in the principal diagnosis field Exclude patients where the only operating room procedure is postoperative control of hemorrhage or drainage of hematoma. Exclude patients where a procedure for postoperative control of hemorrhage or drainage of hematoma occurs before the first operating room procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 2.03 per 1,000 population at risk Bias: Not detected in empirical tests
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to capture cases of hemorrhage or hematoma following a surgical procedure. This indicator limits hemorrhage and hematoma codes to secondary procedure and diagnosis codes, respectively, to isolate those hemorrhages that can truly be linked to a surgical procedure.

Panel Review

Panelists noted that some patients may be at higher risk for developing a postoperative hemorrhage or hematoma. Specifically, they were concerned about patients with coagulopathies and those on anticoagulants. They suggested that where possible, this indicator be stratified for patients with underlying clotting differences. They also noted that patients admitted for trauma may be at a higher risk for developing postoperative hemorrhage or may have a hemorrhage diagnosed that occurred during the trauma. They also suggested that this indicator be stratified for trauma and non-trauma patients.

Literature Review

Coding validity. The original CSP definition had a relatively high confirmation rate among major surgical cases (83% by coders' review, 57% by physicians' review, 52% by nurse-abstracted clinical documentation, and 76% if nurses also accepted physicians' notes as adequate documentation).[73] [74] [75] Hartz and Kuhn estimated

[73] Lawthers A, McCarthy E, Davis R, Peterson L, Palmer R, Iezzoni L. Identification of in-hospital complications from claims data: Is it valid? Med Care 2000;38(8):785-795.

[74] McCarthy EP, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, et al. Does clinical evidence support ICD-9-CM diagnosis coding of complications? Med Care 2000;38(8):868-876.

[75] Weingart SN, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, et al. Use of administrative data to find substandard care: Validation of the

the validity of hemorrhage codes using a gold standard based on transfusion "requirement." [76] They identified only 26% of episodes of bleeding (defined as requiring return to surgery or transfusion of at least six units of blood products) by applying this indicator (9981) to Medicare patients who underwent coronary artery bypass surgery; the predictive value was 75%.

Construct Validity. Explicit process of care failures in the CSP validation study were relatively frequent among major surgical cases with CSP 24, but not among medical cases (66% and 13%, respectively), after excluding patients who had hemorrhage or hematoma at admission.[77] Cases flagged on this indicator and unflagged controls did not differ significantly on a composite of 17 generic process criteria. Similarly, cases flagged on this indicator and unflagged controls did not differ significantly on a composite of four specific process criteria for major surgical cases and two specific process criteria for medical cases in the earlier study of elderly Medicare beneficiaries.[78]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative Hemorrhage or Hematoma generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is lower than most indicators, at 8.6%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than most indicators, at 0.00039, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00006. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Hemorrhage or Hematoma is low, indicating that the measures are likely not biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.)

Source

This indicator was originally proposed by Iezzoni et al.[79] as part of the Complications Screening Program (CSP 24, "post-procedural hemorrhage or hematoma"), although their definition allowed either procedure or diagnosis codes. By contrast, the current definition requires a hemorrhage or hematoma diagnosis with an associated procedure to either control the hemorrhage or drain the hematoma. It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in AHRQ's original HCUP Quality Indicators.[80]

Complications Screening Program. Med Care 2000;38(8):796-806.

[76] Hartz AJ, Kuhn EM. Comparing hospitals that perform coronary artery bypass surgery: The effect of outcome measures and data sources. Am J Public Health 1994;84(10):1609-14.

[77] Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, Mukamal K, et al. Does the complications Screening Program flag case with process of care problems? Using explicit criteria to judge processes. Int J Qual Health Care 1999;11(2):107-18.

[78] Iezzoni L, Lawthers A, Petersen L, McCarthy E, Palmer R, Cahalane M, et al. Project to validate the Complications Screening Program: Health Care Financing Administration; 1998 March 31. Report No: HCFA Contract 500-94-0055.

[79] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[80] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-105. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

Postoperative Physiologic and Metabolic Derangement (PSI 10)

Definition	Cases of specified physiological or metabolic derangement per 1,000 elective surgical discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM codes for physiologic and metabolic derangements in any secondary diagnosis field. Discharges with acute renal failure (subgroup of physiologic and metabolic derangements) must be accompanied by a procedure code for dialysis (3995, 5498).
Denominator	All elective* surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. *Defined by admit type. Exclude patients with ICD-9-CM codes for physiologic and metabolic derangements in the principal diagnosis field, Exclude patients with acute renal failure where a procedure for dialysis occurs before or on the same day as the first operating room procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude patients with both a diagnosis code of ketoacidosis, hyperosmolarity, or other coma (subgroups of physiologic and metabolic derangements coding) **and** a principal diagnosis of diabetes. Exclude patients with both a secondary diagnosis code for acute renal failure (subgroup of physiologic and metabolic derangements coding) **and** a principal diagnosis of acute myocardial infarction, cardiac arrhythmia, cardiac arrest, shock, hemorrhage, or gastrointestinal hemorrhage. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.54 per 1,000 population at risk Bias: Some bias demonstrated
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to flag cases of postoperative metabolic or physiologic complications. The population at risk is limited to elective surgical patients, because patients undergoing non-elective surgery may develop less preventable derangements. In addition, each diagnosis has specific exclusions, designed to reduce the number of flagged cases in which the diagnosis was present on admission or was more likely to be non-preventable.

Panel Review

Panelists expressed concern that acute renal failure suffers from the problem of varied definition: what one doctor may call acute renal failure, another may not. To ensure that the only renal failure cases that are picked up are those that are clinically severe, the panel suggested that acute renal failure be included only when it is paired with a procedure code for dialysis.

Panelists noted that coding of relatively transient metabolic and physiologic complications may be lacking, such as in cases of diabetic ketoacidosis. Conversely, some physicians may capture non-clinically significant events in this indicator.

This indicator includes pediatric patients, which was not specifically discussed by the panel. The incidence of these complications is a function of the underlying prevalence of diabetes and renal impairment, which are less common among children than among adults.

Literature Review

Coding validity. No evidence on validity is available from CSP studies. Geraci et al.[81] confirmed only 5 of 15 episodes of acute renal failure and 12 of 34 episodes of hypoglycemia reported on discharge abstracts of VA patients hospitalized for CHF, COPD, or diabetes. Romano reported no false positives in episodes of acute renal failure or hypoglycemia using discharge abstracts of diskectomy patients.[82] ICD-9-CM diagnoses (585 or 7885) had a sensitivity of 8% and a predictive value of 4% in comparison with the VA's National Surgical Quality Improvement Program database, which defines renal failure as requiring dialysis within 30 days after surgery.[83]

Construct Validity. After adjusting for patient demographic, geographic, and hospital characteristics, Hannan et al. reported that cases with a secondary diagnosis of fluid and electrolyte disorders were no more likely to have received care that departed from professionally recognized standards than cases without that code (2.2% versus 1.7%, OR=1.13).[84] However, these ICD-9-CM codes were omitted from the accepted AHRQ PSIs.

Empirical Evidence

The project team conducted extensive empirical analyses on the PSIs. Postoperative Physiologic and Metabolic Derangement generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is lower than many indicators, at 20.9%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00054, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00033. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Physiologic and Metabolic Derangement is moderate, indicating that the measures may or may not be substantially biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may or may not be related to the patient's risk of experiencing an adverse event.)

Source

This indicator was originally proposed by Iezzoni et al.[85] as part of the CSP (CSP 20, "postoperative physiologic and metabolic derangements"). The University HealthSystem Consortium adopted the CSP indicator for major surgery patients (#2945).

[81] Geraci JM, Ashton CM, Kuykendall DH, Johnson ML, Wu L. International Classification of Diseases, 9th Revision, Clinical Modification codes in discharge abstracts are poor measures of complication occurrence in medical inpatients. Med Care 1997;35(6):589-602.

[82] Romano P. Can administrative data be used to ascertain clinically significant postoperative complications. American Journal of Medical Quality Press.

[83] Best W, Khuri S, Phelan M, Hur K, Henderson W, Demakis J, et al. Identifying patient preoperative risk factors and postoperative adverse events in administrative databases: Results from the Department of Veterans Affairs National Surgical Quality Improvement Program. J Am Coll Surg 2002;194(3):257-266.

[84] Hannan EL, Bernard HR, O'Donnell JF, Kilburn H, Jr. A methodology for targeting hospital cases for quality of care record reviews. Am J Public Health 1989;79(4):430-6.

[85] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

Postoperative Respiratory Failure (PSI 11)

Definition	Cases of acute respiratory failure per 1,000 elective surgical discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM codes for acute respiratory failure (518.81) in any secondary diagnosis field (After 1999, include 518.84).
Denominator	All elective* surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. *Defined by admit type. Exclude patients with ICD-9-CM codes for acute respiratory failure in the principal diagnosis field, Exclude patients where a procedure for tracheostomy is the only operating room procedure. Exclude patients where a procedure for tracheostomy occurs before the first operating room procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude patients with respiratory or circulatory diseases (MDC 4 and MDC 5). Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 3.44 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to flag cases of postoperative respiratory failure. This indicator limits the code for respiratory failure to secondary diagnosis codes to eliminate respiratory failure that was present on admission. It further excludes patients who have major respiratory or circulatory disorders and limits the population at risk to elective surgery patients.

Panel Review

Panelists rated the overall usefulness of this indicator as relatively favorable. They felt that only acute respiratory failure should be retained in this indicator and noted that this clinically significant event is at least partially preventable.

Literature Review

Coding Validity. CSP 3 had a relatively high confirmation rate among major surgical cases in the FY1994 Medicare inpatient claims files from California and Connecticut (72% by coders' review, 75% by physicians' review).[86] [87] Nurse reviews were not performed.

Geraci et al. confirmed 1 of 2 episodes of respiratory failure reported on discharge abstracts of VA patients hospitalized for CHF or diabetes; the sensitivity for respiratory decompensation requiring mechanical ventilation was 25%.[88]

[86] Lawthers a, McCarthy E, Davis R, Peterson L, Palmer R, Iezzoni L. Identification of in-hospital complications from claims data: is it valid? Med Care 2000;38(8):785-795.

[87] Weingart SN, Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, et al. Use of administrative data to find substandard care: Validation of the Complications Screening Program. Med Care 2000;38(8):796-806.

[88] Geraci JM, Ashton CM, Kuykendall DH, Johnson ML, Wu L. In-hospital complications among survivors of admission for congestive heart failure, chronic obstructive pulmonary disease, or diabetes mellitus. J Gen Intern Med 1995;10(6):307-14.

Construct Validity. Explicit process of care failures in the CSP validation study were slightly but not significantly more frequent among major surgical cases with CSP 3 than among unflagged controls (52% versus 46%).[89] Indeed, cases flagged on this indicator were significantly less likely than unflagged controls (24% versus 64%) to have at least one of four specific process-of-care problems in the earlier study of elderly Medicare beneficiaries.[90]

Needleman and Buerhaus found that nurse staffing was independent of the occurrence of pulmonary failure among major surgery patients.[91] However, Kovner and Gergen reported that having more registered nurse hours per adjusted patient day was associated with a lower rate of "pulmonary compromise" after major surgery.[92]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative Respiratory Failure generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is lower than many indicators, at 46.6%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00230, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00187. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Respiratory Failure is high, indicating that the measures likely are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Iezzoni et al. as part of the CSP (CSP 3, "postoperative pulmonary compromise").[93] Their definition also includes pulmonary congestion, other (or postoperative) pulmonary insufficiency, and acute pulmonary edema, which were omitted from this PSI. The University HealthSystem Consortium (#2927) and AHRQ's original HCUP Quality Indicators adopted the CSP indicator for major surgery patients.[94] Needleman and Buerhaus identified postoperative pulmonary failure as an "Outcome Potentially Sensitive to Nursing," using the original CSP definition.[95]

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[89] Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, Mukamal K, et al. Does the Complications Screening Program flag cases with process of care problems? Using explicit criteria to judge processes. Int J Qual Health Care 1999;11(2):107-18.

[90] Hawker GA, Coyte PC, Wright JG, Paul JE, Bombardier C. Accuracy of administrative data for assessing outcomes after knee replacement surgery. J. Clin Epidimiol 1997;50(3):265-73.

[91] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston, MA: Health Resources Services Administration; 2001 February 28. Report No.:230-99-0021.

[92] Kovner C, Gergen PJ. Nurse staffing levels and adverse events following surgery in U.S. hospitals. Image J Nurs Sch 1998;30(4):315-21.

[93] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[94] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

[95] Needleman et al. 2001.

Postoperative Pulmonary Embolism or Deep Vein Thrombosis (PSI 12)

Definition	Cases of deep vein thrombosis (DVT) or pulmonary embolism (PE) per 1,000 surgical discharges with an operating room procedure.
Numerator	Discharges with ICD-9-CM codes for deep vein thrombosis or pulmonary embolism in any secondary diagnosis field.
Denominator	All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. Exclude patients with ICD-9-CM codes for deep vein thrombosis or pulmonary embolism in the principal diagnosis field. Exclude patients where a procedure for interruption of vena cava is the only operating room procedure Exclude patients where a procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 7.08 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to capture cases of postoperative venous thromboses and embolism—specifically, pulmonary embolism and deep venous thrombosis. This indicator limits vascular complications codes to secondary diagnosis codes to eliminate complications that were present on admission. It further excludes patients who have principal diagnosis of DVT, as these patients are likely to have had PE/DVT present on admission.

Panel Review

Panelists rated the overall usefulness of this indicator relatively highly as compared to other indicators. They noted that preventative techniques should decrease the rate of this indicator. This indicator includes pediatric patients. In the absence of specific thrombophilic disorders, postoperative thromboembolic complications in children are most likely to be secondary to venous catheters rather than venous stasis in the lower extremities.

Because the risk for DVT/PE varies greatly according to the type of procedure performed, panelists suggested that this indicator be adjusted or stratified according to surgical procedure types.

Literature Review

Coding validity. Geraci et al. confirmed only 1 of 6 episodes of DVT or PE reported on discharge abstracts of VA patients for CHF, COPD, or diabetes; the sensitivity was 100%.[96] Among Medicare hip fracture patients, by contrast, Keeler et al. confirmed 88% of reported PE cases, and failed to ascertain just 6 cases (65% sensitivity) using ICD-9-CM codes.[97] For DVT, they found just 1 of 6 cases using ICD-9-CM codes (but no false positive codes). Other studies have demonstrated that ICD-9-CM codes for DVT and PE have high predictive value when listed as the principal

[96] Geraci JM, Ashton CM, Kuykendall DH, Johnson ML, Wu L. In-hospital complications among survivors of admission for congestive heart failure, chronic obstructive pulmonary disease, or diabetes mellitus. J Gen Intern Med 1995;10(6):307-14.

[97] Keeler E, Kahn K, Bentow S. Assessing quality of care for hospitalized Medicare patients with hip fracture using coded diagnoses from the Medicare Provider Analysis and Review File. Springfield, VA: NTIS;1991.

diagnosis for readmissions after major orthopedic surgery (100%) or after inferior vena cava filter placement (98%).[98] However, these findings do not directly address the validity of DVT/PE as a secondary diagnosis among patients treated by anticoagulation.

Construct validity. Explicit process of care failures in the CSP validation study were relatively frequent among both major surgical and medical cases with CSP 22 (72% and 69%, respectively), after disqualifying cases in which DVT/PE was actually present at admission.[99] Needleman and Buerhaus found that nurse staffing was independent of the occurrence of DVT/PE among both major surgical or medical patients.[100] However, Kovner and Gergen reported that having more registered nurse hours and non-RN hours was associated with a lower rate of DVT/PE after major surgery.[101]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative PE or DVT generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 72.6%, suggesting that observed differences in risk-adjusted rates likely reflect true differences across hospitals. The signal standard deviation for this indicator is lower than many indicators, at 0.00633, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00511. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative PE or DVT is high, indicating that the measures likely are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP 22, "venous thrombosis and pulmonary embolism")[102] and was one of AHRQ's original HCUP Quality Indicators for major surgery and invasive vascular procedure patients.[103] A code that maps to this indicator in the final AHRQ PSI was proposed by Miller et al. as one component of a broader indicator ("iatrogenic conditions").[104]

[98] White RH, Romano P, Zhou H, Rodrigo J, Barger W. Incidence and time course of thromboembolic outcomes following total hip or knee arthroplasty. Arch Intern Med 1998;158(14):1525-31.

[99] Iezzoni LI, Davis RB, Palmer RH, Cahalane M, Hamel MB, Mukamal K, et al. Does the Complications Screening Program flag cases with process of care problems? Using explicit criteria to judge processes. Int J Qual Health Care 1999;11(2):107-18.

[100] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston, MA: Health Resources Services Administration; 2001 February 28. Report No.:230-99-0021.

[101] Kovner C, Gergen PH. Nurse staffing levels and adverse events following surgery in U.S. hospitals. Image J Nurs Sch 1998;30(4):315-21.

[102] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[103] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

[104] Miller M, Elixhauser A, Zhan C, Meyer G. Patient safety indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Postoperative Sepsis (PSI 13)

Definition	Cases of sepsis per 1,000 elective surgery patients with an operating room procedure and a length of stay of 4 days or more.
Numerator	Discharges with ICD-9-CM code for sepsis in any secondary diagnosis field.
Denominator	All elective* surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure. *Defined by admit type. Exclude patients with ICD-9-CM codes for sepsis in the principal diagnosis field, Exclude patients with a principal diagnosis of infection, any code for immunocompromised state, or cancer. Include only patients with a length of stay of 4 days or more. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 9.75 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Summary

This indicator is intended to flag cases of nosocomial postoperative sepsis. This indicator limits the code for sepsis to secondary diagnosis codes to eliminate sepsis that was present on admission. This indicator also excludes patients who have a principal diagnosis of infection, patients with a length of stay of less than 3 days, and patients with potential immunocompromised states (e.g., AIDS, cancer, transplant).

Panel Review

Panelists rated the overall usefulness of this indicator favorably, although they were less sure that this complication was reflective of medical error.

This indicator includes pediatric patients. High-risk neonates are at particularly high risk for catheter-related infections.

Literature Review

Coding validity. No evidence on validity is available from CSP studies. Barbour reported that only 38% of discharge abstracts with a diagnosis of sepsis actually had hospital-acquired sepsis.[105] However, this review was not limited to cases with a secondary diagnosis of sepsis, and sensitivity could not be evaluated. Geraci et al. confirmed (by blood culture) only 2 of 15 episodes of sepsis or "other infection" reported on discharge abstracts of VA patients hospitalized for CHF, COPD, or diabetes; the sensitivity for a positive blood culture was 50%.[106] In comparison with the VA's National Surgical Quality Improvement Program database, in which "systemic sepsis" is defined by a positive blood culture and systemic manifestations of sepsis within 30 days after surgery, the ICD-9-CM diagnosis had a sensitivity of 37% and a predictive value of 30%.[107]

[105] Barbour GL. Usefulness of a discharge diagnosis of sepsis in detecting iatrogenic infection and quality of care problems. Am J Med Qual 1993;8(1):2-5.

[106] Geraci JM, Ashton CM, Kuykendall DH, Johnson ML, Wu L. In-hospital complications among survivors of admission for congestive heart failure, chronic obstructive pulmonary disease, or diabetes mellitus. J Gen Intern Med 1995;10(6):307-14.

[107] Best W, Khuri S, Phelan M, Hur K, Henderson W, Demakis J, et al. Identifying patient preoperative risk factors and postoperative adverse events in administrative databases: Results from the Department of Veterans Affairs national Surgical

Construct validity. Needleman and Buerhaus found that nurse staffing was independent of the occurrence of sepsis among both major surgical or medical patients.[108]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative Sepsis generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is lower than many indicators, at 53.9%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00869, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00790. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Sepsis is high, indicating that the measures likely are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP 7, "septicemia").[109] Needleman and Buerhaus identified sepsis as an "Outcome Potentially Sensitive to Nursing" using the same CSP definition.[110]

Quality Improvement Program. J Am Coll Surg 2002;194(3):257-266.

[108] Needleman J, Buerhaus PI, Mattke S, Stewart M, Zelevinsky K. Nurse Staffing and Patient Outcomes in Hospitals. Boston, MA: Health Resources Services Administration; 2001 February 28. Report No.:230-99-0021.

[109] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[110] Needleman et al., 2001.

Postoperative Wound Dehiscence (PSI 14)

Provider Level Definition

Definition	Cases of reclosure of postoperative disruption of abdominal wall per 1,000 cases of abdominopelvic surgery.
Numerator	Discharges with ICD-9-CM code for reclosure of postoperative disruption of abdominal wall (54.61) in any procedure field.
Denominator	All abdominopelvic surgical discharges. Exclude patients where a procedure for reclosure of postoperative disruption of abdominal wall occurs before or on the same day as the first abdominopelvic surgery procedure. *Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available*. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 1.41 per 1,000 population at risk Bias: Some bias demonstrated
Risk Adjustment	Age, sex, DRG, comorbidity categories

Postoperative Wound Dehiscence (PSI 24)

Area Level Definition

Definition	Cases of reclosure of postoperative disruption of abdominal wall per 100,000 population.
Numerator	Discharges with ICD-9-CM code for reclosure of postoperative disruption of abdominal wall (5461) in any procedure field. Exclude obstetrical patients in MDC 14.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 20.13 per 100,000 population at risk
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of wound dehiscence in patients who have undergone abdominal and pelvic surgery. This indicator is defined both on a provider level (by including cases based on secondary diagnosis associated with the same hospitalization) and on an area level (by including all cases of wound dehiscence).

Panel Review

Panelists suggested that postoperative wound disruption be excluded from the indicator and that trauma, cancer, and immunocompromised patients be included. They also reported that the risk of developing wound dehiscence varies with patient factors such as age and comorbidities.

Literature Review

Coding validity. No evidence on validity is available from CSP studies. Hawker et al. found that the sensitivity and predictive value of wound dehiscence were both 100%.[111] Faciszewski et al. aggregated

[111] Hawker BA, Coyte PC, Wright JG, Paul JE, Bombardier C. Accuracy of administrative data for assessing outcomes after knee replacement surgery. J Clin Epidemiol 1997;50(3):265-73.

wound dehiscence with postoperative hemorrhage or hematoma and reported a pooled confirmation rate of 17% with 3% sensitivity of coding among patients who underwent spinal fusion.[112] In comparison with the VA's National Surgical Quality Improvement Program database, in which dehiscence is defined as fascial disruption within 30 days after surgery, the ICD-9-CM diagnosis of wound disruption had a sensitivity of 25% and a predictive value of 23%.[113] This code (9983) was ultimately removed from the accepted PSI, because the clinical panel was concerned that the diagnosis definition was too broad and failed to distinguish skin from fascial separation.

Construct validity. Based on two-stage review of randomly selected deaths, Hannan et al. reported that cases with a secondary diagnosis of wound disruption were 3.0 times more likely to have received care that departed from professionally recognized standards than cases without that code (4.3% versus 1.7%), after adjusting for patient demographic, geographic, and hospital characteristics.[114]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Postoperative Wound Dehiscence generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is related to systematic differences (signal) in hospital performance rather than random variation (noise)—is low, at 35.6%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00188, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00171. Signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Postoperative Wound Dehiscence is moderate, indicating that the measures may or may not be substantially biased based on the characteristics observed.

Source

An indicator on this topic (9983) was originally proposed by Hannan et al. to target "cases that would have a higher percentage of quality of care problems than cases without the criterion, as judged by medical record review."[115] The same code was included within a broader indicator ("adverse events and iatrogenic complications") in AHRQ's original HCUP Quality Indicators.[116] Iezzoni et al. identified an associated procedure code for reclosure of an abdominal wall dehiscence (5461), and included both codes in the Complications Screening Program.[117] Miller et al. suggested the use of both codes (as "wound disruption") in the original "AHRQ PSI Algorithms and Groupings."[118]

[112] Faciszewski T, Johnson L, Noren C, Smith MD. Administrative databases' complication coding in anterior spinal fusion procedures. What does it mean? Spine 1995;20(16):1783-8.

[113] Best W, Khuri S, Phelan M, Hur K, Henderson W, Demakis J, et al. Identifying patient preoperative risk factors and postoperative adverse events in administrative databases: Results from the Department of Veterans Affairs national Surgical Quality Improvement Program. J Am Coll Surg 2002;194(3):257-266.

[114] Hannan EL, Bernard HR, O'Donnell JF, Kilburn H, Jr. A methodology for targeting hospital cases for quality of care record reviews. Am J Public Health 1989;79(4):430-6.

[115] Hannan et al., 1989.

[116] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: state and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

[117] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[118] Miller M, Elixhauser A, Zhan C, Meyer G, Patient Safety Indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Accidental Puncture or Laceration (PSI 15)

Provider Level Definition (only secondary diagnosis)

Definition	Cases of technical difficulty (e.g., accidental cut or laceration during procedure) per 1,000 discharges.
Numerator	Discharges with ICD-9-CM code denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Exclude patients with ICD-9-CM code denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in the principal diagnosis field. Exclude obstetrical patients in MDC 14.
Type of Indicator	Provider level
Empirical Performance	Rate: 3.22 per 1,000 population at risk Bias: Substantial bias; should be risk-adjusted
Risk Adjustment	Age, sex, DRG, comorbidity categories

Accidental Puncture or Laceration (PSI 25)

Area Level Definition (principal or secondary diagnosis)

Definition	Cases of technical difficulty (e.g., accidental cut or laceration during procedure) per 100,000 population.
Numerator	Discharges with ICD-9-CM code denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in any diagnosis field (principal or secondary) of all medical and surgical discharges defined by specific DRGs. Exclude obstetrical patients in MDC 14.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 354.08 per 100,000 population at risk
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of complications that arise due to technical difficulties in medical care—specifically, those involving an accidental puncture or laceration.

Panel Review

Panelists were unsure about how the culture of quality improvement in a hospital would affect the coding of this complication. Some physicians may be reluctant to record the occurrence of this complication for fear of punishment. Panelists also noted that some of these occurrences are not preventable.

Literature Review

Coding validity. No evidence on validity is available from CSP studies. A study of laparoscopic cholecystectomy found that 95% of patients with an ICD-9 code of accidental puncture or laceration had a confirmed injury to

the bile duct or gallbladder.[119] However, only 27% had a clinically significant injury that required any intervention; sensitivity of reporting was not evaluated. A similar study of cholecystectomies reported that these two ICD-9 codes had a sensitivity of 40% and a predictive value of 23% in identifying bile duct injuries.[120] Among 185 total knee replacement patients, Hawker et al. found that the sensitivity and predictive value of codes describing "miscellaneous mishaps during or as a direct result of surgery" (definition not given) were 86% and 55%, respectively.[121] Romano et al. identified 19 of 45 episodes of accidental puncture, laceration, or related procedure using discharge abstracts of diskectomy patients; there was one false positive.[122]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Accidental Puncture or Laceration generally performs well on several different dimensions, including reliability, bias, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 82.9%, suggesting that observed differences in risk-adjusted rates most likely reflect true differences across hospitals.

The signal standard deviation for this indicator is lower than many indicators, at 0.00279, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00241. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The project team assessed the effect of age, gender, DRG, and comorbidity risk adjustment on the relative ranking of hospitals compared to no risk adjustment. They measured (1) the impact of adjustment on the assessment of relative hospital performance, (2) the relative importance of the adjustment, (3) the impact on hospitals with the highest and lowest rates, and (4) the impact throughout the distribution. The detected bias for Accidental Puncture or Laceration is high, indicating that the measures likely are biased based on the characteristics observed. (It is possible that characteristics that are not observed using administrative data may be related to the patient's risk of experiencing an adverse event.) Risk adjustment is important for this indicator.

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program, although unlike the final PSI, its codes were split between two CSP indicators (CSP 27, "technical difficulty with medical care," and "sentinel events").[123] It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in AHRQ's original HCUP Quality Indicators.[124] The University HealthSystem Consortium adopted CSP 27 as an indicator for medical (#2806) and major surgery (#2956) patients. Miller et al. also split this set of ICD-9-CM codes into two broader indicators ("miscellaneous misadventures" and "E codes") in the original "AHRQ PSI Algorithms and Groupings."[125] Based on expert consensus panels, McKesson Health Solutions included one component of this PSI (Accidental Puncture or Laceration) in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module.

[119] Taylor B. Common bile duct injury during laparoscopic cholecystectomy in Ontario: Does ICD-9 coding indicate true incidence? CMAJ 1998;158(4):481-5.

[120] Valinsky LJ, Hockey RI, Hobbs MS, Fletcher DR, Pikora TJ, Parsons RW, et al. Finding bile duct injuries using record linkage: A validated study of complications following cholecystectomy. J Clin Epidemiol 1999;52(9):893-901.

[121] Hawker GA, Coyte PC, Wright JG, Paul JE, Bombardier C. Accuracy of administrative data for assessing outcomes after knee replacement surgery. J Clin Epidemiol 1997;50(3):265-73.

[122] Romano P. Can administrative data be used to ascertain clinically significant postoperative complications. American Journal of Medical Quality Press.

[123] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[124] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

[125] Miller M, Elixhauser A, Zhan C, Meyer G, Patient Safety Indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Transfusion Reaction (PSI 16)

Provider Level Definition (only secondary diagnosis)

Definition	Cases of transfusion reaction per 1,000 discharges.
Numerator	Discharges with ICD-9-CM code for transfusion reaction in any secondary diagnosis field.
Denominator	All medical and surgical discharges defined by specific DRGs. Exclude patients with ICD-9-CM code for transfusion reaction in the principal diagnosis field.
Type of Indicator	Provider level
Empirical Performance	Rate: 0.005 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	No risk adjustment

Transfusion Reaction (PSI 26)

Area Level Definition (principal or secondary diagnosis)

Definition	Cases of transfusion reaction per 100,000 population.
Numerator	Discharges with ICD-9-CM code for transfusion reaction in any diagnosis field (principal or secondary) of all medical and surgical discharges defined by specific DRGs.
Denominator	Population of county or MSA associated with FIPS code of patient's residence or hospital location.
Type of Indicator	Area level
Empirical Performance	Rate: 0.52 per 100,000 population
Risk Adjustment	No risk adjustment

Summary

This indicator is intended to flag cases of major reactions due to transfusions (ABO and Rh). This indicator is defined both on a provider level (by including cases based on secondary diagnosis associated with the same hospitalization) and on an area level (by including all cases of transfusion reactions).

Panel Review

The overall usefulness of this indicator was rated as very favorable by panelists. This indicator includes only those events that result in additional medical care. Some minor reactions may be missed, although the panel suggested that these minor reactions are less clearly due to medical error than the Rh or ABO reactions included in the indicator.

Literature Review

The project team was unable to find evidence on validity from prior studies, most likely because this complication is quite rare.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Given the low rates or occurrences for Transfusion Reaction, the project team did not measure reliability or minimum bias. The indicator could not be risk-adjusted due to the small number of numerator cases. Users of the PSI software should note the output will only contain observed rates for Transfusion Reaction.

Source

This indicator was originally proposed by Iezzoni et al. as part of the Complications Screening Program (CSP "sentinel events").[126] It was also included as one component of a broader indicator ("adverse events and iatrogenic complications") in AHRQ's original HCUP Quality Indicators.[127] It was proposed by Miller et al. in the original "AHRQ PSI Algorithms and Groupings." [128]

[126] Iezzoni LI, Daley J, Heeren T, Foley SM, Fisher ES, Duncan C, et al. Identifying complications of care using administrative data. Med Care 1994;32(7):700-15.

[127] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

[128] Miller M, Elixhauser A, Zhan C, Meyer G, Patient safety indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Birth Trauma—Injury to Neonate (PSI 17)

Definition	Cases of birth trauma, injury to neonate, per 1,000 liveborn births.
Numerator	Discharges with ICD-9-CM code for birth trauma in any diagnosis field. Exclude infants with a subdural or cerebral hemorrhage (subgroup of birth trauma coding) **and** any diagnosis code of pre-term infant (denoting birth weight of less than 2,500 grams and less than 37 weeks gestation or 34 weeks gestation or less). Exclude infants with injury to skeleton (767.3, 767.4) **and** any diagnosis code of osteogenesis imperfecta (756.51).
Denominator	All liveborn births.
Type of Indicator	Provider level
Empirical Performance	Rate: 6.34 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Sex

Summary

This indicator is intended to flag cases of birth trauma for infants born alive in a hospital. The indicator excludes patients born pre-term, as birth trauma in these patients may be less preventable than for full-term infants.

Panel Review

The overall usefulness of this indicator was rated as favorable by panelists

Literature Review

Coding validity. A study of newborns that had a discharge diagnosis of birth trauma found that only 25% had sustained a significant injury to the head, neck, or shoulder.[129] The remaining patients either had superficial injuries or injuries inferior to the neck. The project team was unable to find other evidence on the validity of this indicator. Towner et al. linked California maternal and infant discharge abstracts from 1992 through 1994, but they used only infant discharge abstracts to describe the incidence of neonatal intracranial injury, and they did not report the extent of agreement between the two data sets.[130]

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Birth Trauma generally performs well on several different dimensions, including reliability, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is high, relative to other indicators, at 97.0%, suggesting that observed differences in risk-adjusted rates reflect true differences across hospitals.

The signal standard deviation for this indicator is also high, relative to other indicators, at 0.04128, indicating that the systematic differences (signal) among hospitals is high and more likely associated with hospital characteristics. The signal share is also high, relative to other indicators, at 0.13603. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The

[129] Hughes C, Harley E, Milmoe G, Bala R, Martorella A. Birth trauma in the head and neck. Arch Otolaryngol Head Neck Surg 1999;125:193-199.

[130] Towner D, Castro MA, Eby-Wilkens E, Gilbert WM. Effect of mode of delivery in nulliparous women on neonatal intracranial injury. N Engl J Med 1999;341(23):1709-14.

lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The bias for Birth Trauma was not measured, since adequate risk adjustment was not available.

Source

This indicator has been widely used in the obstetric community, although it is most commonly based on chart review rather than administrative data. It was proposed by Miller et al. in the original "AHRQ PSI Algorithms and Groupings."[131] Based on expert consensus panels, McKesson Health Solutions included a broader version of this indicator in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module.

[131] Miller M, Elixhauser A, Zhan C, Meyer G, Patient Safety Indicators: Using administrative data to identify potential patient safety concerns. Health Services Research 2001;36(6 Part II):110-132.

Obstetric Trauma—Vaginal Delivery with Instrument (PSI 18)

Definition	Cases of obstetric trauma (4th degree lacerations, other obstetric lacerations) per 1,000 instrument-assisted vaginal deliveries.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field.
Denominator	All vaginal delivery discharges with any procedure code for instrument-assisted delivery.
Type of Indicator	Provider level
Empirical Performance	Rate: 217.09 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Obstetric Trauma with 3rd Degree Lacerations—Vaginal Delivery with Instrument (PSI 27)

Definition	Cases of obstetric trauma (3rd or 4th degree lacerations, other obstetric lacerations) per 1,000 instrument-assisted vaginal deliveries.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field.
Denominator	All vaginal delivery discharges with any procedure code for instrument-assisted delivery.
Type of Indicator	Provider level
Empirical Performance	Rate: 246.00 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Summary

This indicator is intended to flag cases of potentially preventable trauma during vaginal delivery with instrument.

Panel Review

The overall usefulness of an Obstetric trauma indicator was rated as favorable by panelists. After initial review, the indicator was eventually split into three separate Obstetric Trauma indicators: Vaginal Delivery with Instrument, Vaginal Delivery without Instrument, and Cesarean Delivery.

Literature Review

Coding validity. In a stratified probability sample of vaginal and Cesarean deliveries, the weighted sensitivity and predictive value of coding for third- and fourth-degree lacerations and vulvar/perineal hematomas (based on either diagnosis or procedure codes) were 89% and 90%, respectively.[158] The authors did not report coding validity for third- and fourth-degree lacerations separately. The project team was unable to find other evidence on validity from prior studies.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Obstetric Trauma—Vaginal Delivery with Instrument generally performs well on several different dimensions, including reliability, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is moderately high, relative to other indicators, at 69.9%, suggesting that observed differences in risk-adjusted rates likely reflect true differences across hospitals.

The signal standard deviation for this indicator is also high, relative to other indicators, at 0.09794, indicating that the systematic differences (signal) among hospitals is high and more likely associated with hospital characteristics. The signal share is high, relative to other indicators, at 0.05539. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The bias for Obstetric Trauma—Vaginal Delivery with Instrument was not measured, since adequate risk adjustment was not available.

Source

An overlapping subset of this indicator (third- or fourth-degree perineal laceration) has been adopted by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) as a core performance measure for "pregnancy and related conditions" (PR-25). Based on expert consensus panels, McKesson Health Solutions included the JCAHO indicator in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module. Fourth Degree Laceration, one of the codes mapped to this PSI, was included as one component of a broader indicator ("obstetrical complications") in AHRQ's original HCUP Quality Indicators.[132]

[132] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

Obstetric Trauma—Vaginal Delivery without Instrument (PSI 19)

Definition	Cases of obstetric trauma (4th degree lacerations, other obstetric lacerations) per 1,000 vaginal deliveries without instrument assistance.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field per 1,000 vaginal deliveries without instrument assistance.
Denominator	All vaginal delivery discharges. Exclude instrument-assisted delivery.
Type of Indicator	Provider level
Empirical Performance	Rate: 81.98 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Obstetric Trauma with 3rd Degree Lacerations—Vaginal Delivery without Instrument (PSI 28)

Definition	Cases of obstetric trauma (3rd or 4th degree lacerations, other obstetric lacerations) per 1,000 vaginal deliveries without instrument assistance.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field.
Denominator	All vaginal delivery discharges. Exclude instrument-assisted delivery.
Type of Indicator	Provider level
Empirical Performance	Rate: 88.74 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Summary

This indicator is intended to flag cases of potentially preventable trauma during a vaginal delivery without instrument.

Panel Review

The overall usefulness of an Obstetric Trauma Indicator was rated as favorable by panelists. After initial review, the indicator was split into three separate Obstetric Trauma indicators: Vaginal Delivery with Instrument, Vaginal Delivery without Instrument, and Cesarean Delivery.

Literature Review

Coding validity. In a stratified probability sample of vaginal and Cesarean deliveries, the weighted sensitivity and predictive value of coding for third- and fourth-degree lacerations and vulvar/perineal hematomas (based on either diagnosis or procedure codes) were 89% and 90%, respectively.[158] The authors did not report coding validity for third- and fourth-degree lacerations separately. The project team was unable to find other evidence on validity from prior studies.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Obstetric Trauma—Vaginal Delivery without Instrument generally performs well on several different dimensions, including reliability, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is high, relative to other indicators, at 86.4%, suggesting that observed differences in risk-adjusted rates reflect true differences across hospitals.

The signal standard deviation for this indicator is also high, relative to other indicators, at 0.04314, indicating that the systematic differences (signal) among hospitals is high and more likely associated with hospital characteristics. The signal share is lower than many other indicators, at 0.02470. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The bias for Obstetric Trauma—Vaginal Delivery without Instrument was not measured, since adequate risk adjustment was not available.

Source

An overlapping subset of this indicator (third- or fourth-degree perineal laceration) has been adopted by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) as a core performance measure for "pregnancy and related conditions" (PR-25). Based on expert consensus panels, McKesson Health Solutions included the JCAHO indicator in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module. Fourth-Degree Laceration, one of the codes mapped to this PSI, was included as one component of a broader indicator ("obstetrical complications") in AHRQ's original HCUP Quality Indicators.[133]

[133] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

Obstetric Trauma—Cesarean Delivery (PSI 20)

Definition	Cases of obstetric trauma (4th degree lacerations, other obstetric lacerations) per 1,000 Cesarean deliveries.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field per 1,000 Cesarean deliveries.
Denominator	All Cesarean delivery discharges.
Type of Indicator	Provider level
Empirical Performance	Rate: 5.93 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Obstetric Trauma with 3rd Degree Lacerations—Cesarean Delivery (PSI 29)

Definition	Cases of obstetric trauma (3rd or 4th degree lacerations, other obstetric lacerations) per 1,000 Cesarean deliveries.
Numerator	Discharges with ICD-9-CM code for obstetric trauma in any diagnosis or procedure field.
Denominator	All Cesarean delivery discharges.
Type of Indicator	Provider level
Empirical Performance	Rate: 6.20 per 1,000 population at risk Bias: Did not undergo empirical testing of bias
Risk Adjustment	Age

Summary

This indicator is intended to flag cases of potentially preventable trauma during Cesarean delivery.

Panel Review

The overall usefulness of an Obstetric Trauma Indicator was rated as favorable by panelists. After initial review, the indicator was eventually split into three separate Obstetric Trauma indicators: Vaginal Delivery with Instrument, Vaginal Delivery without Instrument, and Cesarean Delivery.

Literature Review

Coding validity. In a stratified probability sample of vaginal and Cesarean deliveries, the weighted sensitivity and predictive value of coding for third- and fourth-degree lacerations and vulvar/perineal hematomas (based on either diagnosis or procedure codes) were 89% and 90%, respectively.[158] The authors did not report coding validity for third- and fourth-degree lacerations separately. The project team was unable to find other evidence on validity from prior studies.

Empirical Analysis

The project team conducted extensive empirical analyses on the PSIs. Obstetric Trauma—Cesarean Delivery generally performs well on several different dimensions, including reliability, relatedness of indicators, and persistence over time.

Reliability. The signal ratio—measured by the proportion of the total variation across hospitals that is truly related to systematic differences (signal) in hospital performance rather than random variation (noise)—is lower than many indicators, at 45.9%, suggesting that observed differences in risk-adjusted rates may not reflect true differences across hospitals.

The signal standard deviation for this indicator is also lower than many indicators, at 0.00590, indicating that the systematic differences (signal) among hospitals is low and less likely associated with hospital characteristics. The signal share is lower than many indicators, at 0.00576. The signal share is a measure of the share of total variation (hospital and patient) accounted for by hospitals. The lower the share, the less important the hospital in accounting for the rate and the more important other potential factors (e.g., patient characteristics).

Minimum bias. The bias for Obstetric Trauma—Cesarean Delivery was not measured, since adequate risk adjustment was not available.

Source

An overlapping subset of this indicator (third- or fourth-degree perineal laceration) has been adopted by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) as a core performance measure for "pregnancy and related conditions" (PR-25). Based on expert consensus panels, McKesson Health Solutions included the JCAHO indicator in its CareEnhance Resource Management Systems, Quality Profiler Complications Measures Module. Fourth Degree Laceration, one of the codes mapped to this PSI, was included as one component of a broader indicator ("obstetrical complications") in AHRQ's original HCUP Quality Indicators.[134]

[134] Johantgen M, Elixhauser A, Bali JK, Goldfarb M, Harris DR. Quality indicators using hospital discharge data: State and national applications. Jt Comm J Qual Improv 1998;24(2):88-195. Published erratum appears in Jt Comm J Qual Improv 1998;24(6):341.

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Appendix A: Patient Safety Indicators – Detailed Definitions

The ICD-9-CM and DRG codes modified for FY 2004 are identified with the month and year after the code label, e.g., OCT 03.

Complications of Anesthesia (PSI 1)

Numerator:

Discharges with ICD-9-CM diagnosis codes for anesthesia complications in any secondary diagnosis field.

ICD-9-CM Anesthesia Complications diagnosis codes:

Adverse effects in therapeutic use, other central nervous system depressants and anesthetics:

E8763 ENDOTRACHEAL TUBE WRONGLY PLACE DURING ANESTHETIC PROCEDURE
E9381 HALOTHANE
E9382 OTHER GASEOUS ANESTHETICS
E9383 INTRAVENOUS ANESTHETICS
E9384 OTHER AND UNSPECIFIED GENERAL ANESTHETICS
E9385 SURFACE AND INFILTRATION ANESTHETICS
E9386 PERIPHERAL NERVE AND PLEXUS BLOCKING ANESTHETICS
E9387 SPINAL ANESTHETICS
E9389 OTHER AND UNSPECIFIED LOCAL ANESTHETICS

Poisoning by other central nervous system depressants and anesthetics:

9681 HALOTHANE
9682 OTHER GASEOUS ANESTHETICS
9683 INTRAVENOUS ANESTHETICS
9684 OTHER AND UNSPECIFIED GENERAL ANESTHETICS
9687 SPINAL ANESTHETICS
E8551 ACCIDENTAL POISONING, OTHER NERVOUS SYSTEM DEPRESSANTS

Denominator:

All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Surgical Discharge DRGs:

001 CRANIOTOMY, AGE > 17 W/ CC
002 CRANIOTOMY AGE > 17 W/O CC
003 CRANIOTOMY, AGE 0-17
004* SPINAL PROCEDURES
005* EXTRACRANIAL VASCULAR PROCEDURES
006 CARPAL TUNNEL RELEASE
007 PERIPHERAL AND CRANIAL NERVE AND OTHER NERVOUS SYSTEM PROCEDURES W/ CC
008 PERIPHERAL AND CRANIAL NERVE AND OTHER NERVOUS SYSTEM PROCEDURES W/O CC
036 RETINAL PROCEDURES
037 ORBITAL PROCEDURES
038 PRIMARY IRIS PROCEDURES
039 LENS PROCEDURES W/ OR W/O VITRECTOMY
040 EXTRAOCULAR PROCEDURES EXCEPT ORBIT, AGE GREATER THAN 17
041 EXTRAOCULAR PROCEDURES EXCEPT ORBIT, AGE 0-17
042 INTRAOCULAR PROCEDURES EXCEPT RETINA, IRIS AND LENS
049 MAJOR HEAD AND NECK PROCEDURES

Complications of Anesthesia (PSI 1)	
050	SIALOADENECTOMY
051	SALIVARY GLAND PROCEDURES EXCEPT SIALOADENECTOMY
052	CLEFT LIP AND PALATE REPAIR
053	SINUS AND MASTOID PROCEDURES, AGE GREATER THAN 17
054	SINUS AND MASTOID PROCEDURES, AGE 0-17
055	MISCELLANEOUS EAR, NOSE, MOUTH AND THROAT PROCEDURES
056	RHINOPLASTY
057	TONSILLECTOMY AND ADENOIDECTOMY PROCEDURES EXCEPT TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE GREATER THAN 17
058	TONSILLECTOMY AND ADNOIDECTOMY PROCEDURES EXCEPT TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE 0-17
059	TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE GREATER THAN 17
060	TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE 0 – 17
061	MYRINGOTOMY W/ TUBE INSERTION, AGE GREATER THAN 17
062	MYRINGOTOMY W/ TUBE INSERTION, AGE 0-17
063	OTHER EAR, NOSE, MOUTH AND THROAT OR PROCEDURES
075	MAJOR CHEST PROCEDURES
076	OTHER RESPIRATORY SYSTEM OR PROCEDURES W/ CC
077	OTHER RESPIRATORY SYSTEM OR PROCEDURES W/O CC
103	HEART TRANSPLANT
104	CARDIAC VALVE AND OTHER MAJOR CARDIOTHORACIC PROCEDURES W/ CARDIAC CATHETERIZATION
105	CARDIAC VALVE AND OTHER MAJOR CARDIOTHORACIC PROCEDURES W/O CARDIAC CATHETERIZATION
106	CORONARY BYPASS W/ PTCA
107	CORONARY BYPASS W/ CARDIAC CATHETERIZATION
108	OTHER CARDIOTHORACIC PROCEDURES
109	CORONARY BYPASS W/O CARDIAC CATHETERIZATION
110	MAJOR CARDIOVASCULAR PROCEDURES W/ CC
111	MAJOR CARDIOVASCULAR PROCEDURES W/O CC
112*	PERCUTANEOUS CARDIOVASCULAR PROCEDURES
113	AMPUTATION FOR CIRCULATORY SYSTEM DISORDERS EXCEPT UPPER LIMB AND TOE
114	UPPER LIMB AND TOES AMPUTATION FOR CIRCULATORY SITE
115	PERMANENT CARDIAC PACEMAKER IMPLANT W/ ACUTE MYOCARDIAL INFARCTION, HEART FAILURE OR SHOCK OR ACID LEAD OR GENERATOR PROCEDURE
116	OTHER PERMANENT CARDIAC PACEMAKER IMPLANT OR PTCA W/ CORONARY ARTERIAL STENT
117	CARDIAC PACEMAKER REVISION EXCEPT DEVICE REPLACEMENT
118	CARDIAC PACEMAKER DEVICE REPLACEMENT
119	VEIN LIGATION AND STRIPPING
120	OTHER CIRCULATORY SYSTEM OR PROCEDURES
146	RECTAL RESECTION W/ CC
147	RECTAL RESECTION W/O CC
148	MAJOR SMALL AND LARGE BOWEL PROCEDURES W/ CC
149	MAJOR SMALL AND LARGE BOWEL PROCEDURES W/O CC
150	PERITONEAL ADHESIOLYSIS W/ CC
151	PERITONEAL ADHESIOLYSIS W/O CC
152	MINOR SMALL AND LARGE BOWEL PROCEDURES W/ CC
153	MINOR SMALL AND LARGE BOWEL PROCEDURES W/O CC
154	STOMACH, ESOPHAGEAL AND DUODENAL PROCEDURES, AGE GREATER THAN 17 W/ CC
155	STOMACH, ESOPHAGEAL AND DUODENAL PROCEDURES, AGE GREATER THAN 17 WIHOUT CC
156	STOMACH, ESOPHAGEAL AND DUODENAL PROCEDURES, AGE 0-17
157	ANAL AND STOMAL PROCEDURES W/ CC
158	ANAL AND STOMAL PROCEDURES W/O CC
159	HERMIA PROCEDURES EXCEPT INGUINAL AND FEMORAL , AGE GREATER THAN 17 W/ CC
160	HERNIA PROCEDURES EXCEPT INGUINAL AND FEMORAL, AGE GREATER THAN 17 W/O CC
161	INGUINAL AND FEMORAL HERNIA PROCEDURES, AGE GREATER THAN 17 W/ CC
162	INGUINAL AND FEMORAL HERNIA PROCEDURES, AGE GREATER THAN 17 W/O CC
163	HERNIA PROCEDURES, AGE 0-17
164	APPENDECTOMY W/ COMPLICATED PRINCIPAL DIAGNOSIS W/ CC
165	APPENDECTOMY W/ COMPLICATED PRINCIPAL DIAGNOSIS WIHTOUT CC
166	APPENDECTOMY W/O COMPLICATED PRINCIPAL IAGNOSIS W/ CC

Complications of Anesthesia (PSI 1)	
167	APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAGNOSIS W/O CC
168	MOUTH PROCEDURES W/ CC
169	MOUTH PROCEDURES W/O CC
170	OTHER DIGESTIVE SYSTEM OR PROCEDURES W/ CC
171	OTHER DIGESTIVE SYSTEM OR PROCEDURES W/O CC
191	PANCREAS, LIVER AND SHUNT PROCEDURES W/ CC
192	PANCREAS, LIVER AND SHUNT PROCEDURES W/O CC
193	BILIARY TRACT PROCEDURES EXCEPT ONLY CHOLECYSTECTOIMY W/ OR W/O COMMON DUCT EXPLORATION W/ CC
194	BILIARY TRACT PROCEDURES EXCEPT ONLY CHOLECYSTECTOMY W/ OR W/O COMMON DUCT EXPLORATION W/O CC
195	CHOLECYSTECTOMY W/ COMMON DUCT EXPLORATION W/ CC
196	CHOLECYSTECTOMY W/ COMMON DUCT EXPLORATION W/O CC
197	CHOLECYSTECTOMY EXCEPT BY LAPAROSCOPE W/O COMMON DUCT EXPLORATION W/ CC
198	CHOLECYSTECTOMY EXCEPT BY LAPAROSCOPE W/O COMMON DUCT EXPORTATION W/O CC
199	HEPATOBILIARY DIAGNOSTIC PROCEDURE FOR MALIGNANCY
200	HEPATOBILIARY DIAGNOSTIC PROCEDURE FOR NONMALIGNANCY
201	OTHER HEPATOBILIARY OR PANCREAS OR PROCEDURES
209	MAJOR JOINT AND LIMB REATTACHMENT PROCEDURES OF LOWER EXTREMITY
210	HIP AND FEMUR PROCEDURES EXCEPT MAJOR JOINT PROCEDURES, AGE GREATER THAN 17 W/ CC
211	HIP AND FEMUR PROCEDURES EXCEPT MAJOR JOINT PROCEDURES, AGE GREATER THAN 17 W/O CC
212	HIP AND FEMUR PROCEDURES EXCEPT MAJOR JOINT PROCEDURE, AGE 0-17
213	AMPUTATION FOR MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE DISORDERS
214*	BACK & NECK PROCEDURES W CC
215*	BACK & NECK PROCEDURES W/O CC
216	BIOPSIES OF MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE
217	WOUND DEBRIDEMENT AND SKIN GRAFT EXCEPT HAND FOR MUSCULOSKELETAL AND CONNECTIVE TISSUE DISORDERS
218	LOWER EXTREMITY AND HUMERUS PROCEURES EXCEPT HIP, FOOT AND FEMUR, AGE GREATER THAN 17 W/ CC
219	LOWER EXTREMITY AND HUMERUS PROCEDURES EXCEPT HIP, FOOT AND FEMUR, AGE GREATER THAN 17 W/O CC
220	LOWER EXTREMITY AND HUMERUS PROCEDURES EXCEPT HIP, FOOT AND FEMUR, AGE 0-17
221*	KNEE PROCEDURES W CC
222*	KNEE PROCEDURES W/O CC
223	MAJOR SHOULDER/ELBOW PROCEDURES OR OTHER UPPER EXTREMITY PROCEDURES W/ CC
224	SHOULDER, ELBOW OR FOREARM PROCEDURES EXCEPT MAJOR JOINT PROCEDURES W/O CC
225	FOOT PROCEDURES
226	SOFT TISSUE PROCEDURES W/ CC
227	SOFT TISSUE PROCEDURES W/O CC
228	MAJOR THUMB OR JOINT PROCEDURES OR OTHER HAND OR WRIST PROCEDURES W/ CC
229	HAND OR WRIST PROCEDURES EXCEPT MAJOR JOINT PROCEDURES W/O CC
230	LOCAL EXCISION AND REMOVAL OF INTERNAL FIXATION DEVICES OF HIP AND FEMUR
231*	LOCAL EXCISION AND REMOVAL OF INTERNAL FIXATION DEVICES EXCEPT HIP AND FEMUR
232	ARTHROSCOPY
233	OTHER MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE OR PROCEDURES W/ CC
234	OTHER MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE OR PROCEDURES W/O CC
257	TOTAL MASTECTOMY FOR MALIGNANCY W/ CC
258	TOTAL MASTECTOMY FOR MALIGNANCY W/O CC
259	SUBTOTAL MASTECTOMY FOR MALIGNANCY W/ CC
260	SUBTOTAL MASTECTOMY FOR MALIGNANCY W/O CC
261	BREAST PROCEDURE FOR NONMALIGNANCY EXCEPT BIOPSY AND LOCAL EXCISION
262	BREAST BIOPSY AND LOCAL EXCISION FOR NONMALIGNANCY
263	SKIN GRAFT AND/OR DEBRIDEMENT FOR SKIN ULCER OR CELLULITIS W/ CC
264	SKIN GRAFT AND OR DEBRIDEMENT FOR SKIN ULCER OR CELLULITIS W/O CC
265	SKIN GRAFT AND OR DEBRIDEMENT EXCEPT FOR SKIN ULCER OR CELLULITIS W/ CC
266	SKIN GRAFT AND/OR DEBRIDEMENT EXCEPT FOR SKIN ULCER OR CELLUTLITIES W/O CC
267	PERIANAL AND PILONIDAL PROCEDURES
268	SKIN, SUBCUTANEOUS TISSUE AND BREAST PLASTIC PROCEDURES

Complications of Anesthesia (PSI 1)	
269	OTHER SKIN, SUBCUTANEOUS TISSUE AND BREAST PROCEDURES W/ CC
270	OTHER SKIN, SUBCUTANEOUS TISSUE AND BREAST PROCEDURS W/O CC
285	AMPUTAETION OF LOWER LIMB FOR ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS
286	ADRENAL AND PITUITARY PROCEDURES
287	SKIN GRAFTS AND WOUND DEBRIDEMENTS FOR ENDOCRINE, NUTRITIONAL AND METABOLIC DISORDERS
288	OR PROCEDURES FOR OBESITY
289	PARATHYROID PROCEDURES
290	THYROID PROCEDURES
291	THYROGLOSSAL PROCEDURES
292	OTHER ENDOCRINE, NUTRITIONAL AND METABOLIC OR PROCEDURES W/ CC
293	OTHER ENDOCRINE, NUTRITIONAL AND METABOLIC OR PROCEDURES W/O CC
302	KIDNEY TRANSPLANT
303	KIDNEY, URETER AND MAJOR BLADDER PROCEDURES FOR NEOPLASM
304	KIDNEY, URETER AND MAJOR BLADDER PROCEDURES FOR NONNEOPLASMS W/ CC
305	KIDNEY, URETER AND MAJOR BLADDER PROCEDURES FOR NONEOPLSMS W/O CC
306	PROSTATECTOMY W/ CC
307	PROSTATECTOMY W/O CC
308	MINOR BLADDER PROCEDURES W/ CC
309	MINOR BLADDER PROCEDURES W/O CC
310	TRANSURETHRAL PROCEDURES W/ CC
311	TRANSURETHRAL PROCEDURES W/O CC
312	URETHRAL PROCEDURES, AGE GREATER THAN 17 W/ CC
313	URETHRAL PROCEDURES, AGE GREATER THAN 17 W/O CC
314	URETHRAL PROCEDURES, AGE 0-17
315	OTHER KIDNEY AND URINARY TRACT OR PROCEDURES
334	MAJOR MALE PELVIC PROCEDURES W/ CC
335	MAJOR MALE PELVIC PROCEDURES W/O CC
336	TRANSURETHRAL PROSTATECTOMY W/ CC
337	TRANSURETHRAL PROSTATECTOMY W/O CC
338	TESTES PROCEDURES FOR MALIGNANCY
339	TESTES PROCEDURES FOR NONMALIGNANCY, AGE GREATER THAN 17
340	TESTES PROCEDURES FOR NONMALIGNANCY, AGE 0-17
341	PENIS PROCEDURES
342	CIRCUMCISION, AGE GREATER THAN 17
343	CIRCUMCISION, AGE 0-17
344	OTHER MALE REPRODUCTIVE SYSTEM OR PROCEDURES FOR MALIGNANCY
345	OTHER MALE REPRODUCTIVE SYSTEM OR PROCEDURES EXCEPT FOR MALIGNANCY
353	PELVIC EVISCERATION, RADICAL HYSTERECTOMY AND RADICAL VULVECTOMY
354	UTERINE AND ADNEXA PROCEDURES FOR NONOVARIAN/ADNEXAL MALIGNANCY W/ CC
355	UTERINE AND ADNEXA PROCEDURES FOR NONOVARIAN/ADNEXA PROCEDURES W/O CC
356	FEMALE REPRODUCTIVE SYSTEM RECONSTRUCTIVE PROCEDURES
357	UTERINE AND ADNEXA PROCEDURES FOR OVARIAN OR ADNEXAL MALIGNANCY
358	UTERINE AND ADNEXA PROCEDURES FOR NONMALIGNANCY W/ CC
359	UTERINE AND ADNEXA PROCEDURES FOR NONMALIGNANCY W/O CC
360	VAGINA, CERVIX AND VULVA PROCEDURES
361	LAPAROSCOPY AND INCISIONAL TUBAL INTERRUPTION
362	ENDOSCOPIC TUBAL INTERRUPTION
363	D AND C, CONIZATION AND RADIOIMPLANT FOR MALIGNANCY
364	D AND C, CONIZATION EXCEPT FOR MALIGNANCY
365	OTHER FEMALE REPRODUCTIVE SYSTEM OR PROCEDURES
370	CESAREAN SECTION W/ CC
371	CESAREAN SECTION W/O CC
374	VAGINAL DELIVERY W/ STERILIZATION AND/OR D AND C
375	VAGINAL DELIVERY W/ OR PROCEDURE EXCEPT STERILIZATION AND/OR D AND C
377	POSTPARTUM AND POSTABORTION DIAGNOSES W/ OR PROCEDURE
381	ABORTION W/ D AND C ASPIRATION CURETTAGE OR HYSTERECTOMY
392	SPLENECTOMY, AGE GREATER THAN 17
393	SPLENECTOMY, AGE 0-17
394	OTHER OR PROCEDURES OF THE BLOOD AND BLOOD-FORMING ORGANS
400*	LYMPHOMA AND LEUKEMIA W/ MAJOR OR PROCEDURES

Complications of Anesthesia (PSI 1)	
401	LYMPHOMA AND NONACUTE LEUKEMIA W/ OTHER OR PROCEDURE W/ CC
402	LYMPHOMA AND NONACUTE LEUKEMIA W/ OTHER OR PROCEDURE W/O CC
406	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ MAJOR OR PROCEDURES W/ CC
407	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ MAJOR OR PROCEDURES W/O CC
408	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ OTHER OR PROCEDURES
415	OR PROCEDURE FOR INFECTIOUS AND PARASITIC DISEASES
424	OR PROCEDURES W/ PRINCIPAL DIAGNOSIS OF MENTAL ILLNESS
439	SKIN GRAFTS FOR INJURIES
440	WOUND DEBRIDEMENTS FOR INJURIES
441	HAND PROCEDURES FOR INJURIES
442	OTHER OR PROCEDURES FOR INJURIES W/ CC
443	OTHER OR PROCEDURES FOR INJURIES W/O CC
458*	NON-EXTENSIVE BURNS W SKIN GRAFT
459*	NON-EXTENSIVE BURNS W WOUND DEBRIDEMENT OR OTHER O.R. PROC
461	OR PROCEDURES W/ DIAGNOSES OF OTHER CONTACT W/ HEALTH SERVICES
468	EXTENSIVE OR PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS
471	BILATERAL OR MULTIPLE MAJOR JOINT PROCEDURES OF LOWER EXTREMITY
472*	EXTENSIVE BURNS W O.R. PROCEDURE
476	PROSTATIC OR PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS
477	NONEXTENSIVE OR PROCEDURE UNRELATED TO PRINCIPAL DIAGNOSIS
478	OTHER VASCULAR PROCEDURES W/ CC
479	OTHER VASCULAR PROCEDURES W/O CC
480	LIVER TRANSPLANT
481	BONE MARROW TRANSPLANT
482	TRACHEOSTOMY FOR FACE, MOUTH AND NECK DIAGNOSES
483	TRACHEOSTOMY EXCEPT FOR FACE, MOUTH AND NECK DIAGNOSES
484	CRANIOTOMY FOR MULTIPLE SIGNIFICANT TRAUMA
485	LIMB REATTACHMENT, HIP AND FEMUR PROCEDURES FOR MULTIPLE SIGNIFICANT TRAUMA
486	OTHER OR PROCEDURES FOR MULTIPLE SIGNIFICANT TRAUMA
488	HIV W/ EXTENSIVE OR PROCEDURE
491	MAJOR JOINT AND LIMB REATTACHMENT PROCEDURES OF UPPER EXTREMITY
493	LAPAROSCOPIC CHOLECYSTECTOMY W/O COMMON DUCT EXPLORATION W/ CC
494	LAPAROSCOPIC CHOLECYSTECTOMY W/O COMMON DUCT EXPLORATION W/O CC
495	LUNG TRANSPLANT
496	COMBINED ANTERIOR/POSTERIOR SPINAL FUSION
497	SPINAL FUSION W/ CC
498	SPINAL FUSION W/O CC
499	BACK AND NECK PROCEDURES EXCEPT SPINAL FUSION W/ CC
500	BACK AND NECK PROCEDURES EXCEPT SPINAL FUSION W/O CC
501	KNEE PROCEDURES W/ PRINCIPAL DIAGNOSIS OF INFECTION, W/ CC
502	KNEE PROCEDURES W/ PRINCIPAL DIAGNOSIS OF INFECTION, W/O CC
503	KNEE PROCEDURES W/O PRINCIPAL DIAGNOSIS OF INFECTION
504	EXTENSIVE 3RD DEGREE BURNS W SKIN GRAFT
506	FULL THICKNESS BURN W SKIN GRAFT OR INHAL INJ W CC OR SIG TRAUMA
507	FULL THICKNESS BURN W SKIN GRFT OR INHAL INJ W/O CC OR SIG TRAUMA
512	SIMULTANEOUS PANCREAS/KIDNEY TRANSPLANT
513	PANCREAS TRANSPLANT
514*	CARDIAC DEFIBRILLATOR IMPLANT W CARDIAC CATH
515	CARDIAC DEFIBRILLATOR IMPLANT W/O CARDIAC CATH
516	PERCUTANEOUS CARDIOVASC PROC W AMI
517	PERC CARDIO PROC W NON-DRUG ELUTING STENT W/O AMI
518	PERC CARDIO PROC W/O CORONARY ARTERY STENT OR AMI
519	CERVICAL SPINAL FUSION W CC
520	CERVICAL SPINAL FUSION W/O CC
525	HEART ASSIST SYSTEM IMPLANT (OCT 02)
526	PERCUTNEOUS CARDIOVASULAR PROC W DRUG ELUTING STENT W AMI (APR 03)
527	PERCUTNEOUS CARDIOVASULAR PROC W DRUG ELUTING STENT W/O AMI (APR 03)
528	INTRACRANIAL VASCULAR PROC W PDX HEMORRHAGE (OCT 03)

Complications of Anesthesia (PSI 1)

529 VENTRICULAR SHUNT PROCEDURES W CC (OCT 03)
530 VENTRICULAR SHUNT PROCEDURES W/O CC (OCT 03)
531 SPINAL PROCEDURES W CC (OCT 03)
532 SPINAL PROCEDURES W/O CC (OCT 03)
533 EXTRACRANIAL PROCEDURES W CC (OCT 03)
534 EXTRACRANIAL PROCEDURES W/O CC (OCT 03)
535 CARDIAC DEFIB IMPLANT W CARDIAC CATH W AMI/HF/SHOCK (OCT 03)
536 CARDIAC DEFIB IMPLANT W CARDIAC CATH W/O AMI/HF/SHOCK (OCT 03)
537 LOCAL EXCIS & REMOV OF INT FIX DEV EXCEPT HIP & FEMUR W CC (OCT 03)
538 LOCAL EXCIS & REMOV OF INT FIX DEV EXCEPT HIP & FEMUR W/O CC (OCT 03)
539 LYMPHOMA & LEUKEMIA W MAJOR OR PROCEDURE W CC (OCT 03)
540 LYMPHOMA & LEUKEMIA W MAJOR OR PROCEDURE W/O CC (OCT 03)

* No longer valid in FY2004

Exclude:

Patients with ICD-9-CM diagnosis codes for anesthesia complications in the principal diagnosis field

Patients with codes for poisoning due to anesthetics (E8551, 9681-4, 9687) **and** any diagnosis code for active drug dependence, active nondependent abuse of drugs, or self-inflicted injury.

ICD-9-CM Active Drug Dependence diagnosis codes:

30400 OPIOID TYPE DEPENDENCE - UNSPECIFIED
30401 OPIOID TYPE DEPENDENCE - CONTINUOUS
30402 OPIOID TYPE DEPENDENCE - EPISODIC
30410 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC DEPENDENCE - UNSPECIFIED
30411 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC DEPENDENCE - CONTINUOUS
30412 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC DEPENDENCE - EPISODIC
30420 COCAINE DEPENDENCE - UNSPECIFIED
30421 COCAINE DEPENDENCE - CONTINUOUS
30422 COCAINE DEPENDENCE - EPISODIC
30430 CANNABIS DEPENDENCE - UNSPECIFIED
30431 CANNABIS DEPENDENCE - CONTINUOUS
30432 CANNABIS DEPENDENCE - EPISODIC
30440 AMPHETAMINE AND OTHER PSYCHO STIMULANT DEPENDENCE - UNSPECIFIED
30441 AMPHETAMINE AND OTHER PSYCHO STIMULANT DEPENDENCE - CONTINUOUS
30442 AMPHETAMINE AND OTHER PSYCHO STIMULANT DEPENDENCE - EPISODIC
30450 HALLUCINOGEN DEPENDENCE - UNSPECIFIED
30451 HALLUCINOGEN DEPENDENCE - CONTINUOUS
30452 HALLUCINOGEN DEPENDENCE - EPISODIC
30460 OTHER SPECIFIED DRUG DEPENDENCE - UNSPECIFIED
30461 OTHER SPECIFIED DRUG DEPENDENCE - CONTINUOUS
30462 OTHER SPECIFIED DRUG DEPENDENCE - EPISODIC
30470 COMBINATIONS OF OPIOID TYPE DRUG W/ ANY OTHER - UNSPECIFIED
30471 COMBINATIONS OF OPIOID TYPE DRUG W/ ANY OTHER - CONTINUOUS
30472 COMBINATIONS OF OPIOID TYPE DRUG W/ ANY OTHER - EPISODIC
30480 COMBINATIONS OF DRUG EXCLUDING OPIOID TYPE DRUG - UNSPECIFIED
30481 COMBINATIONS OF DRUG EXCLUDING OPIOID TYPE DRUG - CONTINUOUS
30482 COMBINATIONS OF DRUG EXCLUDING OPIOID TYPE DRUG - EPISODIC
30490 UNSPECIFIED DRUG DEPENDENCE - UNSPECIFIED
30491 UNSPECIFIED DRUG DEPENDENCE - CONTINUOUS
30492 UNSPECIFIED DRUG DEPENDENCE - EPISODIC

ICD-9-CM Active Nondependent Abuse of Drugs diagnosis codes:

30520 CANNABIS ABUSE - UNSPECIFIED
30521 CANNABIS ABUSE - CONTINUOUS
30522 CANNABIS ABUSE - EPISODIC

Complications of Anesthesia (PSI 1)

30530 HALLUCINOGEN ABUSE - UNSPECIFIED
30531 HALLUCINOGEN ABUSE - CONTINUOUS
30532 HALLUCINOGEN ABUSE - EPISODIC
30540 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC ABUSE - UNSPECIFIED
30541 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC ABUSE - CONTINUOUS
30542 BARBITURATE AND SIMILARLY ACTING SEDATIVE OR HYPNOTIC ABUSE - EPISODIC
30550 OPIOID ABUSE - UNSPECIFIED
30551 OPIOID ABUSE - CONTINUOUS
30552 OPIOID ABUSE - EPISODIC
30560 COCAINE ABUSE - UNSPECIFIED
30561 COCAINE ABUSE - CONTINUOUS
30562 COCAINE ABUSE - EPISODIC
30570 AMPHETAMINE OR RELATED ACTING SYMPATHOMIMETIC ABUSE - UNSPECIFIED
30571 AMPHETAMINE OR RELATED ACTING SYMPATHOMIMETIC ABUSE - CONTINUOUS
30572 AMPHETAMINE OR RELATED ACTING SYMPATHOMIMETIC ABUSE - EPISODIC
30580 ANTIDEPRESSANT TYPE ABUSE - UNSPECIFIED
30581 ANTIDEPRESSANT TYPE ABUSE - CONTINUOUS
30582 ANTIDEPRESSANT TYPE ABUSE - EPISODIC
30590 OTHER, MIXED, OR UNSPECIFIED DRUG ABUSE - UNSPECIFIED
30591 OTHER, MIXED, OR UNSPECIFIED DRUG ABUSE - CONTINUOUS
30592 OTHER, MIXED, OR UNSPECIFIED DRUG ABUSE - EPISODIC

ICD-9-CM Self-Inflicted Injury diagnosis codes:

Suicide and self-inflicted poisoning by solid or liquid substance:

E9500 ANALGESICS, ANTIPYRETICS, AND ANTIRHEUMATICS
E9501 BARBITURATES
E9502 OTHER SEDATIVE AND HYPNOTICS
E9503 TRANQUILIZERS AND OTHER PSYCHOTROPIC AGENTS
E9504 OTHER SPECIFIED DRUGS AND MEDICINAL SUBSTANCES
E9505 UNSPECIFIED DRUG OR MEDICINAL SUBSTANCE
E9506 AGRICULTURAL AND HORTICULTURAL CHEMICAL AND PHARMACEUTICAL PREPARATIONS OTHER THAN PLANT FOODS AND FERTILIZERS
E9507 CORROSIVE AND CAUSTIC SUBSTANCES
E9508 ARSENIC AND ITS COMPOUNDS
E9509 OTHER AND UNSPECIFIED SOLID AND LIQUID SUBSTANCES

Suicide and self-inflicted poisoning by gases in domestic use:

E9510 GAS DISTRIBUTED BY PIPELINE
E9511 LIQUEFIED PETROLEUM GAS DISTRIBUTED IN MOBILE CONTAINERS
E9518 OTHER UTILITY GASES

Suicide and self-inflicted poisoning by other gases and vapors:

E9520 MOTOR VEHICLE EXHAUST GAS
E9521 OTHER CARBON MONOXIDE
E9528 OTHER SPECIFIED GASES AND VAPORS
E9529 UNSPECIFIED GASES AND VAPORS

Suicide and self-inflicted injury by hanging, strangulation, and suffocation:

E9530 HANGING
E9531 SUFFOCATION BY PLASTIC BAG
E9538 OTHER SPECIFIED MEANS
E954 SUICIDE AND SELF-INFLICTED INJURY BY SUBMERSION [DROWNING]

Complications of Anesthesia (PSI 1)

Suicide and self-inflicted injury by firearms and explosives:

E9550 HANDGUN
E9551 SHOTGUN
E9552 HUNTING RIFLE
E9553 MILITARY FIREARMS
E9554 OTHER AND UNSPECIFIED FIREARMS
E9555 EXPLOSIVES
E9559 UNSPECIFIED
E956 SUICIDE AND SELF INFLICTED INJURY BY CUTTING AND PIERCING INSTRUMENT

Suicide and self-inflicted injury by jumping from a high place:

E9570 RESIDENTIAL PREMISES
E9571 OTHER MAN-MADE STRUCTURES
E9572 NATURAL SITES
E9579 UNSPECIFIED

Suicide and self-inflicted injury by other and unspecified means:

E9580 JUMPING OR LYING BEFORE MOVING OBJECT
E9581 BURNS, FIRE
E9582 SCALD
E9583 EXTREMES OF COLD
E9584 ELECTROCUTION
E9585 CRASHING OF MOTOR VEHICLE
E9586 CRASHING OF AIRCRAFT
E9587 CAUSTIC SUBSTANCES EXCEPT POISONING
E9588 OTHER SPECIFIED MEANS
E9589 UNSPECIFIED MEANS

Death in Low-Mortality DRGs (PSI 2)

Numerator:

Discharges with disposition of “deceased”.

Denominator:

Discharges in DRGs with less than 0.5% mortality rate, based on NIS 1997 low-mortality DRG. If a DRG is divided into “without/with complications,” both DRGs must have mortality rates below 0.5% to qualify for inclusion.

Low-Mortality DRGs:

Adult Medical:

015 TRANSIENT ISCHEMIC ATTACK AND PRECEREBRAL OCCLUSIONS
021 VIRAL MENINGITIS
044 ACUTE MAJOR EYE INFECTIONS
045 NEUROLOGICAL EYE DISORDERS
065 DYSEQUILIBRIUM
068 OTITIS MEDIA AND URI, AGE GREATER THAN 17 W/ CC
071 LARYNGOTRACHEITIS
096 BRONCHITIS AND ASTHMA, AGE GREATER THAN 17 W/ CC
097 BRONCHITIS AND ASTHMA, AGE GREATER THAN 17 W/O CC

Death in Low-Mortality DRGs (PSI 2)

125 CIRCULATORY DISORDERS EXCEPT ACUTE MYOCARDIAL INFARCTION W/ CARDIAC CATHETERIZATION W/O COMPLEX DIAGNOSIS
134 HYPERTENSION
140 ANGINA PECTORIS
141 SYNCOPE AND COLLAPSE W/ CC
142 SYNCOPE AND COLLAPSE W/O CC
143 CHEST PAIN
243 MEDICAL BACK PROBLEMS
246 NONSPECIFIC ARTHROPATHIES
295 DIABETES, AGE 0-35
317 ADMISSION FOR RENAL DIALYSIS
323 URINARY STONES W/ CC AND/OR ESW LITHOTRIPSY
324 URINARY STONES W/O CC
351 STERILIZATION, MALE
369 MENSTRUAL AND OTHER FEMALE REPRODUCTIVE SYSTEM DISORDERS
421 VIRAL ILLNESS, AGE GREATER THAN 17

Pediatric Medical:

026 SEIZURE AND HEADACHE, AGE 0-17
070 OTITIS MEDIA AND URI, AGE 0-17
074 OTHER EAR, NOSE, MOUTH AND THROAT DIAGNOSES, AGE 0-17
091 SIMPLE PNEUMONIA AND PLEURISY, AGE 0-17
098 BRONCHITIS AND ASTHMA, AGE 0-17
184 ESOPHAGITIS, GASTROENTERITIS AND MISCELLANEOUS DIGESTIVE DISORDERS, AGE 0-17
190 OTHER DIGESTIVE SYSTEM DIAGNOSES, AGE 0-17
252 FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF FOREARM, HAND AND FOOT, AGE 0-17
255 FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF UPPER ARM AND LOWER LEG EXCEPT FOOT, AGE 0-17
279 CELLULITIS, AGE 0-17
282 TRAUMA TO SKIN, SUBCUTANEOUS TISSUE AND BREAST, AGE 0-17
298 NUTRITIONAL AND MISCELLANEOUS METABOLIC DISORDERS, AGE GREATER THAN 17 W/O CC
322 KIDNEY AND URINARY TRACT INFECTION, AGE 0-17
333 OTHER KIDNEY AND URINARY TRACT DIAGNOSES, AGE 0-17
396 RED BLOOD CELL DISORDERS, AGE 0-17
422 VIRAL ILLNESS AND FEVER OF UNKNOWN ORIGIN, AGE 0-17
448 ALLERGIC REACTIONS, AGE 0-17
451 POISONING AND TOXIC EFFECTS OF DRUGS, AGE 0-17

Adult Surgical:

036 RETINAL PROCEDURES
037 ORBITAL PROCEDURES
042 INTRAOCULAR PROCEDURES
050 SIALOADENECTOMY
052 CLEFT LIP AND PALATE REPAIR
053 SINUS AND MASTOID PROCEDURES, AGE GREATER THAN 17
055 MISCELLANEOUS EAR, NOSE, MOUTH AND THROAT PROCEDURES
057 TONSILLECTOMY AND ADENOIDECTOMY PROCEDURES EXCEPT TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE GREATER THAN 17
063 OTHER EAR, NOSE, MOUTH AND THROAT OR PROCEDURES
166 APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAGNOSIS W/ CC
167 APPENDECTOMY W/O COMPLICATED PRINCIPAL DIAGNOSIS W/O CC
218 LOWER EXTREMITY AND HUMERUS PROCEDURES EXCEPT HIP, FOOT AND FEMUR, AGE GREATER THAN 17 W/ CC
219 LOWER EXTREMITY AND HUMERUS PROCEDURES EXCEPT HIP, FOOT AND FEMUR, AGE GREATER THAN 17 W/O CC
223 MAJOR SHOULDER, ELBOW PROCEDURES OR OTHER UPPER EXTREMITY PROCEDURES W/ CC
224 SHOULDER, ELBOW OR FOREARM PROCEDURES EXCEPT MAJOR JOINT PROCEDURES W/O CC
225 FOOT PROCEDURES

Death in Low-Mortality DRGs (PSI 2)

228 MAJOR THUMB OR JOINT PROCEDURES OR OTHER HAND OR WRIST PROCEDURES W/ CC
229 HAND OR WRIST PROCEDURES EXCEPT MAJOR JOINT PROCEDURES W/O CC
232 ARTHROSCOPY
261 BREAST PROCEDURE FOR NONMALIGNANCY EXCEPT BIOPSY AND LOCAL EXCISION
262 BREAST BIOPSY AND LOCAL EXCISION OF NONMALIGNANCY
267 PERIANAL AND PILONICAL PROCEDURES
289 PARATHYROID PROCEDURES
290 THYROID PROCEDURES
293 OTHER ENDOCRINE, NUTRITIONAL AND METABOLIC OR PROCEDURES W/O CC
334 MAJOR MALE PELVIC PROCEDURES W/ CC
335 MAJOR MALE PELVIC PROCEDURES W/O CC
336 TRANSURETHRAL PROSTATECTOMY W/ CC
337 TRANSURETHRAL PROSTATECTOMY W/O CC
356 FEMALE REPRODUCTION SYSTEM RECONCSTRUCTIVE PROCEDURES
358 UTERINE AND ADNEXA PROCEDURES FOR NONMALIGNANCY W/ CC
359 UTERINE AND ADNEXA PROCEDURES FOR NONMALIGNANCY W/O CC
360 VAGINA, CERVIX AND VULVA PROCEDURES
361 LAPAROSCOPY AND INCISIONAL TUBAL INTERRUPTION
362 ENDOSCOPIC TUBAL INTERRUPTION
364 D AND C, CONIZATION EXCEPT FOR MALIGNANCY
439 SKIN GRAFTS FOR INJURIES
499 BACK AND NECK PROCEDURES EXCEPT SPINAL FUSION W/ CC
500 BACK AND NECK PROCEDURES EXCEPT SPINAL FUSION W/O CC

Pediatric Surgical:

060 TONSILLECTOMY AND/OR ADENOIDECTOMY ONLY, AGE 0-17
062 MYRINGOTOMY W/ TUBE INSERTION, AGE 0-17
156 STOMACH, ESOPHAGEAL AND DUODENAL PROCEDURES, AGE 0-17
163 HERNIA PROCEDURES, AGE 0-17
212 HIP AND FEMUR PROCEDURES EXCEPT MAJOR JOINT PROCEDURES, AGE 0-17
220 LOWER EXTREMITY AND HUMEROUS PROCEDURES EXCEPT HIP, FOOT AND FEMUR, AGE 0-17
393 SPLENECTOMY, AGE 0-17

Obstetric:

370 CESAREAN SCTION W/ CC
371 CESAREAN SECTION W/O CC
372 VAGINAL DELIVERY W/ COMPLICATING DIAGNOSES
373 VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES
374 VAGINAL DELIVERY W/ STERILIZATION AND/OR D AND C
375 VAGINAL DELIVERY W/ OR PROCEDURE EXCEPT STERILIZATION AND OR D AND C
377 POSTPARTUM AND POSTABORTION DIAGNOSES W/ OR PROCEDURE
378 ECTOPIC PREGNANCY
379 THREATENED ABORTION
380 ABORTION W/O D AND C
381 ABORTION W/ D AND C, ASPIRATION CURETTAGE OR HYTEROTOMY
382 FALSE LABOR
383 OTHER ANTEPARTUM DIAGNOSES W/ MEDICAL COMPLICATIONS
384 OTHER ANTEPARTUM DIAGNOSES W/O MEDICAL COMPLICATIONS

Psychiatric:

425 ACUTE ADJUSTMENT REACTIONS AND DISTURBANCES OF PSYCHOSOCIAL DYSFUNCTION
426 DEPRESSIVE NEUROSES
427 NEUROSIES EXCEPT DEPRESSIVE
428 DISORDERS OF PERSONALITY AND IMPULSE CONTROL
431 CHILDHOOD MENTAL DISORDERS
432 OTHER MENTAL DISORDER DIAGNOSES
434* ALCOHOL/DRUG ABUSE OR DEPENDENCE, DETOXIFICATION OR OTHER SYMPTOMATIC TREATMENT W/ CC

Death in Low-Mortality DRGs (PSI 2)

435* ALCOHOL/DRUG ABUSE OR DEPENDENCE, DETOXIFICATION OR OTHER SYMPTOMATIC TREATMENT W/O CC
436* ALCOHOL/DRUG DEPENDENCE W/ REHABILITATION THERAPY

* No longer valid in FY 2004

Exclude:
Patients with any code for trauma, immunocompromised state, or cancer.

ICD-9-CM Trauma diagnosis codes (includes 4th and 5th digits), New codes are listed through 5th digit:

800 FRACTURE OF VAULT OF SKULL
801 FRACTURE OF BASE OF SKULL
802 FRACTURE OF FACE BONES
803 OTHER AND UNQUALIFIED SKULL FRACTURES
804 MULTIPLE FRACTURES INVOLVING SKULL OR FACE W/ OTHER BONES
805 FRACTURE OF VERTEBRAL COLUMN W/O MENTION OF SPINAL CORD INJURY
806 FRACTURE OF VERTEBRAL COLUMN W/ SPINAL CORD INJURY
807 FRACTURE OF RIB[S] STERNUM, LARYNX, AND TRACHEA
808 FRACTURE OF PELVIS
809 ILL-DEFINED FRACTURES OF BONES OF TRUNK
810 FRACTURE OF CLAVICLE
811 FRACTURE OF SCAPULA
812 FRACTURE OF HUMERUS
813 FRACTURE OF RADIUS AND ULNA
814 FRACTURE OF CARPAL BONE[S]
815 FRACTURE OF METACARPAL BONE[S]
817 MULTIPLE FRACTURE OF HAND BONES
818 ILL-DEFINED FRACTURES OF UPPER LIMB
819 MULTIPLE FRACTURES INVOLVING BOTH UPPER LIMBS, AND UPPER LIMB W/ RIB AND STERNUM
820 FRACTURE OF NECK OF FEMUR
821 FRACTURE OF OTHER AND UNSPECIFIED PARTS OF FEMUR
822 FRACTURE OF PATELLA
823 FRACTURE OF TIBIA AND FIBULA
824 FRACTURE OF ANKLE
825 FRACTURE OF ONE OR MORE TARSAL AND METATARSAL BONES
827 OTHER, MULTIPLE, AND ILL-DEFINED FRACTURES OF LOWER LIMB
828 MULTIPLE FRACTURES INVOLVING BOTH LOWER LIMBS, LOWER W/ UPPER LIMB, AND LOWER LIMB W/ RIB AND STERNUM
829 FRACTURE OF UNSPECIFIED BONES
830 DISLOCATION OF JAW
831 DISLOCATION OF SHOULDER
832 DISLOCATION OF ELBOW
833 DISLOCATION OF WRIST
835 DISLOCATION OF HIP
836 DISLOCATION OF KNEE
837 DISLOCATION OF ANKLE
838 DISLOCATION OF FOOT
839 OTHER, MULTIPLE, AND ILL-DEFINED DISLOCATIONS
850 CONCUSSION
85011 CONCUSSION W/ BRIEF COMA <31 MINUTES (OCT 03)
85012 CONCUSSION W/ BRIEF COMA 31-59 MINUTES (OCT 03)
851 CEREBRAL LACERATION AND CONTUSION
852 SUBARACHNOID, SUBDURAL, AND EXTRADURAL HEMORRHAGE, FOLLOWING INJURY
853 OTHER AND UNSPECIFIED INTRACRANIAL HEMORRHAGE FOLLOWING INJURY
854 INTRACRANIAL INJURY OF OTHER AND UNSPECIFIED NATURE
860 TRAUMATIC PNEUMOTHORAX
861 INJURY TO HEART AND LUNG
862 INJURY TO OTHER AND UNSPECIFIED INTRATHORACIC ORGANS
863 INJURY TO GASTROINTESTINAL TRACT
864 INJURY TO LIVER

Death in Low-Mortality DRGs (PSI 2)

865	INJURY TO SPLEEN
866	INJURY TO KIDNEY
867	INJURY TO PELVIC ORGANS
868	INJURY TO OTHER INTRA-ABDOMINAL ORGANS
869	INTERNAL INJURY TO UNSPECIFIED OR ILL-DEFINED ORGANS
870	OPEN WOUND OF OCULAR ADNEXA
871	OPEN WOUND OF EYEBALL
872	OPEN WOUND OF EAR
873	OTHER OPEN WOUND OF HEAD
874	OPEN WOUND OF NECK
875	OPEN WOUND OF CHEST [WALL]
876	OPEN WOUND OF BACK
877	OPEN WOUND OF BUTTOCK
878	OPEN WOUND OF GENITAL ORGANS [EXTERNAL] INCLUDING TRAUMATIC AMPUTATION
879	OPEN WOUND OF OTHER AND UNSPECIFIED SITES, EXCEPT LIMBS
880	OPEN WOUND OF SHOULDER AND UPPER ARM
881	OPEN WOUND OF ELBOW, FOREARM, AND WRIST
882	OPEN WOUND OF HAND EXCEPT FINGER ALONE
884	MULTIPLE AND UNSPECIFIED OPEN WOUND OF UPPER LIMB
887	TRAUMATIC AMPUTATION OF ARM AND HAND (COMPLETE) (PARTIAL)
890	OPEN WOUND OF HIP AND THIGH
891	OPEN WOUND OF KNEE, LEG (EXCEPT THIGH) AND ANKLE
892	OPEN WOUND OF FOOT EXCEPT TOE ALONE
894	MULTIPLE AND UNSPECIFIED OPEN WOUND OF LOWER LIMB
896	TRAUMATIC AMPUTATION OF FOOT (COMPLETE) (PARTIAL)
897	TRAUMATIC AMPUTATION OF LEG[S] (COMPLETE) (PARTIAL)
900	INJURY TO BLOOD VESSELS OF HEAD AND NECK
901	INJURY TO BLOOD VESSELS OF THORAX
902	INJURY TO BLOOD VESSELS OF ABDOMEN AND PELVIS
903	INJURY TO BLOOD VESSELS OF UPPER EXTREMITY
904	INJURY TO BLOOD VESSELS OF LOWER EXTREMITY AND UNSPECIFIED SITES
925	CRUSHING INJURY OF FACE, SCALP, AND NECK
926	CRUSHING INJURY OF TRUNK
927	CRUSHING INJURY OF UPPER LIMB
928	CRUSHING INJURY OF LOWER LIMB
929	CRUSHING INJURY OF MULTIPLE AND UNSPECIFIED SITES
940	BURN CONFINED TO EYE AND ADNEXA
941	BURN OF FACE, HEAD, AND NECK
942	BURN OF TRUNK
943	BURN OF UPPER LIMB, EXCEPT WRIST AND HAND
944	BURN OF WRIST[S] AND HAND[S]
945	BURN OF LOWER LIMB[S]
946	BURNS OF MULTIPLE SPECIFIED SITES
947	BURN OF INTERNAL ORGANS
948	BURNS CLASSIFIED ACCORDING TO EXTENT OF BODY SURFACE INVOLVED
949	BURN, UNSPECIFIED
952	SPINAL CHORD INJURY W/O EVIDENCE OF SPINAL BONE INJURY
953	INJURY TO NERVE ROOTS AND SPINAL PLEXUS
958	CERTAIN EARLY COMPLICATIONS OF TRAUMA

ICD-9-CM Immunocompromised States diagnosis codes:

042	HUMAN IMMUNODEFICIENCY VIRUS DISEASE
1363	PNEUMOCYSTOSIS
27900	HYPOGAMMAGLOBULINEMIA NOS
27901	SELECTIVE IGA IMMUNODEFICIENCY
27902	SELECTIVE IGM IMMUNODEFICIENCY
27903	OTHER SELECTIVE IMMUNOGLOBULIN DEFICIENCIES
27904	CONGENITAL HYPOGAMMAGLOBULINEMIA
27905	IMMUNODEFICIENCY W/ INCREASED IGM
27906	COMMON VARIABLE IMMUNODEFIENCY

Death in Low-Mortality DRGs (PSI 2)

27909 HUMORAL IMMUNITY DEFICIENCY NEC
27910 IMMUNODEFICIENCY W/ PREDOMINANT T-CELL DEFECT, NOS
27911 DIGEORGE'S SYNDROME
27912 WISKOTT-ALDRICH SYNDROME
27913 NEZELOF'S SYNDROME
27919 DEFICIENCY OF CELL-MEDIATED IMMUNITY, NOS
2792 COMBINED IMMUNITY DEFICIENCY
2793 UNSPECIFIED IMMUNITY DEFICIENCY
2794 AUTOIMMUNE DISEASE, NOT ELSEWHERE CLASSIFIED
2798 OTHER SPECIFIED DISORDERS INVOLVING THE IMMUNE MECHANISM
2799 UNSPECIFIED DISORDER OF IMMUNE MECHANISM

Complications of transplanted organ:

9968 COMPLICATIONS OF TRANSPLANTED ORGAN
99680 TRANSPLANTED ORGAN, UNSPECIFIED
99681 KIDNEY TRANSPLANT
99682 LIVER TRANSPLANT
99683 HEART TRANSPLANT
99684 LUNG TRANSPLANT
99685 BONE MARROW TRANSPLANT
99686 PANCREAS TRANSPLANT
99687 INTESTINE TRANSPLANT
99689 OTHER SPECIFIED ORGAN TRANSPLANT
V420 KIDNEY REPLACED BY TRANSPLANT
V421 HEART REPLACED BY TRANSPLANT
V426 LUNG REPLACED BY TRANSPLANT
V427 LIVER REPLACED BY TRANSPLANT
V428 OTHER SPECIFIED ORGAN OR TISSUE
V4281 BONE MARROW REPLACED BY TRANSPLANT
V4282 PERIPHERAL STEM CELLS REPLACED BY TRANSPLANT
V4283 PANCREAS REPLACED BY TRANSPLANT
V4284 INTESTINES REPLACE BY TRANSPLANT
V4289 OTHER REPLACED BY TRANSPLANT

ICD-9-CM Immunocompromised States procedure codes:

335 LUNG TRANSPLANTATION
3350 LUNG TRANSPLANTATION, NOS
3351 UNILATERAL LUNG TRANSPLANTATION
3352 BILATERAL LUNG TRANSPLANTATION
336 COMBINED HEART-LUNG TRANSPLANTATION
375 HEART TRANSPLANTATION
3751 HEART TRANSPLANTATION (OCT 03)
410 OPERATIONS ON BONE MARROW AND SPLEEN
4100 BONE MARROW TRANSPLANT, NOS
4101 AUTOLOGOUS BONE MARROW TRANSPLANT W/O PURGING
4102 ALLOGENEIC BONE MARROW TRANSPLANT W/ PURGING
4103 ALLOGENEIC BONE MARROW TRANSPLANT W/O PURGING
4104 AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANT W/O PURGING
4105 ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT W/O PURGING
4106 CORD BLOOD STEM CELL TRANSPLANT
4107 AUTOLOGOUS HEMATOPOIETIC STEM CELL TRANSPLANT W/ PURGING
4108 ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT W/ PURGING
4109 AUTOLOGOUS BONE MARROW TRANSPLANT W/ PURGING
5051 AUXILIARY LIVER TRANSPLANT
5059 LIVER TRANSPLANT, NEC
5280 PANCREATIC TRANSPLANT, NOS
5281 REIMPLANTATION OF PANCREATIC TISSUE
5282 HOMOTRANSPLANT OF PANCREAS
5283 HETEROTRANSPLANT OF PANCREAS

Death in Low-Mortality DRGs (PSI 2)

5285 ALLOTRANSPLANTATION OF CELLS OF ISLETS OF LANGERHANS
5286 TRANSPLANTATION OF CELLS OF ISLETS OF LANGERHANS, NOS
5569 OTHER KIDNEY TRANSPLANTATION

ICD-9-CM Cancer diagnosis codes (includes 4th and 5th digits):

140 MALIGNANT NEOPLASM OF LIP
141 MALIGNANT NEOPLASM OF TONGUE
142 MALIGNANT NEOPLASM OF MAJOR SALIVARY GLANDS
143 MALIGNANT NEOPLASM OF GUM
144 MALIGNANT NEOPLASM OF FLOOR OF MOUTH
145 MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED PARTS OF MOUTH
146 MALIGNANT NEOPLASM OF OROPHARYNX
147 MALIGNANT NEOPLASM OF NASOPHARYNX
148 MALIGNANT NEOPLASM OF HYPOPHARYNX
149 MALIGNANT NEOPLASM OF OTHER AND ILL-DEFINED SITES WITHIN THE LIP, ORAL CAVITY, AND PHARYNX
150 MALIGNANT NEOPLASM OF ESOPHAGUS
151 MALIGNANT NEOPLASM OF STOMACH
152 MALIGNANT NEOPLASM OF SMALL INTESTINE, INCLUDING DUODENUM
153 MALIGNANT NEOPLASM OF COLON
154 MALIGNANT NEOPLASM OF RECTUM, RECTOSIGMOID JUNCTION, AND ANUS
155 MALIGNANT NEOPLASM OF LIVER AND INTRAHEPATIC BILE DUCTS
156 MALIGNANT NEOPLASM OF GALLBLADDER AND EXTRAHEPATIC BILE DUCTS
157 MALIGNANT NEOPLASM OF PANCREAS
158 MALIGNANT NEOPLASM OF RETROPERITONEUM AND PERITONEUM
159 MALIGNANT NEOPLASM OF OTHER AND ILL-DEFINED SITES WITHIN THE DIGESTIVE ORGANS AND PERITONEUM
160 MALIGNANT NEOPLASM OF NASAL CAVITIES, MIDDLE EAR, AND ACCESSORY SINUSES
161 MALIGNANT NEOPLASM OF LARYNX
162 MALIGNANT NEOPLASM OF TRACHEA, BRONCHUS, AND LUNG
163 MALIGNANT NEOPLASM OF PLEURA
164 MALIGNANT NEOPLASM OF THYMUS, HEART, AND MEDIASTINUM
165 MALIGNANT NEOPLASM OF OTHER AND ILL-DEFINED SITES WITHIN THE RESPIRATORY SYSTEM AND INTRATHORACIC ORGANS
170 MALIGNANT NEOPLASM OF BONE AND ARTICULAR CARTILAGE
171 MALIGNANT NEOPLASM OF CONNECTIVE AND OTHER SOFT TISSUE
172 MALIGNANT MELANOMA OF SKIN
174 MALIGNANT NEOPLASM OF FEMALE BREAST
175 MALIGNANT NEOPLASM OF MALE BREAST
176 KARPOSI'S SARCOMA
179 MALIGNANT NEOPLASM OF UTERUS, PART UNSPECIFIED
180 MALIGNANT NEOPLASM OF CERVIX UTERI
181 MALIGNANT NEOPLASM OF EYE
182 MALIGNANT NEOPLASM OF BODY OF UTERUS
183 MALIGNANT NEOPLASM OF OVARY AND OTHER UTERINE ADNEXA
184 MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED FEMALE GENITAL ORGANS
185 MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED FEMALE GENITAL ORGANS
186 MALIGNANT NEOPLASM OF TESTES
187 MALIGNANT NEOPLASM OF PENIS AND OTHER MALE GENITAL ORGANS
188 MALIGNANT NEOPLASM OF BLADDER
189 MALIGNANT NEOPLASM OF KIDNEY AND OTHER AND UNSPECIFIED URINARY ORGANS
190 MALIGNANT NEOPLASM OF EYE
191 MALIGNANT NEOPLASM OF BRAIN
192 MALIGNANT NEOPLASM OF OTHER AND UNSPECIFIED PARTS OF NERVOUS SYSTEM
193 MALIGNANT NEOPLASM OF THYROID GLAND
194 MALIGNANT NEOPLASM OF OTHER ENDOCRINE GLANDS AND RELATED STRUCTURES
195 MALIGNANT NEOPLASM OF OTHER, AND ILL-DEFINED SITES
196 SECONDARY AND UNSPECIFIED MALIGNANT NEOPLASM OF LYMPH NODES
197 SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND DIGESTIVE SYSTEMS
198 SECONDARY MALIGNANT NEOPLASM OF OTHER SPECIFIED SITES

Death in Low-Mortality DRGs (PSI 2)

199	MALIGNANT NEOPLASM W/O SPECIFICATION OF SITE
200	LYMPHOSARCOMA AND RETICULOSARCOMA
201	HODGKIN'S DISEASE
202	OTHER MALIGNANT NEOPLASMS OF LYMPHOID AND HISTIOCYTIC TISSUES
203	MULTIPLE MYELOMA AND IMMUNOPROLIFERATIVE NEOPLASMS
204	LYMPHOID LEUKEMIA
205	MYELOID LEUKEMIA
206	MONOCYTIC LEUKEMIA
207	OTHER SPECIFIED LEUKEMIA
208	LEUKEMIA OF UNSPECIFIED CELL TYPE
2386	NEOPLASM OF UNCERTAIN BEHAVIOR OF OTHER AND UNSPECIFIED SITES AND TISSUES, PLASMA CELLS
2733	MACROGLOBULINEMIA

Personal history of malignant neoplasm:

V1000	GASTROINTESTINAL TRACT, UNSPECIFIED
V1001	TONGUE
V1002	OTHER AND UNSPECIFIED ORAL CAVITY AND PHARYNX
V1003	ESOPHAGUS
V1004	STOMACH
V1005	LARGE INTESTINE
V1006	RECTUM, RECTOSIGMOID JUNCTION, AND ANUS
V1007	LIVER
V1009	OTHER
V1011	BRONCHUS AND LUNG
V1012	TRACHEA
V1020	RESPIRATORY ORGAN, UNSPECIFIED
V1021	LARYNX
V1022	NASAL CAVITIES, MIDDLE EAR, AND ACCESSORY SINUSES
V1029	OTHER RESPIRATORY AND INTRATHORACIC ORGANS, OTHER
V103	BREAST
V1040	FEMALE GENITAL ORGAN, UNSPECIFIED
V1041	CERVIX UTERI
V1042	OTHER PARTS OF UTERUS
V1043	OVARY
V1044	OTHER FEMALE GENITAL ORGANS
V1045	MALE GENITAL ORGAN, UNSPECIFIED
V1046	PROSTATE
V1047	TESTES
V1048	EPIDIDYMIS
V1049	OTHER MALE GENITAL ORGANS
V1050	URINARY ORGAN, UNSPECIFIED
V1051	BLADDER
V1052	KIDNEY
V1053	RENAL PELVIS
V1059	URINARY ORGANS, OTHER
V1060	LEUKEMIA, UNSPECIFIED
V1061	LYMPHOID LEUKEMIA
V1062	MYELOID LEUKEMIA
V1063	MONOCYTIC LEUKEMIA
V1069	LEUKEMIA, OTHER
V1071	LYMPHOSARCOMA AND RETICULOSARCOMA
V1072	HODGKIN'S DISEASE
V1079	OTHER LYMPHATIC AND HEMATOPOIETIC NEOPLASMS, OTHER
V1081	BONE
V1082	MALIGNANT MELANOMA OF SKIN
V1083	OTHER MALIGNANT NEOPLASM OF SKIN
V1084	EYE
V1085	BRAIN
V1086	OTHER PARTS OF NERVOUS SYSTEM

Death in Low-Mortality DRGs (PSI 2)

V1087	THYROID
V1088	OTHER ENDOCRINE GLANDS AND RELATED STRUCTURES
V1089	OTHER
V109	UNSPECIFIED PERSONAL HISTORY OF MALIGNANT NEOPLASM

Decubitus Ulcer (PSI 3)

Numerator:

Discharges with ICD-9-CM code of 707.0 in any secondary diagnosis field.

Denominator:

All medical and surgical discharges defined by specific DRGs

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for list of surgical discharge DRG codes.

Medical Discharge DRGs:

009	SPINAL DISORDERS AND INJURIES
010	NERVOUS SYSTEM NEOPLASMS W/ CC
011	NERVOUS SYSTEM NEOPLASMS W/ CC
012	DEGENERATIVE NERVOUS SYSTEM DISORDERS
013	MULTIPLE SCLEROSIS AND CEREBELLAR ATAXIA
014	SPECIFIC CEREBROVASCULAR DISORDERS EXCEPT TRANSIENT ISCHEMIC ATTACK
015	TRANSIENT ISCHEMIC ATTACK AND PRECEREBRAL OCCLUSIONS
016	NONSPECIFIC CEREBROVASCULAR DISORDERS W/ CC
017	NONSPECIFIC CEREBROVASCULAR DISORDERS W/O CC
018	CRANIAL AND PERIPHERAL NERVE DISORDERS W/ CC
019	CRANIAL AND PERIPHERAL NERVE DISORDERS W/O CC
020	NERVOUS SYSTEM INFECTION EXCEPT VIRAL MENINGITIS
021	VIRAL MENINGITIS
022	HYPERTENSIVE ENCEPHALOPATHY
023	NONTRAUMATIC STUPOR AND COMA
024	SEIZURE AND HEADACHE, AGE GREATER THAN 17 W/ CC
025	SEIZURE AND HEADACHE, AGE GREATER THAN 17 W/O CC
026	SEIZURE AND HEADACHE, AGE 0-17
027	TRAUMATIC STUPOR AND COMA, COMA GREATER THAN ONE HOUR
028	TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE GREATER THAN 17 W/ CC
029	TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE GREATER THAN 17 W/O CC
030	TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE 0-17
031	CONCUSSION, AGE GREATER THAN 17 W/ CC
032	CONCUSSION, AGE GREATER THAN 17 W/O CC
033	CONCUSSION, AGE 0-17
034	OTHER DISORDERS OF NERVOUS SYSTEM W/ CC
035	OTHER DISORDERS OF NERVOUS SYSTEM W/O CC
043	HYPHEMA
044	ACUTE MAJOR EYE INFECTIONS
045	NEUROLOGICAL EYE DISORDERS
046	OTHER DISORDERS OF THE EYE, AGE GREATER THAN 17 W/ CC
047	OTHER DISORDER OF THE EYE, AGE GREATER THAN 17 W/O CC
048	OTHER DISORDERS OF THE EYE, AGE 0-17
064	EAR, NOSE, MOUTH AND THROAT MALIGNANCY
065	DISEQUILIBRIA
066	EPISTAXIS
067	EPIGLOTTITIS

Decubitus Ulcer (PSI 3)	
068	OTITIS MEDIA AND URI, AGE GREATER THAN 17 W/ CC
069	OTITIS MEDIA AND URI, AGE GREATER THAN 17 W/O CC
070	OTITIS MEDIA AND URI, AGE 0-17
071	LARYNGOTRACHEITIS
072	NASAL TRAUMA AND DEFORMITY
073	OTHER EAR, NOSE, MOUTH AND THROAT DIAGNOSES, AGE GREATER THAN 17
074	OTHER EAR, NOSE, MOUTH AND THROAT DIAGNOSES, AGE 0-17
078	PULMONARY EMBOLISM
079	RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE GREATER THAN 17 W/ CC
080	RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE GREATER THAN 17 W/O CC
081	RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE 0-17
082	RESPIRATORY NEOPLASMS
083	MAJOR CHEST TRAUMA W/ CC
084	MAJOR CHEST TRAUMA W/O CC
085	PLEURAL EFFUSION W/ CC
086	PLEURAL EFFUSION W/O CC
087	PULMONARY EDEMA AND RESPIRATORY FAILURE
088	CHRONIC OBSTRUCTIVE PULMONARY DISEASE
089	SIMPLE PNEUMONIA AND PLEURISY, AGE GREATER THAN 17 W/ CC
090	SIMPLE PNEUMONIA AND PLEURISY, AGE GREATER THAN 17 W/O CC
091	SIMPLE PNEUMONIA AND PLEURISY, AGE 0-17
092	INTERSTITIAL LUNG DISEASE W/ CC
093	INTERSTITIAL LUNG DISEASE W/O CC
094	PNEUMOTHORAX W/ CC
095	PNEUMOTHORAX W/O CC
096	BRONCHITIS AND ASTHMA, AGE GREATER THAN 17 W/ CC
097	BRONCHITIS AND ASTHMA, AGE GREATER THAN 17 W/O CC
098	BRONCHITIS AND ASTHMA, AGE 0-17
099	RESPIRATORY SIGNS AND SYMPTOMS W/ CC
100	RESPIRATORY SIGNS AND SYMPTOMS W/O CC
101	OTHER RESPIRATORY SYSTEM DIAGNOSES W/ CC
102	OTHER RESPIRATORY SYSTEM DIAGNOSES W/O CC
121	CIRCULATORY DISORDERS W/ ACUTE MYOCARDIAL INFARCTION AND MAJOR COMPLICATION, DISCHARGED ALIVE
122	CIRCULATORY DISORDERS W/ ACUTE MYOCARDIAL INFARCTION W/O MAJOR COMPLICATION, DISCHARGED ALIVE
123	CIRCULATORY DISORDERS W/ ACUTE MYOCARDIAL INFARCTION, EXPIRED
124	CIRCULATORY DISORDERS EXCEPT ACUTE MYOCARDIAL INFARCTION W/ CARDIAC CATHETERIZATION AND COMPLEX DIAGNOSIS
125	CIRCULATORY DISORDERS EXCEPT ACUTE MYOCARDIAL INFARCTION W/ CARDIAC CATHETERIZATION W/O COMPLEX DIAGNOSIS
126	ACUTE AND SUB ACUTE ENDOCARDITIS
127	HEART FAILURE AND SHOCK
128	DEEP VEIN THROMBOPHLEBITIS
129	CARDIAC ARREST, UNEXPLAINED
130	PERIPHERAL VASCULAR DISORDERS W/ CC
131	PERIPHERAL VASCULAR DISORDERS W/O CC
132	ATHEROSCLEROSIS W/ CC
133	ATHEROSCLEROSIS W/O CC
134	HYPERTENSION
135	CARDIAC CONGENITAL AND VALVULAR DISORDERS, AGE GREATER THAN 17 W/ CC
136	CARDIAC CONGENITAL AND VALVULAR DISORDERS, AGE GREATER THAN 17 W/O CC
137	CARDIAC CONGENITAL AND VALVULAR DISORDERS, AGE 0 - 17
138	CARDIAC ARRHYTHMIA AND CONDUCTION DISORDERS W/ CC
139	CARDIAC ARRHYTHMIA AND CONDUCTION DISORDERS W/O CC
140	ANGINA PECTORIS
141	SYNCOPE AND COLLAPSE W/ CC
142	SYNCOPE AND COLLAPSE W/O CC
143	CHEST PAIN
144	OTHER CIRCULATORY SYSTEM DIAGNOSES W/ CC
145	OTHER CIRCULATORY SYSTEM DIAGNOSES W/O CC

Decubitus Ulcer (PSI 3)	
172	DIGESTIVE MALIGNANCY W/ CC
173	DIGESTIVE MALIGNANCY W/O CC
174	GI HEMORRHAGE W/ CC
175	GI HEMORRHAGE W/O CC
176	COMPLICATED PEPTIC ULCER
177	UNCOMPLICATED PEPTIC ULCER W/ CC
178	UNCOMPLICATED PEPTIC ULCER W/O CC
179	INFLAMMATORY BOWEL DISEASE
180	GI OBSTRUCTION W/ CC
181	GI OBSTRUCTION W/O CC
182	ESOPHAGITIS, GASTROENTERITIS AND MISCELLANEOUS DIGESTIVE DISORDERS, AGE GREATER THAN 17 W/ CC
183	ESOPHAGITIS, GASTROENTERITIS AND MISCELLANEOUS DIGESTIVE DISORDERS, AGE GREATER THAN 17 W/O CC
184	ESOPHAGITIS, GASTROENTERITIS AND MISCELLANESOU DIGESTIVE DISORDERS, AGE 0-17
185	DENTAL AND ORAL DISEASES EXCEPT EXTRACTIONS AND RESTORATIONS, AGE GREATER THAN 17
186	DENTAL AND ORAL DISEASED EXCEPT EXTRACTIONS AND RESTORATIONS, AGE 0-17
187	DENTAL EXTRACTIONS AND RESTORATIONS
188	OTHER DIGESTIVE SYSTEM DIAGNOSES, AGE GREATER THAN 17 W/ CC
189	OTHER DIGESTIVE SYSTEM DIAGNOSES, AGE GREATER THAN 17 W/O CC
190	OTHER DIGESTIVE SYSTEM DIAGNOSES, AGE 0-17
202	CIRRHOSIS AND ALCOHOLIC HEPATITIS
203	MALIGNANCY OF HEPATOBILIARY SYSTEM OR PANCREAS
204	DISORDERS OF PANCREAS EXCEPT MALIGNANCY
205	DISORDERS OF LIVER EXCEPT MALIGNANCY, CIRRHOSIS AND ALCOHOLIC HEPATITIS W/ CC
206	DISORDERS OF LIVER EXCEPT MALIGNANCY, CIRRHOSIS AND ALCOHOLIC HEPATITIS W/O CC
207	DISORDERS OF THE BILIARY TRACT W/ CC
208	DISORDERS OF THE BILIARY TRACT W/O CC
235	FRACTURES OF FEMUR
236	FRACTURES OF HIP AND PELVIS
237	SPRAINS, STRAINS AND DISLOCATIONS OF HIP, PELVIS AND THIGH
238	OSTEOMYELITIS
239	PATHOLOGICAL FRACTURES AND MUSCULOSKELETAL AND CONNECTIVE TISSUE MALIGNANCY
240	CONNECTIVE TISSUE DISORDERS W/ CC
241	CONNECTIVE TISSUE DISORDERS W/O CC
242	SEPTIC ARTHRITIS
243	MEDICAL BACK PROBLEMS
244	BONE DISEASES AND SPECIFIC ARTHROPATHIES W/ CC
245	BONE DISEASES AND SPECIFIC ARTHROPATHIES W/O CC
246	NONSPECIFIC ARTHROPATHIES
247	SIGNS AND SYMPTOMS OF MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE
248	TENDONITIS, MYOSITIS AND BURSITIS
249	AFTERCARE, MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE
250	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF FOREARM, HAND AND FOOT, AGE GREATER THAN 17 W/ CC
251	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF FOREARM, HAND AND FOOT, AGE GREATER THAN 17 W/O CC
252	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF FOREARM, HAND AND FOOT, AGE 0-17
253	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF UPPER ARM AND LOWER LEG EXCEPT FOOT, AGE GREATER THAN 17 W/ CC
254	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF UPPER ARM AND LOWER LEG EXCEPT FOOT, AGE GREATER THAN 17 W/O CC
255	FRACTURES, SPRAINS, STRAINS AND DISLOCATIONS OF UPPER ARM AND LOWER LEG EXCEPT FOOT, AGE 0-17
256	OTHER MUSCULOSKELETAL SYSTEM AND CONNECTIVE TISSUE DIAGNOSES
271	SKIN ULCERS
272	MAJOR SKIN DISORDERS W/ CC
273	MAJOR SKIN DISORDERS W/O CC
274	MALIGNANT BREAST DISORDERS W/ CC
275	MALIGNANT BREAST DISORDERS W/O CC

Decubitus Ulcer (PSI 3)	
276	NONMALIGNANT BREAST DISORDERS
277	CELLULITIS, AGE GREATER THAN 17 W/ CC
278	CELLULTIIS, AGE GREATER THAN 17 W/O CC
279	CELLULITIS, AGE 0-17
280	TRAUMA TO SKIN, SUBCUTANEOUS TISSUE AND BREAST, AGE GREATER THAN 17 W/ CC
281	TRAUMA TO SKIN, SUBCUTANEOUS TISSUE AND BREAST, AGE GREATER THAN 17 W/O CC
282	TRAUMA TO SKIN, SUBCUTANEOUS TISSUE AND BREAST, AGE 0-17
283	MINOR SKIN DISORDERS W/ CC
284	MINOR SKIN DISORDERS W/O CC
294	DIABETES, AGE GREATER THAN 35
295	DIABETES, AGE 0-35
296	NUTRITIONAL AND MISCELLANEOUS METABOLIC DISORDERS, AGE GREATER THAN 17 W/ CC
297	NUTRITIONAL AND MISCELLANEOUS METABOLIC DISORDERS, AGE GREATER THAN 17 W/O CC
298	NUTRITIONAL AND MISCELLANEOUS METABOLIC DISORDERS, AGE 0-17
299	INBORN ERRORS OF METABOLISM
300	ENDOCRINE DISORDERS W/ CC
301	ENDOCRINE DISORDERS W/O CC
316	RENAL FAILURE
317	ADMISSION FOR RENAL DIALYSIS
318	KIDNEY AND URINARY TRACT NEOPLASMS W/ CC
319	KIDNEY AND URINARY TRACT NEOPLASMS W/O CC
320	KIDNEY AND URINARY TRACT INFECTIONS, AGE GREATER THAN 17 W/ CC
321	KIDNEY AND URINARY TRACT INFECTIONS, AGE GREATER THAN 17 W/O CC
322	KIDNEY AND URINARY TRACT INFECTION, AGE 0-17
323	URINARY STONES W/ CC AND/ OR ESW LITHOTRIPSY
324	URINARY STONES W/O CC
325	KIDNEY AND URINARY TRACT SIGNS AND SYMPTOMS, AGE GREATER THAN 17 W/ CC
326	KIDNEY AND URINARY TRACT SIGNS AND SYMPTOMS, AGE GREATER THAN 17 W/O CC
327	KIDNEY AND URINARY TRACT SIGNS AND SYMPTOMS, AGE 0-17
328	URETHRAL STRICTURE, AGE GREATER THAN 17 W/ CC
329	URETHRAL STRICTURE, AGE GREATER THAN 17 W/O CC
330	URETHRAL STRICTURE, AGE AGE 0-17
331	OTHER KIDNEY AND URINARY TRACT DIAGNOSES, AGE GREATER THAN 17 W/ CC
332	OTHER KIDNEY AND URINARY TRACT DIAGNOSES, AGE GREATER THAN 17 W/O CC
333	OTHER KIDNEY AND URINARY TRACT DIAGNOSES, AGE 0-17
346	MALIGNANCY OF MALE REPRODUCTIVE SYSTEM W/ CC
347	MALIGNANCY OF MALE REPRODUCTIVE SYSTEM W/O CC
348	BENIGN PROSTATIC HYPERTROPHY W/ CC
349	BENIGN PROSTATIC HYPERTROPHY W/O CC
350	INFLAMMATION OF THE MALE REPRODUCTIVE SYSTEM
351	STERILIZATION, MALE
352	OTHER MALE REPRODUCTIVE SYSTEM DIAGNOSES
366	MALIGNANCY OF FEMALE REPRODUCTIVE SYSTEM W/ CC
367	MALIGNANCY OF FEMALE REPRODUCTIVE SYSTEM W/O CC
368	INFECTIONS OF FEMALE REPRODUCTIVE SYSTEM
369	MENSTRUAL AND OTHER FEMALE REPRODUCTIVE SYSTEM DISORDERS
372	VAGINAL DELIVERY W/ COMPLICATING DIAGNOSES
373	VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES
376	POSTPARTUM AND POSTABORTION DIAGNOSES W/O OR PROCEDURE
378	ENTOPIC PREGNANCY
379	THREATENED ABORTION
380	ABORTION W/O D AND G
382	FALSE LABOR
383	OTHER ANTEPARTUM DIAGNOSES W/ MEDICAL COMPLICATIONS
384	OTHER ANTEPARTUM DIAGNOSES W/O MEDICAL COMPLICATIONS
395	RED BLOOD CELL DISORDERS, AGE GREATER THAN 17
396	RED BLOOD CELL DISORDERS, AGE 0-17
397	COAGULATION DISORDERS
398	RETICULOENDOTHELIAL AND IMMUNITY DISORDERS W/ CC
399	RETICULOENDOTHELIAL AND IMMUNITY DISORDERS W/O CC
403	LYMPHOMA AND NONACUTE LEUKEMIA W/ CC

Decubitus Ulcer (PSI 3)	
404	LYMPHOMA AND NONACUTE LEUKEMIA W/O CC
405	ACUTE LEUKEMIA W/O MAJOR OR PROCEDURE, AGE 0-17
409	RADIOTHERAPY
410	CHEMOTHERAPY W/O ACUTE LEUKEMIA AS SECONDARY DIAGNOSIS
411	HISTORY OF MALIGNANCY W/O ENDOSCOPY
412	HISTORY OF MALIGNANCY W/ ENDOSCOPY
413	OTHER MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASM DIAGNOSES W/ CC
414	OTHER MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASM DIAGNOSES W/O CC
416	SEPTICEMIA, AGE GREATER THAN 17
417	SEPTICEMIA, AGE 0-17
418	POSTOPERATIVE AND POSTTRAUMATIC INFECTIONS
419	FEVER OF UNKNOWN ORIGIN, AGE GREATER THAN 17 W/ CC
420	FEVER OF UNKNOWN ORIGIN, AGE GREATER THAN 17 W/O CC
421	VIRAL ILLNESS, AGE GREATER THAN 17
422	VIRAL ILLNESS AND FEVER OF UNKNOWN ORIGIN, AGE 0-17
423	OTHER INFECTIOUS AND PARASITIC DISEASES DIAGNOSES
425	ACUTE ADJUSTMENT REACTIONS AND DISTURBANCES OF PSYCHOSOCIAL DYSFUNCTION
426	DEPRESSIVE NEUROSES
427	NEUROSES EXCEPT DEPRESSIVE
428	DISORDERS OF PERSONALITY AND IMPULSE CONTROL
429	ORGANIC DISTURBANCES AND MENTAL RETARDATION
430	PSYCHOSES
431	CHILDHOOD MENTAL DISORDERS
432	OTHER MENTAL DISORDER DIAGNOSES
433	ALCOHOL/DRUG ABUSE OR DEPENDENCE, LEFT AGAINST MEDICAL ADVICE
434*	ALCOHOL/DRUG ABUSE OR DEPENDENCE, DETOXIFICATION OR OTHER SYMPTOMATIC TREATMENT W/ CC
435*	ALCOHOL/DRUG ABUSE OR DEPENDENCE, DETOXIFICATION OR OTHER SYMPTOMATIC TREATMENT W/O CC
436*	ALCOHOL/DRUG DEPENDENCE W/ REHABILITATION THERAPY
437*	ALCOHOL DRUG DEPENDENCE W/ COMBINED REHABILITATION AND DETOXIFICATION THERAPY
444	TRAUMATIC INJURY, AGE GREATER THAN 17 W/ CC
445	TRAUMATIC INJURY, AGE GREATER THAN 17 W/O CC
446	TRAUMATIC INJURY, AGE 0-17
447	ALLERGIC REACTIONS, AGE GREATER THAN 17
448	ALLERGIC REACTIONS, AGE 0-17
449	POISONING AND TOXIC EFFECTS OF DRUGS, AGE GREATER THAN 17 W/ CC
450	POISONING AND TOXIC EFFECTS OF DRUGS, AGE GREATER THAN 17 W/O CC
451	POISONING AND TOXIC EFFECTS OF DRUGS, AGE 0-17
452	COMPLICATIONS OF TREATMENT W/ CC
453	COMPLICATIONS OF TREATMENT W/O CC
454	OTHER INJURY, POISONING AND TOXIC EFFECT DIAGNOSES W/ CC
455	OTHER INJURY, POISONING AND TOXIC EFFECT DIAGNOSES W/O CC
456*	BURNS, TRANSFERRED TO ANOTHER ACUTE CARE FACILITY
457*	EXTENSIVE BURNS W/O O.R. PROCEDURE
460*	NON-EXTENSIVE BURNS W/O O.R. PROCEDURE
462	REHABILITATION
463	SIGNS AND SYMPTOMS W/ CC
464	SIGNS AND SYMPTOMS W/O CC
465	AFTERCARE W/ HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS
466	AFTERCARE W/O HISTORY OF MALIGNANCY AS SECONDARY DIAGNOSIS
467	OTHER FACTORS INFLUENCING HEALTH STATUS
473	ACUTE LEUKEMIA W/O MAJOR OR PROCEDURE, AGE GREATER THAN 17
475	RESPIRATORY SYSTEM DIAGNOSIS W/ VENTILATOR SUPPORT
487	OTHER MULTIPLE SIGNIFICANT TRAUMA
489	HIV W/ MAJOR RELATED CONDITION
490	HIV W/ OR W/O OTHER RELATED CONDITION
492	CHEMOTHERAPY W/ ACUTE LEUKEMIA AS SECONDARY DIAGNOSIS
505	EXTENSIVE 3RD DEGREE BURNS W/O SKIN GRAFT

Decubitus Ulcer (PSI 3)

508 FULL THICKNESS BURN W/O SKIN GRFT OR INHAL INJ W CC OR SIG TRAUMA
509 FULL THICKNESS BURN W/O SKIN GRFT OR INH INJ W/O CC OR SIG TRAUMA
510 NON-EXTENSIVE BURNS W CC OR SIGNIFICANT TRAUMA
511 NON-EXTENSIVE BURNS W/O CC OR SIGNIFICANT TRAUMA
521 ALCOHOL/DRUG ABUSE OR DEPENDENCE W CC
522 ALC/DRUG ABUSE OR DEPEND W REHABILITATION THERAPY W/O CC
523 ALC/DRUG ABUSE OR DEPEND W/O REHABILITATION THERAPY W/O CC
524 TRANSIENT ISCHEMIA

* No longer valid in FY2004

Include only patients with a length of stay of 5 or more days.

Exclude:

Patients with ICD-9-CM code of 707.0 in the principal diagnosis field.
Patients in MDC 9 (Skin, Subcutaneous Tissue, and Breast) or MDC 14 (Pregnancy, Childbirth and the Puerperium)
Patients with any diagnosis of hemiplegia, paraplegia, or quadriplegia.
Patients admitted from a long-term care facility.

ICD-9-CM Hemiplegia, Paraplegia, or Quadriplegia diagnosis codes (includes 4th and 5th digits):

3420 FLACCID HEMIPLEGIA
3421 SPASTIC HEMIPLEGIA
3428 OTHER SPECIFIED HEMIPLEGIA
3429 HEMIPLEGIA, UNSPECIFIED
3430 INFANTILE CEREBRAL PALSY, DIPLEGIC
3431 INFANTILE CEREBRAL PALSY, HEMIPLEGIC
3432 INFANTILE CEREBRAL PALSY, QUADRIPLEGIC
3433 INFANTILE CEREBRAL PALSY, MONOPLEGIC
3434 INFANTILE CEREBRAL PALSY INFANTILE HEMIPLEGIA
3438 INFANTILE CEREBRAL PALSY OTHER SPECIFIED INFANTILE CEREBRAL PALSY
3439 INFANTILE CEREBRAL PALSY, INFANTILE CEREBRAL PALSY, UNSPECIFIED
3440 QUADRIPLEGIA AND QUADRIPARESIS
3441 PARAPLEGIA
3442 DIPLEGIA OF UPPER LIMBS
3443 MONOPLEGIA OF LOWER LIMB
3444 MONOPLEGIA OF UPPER LIMB
3445 UNSPECIFIED MONOPLEGIA
3446 CAUDA EQUINA SYNDROME
3448 OTHER SPECIFIED PARALYTIC SYNDROMES
3449 PARALYSIS, UNSPECIFIED
4382 HEMIPLEGIA/HEMIPARESIS
4383 MONOPLEGIA OF UPPER LIMB
4384 MONOPLEGIA OF LOWER LIMB
4385 OTHER PARALYTIC SYNDROME

Long-Term Care Facility

Admission source is recorded as long-term care facility (ASource=3)

Failure to Rescue (PSI 4)

Numerator:

All discharges with a disposition of "deceased".

Denominator:

Discharges with potential complications of care listed in failure to rescue (FTR) definition (e.g., pneumonia, DVT/PE, sepsis, acute renal failure, shock/cardiac arrest, or GI hemorrhage/acute ulcer). **NOTE: Exclusion criteria is specific to each diagnosis**.

FTR 1 - Acute renal failure

ICD-9-CM Acute Renal Failure diagnosis codes (includes 4th and 5th digits):

5845 W/ LESION OF TUBULAR NECROSIS
5846 W/ LESION OF RENAL CORTICAL NECROSIS
5847 W/ LESION OF RENAL MEDULLARY NECROSIS
5848 W/ OTHER SPECIFIED PATHOLOGICAL LESION
5849 ACUTE RENAL FAILURE, UNSPECIFIED
6393 COMPLICATIONS FOLLOWING ABORTION AND ECTOPIC AND MOLAR PREGNANCIES, RENAL FAILURE
66930 ACUTE RENAL FAILURE FOLLOWING LABOR AND DELIVERY, UNSPECIFIED AS TO EPISODE OF CARE OR NOT APPLICABLE
66932 ACUTE RENAL FAILURE FOLLOWING LABOR AND DELIVERY, DELIVERED, W/ MENTION OF POSTPARTUM COMPLICATION
66934 ACUTE RENAL FAILURE FOLLOWING LABOR AND DELIVERY, POSTPARTUM CONDITION OR COMPLICATION

Exclude:

Principal diagnosis of acute renal failure, abortion-related renal failure, acute myocardial infarction, cardiac arrest, cardiac arrhythmia, hemorrhage, GI hemorrhage, shock, or trauma.

ICD-9-CM Abortion-related Renal Failure diagnosis codes:

63430 SPONTANEOUS ABORTION W/ RENAL FAILURE - UNSPECIFIED
63431 SPONTANEOUS ABORTION W/ RENAL FAILURE - INCOMPLETE
63432 SPONTANEOUS ABORTION W/ RENAL FAILURE - COMPLETE
63530 LEGAL ABORTION W/ RENAL FAILURE - UNSPECIFIED
63531 LEGAL ABORTION W/ RENAL FAILURE - INCOMPLETE
63532 LEGAL ABORTION W/ RENAL FAILURE - COMPLETE
63630 ILLEGAL ABORTION W/ RENAL FAILURE - UNSPECIFIED
63631 ILLEGAL ABORTION W/ RENAL FAILURE - INCOMPLETE
63632 ILLEGAL ABORTION W/ RENAL FAILURE - COMPLETE
63730 ABORTION NOS W/ RENAL FAILURE - UNSPECIFIED
63731 ABORTION NOS W/ RENAL FAILURE - INCOMPLETE
63732 ABORTION NOS W/ RENAL FAILURE - COMPLETE
6383 ATTEMPTED ABORTION W/ RENAL FAILURE

ICD-9-CM Acute Myocardial Infarction diagnosis codes:

41000 AMI OF ANTEROLATERAL WALL – EPISODE OF CARE UNSPECIFIED
41001 AMI OF ANTEROLATERAL WALL – INITIAL EPISODE OF CARE
41010 AMI OF OTHER ANTERIOR WALL – EPISODE OF CARE UNSPECIFIED
41011 AMI OF OTHER ANTERIOR WALL – INITIAL EPISODE OF CARE
41020 AMI OF INFEROLATERAL WALL – EPISODE OF CARE UNSPECIFIED
41021 AMI OF INFEROLATERAL WALL – INITIAL EPISODE OF CARE
41030 AMI OF INFEROPOSTERIOR WALL – EPISODE OF CARE UNSPECIFIED
41031 AMI OF INFEROPOSTERIOR WALL – INITIAL EPISODE OF CARE
41040 AMI OF INFERIOR WALL – EPISODE OF CARE UNSPECIFIED

Failure to Rescue (PSI 4)

41041 AMI OF INFERIOR WALL – INITIAL EPISODE OF CARE
41050 AMI OF OTHER LATERAL WALL – EPISODE OF CARE UNSPECIFIED
41051 AMI OF OTHER LATERAL WALL – INITIAL EPISODE OF CARE
41060 AMI TRUE POSTERIOR WALL INFARCTION – EPISODE OF CARE UNSPECIFIED
41061 AMI TRUE POSTERIOR WALL INFARCTION – INITIAL EPISODE OF CARE
41070 AMI SUBENDOCARDIAL INFARCTION – EPISODE OF CARE UNSPECIFIED
41071 AMI SUBENDOCARDIAL INFARCTION – INITIAL EPISODE OF CARE
41080 AMI OF OTHER SPECIFIED SITES – EPISODE OF CARE UNSPECIFIED
41081 AMI OF OTHER SPECIFIED SITES – INITIAL EPISODE OF CARE
41090 AMI UNSPECIFIED SITE – EPISODE OF CARE UNSPECIFIED
41091 AMI UNSPECIFIED SITE – INITIAL EPISODE OF CARE

ICD-9-CM Cardiac Arrhythmia diagnosis codes:

4260 ATRIOVENTRICULAR BLOCK, COMPLETE
4270 PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA
4271 PAROXYSMAL VENTRICULAR TACHYCARDIA
4272 PAROXYSMAL TACHYCARDIA, UNSPECIFIED
42731 ATRIAL FIBRILLATION
42732 ATRIAL FLUTTER
42741 VENTRICULAR FIBRILLATION
42742 VENTRICULAR FLUTTER
4279 CARDIAC DYSRHYTHMIA

ICD-9-CM Cardiac Arrest diagnosis code:

4275 CARDIAC ARREST

ICD-9-CM Hemorrhage diagnosis codes:

2851 ACUTE POSTHEMORRHAGIC ANEMIA
4590 OTHER DISORDERS OF CIRCULATORY SYSTEM, HEMORRHAGE, UNSPECIFIED
9582 CERTAIN EARLY COMPLICATIONS OF TRAUMA, SECONDARY AND RECURRENT HEMORRHAGE
99811 HEMORRHAGE COMPLICATING A PROCEDURE

ICD-9-CM Shock diagnosis codes:

63450 SPONTANEOUS ABORTION W/ SHOCK - UNSPECIFIED
63451 SPONTANEOUS ABORTION W/ SHOCK - INCOMPLETE
63452 SPONTANEOUS ABORTION W/ SHOCK - COMPLETE
63550 LEGAL ABORTION W/ SHOCK - UNSPECIFIED
63551 LEGAL ABORTION W/ SHOCK - INCOMPLETE
63552 LEGAL ABORTION W/ SHOCK - COMPLETE
63650 ILLEGAL ABORTION W/ SHOCK - UNSPECIFIED
63651 ILLEGAL ABORTION W/ SHOCK - INCOMPLETE
63652 ILLEGAL ABORTION W/ SHOCK - COMPLETE
63750 ABORTION NOS W/ SHOCK - UNSPECIFIED
63751 ABORTION NOS W/ SHOCK - INCOMPLETE
63752 ABORTION NOS W/ SHOCK - COMPLETE
6385 ATTEMPTED ABORTION W/ SHOCK
6395 COMPLICATIONS FOLLOWING ABORTION AND ECTOPIC AND MOLAR PREGNANCIES, SHOCK
66910 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY, UNSPECIFIED AS TO EPISODE OF CARE OR NOT APPLICABLE
66911 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY, DELIVERED W/ OR W/O MENTION OF ANTEPARTUM CONDITION
66912 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY, DELIVERED W/ MENTION OF POSTPARTUM COMPLICATION
66913 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY, ANTEPARTUM CONDITION OR COMPLICATION
66914 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY, POSTPARTUM CONDITION OR COMPLICATION

Failure to Rescue (PSI 4)

7855 SHOCK W/O MENTION OF TRAUMA
78550 SHOCK, UNSPECIFIED
78551 CARDIOGENIC SHOCK
78552 SEPTIC SHOCK (OCT 03)
78559 SHOCK W/O MENTION OF TRAUMA, OTHER
9950 OTHER ANAPHYLACTIC SHOCK
9954 SHOCK DUE TO ANESTHESIA
9980 POSTOPERATIVE SHOCK
9994 ANAPHYLACTIC SHOCK, DUE TO SERUM

ICD-9-CM Gastrointestinal (GI) Hemorrhage diagnosis codes:

4560 ESOPHAGEAL VARICES W/ BLEEDING
45620 ESOPHAGEAL VARICES IN DISEASES CLASSIFIED ELSEWHERE W/ BLEEDING
5307 GASTROESOPHAGEAL LACERATION – HEMORRHAGE SYNDROME
53082 ESOPHAGEAL HEMORRHAGE
53100 GASTRIC ULCER ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53101 GASTRIC ULCER ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53120 GASTRIC ULCER ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53121 GASTRIC ULCER ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53140 GASTRIC ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53141 GASTRIC ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/ OBSTRUCTION
53160 GASTRIC ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53161 GASTRIC ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53200 DUODENAL ULCER ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53201 DUODENAL ULCER ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53220 DUODENAL ULCER ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53221 DUODENAL ULCER ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53240 DUODENAL ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53241 DUODENAL ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/ OBSTRUCTION
53260 DUODENAL ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53261 DUODENAL ULCER CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53300 PEPTIC ULCER, SITE UNSPECIFIED, ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53301 PEPTIC ULCER, SITE UNSPECIFIED, ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53320 PEPTIC ULCER, SITE UNSPECIFIED, ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53321 PEPTIC ULCER, SITE UNSPECIFIED, ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53340 PEPTIC ULCER, SITE UNSPECIFIED, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53341 PEPTIC ULCER, SITE UNSPECIFIED, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/ OBSTRUCTION
53360 PEPTIC ULCER, SITE UNSPECIFIED, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53361 PEPTIC ULCER, SITE UNSPECIFIED, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53400 GASTROJEJUNAL ULCER, ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53401 GASTROJEJUNAL ULCER, ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53420 GASTROJEJUNAL ULCER, ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53421 GASTROJEJUNAL ULCER, ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53440 GASTROJEJUNAL ULCER, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION

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53441 GASTROJEJUNAL ULCER, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE – W/ OBSTRUCTION
53460 GASTROJEJUNAL ULCER, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53461 GASTROJEJUNAL ULCER, CHRONIC OR UNSPECIFIED W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53501 GASTRITIS AND DUODENITIS, ACUTE GASTRITIS W/ HEMORRHAGE
53511 GASTRITIS AND DUODENITIS, ATROPHIC GASTRITIS W/ HEMORRHAGE
53521 GASTRITIS AND DUODENITIS, GASTRIC MUCOSAL HYPERTROPHY, W/ HEMORRHAGE
53531 GASTRITIS AND DUODENITIS, ALCOHOLIC GASTRITIS, W/ HEMORRHAGE
53541 GASTRITIS AND DUODENITIS, OTHER SPECIFIED GASTRITIS – W/ HEMORRHAGE
53551 GASTRITIS AND DUODENITIS, UNSPECIFIED GASTRITIS AND GASTRODUODENITIS – W/ HEMORRHAGE
53561 GASTRITIS AND DUODENITIS, DUODENITIS – W/ HEMORRHAGE
53783 OTHER SPECIFIED DISORDERS OF STOMACH AND DUODENUM, ANGIODYSPLASIA OF STOMACH AND DUODENUM – W/ HEMORRHAGE
53784 DIEULAFOY LESION (HEMORRHAGIC) OF STOMACH AND DUODENUM
56202 DIVERTICULOSIS OF SMALL INTESTINE – W/ HEMORRHAGE
56203 DIVERTICULITIS OF SMALL INTESTINE – W/ HEMORRHAGE
56212 DIVERTICULOSIS OF COLON – W/ HEMORRHAGE
56213 DIVERTICULITIS OF COLON – W/ HEMORRHAGE
5693 HEMORRHAGE OF RECTUM AND ANUS
56985 ANGIODYSPLASIA OF INTESTINE - W/ HEMORRHAGE
56986 DIEULAFOY LESION (HEMORRHAGIC) OF INTESTINE
5780 GASTROINTESTINAL HEMORRHAGE, HEMATEMESIS
5781 GASTROINTESTINAL HEMORRHAGE, BLOOD IN STOOL
5789 GASTROINTESTINAL HEMORRHAGE, HEMORRHAGE OF GASTROINTESTINAL TRACT, UNSPECIFIED

ICD-9-CM Trauma diagnosis codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of trauma diagnosis codes

Trauma DRGs:

002 CRANIOTOMY FOR TRAUMA, AGE GREATER THAN 17
027 TRAUMATIC STUPOR AND COMA, COMA GREATER THAN ONE HOUR
028 TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE GREATER THAN 17 W/ CC
029 TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE GREATER THAN 17 W/O CC
030 TRAUMATIC STUPOR AND COMA, COMA LESS THAN ONE HOUR, AGE 0-17
031 CONCUSSION, AGE GREATER THAN 17 W/ CC
032 CONCUSSION, AGE GREATER THAN 17 W/O CC
033 CONCUSSION, AGE 0-17
072 NASAL TRAUMA AND DEFORMITY
083 MAJOR CHEST TRAUMA W/ CC
084 MAJOR CHEST TRAUMA W/O CC
235 FRACTURES OF FEMUR
236 FRACTURE OF HIP AND PELVIS
237 SPRAINS, STRAINS AND DISLOCATIONS OF HIP, PELVIS AND THIGH
440 WOUND DEBRIDEMENTS FOR INJURIES
441 HAND PROCEDURES FOR INJURIES
442 OTHER OR PROCEDURES FOR INJURIES W/ CC
443 OTHER OR PROCEDURES FOR INJURIES W/O CC
444 TRAUMATIC INJURY, AGE GREATER THAN 17 W/ CC
445 TRAUMATIC INJURY, AGE GREATER THAN 17 W/O CC
446 TRAUMATIC INJURY, AGE 0-17
456* BURNS, TRANSFERRED TO ANOTHER ACUTE CARE FACILITY
457* EXTENSIVE BURNS W/O O.R. PROCEDURE
458* NON-EXTENSIVE BURNS W SKIN GRAFT
459* NON-EXTENSIVE BURNS W WOUND DEBRIDEMENT OR OTHER O.R. PROC
460* NON-EXTENSIVE BURNS W/O O.R. PROCEDURE
484 CRANIOTOMY FOR MULTIPLE SIGNIFICANT TRAUMA

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485 LIMB REATTACHMENT, HIP AND FEMUR PROCEDURES FOR MULTIPLE SIGNIFICANT TRAUMA
486 OTHER OR PROCEDURES FOR MULTIPLE SIGNIFICANT TRAUMA
487 OTHER MULTIPLE SIGNIFICANT TRAUMAS
491 MAJOR JOINT AND LIMB REATTACHMENT PROCEDURES OF UPPER EXTREMITY
504 TOTAL HEPATECTOMY
505 EXTENSIVE 3RD DEGREE BURNS W/O SKIN GRAFT
506 FULL THICKNESS BURN W/ SKIN GRAFT OR INHALATION INJURY W/ CC OR SIGNIFICANT TRAUMA
507 FULL THICKNESS BURN W/ SKIN GRAFT OR INHALATION INJURY W/O CC OR SIGNIFICANT TRAUMA
508 FULL THICKNESS BURN W/O SKIN GRAFT OR INHALATION INJURY W/ CC OR SIGNIFICANT TRAUMA
509 FULL THICKNESS BURN W/O SKIN GRAFT OR INHALATION INJURY W/O CC OR SIGNIFICANT TRAUMA
510 NON-EXTENSIVE BURNS W/ CC OR SIGNIFICANT TRAUMA
511 NON-EXTENSIVE BURNS W/O CC OR SIGNIFICANT TRAUMA

* No longer valid in FY 2004

FTR 2 - DVT/PE

Include ICD-9-CM DVT/PE diagnosis codes:

4151 PULMONARY EMBOLISM AND INFARCTION
41511 IATROGENIC PULMONARY EMBOLISM
41519 OTHER PULMONARY EMBOLISM AND INFARCTION
45111 PHLEBITIS AND THORBOPHLEBITIS FEMORAL VEIN (DEEP) (SUPERFICIAL)
45119 PHLEBITIS AND THORBOPHLEBITIS, OTHER DEEP VESSEL OF LOWER EXTREMITIES
4512 PHLEBITIS AND THORBOPHLEBITIS, LOWER EXTREMITIES
45181 PHLEBITIS AND THORBOPHLEBITIS, ILIAC VEIN
4519 PHLEBITIS AND THORBOPHLEBITIS, UNSPECIFIED SITE
4538 OTHER VENOUS EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS
4539 OTHER VENOUS EMBOLISM AND THROMBOSIS OF UNSPECIFIED SITE

Exclude:
Principal diagnosis of pulmonary embolism or deep vein thrombosis, abortion related and postpartum obstetric pulmonary embolism.

ICD-9-CM Abortion-related and Postpartum Obstetric Pulmonary Embolism diagnosis codes:

63460 SPONTANEOUS ABORTION W/ EMBOLISM - UNSPECIFIED
63461 SPONTANEOUS ABORTION W/ EMBOLISM - INCOMPLETE
63462 SPONTANEOUS ABORTION W/ EMBOLISM - COMPLETE
63560 LEGAL ABORTION W/ EMBOLISM - UNSPECIFIED
63561 LEGAL ABORTION W/ EMBOLISM - INCOMPLETE
63562 LEGAL ABORTION W/ EMBOLISM - COMPLETE
63660 ILLEGAL ABORTION W/ EMBOLISM - UNSPECIFIED
63661 ILLEGAL ABORTION W/ EMBOLISM - INCOMPLETE
63662 ILLEGAL ABORTION W/ EMBOLISM - COMPLETE
63760 ABORTION NOS W/ EMBOLISM - UNSPECIFIED
63761 ABORTION NOS W/ EMBOLISM - INCOMPLETE
63762 ABORTION NOS W/ EMBOLISM - COMPLETE
6386 ATTEMPTED ABORTION W/ EMBOLISM
6396 POSTABORTION EMBOLISM
67320 OBSTETRICAL BLOOD-CLOT EMBOLISM, UNSPECIFIED AS TO EPISODE OF CARE OR NOT APPLICABLE
67321 OBSTETRICAL BLOOD-CLOT EMBOLISM, DELIVERED, W/ OR W/O MENTION OF ANTEPARTUM CONDITION
67322 OBSTETRICAL BLOOD-CLOT EMBOLISM, DELIVERED, W/ MENTION OF POSTPARTUM COMPLICATION
67323 OBSTETRICAL BLOOD-CLOT EMBOLISM, ANTEPARTUM CONDITION OR COMPLICATION

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67324 OBSTETRICAL BLOOD-CLOT EMBOLISM, POSTPARTUM CONDITION OR COMPLICATION

FTR 3 - Pneumonia

Include ICD-9-CM Pneumonia diagnosis codes:

4820 PNEUMONIA DUE TO KLEBSIELLA PNEUMONIAE
4821 PNEUMONIA DUE TO PSEUDOMONAS
4822 PNEUMONIA DUE TO HEMOPHILUS INFLUENZAE [H. INFLUENZAE]
4823 PNEUMONIA DUE TO STREPTOCOCCUS
48230 PNEUMONIA DUE TO STREPTOCOCCUS – STREPTOCOCCUS, UNSPECIFIED
48231 PNEUMONIA DUE TO STREPTOCOCCUS – GROUP A
48232 PNEUMONIA DUE TO STREPTOCOCCUS – GROUP B
48239 PNEUMONIA DUE TO STREPTOCOCCUS – OTHER STREPTOCOCCUS
4824 PNEUMONIA DUE TO STAPHYLOCOCCUS
48240 PNEUMONIA DUE TO STAPHYLOCOCCUS – PNEUMONIA DUE TO STAPHYLOCOCCUS, UNSPECIFIED
48241 PNEUMONIA DUE TO STAPHYLOCOCCUS – PNEUMONIA DUE TO STAPHYLOCCOCCUS AUREUS
48249 PNEUMONIA DUE TO STAPHYLOCOCCUS – OTHER STAPHYLOCOCCUS PNEUMONIA
4828 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA
48281 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA – ANAEROBES
48282 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA – EXCHERICHIA COLI [E COLI]
48283 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA – OTHER GRAM-NEGATIVE BACTERIA
48284 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA – LEGIONNAIRES' DISEASE
48289 PNEUMONIA DUE TO OTHER SPECIFIED BACTERIA – OTHER SPECIFIED BACTERIA
4829 BACTERIAL PNEUMONIA UNSPECIFIED
485 BRONCHOPNEUMONIA, ORGANISM UNSPECIFIED
486 PNEUMONIA, ORGANISM UNSPECIFIED
5070 DUE TO INHALATION OF FOOD OR VOMITUS
514 PULMONARY CONGESTION AND HYPOSTASIS

Exclude:

Principal diagnosis code for pneumonia or 997.3, any diagnosis code for viral pneumonia, MDC 4, and any diagnosis of immunocompromised state.

ICD-9-CM Viral Pneumonia diagnosis codes:

4800 ADENOVIRAL PNEUMONIA
4801 RESPIRATORY SYNCYTIAL VIRAL PNEUMONIA
4802 PARAINFLUENZA VIRAL PNEUMONIA
4803 PNEUMONIA DUE TO SARS (OCT 03)
4808 VIRAL PNEUMONIA NOT ELSEWHERE CLASSIFIED
4809 VIRAL PNEUMONIA UNSPECIFIED
481 PNEUMOCOCCAL PNEUMONIA
4830 PNEUMONIA DUE TO MYCOPLASMA PNEUMONIAE
4831 PNEUMONIA DUE TO CHLAMYDIA
4838 PNEUMONIA DUE TO OTHER SPECIFIED ORGANISM
4841 PNEUMONIA IN CYTOMEGALIC INCLUSION DISEASE
4843 PNEUMONIA IN WHOOPING COUGH
4845 PNEUMONIA IN ANTHRAX
4846 PNEUMONIA IN ASPERGILLOSIS
4847 PNEUMONIA IN OTHER SYSTEMIC MYCOSES
4848 PNEUMONIA IN INFECTIOUS DISEASE NOT ELSEWHERE CLASSIFIED
4870 INFLUENZA W/ PNEUMONIA
4871 FLU W/ RESPIRATORY MANIFEST NOT ELSEWHERE CLASSIFIED
4878 FLU W/ MANIFESTATION NOT ELSEWHERE CLASSIFIED

ICD-9-CM Immunocompromised States diagnosis codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised state diagnosis and

procedure codes.

MDC 4 DISEASES AND DISORDERS OF THE RESPIRATORY SYSTEM

FTR 4 - Sepsis

Include ICD-9-CM Sepsis diagnosis codes:

0380	STREPTOCOCCAL SEPTICEMIA
0381	STAPHYLOCOCCAL SEPTICEMIA
03810	STAPHYLOCOCCAL SEPTICEMIA, UNSPECIFIED
03811	STAPHYLOCOCCUS AUREAU SEPTICEMIA
03819	OTHER STAPHYLOCOCCAL SEPTICEMIA
03840	SEPTICEMIA DUE TO GRAM NEGATIVE ORGANISM, UNSPECIFIED
0382	PNEUMOCOCCAL SEPTICEMIA [STREPTOCOCCUS PNEUMONIAE SEPTICEMIA]
0383	SEPTICEMIA DUE TO ANAEROBES
03841	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS, HEMOPHILUS INFLUENZE [H. INFLUENZAE]
03842	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS, ESCHERICHIA COLI [E COLI]
03843	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS, PSEUDOMONAS
03844	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS, SERRATIA
03849	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS, OTHER
0388	OTHER SPECIFIED SEPTICEMIAS
0389	UNSPECIFIED SEPTICEMIA
7907	BACTEREMIA
99591	SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTIOUS PROCESS W/O ORGAN DYSFUNCTION
99592	SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTION PROCESS W/ ORGAN DYSFUNCTION

Exclude:

Any diagnosis of immunocompromised state and principal diagnosis of infection or sepsis and patients with a length of stay 3 days or less[135].

ICD-9-CM Immunocompromised States diagnosis codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised state diagnosis and procedure codes.

ICD-9-CM Infection diagnosis codes:

5400	ACUTE APPENDICITIS W/ GENERALIZED PERITONITIS
5401	ACUTE APPENDICITIS W/ PERITONEAL ABSCESS
5409	ACUTE APPENDICITIS W/O MENTION OF PERITONITIS
541	APPENDICITIS, UNQUALIFIED
542	OTHER APPENDICITIS
56201	DIVERTICULITIS OF SMALL INTESTINE (W/O MENTION OF HEMORRHAGE)
56203	DIVERTICULITIS OF SMALL INTESTINE W/ HEMORRHAGE
56211	DIVERTICULITIS OF COLON (W/O MENTION OF HEMORRHAGE)
56213	DIVERTICULITIS OF COLON W/ HEMORRHAGE
566	ABSCESS OF ANAL AND RECTAL REGIONS
5670	PERITONITIS IN INFECTIOUS DISEASES CLASSIFIED ELSEWHERE
5671	PNEUMOCOCCAL PERITONITIS
5672	OTHER SUPPURATIVE PERITONITIS
5678	OTHER SPECIFIED PERITONITIS
5679	UNSPECIFIED PERITONITIS

[135] Note: The length of stay exclusion criteria has been corrected in this version of the PSI Guide. The first version noted length of stay of 4 or more days which was incorrect.

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5695 ABSCESS OF INTESTINE
56961 INFECTION OF COLOSTOMY OR ENTEROSTOMY
5720 ABSCESS OF LIVER
5721 PORTAL PYEMIA
57400 CALCULUS OF GALLBLADDER W/ ACUTE CHOLECYSTITIS - W/OMENTION OF OBSTRUCTION
57401 CALCULUS OF GALLBLADDER W/ ACUTE CHOLECYSTITS - W/ OBSTRUCTION
57430 CALCULUS OF BILE DUCT W/ ACUTE CHOLECYSTITIS – W/OMENTION OF OBSTRUCTION
57431 CALCULUS OF BILE DUCT W/ ACUTE CHOLECYSTITIS - W/ OBSTRUCTION
57460 CALCULUS OF GALLBLADDER AND BILE DUCT W/ ACUTE CHOLECYSTITIS - W/OMENTION OF OBSTRUCTION
57461 CALCULUS OF GALLBLADDER AND BILE DUCT W/ ACUTE CHOLECYSTITIS - W/ OBSTRUCTION
57480 CALCULUS OF GALLBLADDER AND BILE DUCT W/ ACUTE AND CHRONIC CHOLECYSTITIS - W/OMENTION OF OBSTRUCTION
57481 CALCULUS OF GALLBLADDER AND BILE DUCT W/ ACUTE AND CHRONIC CHOLECYSTITIS - W/ OBSTRUCTION
5750 ACUTE CHOLECYSTITIS
5754 PERFORATION OF GALLBLADDER
5761 CHOLANGITIS
5763 PERFORATION OF BILE DUCT

Infection DRGs:

020 NERVOUS SYSTEM INFECTION EXCEPT VIRAL MENINGITIS
068 OTITIS MEDIA AND URI, AGE GREATER THAN 17 W/ CC
069 OTITIS MEDIA AND URI, AGE GREATER THAN 17 W/O CC
070 OTITIS MEDIA AND URI, AGE LESS THAN OR EQUAL TO 17
079 RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE GREATER THAN 17 W/ CC
080 RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE GREATER THAN 17 W/O CC
081 RESPIRATORY INFECTIONS AND INFLAMMATIONS, AGE 0-17
089 SIMPLE PNEUMONIA AND PLEURISY, AGE GREATER THAN 17 W/ CC
090 SIMPLE PNEUMONIA AND PLEURISY, AGE GREATER THAN 17 W/O CC
091 SIMPLE PNEUMONIA AND PLEURISY, AGE LESS THAN OR EQUAL TO 17
126 ACUTE AND SUBACUTE ENDOCARDITIS
238 OSTEOMYELITIS
242 SEPTIC ARTHRITIS
277 CELLULITIS, AGE GREATER THAN 17 W/ CC
278 CELLULITIS, AGE GREATER THAN 17 W/O CC
279 CELLULITIS, AGE 0-17
320 KIDNEY AND URINARY TRACT INFECTIONS, AGE GREATER THAN 17 W/ CC
321 KIDNEY AND URINARY TRACT INFECTIONS, AGE GREATER THAN 17 W/O CC
322 KIDNEY AND URINARY TRACT INFECTIONS, AGE 0-17
368 INFECTIONS OF FEMALE REPRODUCTIVE SYSTEM
415 OR PROCEDURE FOR INFECTIOUS AND PARASITIC DISEASES
416 SEPTICEMIA, AGE GREATER THAN 17
417 SEPTICEMIA, AGE 0-17
423 OTHER INFECTIOUS AND PARASITIC DISEASES DIAGNOSES

<u>FTR 5 - Shock or Cardiac Arrest</u>

Include ICD-9-CM Shock or Cardiac Arrest diagnosis codes:

4275 CARDIAC ARREST
6395 COMPLICATIONS FOLLOWING ABORTION AND ECTOPIC AND MOLAR PREGNANCIES, SHOCK

Shock during or following labor and delivery:

66910 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY – UNSPECIFIED AS TO EPISODE OF CARE OR NOT APPLICABLE
66911 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY – DELIVERED, W/ OR W/O MENTION OF ANTEPARTUM CONDITION

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66912 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY – DELIVERED, W/ MENTION OF POSTPARTUM COMPLICATION
66913 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY – ANTEPARTUM CONDITION OR COMPLICATION
66914 SHOCK DURING OR FOLLOWING LABOR AND DELIVERY – POSTPARTUM CONDITION OR COMPLICATION
7855 SHOCK NOS
78550 SHOCK, UNSPECIFIED
78551 CARDIOGENIC SHOCK
78552 SEPTIC SHOCK (OCT 03)
78559 SHOCK W/O MENTION OF TRAUMA- OTHER
7991 RESPIRATORY ARREST
9950 OTHER ANAPHYLACTIC SHOCK
9954 SHOCK DUE TO ANESTHESIA
9980 POSTOPERATIVE SHOCK
9994 ANAPHYLACTIC SHOCK DUE TO SERUM

ICD-9-CM procedure codes:

9393 NONMECHANICAL METHODS OF RESUSCITATION
9960 CARDIOPULMONARY RESUSCITATION, NOS
9963 CLOSED CHEST CARDIAC MASSAGE

Exclude:
MDC 4 and 5, principal diagnosis of shock or cardiac arrest, abortion-related shock, hemorrhage, trauma, GI hemorrhage.

MDC 4 DISEASES AND DISORDERS OF THE RESPIRATORY SYSTEM
MDC 5 DISEASES AND DISORDERS OF THE CIRCULATORY SYSTEM

ICD-9-CM Abortion-related Shock diagnosis codes:

63450 SPONTANEOUS ABORTION W/ SHOCK - UNSPECIFIED
63451 SPONTANEOUS ABORTION W/ SHOCK - INCOMPLETE
63452 SPONTANEOUS ABORTION W/ SHOCK - COMPLETE
63550 LEGAL ABORTION W/ SHOCK - UNSPECIFIED
63551 LEGAL ABORTION W/ SHOCK - INCOMPLETE
63552 LEGAL ABORTION W/ SHOCK - COMPLETE
63650 ILLEGAL ABORTION W/ SHOCK - UNSPECIFIED
63651 ILLEGAL ABORTION W/ SHOCK - INCOMPLETE
63652 ILLEGAL ABORTION W/ SHOCK - COMPLETE
63750 ABORTION NOS W/ SHOCK - UNSPECIFIED
63751 ABORTION NOS W/ SHOCK - INCOMPLETE
63752 ABORTION NOS W/ SHOCK - COMPLETE
6385 ATTEMPTED ABORTION W/ SHOCK

ICD-9-CM Hemorrhage Diagnosis Codes:

See FTR 1 **Acute Renal Failure** for a list of hemorrhage diagnosis codes

ICD-9-CM Trauma Diagnosis Codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of trauma diagnosis codes

DRGs:

See FTR 1 **Acute Renal Failure** for list of trauma DRG codes

ICD-9-CM GI hemorrhage diagnosis codes:

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See FTR 1 **Acute Renal Failure** for list of GI hemorrhage diagnosis codes

FTR 6 - GI Hemorrhage/Acute Ulcer

Include ICD-9-CM GI Hemorrhage/Acute Ulcer diagnosis codes:

4560 ESOPHAGEAL VARICES W/ BLEEDING
45620 ESOPHAGEAL VARICES IN DISEASES CLASSIFIED ELSEWHERE W/ BLEEDING
5307 GASTROESOPHAGEAL LACERATION-HEMORRHAGE SYNDROME
53082 ESOPHAGEAL HEMORRHAGE

Gastric ulcer:

53100 ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53101 ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53110 ACUTE W/ PERFORATION – W/O MENTION OF OBSTRUCTION
53111 ACUTE W/ PERFORATION – W/ OBSTRUCTION
53120 ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53121 ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53130 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53131 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION
53190 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53191 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION

Duodenal ulcer:

53200 ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53201 ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53210 ACUTE W/ PERFORATION – W/O MENTION OF OBSTRUCTION
53211 ACUTE W/ PERFORATION – W/ OBSTRUCTION
53220 ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53221 ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53230 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53231 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION
53290 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53291 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION

Peptic ulcer:

53300 SITE UNSPECIFIED ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53301 SITE UNSPECIFIED ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53310 SITE UNSPECIFIED ACUTE W/ PERFORATION – W/O MENTION OF OBSTRUCTION
53311 SITE UNSPECIFIED ACUTE W/ PERFORATION – W/ OBSTRUCTION
53320 SITE UNSPECIFIED ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53321 SITE UNSPECIFIED ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53330 SITE UNSPECIFIED ACUTE W/O MENTION OF HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53331 SITE UNSPECIFIED ACUTE W/O MENTION OF HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53390 SITE UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53391 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION

Failure to Rescue (PSI 4)

Gastrojejunal ulcer:

53400 ACUTE W/ HEMORRHAGE – W/O MENTION OF OBSTRUCTION
53401 ACUTE W/ HEMORRHAGE – W/ OBSTRUCTION
53410 ACUTE W/ PERFORATION – W/O MENTION OF OBSTRUCTION
53411 ACUTE W/ PERFORATION – W/ OBSTRUCTION
53420 ACUTE W/ HEMORRHAGE AND PERFORATION – W/O MENTION OF OBSTRUCTION
53421 ACUTE W/ HEMORRHAGE AND PERFORATION – W/ OBSTRUCTION
53430 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53431 ACUTE W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION
53490 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/O MENTION OF OBSTRUCTION
53491 UNSPECIFIED AS ACUTE OR CHRONIC, W/O MENTION OF HEMORRHAGE OR PERFORATION – W/ OBSTRUCTION

Gastritis and duodenitis:

53501 ACUTE GASTRITIS – W/ HEMORRHAGE
53511 ATROPHIC GASTRITIS – W/ HEMORRHAGE
53521 GASTRIC MUCOSAL HYPERTROPHY – W/ HEMORRHAGE
53531 ALCOHOLIC GASTRITIS – W/ HEMORRHAGE
53541 OTHER SPECIFIED GASTRITIS – W/ HEMORRHAGE
53551 UNSPECIFIED GASTRITIS AND GASTRODUODENITIS – W/ HEMORRHAGE
53561 DUODENITIS – W/ HEMORRHAGE
53783 ANGIODYSPLASIA OF STOMACH AND DUODENUM – W/ HEMORRHAGE
53784 DIEULAFOY LESION (HEMORRHAGIC) OF STOMACH AND DUODENUM
56202 DIVERTICULOSIS OF SMALL INTESTINE – W/ HEMORRHAGE
56203 DIVERTICULITIS OF SMALL INTESTINE – W/ HEMORRHAGE
56212 DIVERTICULOSIS OF COLON – W/ HEMORRHAGE
56213 DIVERTICULITIS OF COLON – W/ HEMORRHAGE

5693 HEMORRHAGE OF RECTUM AND ANUS
56985 ANGIODYSPLASIA OF INTESTINE – W/ HEMORRHAGE
56986 DIEULAFOY LESION (HEMORRHAGIC) OF INTESTINE
5780 HEMATEMESIS
5781 BLOOD IN STOOL
5789 HEMORRHAGE OF GASTROINTESTINAL TRACT, UNSPECIFIED

Exclude:
MDC codes 6, 7, principal diagnosis of GI hemorrhage/Acute Ulcer, trauma, alcoholism and ICD-9-CM diagnosis codes 280.0 and 285.1:

MDC 6 DISEASES AND DISORDERS OF THE DIGESTIVE SYSTEM
MDC 7 DISEASES AND DISORDERS OF THE HEPATOBILIARY SYSTEM AND PANCREAS

2800 SECONDARY TO BLOOD LOSS [CHRONIC]
2851 ACUTE POSTHEMORRHAGIC ANEMIA

ICD-9-CM Trauma Diagnosis Codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of trauma diagnosis codes

DRGs:

See FTR 1 **Acute Renal Failur**e for list of trauma DRG codes

ICD-9-CM Alcoholism diagnosis codes:

Failure to Rescue (PSI 4)

2910 ALCOHOL WITHDRAWAL DELIRIUM
2911 ALCOHOL AMNESTIC SYNDROME
2912 OTHER ALCOHOLIC DEMENTIA
2913 ALCOHOL WITHDRAWAL HALLUCINOSIS
2914 IDIOSYNCRATIC ALCOHOL INTOXICATION
2915 ALCOHOLIC JEALOUSY
29181 OTHER SPECIFIED ALCOHOLIC PSYCHOSES, ALCOHOL WITHDRAWAL
29189 OTHER SPECIFIED ALCOHOLIC PSYCHOSES, OTHER
2919 UNSPECIFIED ALCOHOLIC PSYCHOSIS
30300 ACUTE ALCOHOLIC INTOXICATION - UNSPECIFIED
30301 ACUTE ALCOHOLIC INTOXICATION - CONTINUOUS
30302 ACUTE ALCOHOLIC INTOXICATION - EPISODIC
30303 ACUTE ALCOHOLIC INTOXICATION - IN REMISSION
30390 OTHER AND UNSPECIFIED ALCOHOL DEPENDENCE - UNSPECIFIED
30391 OTHER AND UNSPECIFIED ALCOHOL DEPENDENCE - CONTINUOUS
30392 OTHER AND UNSPECIFIED ALCOHOL DEPENDENCE - EPISODIC
30393 OTHER AND UNSPECIFIED ALCOHOL DEPENDENCE - IN REMISSION
30500 NONDEPENDENT ABUSE OF DRUGS, ALCOHOL ABUSE - UNSPECIFIED
30501 NONDEPENDENT ABUSE OF DRUGS, ALCOHOL ABUSE - CONTINUOUS
30502 NONDEPENDENT ABUSE OF DRUGS, ALCOHOL ABUSE - EPISODIC
30503 NONDEPENDENT ABUSE OF DRUGS, ALCOHOL ABUSE – IN REMISSION
4255 ALCOHOLIC CARDIOMYOPATHY
53530 ALCOHOLIC GASTRITIS, W/O MENTION OF HEMORRHAGE
53531 ALCOHOLIC GASTRITIS, W/ HEMORRHAGE
5710 ALCOHOLIC FATTY LIVER
5711 ACUTE ALCOHOLIC HEPATITIS
5712 ALCOHOLIC CIRRHOSIS OF LIVER
5713 ALCOHOLIC LIVER DAMAGE, UNSPECIFIED
9800 TOXIC EFFECT OF ALCOHOL, ETHYL ALCOHOL
9809 TOXIC EFFECT OF ALCOHOL, UNSPECIFIED ALCOHOL

Exclude:

Patients age 75 years and older.

Neonatal patients in MDC 15 (Newborns and Other Neonates with Conditions Originating in the Neonatal Period).

Patients transferred to an acute care facility
Patients transferred from an acute care facility
Patients admitted from a long-term care facility

Transferred to Acute Care Facility:

Discharge disposition recorded as transfer to another acute care facility (Discharge Disposition = 2)

Transferred from Acute Care or Long-Term Care Facility:

Admission source is recorded as acute care facility (Admission Source = 2)
Admission source is recorded as long-term care facility (Admission Source=3)

Foreign Body Left During Procedure, Secondary Diagnosis Field (PSI 5)

Numerator:

Discharges with ICD-9-CM codes for foreign body left in during procedure in any secondary diagnosis field.

ICD-9-CM Foreign Body Left in During Procedure diagnosis codes:

Foreign Body Left During Procedure, Secondary Diagnosis Field (PSI 5)

9984 FOREIGN BODY ACCIDENTALLY LEFT DURING A PROCEDURE
9987 ACUTE REACTIONS TO FOREIGN SUBSTANCE ACCIDENTALLY LEFT DURING A PROCEDURE

Foreign body left in during:

E8710 SURGICAL OPERATION
E8711 INFUSION OR TRANSFUSION
E8712 KIDNEY DIALYSIS OR OTHER PERFUSION
E8713 INJECTION OR VACCINATION
E8714 ENDOSCOPIC EXAMINATION
E8715 ASPIRATION OF FLUID OR TISSUE, PUNCTURE, AND CATHETERIZATION
E8716 HEART CATHETERIZATION
E8717 REMOVAL OF CATHETER OR PACKING
E8718 OTHER SPECIFIED PROCEDURES
E8719 UNSPECIFIED PROCEDURE

Denominator:

All medical and surgical discharges defined by specific DRGs

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Medical Discharge DRGs:

See PSI 3 **Decubitus Ulcer** for a list of medical DRG codes.

Exclude:

Patients with ICD-9-CM codes for foreign body left in during procedure in the principal diagnosis field

Iatrogenic Pneumothorax, Secondary Diagnosis Field (PSI 6)

Numerator:

Discharges with ICD-9-CM code of 512.1 in any secondary diagnosis field.

Denominator:

All medical and surgical discharges defined by specific DRGs

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Medical Discharge DRGs:

See PSI 3 **Decubitus Ulcer** for a list of medical DRG codes.

Exclude:

Patients with ICD-9-CM code of 512.1 in the principal diagnosis field.
Patients with any diagnosis of trauma.
Patients with any code indicating thoracic surgery, lung or pleural biopsy, or assigned to cardiac surgery DRGs
Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

ICD-9-CM Trauma diagnosis codes (includes 4th and 5th digits):

Iatrogenic Pneumothorax, Secondary Diagnosis Field (PSI 6)

See PSI 2 **Death In Low Mortality DRGs** for a list of trauma diagnosis codes.

DRGs:

See FTR 1 **Acute Renal Failure** for a list of trauma DRG codes.

ICD-9-CM Thoracic Surgery procedure codes:

3121 MEDIASTINAL TRACHEOSTOMY
3145 OPEN BIOPSY OF LARYNX OR TRACHEA
3173 CLOSURE OF OTHER FISTULA OF TRACHEA
3179 OTHER REPAIR AND PLASTIC OPERATIONS ON TRACHEA
3199 OTHER OPERATIONS ON TRACHEA
3209 OTHER LOCAL EXCISION OR DESTRUCTION OF LESION OR TISSUE OF BRONCHUS
321 OTHER EXCISION OF BRONCHUS

Local excision or destruction of lesion or tissue of lung:

3221 PLICATION OF EMPHYSEMATIOUS BLEB
3222 LUNG VOLUME REDUCTION SURGERY
3228 ENDOSCOPIC EXCISION OR DESTRUCTION OF LESION OR TISSUE OF LUNG
3229 OTHER LOCAL EXCISION OR DESTRUCTION OF LESION OR TISSUE OF LUNG
323 SEGMENTAL RESECTION OF LUNG
324 LOBECTOMY OF LUNG
325 COMPLETE PNEUMONECTOMY
326 RADICAL DISSECTION OF THORACIC STRUCTURES
329 OTHER EXCISION OF LUNG
330 INCISION OF BRONCHUS
331 INCISION OF LUNG
3325 OPEN BIOPSY OF BRONCHUS
3326 CLOSE [PERCUTANEOUS][NEEDLE] BIOPSY OF LUNG
3327 CLOSED ENDOSCOPIC BIOPSY OF LUNG
3328 OPEN BIOPSY OF LUNG
3331 DESTRUCTION OF PHRENIC NERVE FOR COLLAPSE OF LUNG (NO LONGER PERFORMED)
3332 ARTIFICIAL PNEUMOTHORAX FOR COLLAPSE OF LUNG
3334 THORACOPLASTY
3339 OTHER SURGICAL COLLAPSE OF LUNG

Repair and plastic operation on lung and bronchus:

3341 SUTURE OF LACERATION OF BRONCHUS
3342 CLOSURE OF BRONCHIAL FISTULA
3343 CLOSURE OF LACERATION OF LUNG
3348 OTHER REPAIR AND PLASTIC OPERATIONS ON BRONCHUS
3349 OTHER REPAIR AND PLASTIC OPERATIONS ON LUNG

Lung transplant:

335 LUNG TRANSPLANTATION
3350 LUNG TRANSPLANTATION, NOS
3351 UNILATERAL LUNG TRANSPLANTATION
3352 BILATERAL LUNG TRANSPLANTATION
336 COMBINED HEART-LUNG TRANSPLANTATION
3392 LIGATION OF BRONCHUS
3393 PUNCTURE OF LUNG
3398 OTHER OPERATIONS ON BRONCHUS
3399 OTHER OPERATIONS ON LUNG
3329 OTHER DIAGNOSTIC PROCEDURE ON LUNG AND BRONCHUS
3333 PNEUMOPERITONEUM FOR COLLAPSE OF LUNG

Iatrogenic Pneumothorax, Secondary Diagnosis Field (PSI 6)

3401 INCISION OF CHEST WALL
3402 EXPLORATORY THORACOTOMY
3403 REOPENING OF RECENT THORACOTOMY SITE
3405 CREATION OF PLEUROPERITONEAL SHUNT
3409 OTHER INCISION OF PLEURA
341 INCISION OF MEDIASTINUM

Diagnostic procedures on chest wall, pleura, mediastinum, and diaphragm:

3421 TRANSPLEURAL THORACOSOCOPY
3422 MEDIASTINOSCOPY
3423 BIOPSY OF CHEST WALL
3424 PLEURAL BIOPSY
3425 CLOSED [PERCUTANEOUS][NEEDLE] BIOPSY OF MEDIASTINUM
3426 OPEN BIOPSY OF MEDIASTINUM
3427 BIOPSY OF DIAPHRAGM
3428 OTHER DIAGNOSTIC PROCEDURES ON CHEST WALL, PLEURA, AND DIAPHRAGM
3429 OTHER DIAGNOSTIC PROCEDURES ON MEDIASTINUM
343 EXCISION OR DESTRUCTION OF LESION OR TISSUE OF MEDIASTINUM
344 EXCISION OR DESTRUCTION OF LESION OF CHEST WALL
3451 DECORTICATION OF LUNG
3459 OTHER EXCISION OF PLEURA

Repair of chest wall:

3471 SUTURE OF LACERATION OF CHEST WALL
3472 CLOSURE OF THORACOSTOMY
3473 CLOSURE OF OTHER FISTULA OF THORAX
3474 REPAIR OF PECTUS DEFORMITY
3479 OTHER REPAIR OF CHEST WALL

Operations on diaphragm:

3481 EXCISION OF LESION OR TISSUE OF DIAPHRAGM
3482 SUTURE OF LACERATION OF DIAPHRAGM
3483 CLOSURE OF FISTULA OF DIAPHRAGM
3484 OTHER REPAIR OF DIAPHRAGM
3485 IMPLANTATION OF DIAPHRAGMATIC PACEMAKER
3489 OTHER OPERATIONS ON DIAPHRAGM
3493 REPAIR OF PLEURA
3499 OTHER OPERATIONS ON THORAX, OTHER

Operations on thoracic duct:

4061 CANNULATION OF THORACIC DUCT
4062 FISTULIZATION OF THORACIC DUCT
4063 CLOSURE OF FISTULA OF THORACIC DUCT
4064 LIGATION OF THORACIC DUCT
4069 OTHER OPERATIONS ON THORACIC DUCT

Esophagotomy:

4201 INCISION OF ESOPHAGEAL WEB
4209 OTHER INCISION OF ESOPHAGUS
4210 ESOPHAGOSTOMY, NOS
4211 CERVICAL ESOPHAGOSTOMY
4212 EXTERIORIZATION OF ESOPHAGEAL POUCH
4219 OTHER EXTERNAL FISTULIZATION OF ESOPHAGUS
4221 OPERATIVE ESOPHAGOSCOPY BY INCISION
4225 OPEN BIOPSY OF ESOPHAGUS

Iatrogenic Pneumothorax, Secondary Diagnosis Field (PSI 6)

4231 LOCAL EXCISION OF ESOPHAGEAL DIVERTICULUM
4232 LOCAL EXCISION OF OTHER LESION OR TISSUE OF ESOPHAGUS
4239 OTHER DESTRUCTION OF LESION OR TISSUE OF ESOPHAGUS

Excision of esophagus:

4240 ESOPHAGECTOMY, NOS
4241 PARTIAL ESOPHAGECTOMY
4242 TOTAL ESOPHAGECTOMY

Intrathoracic anastomosis of exophagus

4251 INTRATHORACIC ESOPHAGOESOPHAGOSTOMY
4252 INTRATHORACIC ESOPHAGOGASTROSTOMY
4253 INTRATHORACIC ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF SMALL BOWEL
4254 OTHER INTRATHORACIC ESOPHAGOENTEROSTOMY
4255 INTRATHORACIC ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF COLON
4256 OTHER INTRATHORACIC ESOPHAGOCOLOSTOMY
4258 INTRATHORACIC ESOPHAGEAL ANASTOMOSIS W/ OTHER INTERPOSITION
4259 OTHER INTRATHORACIC ANASTOMOSIS OF ESOPHAGUS

Antesternal anastomosis

4261 ANTESTERNAL ESOPHAGOESOPHAGOSTOMY
4262 ANTESTERNAL ESOPHAGOGASTROSTOMY
4263 ANTESTERNAL ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF SMALL BOWEL
4264 OTHER ANTESTERNAL ESOPHAGOENTEROSTOMY
4265 ANTESTERNAL ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF COLON
4266 OTHER ANTESTERNAL ESOPHAGOCOLOSTOMY
4268 OTHER ANTESTERNAL ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION
4269 OTHER ANTESTERNAL ANASTOMOSIS OF ESOPHAGUS
427 ESOPHAGOMYOTOMY

Other repair of esophagus

4281 INSERTION OF PERMANENT TUBE INTO ESOPHAGUS
4282 SUTURE OF LACERATION OF ESOPHAGUS
4283 CLOSURE OF ESOPHAGOSTOMY
4284 REPAIR OF ESOPHAGEAL FISTULA, NEC
4285 REPAIR OF ESOPHAGEAL STRICTURE
4286 PRODUCTION OF SUBCUTANEOUS TUNNEL W/O ESOPHAGEAL ANASTOMOSIS
4287 OTHER GRAFT OF ESOPHAGUS
4289 OTHER REPAIR OF ESOPHAGUS
4465 ESOPHAGOGASTROPLASTY
4466 OTHER PROCEDURES FOR CREATION OF ESOPHAGOGASTRIC SPHINCTERIC COMPETENCE
8104 DORSAL AND DORSO-LUMBAR FUSION, ANTERIOR TECHNIQUE
8134 REFUSION OF DORSAL AND DORSOLUMBAR SPINE, ANTERIOR TECHNIQUE

ICD-9-CM Lung or Pleural Biopsy procedure codes:

3326 CLOSED [PERCUTANEOUS] [NEEDLE] BIOPSY OF LUNG
3328 OPEN BIOPSY OF LUNG
3424 PLEURAL BIOPSY

Cardiac Surgery DRGs:

103 HEART TRANSPLANT
104 CARDIAC VALVE AND OTHER MAJOR CARDIOTHORACIC PROCEDURES W/ CARDIAC CATHETERIZATION
105 CARDIAC VALVE AND OTHER MAJOR CARDIOTHORACIC PROCEDURES W/O CARDIAC

Iatrogenic Pneumothorax, Secondary Diagnosis Field (PSI 6)

	CATHETERIZATION
106	CORONARY BYPASS W/ PTCA
107	CORONARY BYPASS W/ CARDIAC CATHETERIZATION
108	OTHER CARDIOTHORACIC PROCEDURES
109	CORONARY BYPASS W/O CARDIAC CATHETERIZATION
110	MAJOR CARDIOVASCULAR PROCEDURES W/ CC
111	MAJOR CARDIOVASCULAR PROCEDURES W/O CC
525	HEART ASSIST SYSTEM IMPLANT (OCT 02)

Selected Infections Due to Medical Care, Secondary Diagnosis Field (PSI 7)

Numerator:

Discharges with ICD-9-CM code of 999.3 or 996.62 in any secondary diagnosis field.

Denominator:

All medical and surgical discharges defined by specific DRGs

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Medical Discharge DRGs:

See PSI 3 **Decubitus Ulcer** for a list of medical DRG codes.

Exclude:

Patients with ICD-9-CM code of 999.3 or 996.62 in the principal diagnosis field
Patients with any code for immunocompromised state or cancer.

ICD-9-CM Immunocompromised States diagnosis codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised states diagnosis codes.

ICD-9-CM procedure codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised states procedure codes.

Cancer:

See PSI 2 Death in Low Mortality DRGs for a list of cancer diagnosis codes

DRGs:

010	NERVOUS SYSTEM NEOPLASMS W/ CC
011	NERVOUS SYSTEM NEOPLASMS W/O CC
064	EAR, NOSE, MOUTH AND THROAT MALIGNANCY
082	RESPIRATORY NEOPLASMS
172	DIGESTIVE MALIGNANCY W/ CC
173	DIGESTIVE MALIGNANCY W/O CC
199	HEPATOBILIARY DIAGNOSTIC PROCEDURE FOR MALIGNANCY
203	MALIGNANCY OF HEPATOBILIARY SYSTEM OR PANCREAS
239	PATHOLOGICAL FRACTURES AND MUSCULOSKELETAL AND CONNECTIVE TISSUE MALIGNANCY
257	TOTAL MASTECTOMY FOR MALIGNANCY W/ CC
258	TOTAL MASTECTOMY FOR MALIGNANCY W/O CC
259	SUBTOTAL MASTECTOMY FOR MALIGNANCY W/ CC
260	SUBTOTAL MASTECTOMY FOR MALIGNANCY W/O CC

Selected Infections Due to Medical Care, Secondary Diagnosis Field (PSI 7)

274	MALIGNANT BREAST DISORDERS W/ CC
275	MALIGNANT BREAST DISORDERS W/O CC
303	KIDNEY, URETER AND MAJOR BLADDER PROCEDURES FOR NEOPLASM
318	KIDNEY AND URINARY TRACT NEOPLASMS W/ CC
319	KIDNEY AND URINARY TRACT NEOPLASMS W/O CC
338	TESTES PROCEDURES FOR MALIGNANCY
344	OTHER MALE REPRODUCTIVE SYSTEM OR PROCEDURES FOR MALIGNANCY
346	MALIGNANCY OF MALE REPRODUCTIVE SYSTEM W/ CC
347	MALIGNANCY OF MALE REPRODUCTIVE SYSTEM W/O CC
354	UTERINE AND ADNEXA PROCEDURES FOR NONOVARIAN/ADNEXAL MALIGNANCY W/ CC
355	UTERINE AND ADNEXA PROCEDURES FOR NONOVARIAN/ADNEXAL MALIGNANCY W/O CC
357	UTERINE AND ADNEXA PROCEDURES FOR OVARIAN OR ADNEXAL MALIGNANCY
363	D AND C, CONIZATION AND RADIOIMPLANT FOR MALIGNANCY
367	MALIGNANCY OF FEMALE REPRODUCTIVE SYSTEM W/O CC
400*	LYMPHOMA AND LEUKEMIA W/ MAJOR OR PROCEDURES
401	LYMPHOMA AND NONACUTE LEUKEMIA W/ OTHER OR PROCEDURE W/ CC
402	LYMPHOMA AND NONACUTE LEUKEMIA W/ OTHER OR PROCEDURE W/O CC
403	LYMPHOMA AND NONACUTE LEUKEMIA W/ CC
404	LYMPHOMA AND NONACUTE LEUKEMIA W/O CC
405	ACUTE LEUKEMIA W/O MAJOR OR PROCEDURE, AGE 0-17
406	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ MAJOR OR PROCEDURES W/ CC
407	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ MAJOR OR PROCEDURE W/O CC
408	MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASMS W/ OTHER OR PROCEDURES
409	RADIOTHERAPY
410	CHEMOTHERAPY W/O ACUTE LEUKEMIA AS SECONDARY DIAGNOSIS
411	HISTORY OF MALIGNANCY W/O ENDOSCOPY
412	HISTORY OF MALIGNANCY W/ ENDOSCOPY
413	OTHER MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASM DIAGNOSES W/ CC
414	OTHER MYELOPROLIFERATIVE DISORDERS OR POORLY DIFFERENTIATED NEOPLASM DIAGNOSES W/O CC
473	ACUTE LEUKEMIA W/O MAJOR OR PROCEDURE, AGE GREATER THAN 17
492	CHEMOTHERAPY W/ ACUTE LEUKEMIA AS SECONDARY DIAGNOSIS
539	LYMPHOMA & LEUKEMIA W MAJOR OR PROCEDURE W/ CC (OCT 03)
540	LYMPHOMA & LEUKEMIA W MAJOR OR PROCEDURE W/O CC (OCT 03)

*No Longer valid in FY2004

Postoperative Hip Fracture (PSI 8)

Numerator:

Discharges with ICD-9-CM code for hip fracture in any secondary diagnosis field

ICD-9-CM Hip Fracture diagnosis codes (includes all 5th digits):

8200	FRACTURE OF NECK OF FEMUR – TRANSCERVICAL FRACTURE, CLOSED
8201	FRACTURE OF NECK OF FEMUR – TRANSCERVICAL FRACTURE, OPEN
8202	FRACTURE OF NECK OF FEMUR – PERTROCHANTERIC FRACTURE, CLOSED
8203	FRACTURE OF NECK OF FEMUR – PERTROCHANTERIC FRACTURE, OPEN
8208	UNSPECIFIED PART OF NECK OF FEMUR, CLOSED
8209	UNSPECIFIED PART OF NECK OF FEMUR, OPEN

Denominator:

Postoperative Hip Fracture (PSI 8)

All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesi**a for a list of surgical DRG codes.

Exclude:

Patients with ICD-9-CM code for hip fracture in the principal diagnosis field.

Patients where the only operating room procedure is hip frature repair.

Patients where a procedure for hip frature repair occurs before the first operating room procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available

Patients who have diseases and disorders of the musculoskeletal system and connective tissue (MDC 8).

Patients with principal diagnosis codes for seizure, syncope, stroke, coma, cardiac arrest, poisoning, trauma, delirium and other psychoses, or anoxic brain injury.

Patients with any diagnosis of metastatic cancer, lymphoid malignancy or bone malignancy, or self-inflicted injury.

Obstetrical patients in MDC14 (Pregnancy, Childbirth and the Puerperium).

Patients 17 years of age and younger.

ICD-9-CM Hip Fracture Repair procedure codes:

7855	INTERNAL FIXATION-FEMUR
7915	CLOSED RED-INT FIX FEMUR
7925	OPEN REDUCTION-FEMUR FX
7935	OPEN REDUC-INT FIX FEMUR
8151	TOTAL HIP REPLACEMENT
8152	PARTIAL HIP REPLACEMENT

ICD-9-CM Seizure diagnosis codes:

34500	GENERALIZED NONCONVULSIVE EPILEPSY – W/O MENTION OF INTRACTABLE EPILEPSY
34501	GENERALIZED NONCONVULSIVE EPILEPSY – W/ INTRACTABLE EPILEPSY
34510	GENERALIZED CONVULSIVE EPILEPSY – W/O MENTION OF INTRACTABLE EPILEPSY
34511	GENERALIZED CONVULSIVE EPILEPSY – W/ INTRACTABLE EPILEPSY
3452	EPILEPSY – PETIT MAL STATUS
3453	EPILEPSY – GRAND MAL STATUS
34540	PARTIAL EPILEPSY, W/ IMPAIRMENT OF CONSCIOUSNESS – W/ INTRACTABLE EPILEPSY
34541	PARTIAL EPILEPSY, W/ IMPAIRMENT OF CONSCIOUSNESS – W/O MENTION OF INTRACTABLE EPILEPSY
34550	PARTIAL EPILEPSY, W/O MENTION OF IMPAIRMENT OF CONSCIOUSNESS – W/O MENTION OF INTRACTABLE EPILEPSY
34551	PARTIAL EPILEPSY, W/O MENTION OF IMPAIRMENT OF CONSCIOUSNESS – W/ INTRACTABLE EPILEPSY
34560	INFANTILE SPASMS – W/O MENTION OF INTRACTABLE EPILEPSY
34561	INFANTILE SPASMS – W/ INTRACTABLE EPILEPSY
34570	EPILEPSIA PARTIALIS CONTINUA – W/O MENTION OF INTRACTABLE EPILEPSY
34571	EPILEPSIA PARTIALIS CONTINUA – W/ INTRACTABLE EPILEPSY
34580	OTHER FORMS OF EPILEPSY – W/O MENTION OF INTRACTABLE EPILEPSY
34581	OTHER FORMS OF EPILEPSY – W/ INTRACTABLE EPILEPSY
34590	EPILEPSY, UNSPECIFIED – W/O MENTION OF INTRACTABLE EPILEPSY

Postoperative Hip Fracture (PSI 8)

34591 EPILEPSY, UNSPECIFIED – W/ INTRACTABLE EPILEPSY
7803 CONVULSIONS
78031 FEBRILE CONVULSIONS
78039 OTHER CONVULSIONS
7803 CONVULSIONS (OLD CODE NO LONGER VALID)

ICD-9-CM Syncope diagnosis codes:

7802 SYNCOPE AND COLLAPSE

ICD-9-CM Stroke diagnosis codes:

430 SUBARACHNOID HEMORRHAGE
431 INTRACEREBRAL HEMORRHAGE
4320 NONTRAUMATIC EXTRADURAL HEMORRHAGE
4321 SUBDURAL HEMORRHAGE
4329 UNSPECIFIED INTRACRANIAL HEMORRHAGE
436 ACUTE, BUT ILL-DEFINED CEREBROVASCULAR DISEASE
99702 POSTOPERATIVE CEREBROVASCULAR ACCIDENT

Occlusion and stenosis of precerebral arteries:

43301 BASILAR ARTERY, W/ CEREBRAL INFARCTION
43311 CAROTID ARTERY, W/ CEREBRAL INFARCTION
43321 VERTEBRAL ARTERY - W/ CEREBRAL INFARCTION
43331 MULTIPLE AND BILATERAL W/ CEREBRAL INFARCTION
43381 OTHER SPECIFIED PRECEREBRAL ARTERY W/ CEREBRAL INFARCTION
43391 OCCLUSION AND STENOSIS OF PRECEREBRAL ARTERIES, UNSPECIFIED PRECEREBRAL ARTERY W/ CEREBRAL INFARCTION

Occlusion of cerebral arteries:

43401 CEREBRAL THROMBOSIS – W/ CEREBRAL INFARCTION
43411 CEREBRAL EMBOLISM – W/ CEREBRAL INFARCTION
43491 CEREBRAL ARTERY OCCLUSION, UNSPECIFIED - W/ CEREBRAL INFARCTION

ICD-9-CM Coma diagnosis codes:

25020 DIABETES W/ HYPEROSMOLARITY, TYPE 2 [NONINSULIN DEPENDENT TYPE][NIDDM TYPE][ADULT-ONSET] OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED
25021 DIABETES W/ HYPEROSMOLARITY, TYPE 1 [INSULIN DEPENDENT TYPE][IDDM-TYPE] [JUVENILE TYPE], NOT STATED AS UNCONTROLLED
25022 DIABETES W/ HYPEROSMOLARITY, TYPE 2
25023 DIABETES MELLITUS, DIABETES W/ HYPEROSMOLARITY, TYPE 1 [INSULIN DEPENDENT TYPE][IDDM-TYPE][JUVENILE TYPE] UNCONTROLLED
25030 DIABETES W/ OTHER COMA, TYPE 2 NOT STATED AS UNCONTROLLED
25031 DIABETES W/ OTHER COMA, TYPE 1 NOT STATED AS UNCONTROLLED
25032 DIABETES MELLITUS, DIABETES W/ OTHER COMA, TYPE 2 UNCONTROLLED
25033 DIABETES MELLITUS, DIABETES W/ OTHER COMA, TYPE 1 UNCONTROLLED
2510 OTHER DISORDERS OF PANCREATIC INTERNAL SECRETION, HYPOGLYCEMIC COMA
5722 LIVER ABSCESS AND SEQUELAE OF CHRONIC LIVER DISEASE, HEPATIC COMA
78001 GENERAL SYMPTOMS, ALTERATION OF CONSCIOUSNESS, COMA
78003 GENERAL SYMPTOMS, ALTERATION OF CONSCIOUSNESS PERSISTENT VEGETATIVE STATE

ICD-9-CM Cardiac Arrest diagnosis code:

See FTR 1 **Acute Renal Failure** for a list of cardiac arrest diagnosis codes.

ICD-9-CM Poisoning diagnosis codes (includes 4th and 5th digits):

Postoperative Hip Fracture (PSI 8)

960 POISONING BY ANTIBIOTICS
961 POISONING BY OTHER ANTI-INFECTIVES
962 POISONING BY HORMONES AND SYNTHETIC SUBSTITUTES
963 POISONING BY PRIMARILY SYSTEMIC AGENTS
964 POISONING BY AGENTS PRIMARILY AFFECTING BLOOD CONSTITUENTS
965 POISONING BY ANALGESICS, ANTIPYRETICS, AND ANTIRHEUMATICS
966 POISONING BY ANTICONVULSANTS AND ANTI-PARKINSONISM DRUGS
967 POISONING BY SEDATIVES AND HYPNOTICS
968 POISONING BY OTHER CENTRAL NERVOUS SYSTEM DEPRESSANTS AND ANESTHETICS
969 POISONING BY PSYCHOTROPIC AGENTS
970 POISONING BY CENTRAL NERVOUS SYSTEM STIMULANTS
971 POISONING BY DRUGS PRIMARILY AFFECTING THE AUTONOMIC NERVOUS SYSTEM
972 POISONING BY AGENTS PRIMARILY AFFECTING THE CARDIOVASCULAR SYSTEM
973 POISONING BY AGENTS PRIMARILY AFFECTING THE GASTROINTESTINAL SYSTEM
974 POISONING BY WATER, MINERAL, AND URIC ACID METABOLISM DRUGS
975 POISONING BY AGENTS PRIMARILY ACTING ON THE SMOOTH AND SKELETAL MUSCLES AND RESPIRATORY SYSTEM
976 POISONING BY AGENTS PRIMARILY AFFECTING SKIN AND MUCOUS MEMBRANE, OPTHAMOLOGICAL, OTORHINOLARYNCOLOGICAL AND DENTAL DRUGS
977 POISONING BY OTHER AND UNSPECIFIED DRUGS AND MEDICINAL SUBSTANCES
978 POISONING BY BACTERIAL VACCINES
979 POISONING BY OTHER VACCINES AND BIOLOGICAL SUBSTANCES
E850 ACCIDENTAL POISONING BY ANALGESICS, ANTIPYRETICS, AND ANTIRHEUMATICS
E851 ACCIDENTAL POISONING BY BARBITURATES
E852 ACCIDENTAL POISONING BY OTHER SEDATIVES AND HYPNOTICS
E853 ACCIDENTAL POISONING BY TRANQUILIZERS
E854 ACCIDENTAL POISONING BY OTHER PSYCHOTROPIC AGENTS
E855 ACCIDENTAL POISONING BY OTHER DRUGS ACTING ON CENTRAL AND AUTONOMIC NERVOUS SYSTEM
E856 ACCIDENTAL POISONING BY ANTIBIOTICS
E857 ACCIDENTAL POISONING BY OTHER ANTI-INFECTIVES
E858 ACCIDENTAL POISONING BY OTHER DRUGS
E860 ACCIDENTAL POISONING BY ALCOHOL, NEC
E861 ACCIDENTAL POISONING BY CLEANING AND POLISHING AGENTS, DISINFECTANTS, PAINTS, AND VARNISHES
E862 ACCIDENTAL POISONING BY PETROLEUM PRODUCTS, OTHER SOLVENTS AND THEIR VAPORS, NEC
E863 ACCIDENTAL POISONING BY AGRICULTURAL AND HORTICULTURAL CHEMICAL AND PHARMACEUTICAL PREPARATIONS OTHER THAN PLANT FOODS AND FERTILIZERS
E864 ACCIDENTAL POISONING BY CORROSIVES AND CAUSTICS, NEC
E865 ACCIDENTAL POISONING FROM POISONOUS FOODSTUFFS AND POISONOUS PLANTS
E866 ACCIDENTAL POISONING BY OTHER AND UNSPECIFIED SOLID AND LIQUID SUBSTANCES
E867 ACCIDENTAL POISONING BY GAS DISTRIBUTED BY PIPELINE
E868 ACCIDENTAL POISONING BY OTHER UTILITY GAS AND OTHER CARBON MONOXIDE
E869 ACCIDENTAL POISONING BY OTHER GASES AND VAPORS
E951 SUICIDE AND SELF-INFLICTED POISONING BY GASES IN DOMESTIC USE
E952 SUICIDE AND SELF-INFLICTED POISONING BY OTHER GASES AND VAPORS
E962 ASSAULT BY POISONING
E980 POISONING BY SOLID OR LIQUID SUBSTANCES, UNDETERMINED WHETHER ACCIDENTALLY OR PURPOSELY INFLICTED
E981 POISONING BY GASES IN DOMESTIC USE, UNDETERMINED WHETHER ACCIDENTALLY OR PURPOSELY INFLICTED
E982 POISONING BY OTHER GASES, UNDETERMINED WHETHER ACCIDENTALLY OR PURPOSELY INFLICTED

ICD-9-CM Trauma diagnosis codes (includes 4th and 5th digits):

See PSI 2 **Dealth in Low Mortality** DRGs for a list of trauma diagnosis codes.

DRGs:

Postoperative Hip Fracture (PSI 8)

See FTR 1 **Acute Renal Failure** for a list of trauma DRG codes.

ICD-9-CM Delirium and Other Psychoses diagnosis codes (includes 4th and 5th digits):

290 SENILE AND PRESENILE ORGANIC PSYCHOTIC CONDITIONS
291 ALCOHOLIC PSYCHOSES
292 DRUG PSYCHOSES
293 TRANSIENT ORGANIC PSYCHOTIC CONDITIONS
294 OTHER ORGANIC PSYCHOTIC CONDITIONS
295 SCHIZOPHRENIC DISORDERS
296 AFFECTIVE PSYCHOSES
297 PARANOID STATES
298 OTHER NONORGANIC PSYCHOSES
299 PSYCHOSES W/ ORIGIN SPECIFIC TO CHILDHOOD

ICD-9-CM Anoxic Brain Injury diagnosis code:

3481 ANOXIC BRAIN DAMAGE

ICD-9-CM Metastatic Cancer diagnosis codes (includes 4th and 5th digits):

196 SECONDARY AND UNSPECIFIED MALIGNANT NEOPLASM OF LYMPH NODES
197 SECONDARY MALIGNANT NEOPLASM OF RESPIRATORY AND DIGESTIVE SYSTEMS
198 SECONDARY MALIGNANT NEOPLASM OF OTHER SPECIFIED SITES
1990 MALIGNANT NEOPLASM W/O SPECIFICATION OF SITE, DISSEMINATED

ICD-9-CM Lymphoid Malignancy diagnosis codes (includes 4th and 5th digits):

200 LYMPHOSARCOMA AND RETICULOSARCOMA
201 HODGKIN'S DISEASE
202 OTHER MALIGNANT NEOPLASMS OF LYMPHOID AND HISTIOCYTIC TISSUE
203 MULTIPLE MYELOMA AND IMMUNOPROLIFERATIVE NEOPLASMS
204 LYMPHOID LEUKEMIA
205 MYELOID LEUKEMIA
206 MONOCYTIC LEUKEMIA
207 OTHER SPECIFIED LEUKEMIA
208 LEUKEMIA OF UNSPECIFIED CELL TYPE

ICD-9-CM Bone Malignancy diagnosis code (includes 4th and 5th digits):

170 MALIGNANT NEOPLASM OF BONE AND ARTICULAR CARTILAGE

ICD-9-CM Self-Inflicted Injury diagnosis codes:

See PSI 1 **Complications of Anesthesia** for a list of self-inflicted injury diagnosis codes.

Postoperative Hemorrhage or Hematoma (PSI 9)

Numerator:

Discharges with ICD-9-CM codes for postoperative hemorrhage or postoperative hematoma iin any secondary diagnosis field and codes for postoperative control of hemorrhage or drainage of hematoma in any procedure code field.

ICD-9-CM Postoperative Hematoma diagnosis code:

Postoperative Hemorrhage or Hematoma (PSI 9)

99812 HEMATOMA COMPLICATING A PROCEDURE

ICD-9-CM Postoperative Hemorrhage diagnosis code:

99811 HEMORRHAGE COMPLICATING A PROCEDURE

ICD-9-CM Control of Postoperative Hemorrhage procedure codes:

287 CONTROL OF HEMORRHAGE AFTER TONSILLECTOMY AND ADENOIDECTOMY
3880 OTHER SURGICAL OCCLUSION OF UNSPECIFIED SITE
3881 OTHER SURGICAL OCCLUSION OF INTRACRANIAL VESSELS
3882 OTHER SURGICAL OCCLUSION OF OTHER VESSELS OF HEAD AND NECK
3883 OTHER SURGICAL OCCLUSION OF UPPER LIMB VESSELS
3884 OTHER SURGICAL OCCLUSION OF AORTA, ABDOMINAL
3885 OTHER SURGICAL OCCLUSION OF THORACIC VESSEL
3886 OTHER SURGICAL OCCLUSION OF ABDOMINAL ARTERIES
3887 OTHER SURGICAL OCCLUSION OF ABDOMINAL VEINS
3888 OTHER SURGICAL OCCLUSION OF LOWER LIMB ARTERIES
3889 OTHER SURGICAL OCCLUSION OF LOWER LIMB VEINS
3941 CONTROL OF HEMORRHAGE FOLLOWING VASCULAR SURGERY
3998 CONTROL OF HEMORRHAGE NOS
4995 CONTROL OF (POSTOPERATIVE) HEMORRHAGE OF ANUS
5793 CONTROL OF (POSTOPERATIVE HEMORRHAGE OF BLADDER
6094 CONTROL OF (POSTOPERATIVE) HEMORRHAGE OF PROSTATE

ICD-9-CM Drainage of Hematoma procedure codes:

1809 OTHER INCISION OF EXTERNAL EAR
540 INCISION OF ABDOMINAL WALL
5412 REOPENING OF RECENT LAPAROTOMY SITE
5919 OTHER INCISION OF PERIVESICLE TISSUE
610 INCISION AND DRAINAGE OF SCROTUM AND TUNICA AND VAGINALIS
6998 OTHER OPERATIONS ON SUPPORTING STRUCTURES OF UTERUS
7014 OTHER VAGINOTOMY
7109 OTHER INCISION OF VULVA AND PERINEUM
7591 EVACUATION OF OBSTETRICAL INCISIONAL HEMATOMA OF PERINEUM
7592 EVACUATION OF OTHER HEMATOMA OF VULVA OR VAGINA
8604 OTHER INCISION W/ DRAINAGE OF SKIN AND SUBCUTANEOUS TISSUE

Denominator:

All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Exclude:

Patients with ICD-9-CM codes for postoperative hemorrhage or postoperative hematoma in the principal diagnosis field

Patients where the only operating room procedure is postoperative control of hemorrhage or drainage of hematoma.

Patients where a procedure for postoperative control of hemorrhage or drainage of hematoma occurs before the first operating room procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than

Postoperative Hemorrhage or Hematoma (PSI 9)

if the information was available.

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

Postoperative Physiologic and Metabolic Derangement (PSI 10)

Numerator:

Discharges with ICD-9-CM codes for physiologic and metabolic derangements in any secondary diagnosis field.

Discharges with acute renal failure (subgroup of physiologic and metabolic derangements) must be accompanied by a procedure code for dialysis (39.95, 54.98).

ICD-9-CM Physiologic and Metabolic Derangements diagnosis codes:

Diabetes with ketoacidosis:

25010 TYPE 2, OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED
25011 TYPE 1 NOT STATED AS UNCONTROLLED
25012 TYPE 2, OR UNSPECIFIED TYPE, UNCONTROLLED
25013 TYPE 1 UNCONTROLLED

Acute renal failure:

5845 W/ LESION OF TUBULAR NECROSIS
5846 W/ LESION OF RENAL CORTICAL NECROSIS
5847 W/ LESION OF RENAL MEDULLARY [PAPILLARY] NECROSIS
5848 W/ OTHER SPECIFIED PATHOLOGICAL LESION IN KIDNEY
5849 ACUTE RENAL FAILURE, UNSPECIFIED

Diabetes with hyperosmolarity:

25020 TYPE 2, OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED
25021 TYPE 1 NOT STATED AS UNCONTROLLED
25022 TYPE 2, OR UNSPECIFIED TYPE, UNCONTROLLED
25023 TYPE 1 UNCONTROLLED

Diabetes with other coma:

25030 TYPE 2, OR UNSPECIFIED TYPE, NOT STATED AS UNCONTROLLED
25031 TYPE 1 NOT STATED AS UNCONTROLLED
25032 TYPE 2, OR UNSPECIFIED TYPE, UNCONTROLLED
25033 TYPE 1 UNCONTROLLED

Denominator:

All elective* surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Elective

Admission type # is recorded as elective (ATYPE = 3)

Surgical Discharge DRGs:

Postoperative Physiologic and Metabolic Derangement (PSI 10)

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Exclude:

Patients with ICD-9-CM codes for physiologic and metabolic derangements in the principal diagnosis field.

Patients with acute renal failure where a procedure for dialysis occurs before or on the same day as the first operating room procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available.

Patients with both a diagnosis code of ketoacidosis, hyperosmolarity, or other coma (subgroups of physiologic and metabolic derangements coding) and a principal diagnosis of diabetes.

Patients with both a secondary diagnosis code for acute renal failure (subgroup of physiologic and metabolic derangements coding) and a principal diagnosis of acute myocardial infarction, cardiac arrhythmia, cardiac arrest, shock, hemorrhage, or gastrointestinal hemorrhage.

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

ICD-9-CM Diabetes diagnosis codes (includes 4th and 5th digits):

2500 DIABETES MELLITUS W/O MENTION OF COMPLICATION
2501 DIABETES W/ KETOACIDOSIS
2502 DIABETES W/ HYPEROSMOLARITY
2503 DIABETES W/ OTHER COMA
2504 DIABETES W/ RENAL MANIFESTATIONS
2505 DIABETES W/ OPHTHALMIC MANIFESTATIONS
2506 DIABETES W/ NEUROLOGICAL MANIFESTATIONS
2507 DIABETES W/ PERIPHERAL CIRCULATORY DISORDERS
2508 DIABETES W/ OTHER SPECIFIED MANIFESTATIONS
2509 DIABETES W/ OTHER UNSPECIFIED COMPLICATIONS

ICD-9-CM Acute Myocardial Infarction diagnosis codes:

See FTR 1 **Acute Renal Failure** for a list of acute myocardial infarction diagnosis codes.

ICD-9-CM Cardiac Arrhythmia diagnosis codes:

See FTR 1 **Acute Renal Failure** for a list of cardiac arrhythmia diagnosis codes.

DRGs:

138 CARDIAC ARRHYTHMIA AND CONDUCTION DISORDERS W/ CC
139 CARDIAC ARRHYTHMIA AND CONDUCTION DISORDERS W/O CC

ICD-9-CM Cardiac Arrest diagnosis code:

See FTR 1 **Acute Renal Failure** for a list of cardiac arrest diagnosis codes.

ICD-9-CM Shock diagnosis codes:

See FTR 1 **Acute Renal Failure** for a list of shock diagnosis codes.

ICD-9-CM Hemorrhage diagnosis codes:

See FTR 1 **Acute Renal Failure** for a list of hemorrhage diagnosis codes.

Postoperative Physiologic and Metabolic Derangement (PSI 10)

ICD-9-CM Gastrointestinal (GI) Hemorrhage diagnosis codes:

See FTR 1 **Acute Renal Failure** for a list of GI hemorrhage diagnosis codes.

Postoperative Respiratory Failure (PSI 11)

Numerator:

Discharges with ICD-9-CM codes for acute respiratory failure (518.81) in any secondary diagnosis field. (After 1999, include 518.84).

Denominator:

All elective* surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Elective:

Admission type # is recorded as elective (ATYPE = 3).

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Exclude:

Patients with ICD-9-CM codes for acute respiratory failure in the principal diagnosis field.

Patients where a procedure for tracheostomy is the only operating room procedure.

Patients where a procedure for tracheostomy occurs before the first operating room procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available.

Patients with respiratory or circulatory diseases (MDC 4 and 5).

Obstetrical patients in MDC 14 (Pregnancy, Childbirth, and the Puerperium).

ICD-9-CM Tracheostom yprocedure codes:

3121	MEDIASTINAL TRACHEOSTOMY
3129	OTHER PERM TRACHEOSTOMY
3174	REVISION OF TRACHEOSTOMY

Postoperative Pulmonary Embolism or Deep Vein Thrombosis (PSI 12)

Numerator:

Discharges with ICD-9-CM codes for deep vein thrombosis or pulmonary embolism in any secondary diagnosis field.

ICD-9-CM Deep Vein Thrombosis diagnosis codes:

45111	PHLEBITIS AND THROMBOSIS OF FEMORAL VEIN (DEEP) (SUPERFICIAL)
45119	PHLEBITIS AND THROMBOPHLEBITIS OF DEEP VESSEL OF LOWER EXTREMITIES – OTHER
4512	PHLEBITIS AND THROMBOPHLEBITIS OF LOWER EXTREMITIES UNSPECIFIED
45181	PHLEBITIS AND THROMBOPHLEBITIS OF ILIAC VEIN

Postoperative Pulmonary Embolism or Deep Vein Thrombosis (PSI 12)

4519 PHLEBITIS AND THROMBOPHLEBITIS OF OTHER SITES - OF UNSPECIFIED SITE
4538 OTHER VENOUS EMBOLISM AND THROMBOSIS OF OTHER SPECIFIED VEINS
4539 OTHER VENOUS EMBOLISM AND THROMBOSIS OF UNSPECIFIED SITE

ICD-9-CM Pulmonary Embolism diagnosis codes:

4151 PULMONARY EMBOLISM AND INFARCTION
41511 IATROGENIC PULMONARY EMBOLISM AND INFARCTION
41519 PULMONARY EMBOLISM AND INFARCTION, OTHER

Denominator:

All surgical discharges defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Exclude:

Patients with ICD-9-CM codes for deep vein thrombosis or pulmonary embolism in the principal diagnosis field.

Patients where a procedure for interruption of vena cava is the only operating room procedure

Patients where a procedure for interruption of vena cava occurs before or on the same day as the first operating room procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available.

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

ICD-9-CM Interruption Of Vena Cava procedure code:

387 INTERRUPTION OF VENA CAVA

Postoperative Sepsis (PSI 13)

Numerator:

Discharges with ICD-9-CM code for sepsis in any secondary diagnosis field.

ICD-9-CM Sepsis diagnosis codes:

0380 STREPTOCOCCAL SEPTICEMIA
0381 STAPHYLOCOCCAL SEPTICEMIA
03810 STAPHYLOCOCCAL SEPTICEMIA, UNSPECIFIED
03811 STAPHYLOCOCCUS AUREUS SEPTICEMIA
03819 OTHER STAPHYLOCOCCAL SEPTICEMIA
0382 PNEUMOCOCCAL SEPTICEMIA (STREPTOCOCCUS PNEUMONIAE SEPTICEMIA)
0383 SEPTICEMIA DUE TO ANAEROBES

Septicemia due to:

03840 GRAM-NEGATIVE ORGANISM, UNSPECIFIED
03841 HEMOPHILUS INFLUENZAE

Postoperative Sepsis (PSI 13)

03842	ESCHERICHIA COLI
03843	PSEUDOMONAS
03844	SERRATIA
03849	SEPTICEMIA DUE TO OTHER GRAM-NEGATIVE ORGANISMS
0388	OTHER SPECIFIED SEPTICEMIAS
0389	UNSPECIFIED SEPTICEMIA
99591	SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTIOUS PROCESS W/O ORGAN DYSFUNCTION
99592	SYSTEMIC INFLAMMATORY RESPONSE SYNDROME DUE TO INFECTIOUS PROCESS W/ ORGAN DYSFUNCTION

Denominator:

All elective* surgical defined by specific DRGs and an ICD-9-CM code for an operating room procedure (Appendix C).

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Elective:

Admission type # is recorded as elective (ATYPE = 3)

Exclude:

Patients with ICD-9-CM codes for sepsis in the principal diagnosis field,

Patients with a principal diagnosis of infection, or any code for immunocompromised state, or cancer.

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

Include only patients with a length of stay of 4 or more days.

ICD-9-CM Infection diagnosis codes:

See FTR 4 **Sepsis** for a list of infection diagnosis codes.

Infection DRGs:

See FTR 4 **Sepsis** for a list of infection DRG codes.

ICD-9-CM Immunocompromised States diagnosis codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised state diagnosis codes.

ICD-9-CM Immunocompromised States procedure codes:

See PSI 2 **Death in Low Mortality DRGs** for a list of immunocompromised state procedure codes.

ICD-9-CM Cancer diagnosis codes (includes 4^{th} and 5^{th} digits):

See PSI 2 **Death in Low Mortality DRGs** for a list of cancer diagnosis codes.

Cancer DRGs:

See PSI 7 Infection due to Medical Care for a list of cancer DRG codes.

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)

Numerator:

Discharges with ICD-9-CM code for reclosure of postoperative disruption of abdominal wall (54.61) in any procedure field.

Denominator:

All abdominopelvic surgical discharges.

Exclude:

Patients where a procedure for reclosure of postoperative disruption of abdominal wall occurs before or on the same day as the first abdominopelvic surgery procedure.

Note: If day of procedure is not available in the input data file, the rate may be slightly lower than if the information was available

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

ICD-9-CM Abdominopelvic procedure codes:

3804	INCISION OF AORTA
3806	INCISION OF ABDOMINAL ARTERIES
3807	INCISION OF ABDOMINAL VEINS
3814	ENDARTERECTOMY OF AORTA
3816	ENDARTERECTOMY OF ABDOMINAL ARTERIES
3834	RESECTION OF AORTA W/ ANASTOMOSIS
3836	RESECTION OF ABDOMINAL ARTERIES W/ ANASTOMOSIS
3837	RESECTION OF ABDOMINAL VEINS W/ ANASTOMOSIS
3844	RESECTION OF AORTA, ABDOMINAL W/ REPLACEMENT
3846	RESECTION OF ABDOMINAL ARTERIES W/ REPLACEMENT
3847	RESECTION OF ABDOMINAL VEINS W/ REPLACEMENT
3857	LIGATION AND STRIPPING OF VARICOSE VEINS, ABDOMINAL VEINS
3864	OTHER EXCISION OF AORTA, ABDOMINAL
3866	OTHER EXCISION OF ABDOMINAL ARTERIES
3867	OTHER EXCISION OF ABDOMINAL VEINS
3884	OTHER SURGICAL OCCLUSION OF AORTA, ABDOMINAL
3886	OTHER SURGICAL OCCLUSION OF ABDOMINAL ARTERIES
3887	OTHER SURGICAL OCCLUSION OF ABDOMINAL VEINS
391	INTRA-ABDOMINAL VENOUS SHUNT
3924	AORTA-RENAL BYPASS
3925	AORTA-ILIAC-FEMORAL BYPASS
3926	OTHER INTRA-ABDOMINAL VASCULAR SHUNT OR BYPASS
4052	RADICAL EXCISION OF PERIAORTIC LYMPH NODES
4053	RADICAL EXCISION OF ILIAC LYMPH NODES
412	SPLENOTOMY
4133	OPEN BIOPSY OF SPLEEN
4141	MARSUPIALIZATION OF SPLENIC CYST
4142	EXCISION OF LESION OR TISSUE OF SPLEEN
4143	PARTIAL SPLENECTOMY
415	TOTAL SPLENECTOMY
4193	EXCISION OF ACCESSORY SPLEEN
4194	TRANSPLANTATION OF SPLEEN
4195	REPAIR AND PLASTIC OPERATIONS ON SPLEEN
4199	OTHER OPERATIONS ON SPLEEN
4240	ESOPHAGECTOMY, NOS
4241	PARTIAL ESOPHAGECTOMY
4242	TOTAL ESOPHAGECTOMY
4253	INTRATHORACIC ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF SMALL BOWEL
4254	OTHER INTRATHORACIC ESOPHAGOENTEROSTOMY
4255	INTRATHORACIC ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF COLON

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)	
4256	OTHER INTRATHORACIC ESOPHAGOCOLOSTOMY
4263	ANTESTERNAL ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF SMALL BOWEL
4264	OTHER ANTESTERNAL ESOPHAGOENTEROSTOMY
4265	ANTESTERNAL ESOPHAGEAL ANASTOMOSIS W/ INTERPOSITION OF COLON
4266	OTHER ANTESTERNAL ESOPHAGOCOLOSTOMY
4291	LIGATION OF ESOPHAGEAL VARICES
430	GASTROSTOMY
433	PYLOROMYOTOMY
4342	LOCAL EXCISION OF OTHER LESION OR TISSUE OF STOMACH
4349	OTHER DESTRUCTION OF LESION OR TISSUE OF STOMACH
435	PARTIAL GASTRECTOMY W/ ANASTOMOSIS TO ESOPHAGUS
436	PARTIAL GASTRECTOMY W/ ANASTOMOSIS TO DUODENUM
437	PARTIAL GASTRECTOMY W/ ANASTOMOSIS TO JEJUNUM
4381	PARTIAL GASTRECTOMY W/ JEJUNA TRANSPOSITION
4389	OTHER PARTIAL GASTRECTOMY
4391	TOTAL GASTRECTOMY W/ INTESTINAL INTERPOSITION
4399	OTHER TOTAL GASTRECTOMY
4400	VAGOTOMY, NOS
4401	TRUNCAL VAGOTOMY
4402	HIGHLY SELECTIVE VAGOTOMY
4403	OTHER SELECTIVE VAGOTOMY
4411	TRANSABDOMINAL GASTROSCOPY
4415	OPEN BIOPSY OF STOMACH
4421	DILATION OF PYLORUS BY INCISION
4429	OTHER PYLOROPLASTY
4431	HIGH GASTRIC BYPASS
4439	OTHER GASTROENTEROSTOMY
4440	SUTURE OF PEPTIC ULCER, NOS
4441	SUTURE OF GASTRIC ULCER SITE
4442	SUTURE OF DUODENAL ULCER SITE
445	REVISION OF GASTRIC ANASTOMOSIS
4461	SUTURE OF LACERATION OF STOMACH
4463	CLOSURE OF OTHER GASTRIC FISTULA
4464	GASTROPEXY
4465	ESOPHAGOGASTROPLASTY
4466	OTHER PROCEDURES FOR CREATION OF ESOPHAGOGASTRIC SPHINCTERIC COMPETENCE
4469	OTHER REPAIR OF STOMACH
4491	LIGATION OF GASTRIC VARICES
4492	INTRAOPERATIVE MANIPULATION OF STOMACH
4500	INCISION OF INTESTINE, NOS
4501	INCISION OF DUODENUM
4502	OTHER INCISION OF SMALL INTESTINE
4503	INCISION OF LARGE INTESTINE
4531	OTHER LOCAL EXCISION OF LESION OF DUODENUM
4532	OTHER DESTRUCTION OF LESION OF DUODENUM
4533	LOCAL EXCISION OF LESION OR TISSUE OF SMALL INTESTINE, EXCEPT DUODENUM
4534	OTHER DESTRUCTION OF LESION OF SMALL INTESTINE, EXCEPT DUODENUM
4541	EXCISION OF LESION OR TISSUE OF LARGE INTESTINE
4549	OTHER DESTRUCTION OF LESION OF LARGE INTESTINE
4550	ISOLATION OF INTESTINAL SEGMENT, NOS
4551	ISOLATION OF SEGMENT OF SMALL INTESTINE
4552	ISOLATION OF SEGMENT OF LARGE INTESTINE
4561	MULTIPLE SEGMENTAL RESECTION OF SMALL INTESTINE
4562	OTHER PARTIAL RESECTION OF SMALL INTESTINE
4563	TOTAL REMOVAL OF SMALL INTESTINE
4571	MULTIPLE SEGMENTAL RESECTION OF LARGE INTESTINE
4572	CESECTOMY
4573	RIGHT HEMICOLECTOMY
4574	RESECTION OF TRANSVERSE COLON
4575	LEFT HEMICOLECTOMY
4576	SIGMOIDECTOMY
4579	OTHER PARTIAL EXCISION OF LARGE INTESTINE

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)	
458	TOTAL INTRA-ABDOMINAL COLECTOMY
4590	INTESTINAL ANASTOMOSIS, NOS
4591	SMALL-TO-SMALL INTESTINAL ANASTOMOSIS
4592	ANASTOMOSIS OF SMALL INTESTINE TO RECTAL STUMP
4593	OTHER SMALL-TO-LARGE INTESTINAL ANASTOMOSIS
4594	LARGE-TO-LARGE INTESTINAL ANASTOMOSIS
4595	ANASTOMOSIS TO ANUS
4601	EXTERIORIZATION OF SMALL INTESTINE
4603	EXTERIORIZATION OF LARGE INTESTINE
4610	COLOSTOMY, NOS
4611	TEMPORARY COLOSTOMY
4613	PERMANENT COLOSTOMY
4620	ILEOSTOMY, NOS
4621	TEMPORARY ILESOSTOMY
4622	CONTINENT ILEOSTOMY
4623	OTHER PERMANENT ILEOSTOMY
4640	REVISION OF INTESTINA STOMA, NOS
4641	REVISION OF STOMA OF SMALL INTESTINE
4642	REPAIR OF PERICOLOSTOMY HERNIA
4643	OTHER REVISION OF STOMA OF LARGE INTESTINE
4650	CLOSURE OF INTESTINAL STOMA, NOS
4651	CLOSURE OF STOMA OF SMALL INTESTINE
4652	CLOSURE OF STOMA OF LARGE INTESTINE
4660	FIXATION OF INTESTINE, NOS
4661	FIXATION OF SMALL INTESTINE TO ABDOMINAL WALL
4662	OTHER FIXATION OF SMALL INTESTINE
4663	FIXATION OF LARGE INTESTINE TO ABDOMINAL WALL
4664	OTHER FIXATION OF LARGE INTESTINE
4672	CLOSURE OF FISTULA OF DUODENUM
4674	CLOSURE OF FISTULA OF SMALL INTESTINE, EXCEPT DUODENUM
4676	CLOSURE OF FISTULA OF LARGE INTESTINE
4680	INTRA-ABDOMINAL MANIPULATION OF INTESTINE, NOS
4681	INTRA-ABDOMINAL MANIPULATION OF SMALL INTESTINE
4682	INTRA-ABDOMINAL MANIPULATION OF LARGE INTESTINE
4691	MYOTOMY OF SIGMOID COLON
4692	MYOTOMY OF OTHER PARTS OF COLON
4693	REVISION OF ANASTOMOSIS OF SMALL INTESTINE
4694	REVISION OF ANASTOMOSIS OF LARGE INTESTINE
4699	OTHER OPERATIONS ON INTESTINES
4709	OTHER APPENDECTOMY
4719	OTHER INCIDENTAL APPENDECTOMY
472	DRAINAGE OF APPENDICEAL ABSCESS
4791	APPENDECTOMY
4792	CLOSURE OF APPENDICEAL FISTULA
4799	OTHER OPERATIONS ON APPENDIX, OTHER
4841	SUBMUCOSAL RESECTION OF RECTUM
4849	OTHER PULL-THROUGH RESECTION OF RECTUM
485	ABDOMINOPERINEAL RESECTION OF RECTUM
4875	ABDOMINAL PROCTOPEXY
500	HEPATOTOMY
5012	OPEN BIOPSY OF LIVER
5021	MARSUPIALIZATION OF LESION OF LIVER
5022	PARTIAL HEPATECTOMY
5029	OTHER DESTRUCTION OF LESION OF LIVER
503	LOBECTOMY OF LIVER
504	TOTAL HEPATECTOMY
5051	AUXILIARY LIVER TRANSPLANT
5059	OTHER TRANSPLANT OF LIVER
5069	OTHER REPAIR OF LIVER
5103	OTHER CHOLECYSTOSTOMY
5104	OTHER CHOLECYSTOTOMY
5113	OPEN BIOPSY OF GALLBLADDER OR BILE DUCTS

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)	
5121	OTHER PARTIAL CHOLECYSTECTOMY
5122	CHOLECYSTECTOMY
5131	ANASTOMOSIS OF GALLBLADDER TO HEPATIC DUCTS
5132	ANASTOMOSIS OF GALLBLADDER TO INTESTINE
5133	ANASTOMOSIS OF GALLBLADDER TO PANCREAS
5134	ANASTOMOSIS OF GALLBLADDER TO STOMACH
5135	OTHER GALLBLADDER ANASTOMOSIS
5136	CHOLEDOCHOENTEROSTOMY
5137	ANASTOMOSIS OF HEPATIC DUCT TO GASTROINTESTINAL TRACT
5139	OTHER BILE DUCT ANASTOMOSIS
5141	COMMON DUCT EXPLORATION FOR REMOVAL OF CALCULUS
5142	COMMON DUCT EXPLORATION FOR RELIEF OF OTHER OBSTRUCTION
5143	INSERTION OF CHOLEDOCHOHEPATIC TUBE FOR DECOMPRESSION
5149	INCISION OF OTHER BILE DUCTS FOR RELIEF OF OBSTRUCTION
5151	EXPLORATION OF COMMON DUCT
5159	INCISION OF OTHER BILE DUCT
5161	EXCISION OF CYSTIC DUCT REMNANT
5162	EXCISION OF AMPULLA OF VATER W/ REIMPLANTATION OF COMMON DUCT
5163	OTHER EXCISION OF COMMON DUCT
5169	EXCISION OF OTHER BILE DUCT
5171	SIMPLE SUTURE OF COMMON BILE DUCT
5172	CHOLEDOCHOPLASTY
5179	REPAIR OF OTHER BILE DUCTS
5181	DILATION OF SPHINCTER OF ODDI
5182	PANCREATIC SPHINCTEROTOMY
5183	PANCREATIC SPHINCTEROPLASTY
5189	OTHER OPERATIONS ON SPHINCTER OF ODDI
5192	CLOSURE OF CHOLECYSTOSTOMY
5193	CLOSURE OF OTHER BILIARY FISTULA
5194	REVISION OF ANASTOMOSIS OF BILIARY TRACT
5195	REMOVAL OF PROSTHETIC DEVICE FROM BILE DUCT
5199	OTHER OPERATIONS ON BILIARY TRACT
5201	DRAINAGE OF PANCREATIC CYST BY CATHETER
5209	OTHER PANCREATOTOMY
5212	OPEN BIOPSY OF PANCREAS
5222	OTHER EXCISION OR DESTRUCTION OF LESION OR TISSUE OF PANCREAS OR PANCREATIC DUCT
523	MARSUPIALIZATION OF PANCREATIC CYST
524	INTERNAL DRAINAGE OF PANCREATIC CYST
5251	PROXIMAL PANCREATECTOMY
5252	DISTAL PANCREATECTOMY
5253	RADICAL SUBTOTAL PANCREATECTOMY
5259	OTHER PARTIAL PANCREATECTOMY
526	TOTAL PANCREATECTOMY
527	RADICAL PANCREATICODUODENECTOMY
5280	PANCREATIC TRANSPLANT, NOS
5281	REIMPLANTATION
5282	HOMOTRANSPLANT OF PANCREAS
5283	HETEROTRANSPLANT OF PANCREAS
5292	CANNULATION OF PANCREATIC DUCT
5295	OTHER REPAIR OF PANCREAS
5296	ANASTOMOSIS OF PANCREAS
5299	OTHER OPERATIONS ON PANCREAS
5300	UNILATERAL REPAIR OF INGUINAL HERNIA, NOS
5301	REPAIR OF DIRECT INGUINAL HERNIA
5302	REPAIR OF INDIRECT INGUINAL HERNIA
5303	REPAIR OF DIRECT INGUINAL HERNIA W/ GRAFT OR PROSTHESIS
5304	REPAIR OF INDIRECT INGUINAL HERNIA W/ GRAFT OR PROSTHESIS
5305	REPAIR OF INGUINAL HERNIA W/ GRAFT OR PROSTHESIS, NOS
5310	BILATERAL REPAIR OF INGUINAL HERNIA, NOS
5311	BILATERAL REPAIR OF DIRECT INGUINAL HERNIA
5312	BILATERAL REPAIR OF INDIRECT INGUINAL HERNIA

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)	
5313	BILATERAL REPAIR OF INGUINAL HERNIA, ONE DIRECT AND ONE INDIRECT
5314	BILATERAL REPAIR OF DIRECT INGUINAL HERNIA W/ GRAFT OR PROSTHESIS
5315	BILATERAL REPAIR OF INDIRECT INGUINAL HERNIA W/ GRAFT OR PROSTHESIS
5316	BILATERAL REPAIR OF INGUINAL HERNIA, ONE DIRECT AND ONE INDIRECT, W/ GRAFT OR PROSTHESIS
5317	BILATERAL INGUINAL HERNIA REPAIR W/ GRAFT OR PROSTHESIS, NOS
5321	UNILATERAL REPAIR OF FEMORAL HERNIA
5329	OTHER UNILATERAL FEMORAL HERNIORRHAPHY
5331	BILATERAL REPAIR OF FEMORAL HERNIA W/ GRAFT OR PROSTHESIS
5339	OTHER BILATERAL FEMORAL HERNIORRHAPHY
5341	REPAIR OF UMBILICAL HERNIA W/ PROSTHESIS
5349	OTHER UMBILICAL HERNIORRHAPHY
5351	INCISIONAL HERNIA REPAIR
5359	REPAIR OF OTHER HERNIA OF ANTERIOR ABDOMINAL WALL
5361	INCISIONAL HERNIA REPAIR W/ PROSTHESIS
5369	REPAIR OF OTHER HERNIA OF ANTERIOR ABDOMINAL WALL W/ PROSTHESIS
537	REPAIR OF DIAPHRAGMATIC HERNIA, ABDOMINAL APPROACH
540	INCISION OF ABDOMINAL WALL
5411	EXPLORATORY LAPAROTOMY
5419	OTHER LAPAROTOMY
5422	BIOPSY OF ABDOMINAL WALL OR UMBILICUS
5423	BIOPSY OF ABDOMINAL WALL OR UMBILICUS
543	EXCISION OR DESTRUCTION OF LESION OR TISSUE OF ABDOMINAL WALL OR UMBILICUS
544	EXCISION OR DESTRUCTION OF PERITONEAL TISSUE
5459	OTHER LYSIS OF PERITONEAL ADHESIONS
5463	OTHER SUTURE OF ABDOMINAL WALL
5464	SUTURE OF PERITONEUM
5471	REPAIR OF GASTROSCHISIS
5472	OTHER REPAIR OF ABDOMINAL WALLS
5473	OTHER REPAIR OF PERITONEUM
5474	OTHER REPAIR OF OMENTUM
5475	OTHER REPAIR OF MESENTERY
5492	REMOVAL OF FOREIGN BODY FROM PERITONEAL CAVITY
5493	CREATION OF CUTANEOPERITONEAL FISTULA
5494	CREATION OF PERITONEOVASCULAR SHUNT
5495	INCISION OF PERITONEUM
5551	NEPHROURETERECTOMY
5552	NEPHRECTOMY OF REMAINING KIDNEY
5553	REMOVAL OF TRANSPLANTED OR REGECTED KIDNEY
5554	BILATERAL NEPHRECTOMY
5561	RENAL AUTOTRANSPLANTATION
5569	ULCERATIVE COLITIS, UNSPECIFIED
557	NEPHROPEXY
5583	CLOSURE OF OTHER FISTULA OF KIDNEY
5584	REDUCTION OF TORSION OF RENAL
5585	SYMPHYSIOTOMY FOR HORESHOE KIDNEY
5586	ANASTOMOSIS OF KIDNEY
5587	CORRECTION OF URETEROPELVIC JUNCTION
5591	DECAPSULATION OF KIDNEY
5597	IMPLANTATION OR REPLACEMENT OF MECHANICAL KIDNEY
5598	REMOVAL OF MECHANICAL KIDNEY
5651	FORMATION OF CUTANEOUS URETERO-ILEOSTOMY
5652	REVISION OF CUTANEOUS URETERO-ILEOSTOMY
5661	FORMATION OF OTHER CUTANEOUS URETEROSTOMY
5662	REVISION OF OTHER CUTANEOUS URETEROSTOMY
5671	URINARY DIVERSION TO INTESTINE
5672	REVISION OF URETEROINTESTINAL ANASTOMOSIS
5673	NEPHROCYSTANASTOMOSIS, NOS
5674	URETERONEOXYSTOSTOMY
5675	TRANSURETEROURETEROSTOMY
5683	CLOSURE OF URETEROSTOMY
5684	CLOSURE OF OTHER FISTULA OF URETER

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)	
5685	URETEROPEXY
5686	REMOVAL OF LIGATURE FROM URETER
5689	OTHER REPAIR OF URETER
5695	LIGATION OF URETER
5771	RADICAL CYSTECTOMY
5779	OTHER TOTAL CYSTECTOMY
5782	CLOSURE OF CYSTOSTOMY
5787	RECONSTRUCTION OF URINARY BLADDER
5900	RETROPERITONEAL DISSECTION, NOS
5902	OTHER LYSIS OF PERIRENAL OR PERIURETERAL ADHESIONS
5909	OTHER INCISION OF PERIRENAL OR PERIURETERAL TISSUE
6012	OPEN BIOPSY OF PROSTATE
6014	OPEN BIOPSY OF SEMINAL VESICLES
6015	BIOPSY OF PERIPROSTATIC TISSUE
603	SUPRAPUBIC PROSTATECTOMY
604	RETROPUBIC PROSTATECTOMY
605	RADICAL PROSTATECTOMY
6061	LOCAL EXCISION OF LESION OF PROSTATE
6072	INCISION OF SEMINAL VESICLE
6073	EXCISION OF SEMINAL VESICLE
6079	OTHER OPERATIONS ON SEMINAL VESICLES
6093	REPAIR OF PROSTATE
6509	OTHER OOPHORECTOMY
6512	OTHER BIOPSY OF OVARY
6521	MARSUPIALIZATION OF OVARIAN CYST
6522	WEDGE RESECTION OF OVARY
6529	OTHER LOCAL EXCISION OR DESTRUCTION OF OVARY
6539	OTHER UNLILATERAL OOPHORECTOMY
6549	OTHER UNILATERAL SALPINGOOPHORECTOMY
6551	OTHER REMOVAL OF BOTH OVARIES AT SAME OPERATIVE EPISODE
6552	OTHER REMOVAL OF REMAINING OVARY
6561	OTHER REMOVAL OF BOTH OVARIES AND TUBES AT SAME OPERATIVE EPISODE
6562	OTHER REMOVAL OF REMAINING OVARY AND TUBE
6571	OTHER SIMPLE SUTURE OF OVARY
6572	OTHER REIMPLANTATION OF OVARY
6573	OTHER SALPINGO OOPHOROPLASTY
6579	OTHER REPAIR OF OVARY
6589	OTHER LYSIS OF ADHESIONS OF OVARY AND FALLOPIAN TUBE
6592	TRANSPLANTATION OF OVARY
6593	MANUAL RUPTURE OF OVARIAN CYST
6594	OVARIAN DENERVATION
6595	RELEASE OF TORSION OF OVARY
6599	OTHER OPERATIONS ON OVARY
6601	SALPINGOTOMY
6602	SALPINGOSTOMY
6631	OTHER BILATERAL LIGATION AND CRUSHING OF FALLOPIAN TUBES
6632	OTHER BILATERAL LIGATION AND DIVISION OF FALLOPIAN TUBES
6639	OTHER BILATERAL DESTRUCTION OR OCCLUSION OF FALLOPIAN TUBES
664	TOTAL UNILATERAL SALPINGECTOMY
6651	REMOVAL OF BOTH FALLOPIAN TUBES AT SAME OPERATIVE EPISODE
6652	REMOVAL OF REMAINING FALLOPIAN TUBE
6661	EXCISION OR DESTRUCTION OF LESION OF FALLOPIAN TUBE
6662	SALPINGECTOMY W/ REMOVAL OF TUBAL PREGNANCY
6663	BILATERAL PARTIAL SALPINGECTOMY, NOS
6669	OTHER PARTIAL SALPINGECTOMY
6671	SIMPLE SUTURE OF FALLOPIAN TUBE
6672	SALPINGO-OOPHOROSTOMY
6673	SALPINGO-SALPINGOSTOMY
6674	SALPINGO-UTEROSTOMY
6679	OTHER REPAIR OF FALLOPIAN TUBE
6692	UNILATERAL DESTRUCTION OR OCCLUSION OF FALLOPIAN TUBE
6697	BURYING OF FIMBRIAE IN UTERINE WALL

Postoperative Wound Dehiscence, Secondary Diagnosis Field (PSI 14)

680 OTHER INCISION AND EXCISION OF UTERUS
6813 OPEN BIOPSY OF UTERUS
6814 OPEN BIOPSY OF UTERINE LIGAMENTS
683 SUBTOTAL ABDOMINAL HYSTERECTOMY
6839 OTHER SUBTOTAL ABDOMINAL HYSTERECTOMY (OCT 03)
684 TOTAL ABDOMINAL HYSTERECTOMY
686 RADICAL ABDOMINAL HYSTERECTOMY
688 PELVIC EVISCERATION
6922 OTHER UTERINE SUSPENSION
693 PARACERVICAL UTERINE DENERVATION
6941 SUTURE OF LACERATION OF UTERUS
6942 CLOSURE OF FISTULA OF UTERUS
6949 OTHER REPAIR OF UTERUS

Accidental Puncture or Laceration, Secondary Diagnosis Field (PSI 15)

Numerator:

Discharges with ICD-9-CM code denoting accidental cut, puncture, perforation or laceration during a procedure in any secondary diagnosis field.

*ICD-9-CM Accidental Puncture or Laceration**diagnosis codes:*

Accidental cut, puncture, perforation, or hemorrhage during medical care:

E8700 SURGICAL OPERATION
E8701 INFUSION OR TRANSFUSION
E8702 KIDNEY DIALYSIS OR OTHER PERFUSION
E8703 INJECTION OR VACCINATION
E8704 ENDOSCOPIC EXAMINATION
E8705 ASPIRATION OF FLUID OR TISSUE, PUNCTURE, AND CATHETERIZATION
E8706 HEART CATHETERIZATION
E8707 ADMINISTRATION OF ENEMA
E8708 OTHER SPECIFIED MEDICAL CARE
E8709 UNSPECIFIED MEDICAL CARE

9982 ACCIDENTAL PUNCTURE OR LACERATION DURING A PROCEDURE

Denominator:

All medical and surgical discharges defined by specific DRGs.

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Medical Discharge DRGs:

See PSI 3 **Decubitus Ulcer** for a list of medical DRG codes.

Exclude:

Patients with ICD-9-CM code denoting technical difficulty (e.g., accidental cut, puncture, perforation, or laceration) in the principal diagnosis field

Obstetrical patients in MDC 14 (Pregnancy, Childbirth and the Puerperium).

Transfusion Reaction, Secondary Diagnosis Field (PSI 16)

Numerator:

Discharges with ICD-9-CM codes for transfusion reaction in any secondary diagnosis field.

ICD-9-CM Transfusion Reaction diagnosis codes:

9996	ABO INCOMPATIBILITY REACTION
9997	RH INCOMPATIBILITY REACTION
E8760	MISMATCHED BLOOD IN TRANSFUSION

Denominator:

All medical and surgical discharges defined by specific DRGs.

Surgical Discharge DRGs:

See PSI 1 **Complications of Anesthesia** for a list of surgical DRG codes.

Medical Discharge DRGs:

See PSI 3 **Decubitus Ulcer** for a list of medical DRG codes.

Exclude:

Patients with ICD-9-CM code for transfusion reaction in the principal diagnosis field

Birth Trauma—Injury to Neonate (PSI 17)

Numerator:

Discharges with ICD-9-CM codes for birth trauma in any diagnosis field.

ICD-9-CM Birth Trauma diagnosis codes:

7670	SUBDURAL AND CEREBRAL HEMORRHAGE (DUE TO TRAUMA OR TO INTRAPARTUM ANOXIA OR HYPOXIA)
76711	EPICRANIAL SUBAPONEUROTIC HEMORRHAGE (MASSIVE) (OCT 03)
7673	INJURIES TO SKELETON (EXCLUDES CLAVICLE)
7674	INJURY TO SPINE AND SPINAL CORD
7677	OTHER CRANIAL AND PERIPHERAL NERVE INJURIES
7678	OTHER SPECIFIED BIRTH TRAUMA
7679	BIRTH TRAUMA, UNSPECIFIED

Note: Because 767.1 was not previously included in the numerator specification, the addition of 767.11 may cause an increase in the rate.

Exclude:

Infants with a subdural or cerebral hemorrhage (subgroup of birth trauma coding) **and** any diagnosis code of pre-term infant (denoting birth weight of less than 2,500 grams and less than 37 weeks gestation or 34 weeks gestation or less).
Infants with injury to skeleton (767.3, 767.4) **and** any diagnosis code of osteogenesis imperfecta (756.51).

Birth Trauma—Injury to Neonate (PSI 17)

ICD-9-CM Preterm Infant diagnosis codes:

76501 EXTREME IMMATURITY, LESS THAN 500 GRAMS
76502 EXTREME IMMATURITY, 500 – 749 GRAMS
76503 EXTREME IMMATURITY, 750 – 999 GRAMS
76504 EXTREME IMMATURITY, 1000 – 1249 GRAMS
76505 EXTREME IMMATURITY, 1250 – 1499 GRAMS
76506 EXTREME IMMATURITY, 1500 – 1749 GRAMS
76507 EXTREME IMMATURITY, 1750 – 1999 GRAMS
76508 EXTREME IMMATURITY, 2000 – 2499 GRAMS
76511 OTHER PRETERM INFANTS, LESS THAN 500 GRAMS
76512 OTHER PRETERM INFANTS, 500 – 749 GRAMS
76513 OTHER PRETERM INFANTS, 750 – 999 GRAMS
76514 OTHER PRETERM INFANTS, 1000 – 1249 GRAMS
76515 OTHER PRETERM INFANTS, 1250 – 1499 GRAMS
76516 OTHER PRETERM INFANTS, 1500 – 1749 GRAMS
76517 OTHER PRETERM INFANTS, 1750 – 1999 GRAMS
76518 OTHER PRETERM INFANTS, 2000 – 2499 GRAMS
76521 LESS THAN 24 COMPLETED WEEKS OF GESTATION
76522 24 COMPLETED WEEKS OF GESTATION
76523 25-26 COMPLETED WEEKS OF GESTATION
76524 27-28 COMPLETED WEEKS OF GESTATION
76525 29-30 COMPLETED WEEKS OF GESTATION
76526 31-32 COMPLETED WEEKS OF GESTATION
76527 33-34 COMPLETED WEEKS OF GESTATION

Denominator:

All liveborn births.

Admission type recorded as (4):

AND

Liveborn DRGs:

385 NEONATES, DIED OR TRANSFERRED TO ANOTHER ACUTE CARE FACILITY
386 EXTREME IMMATURITY OR RESPIRATORY DISTRESS SYNDROME OF NEONATE
387 PREMATURITY W/ MAJOR PROBLEMS
388 PREMATURITY W/O MAJOR PROBLEMS
389 FULL TERM NEONATE W/ MAJOR PROBLEMS
390 NEONATE W/ OTHER SIGNIFICANT PROBLEMS
391 NORMAL NEWBORN

OR

ICD-9-CM Liveborn diagnosis codes (includes 4th and 5th digits):*

764 SLOW FETAL GROWTH AND FETAL MALNUTRITION
765 DISORDERS RELATING TO SHORT GESTATION AND UNSPECIFIED LOW BIRTH WEIGHT
766 DISORDERS RELATING TO LONG GESTATION AND HIGH BIRTH WEIGHT
76621 POST-TERM INFANT (OCT 03)
76622 PROLONGED GESTATION - INFANT (OCT 03)
767 BIRTH TRAUMA
76711 EPICRANIAL SUBAPONEUROTIC HEMORRHAGE (MASSIVE) (OCT 03)
76719 OTHER INJURIES TO SCALP (OCT 03)
768 INTRAUTERINE HYPOXIA AND BIRTH ASPHYXIA
769 RESPIRATORY DISTRESS SYNDROME
770 OTHER RESPIRATORY CONDITIONS OF FETUS AND NEWBORN

Birth Trauma—Injury to Neonate (PSI 17)

77081 PRIMARY APNEA OF NEWBORN (OCT 02)
77082 OTHER APNEA OF NEWBORN (OCT 02)
77083 CYANOTIC ATTACKS OF NEWBORN (OCT 02)
77084 RESPIRATORY FAILURE OF NEWBORN (OCT 02)
77089 OTHER RESPIRATORY PROBLEMS AFTER BIRTH (OCT 02)
771 INFECTIONS SPECIFIC TO THE PERINATAL PERIOD
77181 SEPTICEMIA [SEPSIS] OF NEWBORN (OCT 02)
77182 URINARY TRACT INFECTION OF NEWBORN (OCT 02)
77183 BACTEREMIA OF NEWBORN (OCT 02)
77189 OTHER INFECTIONS SPECIFIC TO THE PERINATAL PERIOD (OCT 02)
772 FETAL AND NEONATAL HEMORRHAGE
77210 BLEEDING WITH ENLARGEMENT OF VENTRICLE, UNSPECIFIED GRADE (OCT 01)
77211 BLEEDING WITH ENLARGEMENT OF VENTRICLE, GRADE I (OCT 01)
77212 BLEEDING WITH ENLARGEMENT OF VENTRICLE, GRADE II (OCT 01)
77213 BLEEDING WITH ENLARGEMENT OF VENTRICLE, GRADE III (OCT 01)
77214 BLEEDING WITH ENLARGEMENT OF VENTRICLE, GRADE IV (OCT 01)
773 HEMOLYTIC DISEASE OF FETUS OR NEWBORN, DUE TO ISOIMMUNIZATION
774 OTHER PERINATAL JAUNDICE
775 ENDOCRINE AND METABOLIC DISTURBANCES SPECIFIC TO THE FETUS AND NEWBORN
776 HEMATOLOGICAL DISORDERS OF FETUS AND NEWBORN
777 PERINATAL DISORDERS OF DIGESTIVE SYSTEM
778 CONDITIONS INVOLVING THE INTEGUMENT AND TEMPERATURE REGULATION OF FETUS AND NEWBORN
779 OTHER AND ILL-DEFINED CONDITIONS ORIGINATING IN THE PERINATAL PERIOD
77981 NEONATAL BRADYCARDIA (OCT 02)
77982 NEONATAL TACHYCARDIA (OCT 02)
77983 DELAYED SEPARATION OF UMBILICAL CORD (OCT 03)
77989 OTHER SPECIFIED CONDITIONS ORIGINATING IN THE PERINATAL PERIOD (OCT 02)
V30 SINGLE LIVEBORN
V31 TWIN, MATE LIVEBORN
V32 TWIN, MATE STILLBORN
V33 TWIN, UNSPECIFIED
V34 OTHER MULTIPLE, MATES ALL LIVEBORN
V35 OTHER MULTIPLE, MATES ALL STILLBORN
V36 OTHER MULTIPLE, MATES LIVE- AND STILLBORN
V37 OTHER MULTIPLE, UNSPECIFIED
V39 UNSPECIFIED

* Does not include diagnosis codes 768.0, 768.1 and 779.6

Obstetric Trauma—Vaginal Delivery with Instrument (PSI 18 and 27)

Numerator:

Discharges with ICD-9-CM codes for obstetric trauma in any diagnosis or procedure field.

ICD-9-CM Obstetric Trauma diagnosis codes:

66420,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, THIRD DEGREE PERINEAL LACERATION (PSI 27 ONLY)
66430,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, FOURTH DEGREE PERINEAL LACERATION
66530,1,4 OTHER OBSTETRICAL TRAUMA, LACERATION OF CERVIX
66540,1,4 OTHER OBSTETRICAL TRAUMA, HIGH VAGINAL LACERATIONS
66550,1,4 OTHER OBSTETRICAL TRAUMA, OTHER INJURY TO PELVIC ORGANS

ICD-9-CM Obstetric Trauma procedure codes:

Obstetric Trauma—Vaginal Delivery with Instrument (PSI 18 and 27)

7550 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF UTERUS
7551 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CERVIX
7552 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CORPUS UTERI
7561 REPAIR OF CURRENT OBSTETRIC LACERATION OF BLADDER AND URETHRA
7562 REPAIR OF CURRENT OBSTETRIC LACERATION OF RECTUM AND SPHINCTER ANI

Denominator:

All vaginal delivery discharges with any procedure code for instrument-assisted delivery.

Vaginal Delivery DRGs:

372 VAGINAL DELIVERY W/ COMPLICATING DIAGNOSES
373 VAGINAL DELIVERY W/O COMPLICATING DIAGNOSES
374 VAGINAL DELIVERY W/ STERILIZATION AND/OR D AND C
375 VAGINAL DELIVERY W/ OR PROCEDURE EXCEPT STERILIZATION AND/OR D AND C

ICD-9-CM Instrument-Assisted Delivery procedure codes:

720 LOW FORCEPS OPERATION
721 LOW FORCEPS OPERATION W/ EPISIOTOMY
7221 MID FORCEPS OPERATION W/ EPISIOTOMY
7229 OTHER MID FORCEPS OPERATION
7231 HIGH FORCEPS OPERATION W/ EPISIOTOMY
7239 OTHER HIGH FORCEPS OPERATION
724 FORCEPS ROTATION OF FETAL HEAD
7251 PARTIAL BREECH EXTRACTION W/ FORCEPS TO AFTERCOMING HEAD
7253 TOTAL BREECH EXTRACTION W/ FORCEPS TO AFTERCOMING HEAD
726 FORCEPS APPLICATION TO AFTERCOMING HEAD
7271 VACUUM EXTRACTION W/ EPISIOTOMY
7279 VACUUM EXTRACTION DELIVERY NEC
728 OTHER SPECIFIED INSTRUMENTAL DELIVERY
729 UNSPECIFIED INSTRUMENTAL DELIVERY

Obstetric Trauma—Vaginal Delivery without Instrument (PSI 19 and 28)

Numerator:

Discharges with ICD-9-CM codes for obstetric trauma in any diagnosis or procedure field.

ICD-9-CM Obstetric Trauma diagnosis codes:

66420,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, THIRD DEGREE PERINEAL LACERATION (PSI 28 ONLY)
66430,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, FOURTH DEGREE PERINEAL LACERATION
66530,1,4 OTHER OBSTETRICAL TRAUMA, LACERATION OF CERVIX
66540,1,4 OTHER OBSTETRICAL TRAUMA, HIGH VAGINAL LACERATIONS
66550,1,4 OTHER OBSTETRICAL TRAUMA, OTHER INJURY TO PELVIC ORGANS

ICD-9-CM Obstetric Trauma procedure codes:

7550 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF UTERUS
7551 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CERVIX
7552 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CORPUS UTERI
7561 REPAIR OF CURRENT OBSTETRIC LACERATION OF BLADDER AND URETHRA

Obstetric Trauma—Vaginal Delivery without Instrument (PSI 19 and 28)

7562 REPAIR OF CURRENT OBSTETRIC LACERATION OF RECTUM AND SPHINCTER ANI

Denominator:

All vaginal delivery discharge patients.

Vaginal Delivery DRGs:

372 VAGINAL DELIVERY W/ COMPLICATING DIAGNOSES
373 VAGINAL DELIVERY W/OCOMPLICATING DIAGNOSES
374 VAGINAL DELIVERY W/ STERILIZATION AND/OR D AND C
375 VAGINAL DELIVERY W/ OR PROCEDURE EXCEPT STERILIZATION AND/OR D AND C

Exclude:

Instrument-assisted delivery.

ICD-9-CM Instrument-Assisted Delivery procedure codes

720 LOW FORCEPS OPERATION
721 LOW FORCEPS OPERATION W/ EPISIOTOMY
7221 MID FORCEPS OPERATION W/ EPISIOTOMY
7229 OTHER MID FORCEPS OPERATION
7231 HIGH FORCEPS OPERATION W/ EPISIOTOMY
7239 OTHER HIGH FORCEPS OPERATION
724 FORCEPS ROTATION OF FETAL HEAD
7251 PARTIAL BREECH EXTRACTION W/ FORCEPS TO AFTERCOMING HEAD
7253 TOTAL BREECH EXTRACTION W/ FORCEPS TO AFTERCOMING HEAD
726 FORCEPS APPLICATION TO AFTERCOMING HEAD
7271 VACUUM EXTRACTION W/ EPISIOTOMY
7279 VACUUM EXTRACTION DELIVERY NEC
728 OTHER SPECIFIED INSTRUMENTAL DELIVERY
729 UNSPECIFIED INSTRUMENTAL DELIVERY

Obstetric Trauma—Cesarean Delivery (PSI 20 and 29)

Numerator:

Discharges with ICD-9-CM codes for obstetric trauma in any diagnosis or procedure field.

ICD-9-CM Obstetric Trauma diagnosis codes:

66420,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, THIRD DEGREE PERINEAL LACERATION (PSI 29 ONLY)
66430,1,4 TRAUMA TO PERINEUM AND VULVA DURING DELIVERY, FOURTH DEGREE PERINEAL LACERATION
66530,1,4 OTHER OBSTETRICAL TRAUMA, LACERATION OF CERVIX
66540,1,4 OTHER OBSTETRICAL TRAUMA, HIGH VAGINAL LACERATIONS
66550,1,4 OTHER OBSTETRICAL TRAUMA, OTHER INJURY TO PELVIC ORGANS

ICD-9-CM Obstetric Trauma procedure codes:

7550 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF UTERUS
7551 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CERVIX
7552 REPAIR OF CURRENT OBSTETRIC LACERATIONS OF CORPUS UTERI
7561 REPAIR OF CURRENT OBSTETRIC LACERATION OF BLADDER AND URETHRA
7562 REPAIR OF CURRENT OBSTETRIC LACERATION OF RECTUM AND SPHINCTER ANI

Denominator:

Obstetric Trauma—Cesarean Delivery (PSI 20 and 29)

All cesarean delivery discharges.

Cesarean Delivery DRGs:

370 CESAREAN SECTION W/ CC
371 CESAREAN SECTION W/OCC

Appendix B: Detailed Methods

Empirical analyses were conducted to provide additional information about the indicators. These analyses were intended not as decision making tools, but rather explorations into the characteristics of the indicators. Specifically, these analyses explore the frequency and variation of the indicators, the potential bias, based on limited risk adjustment, and the relationship between indicators.

Analysis Approach

Data sources. The data sources used in the empirical analyses were the 1997 Florida State Inpatient Database (SID) (for initial testing and development; 1995-1997 used for persistence analysis) and the 1997 State Inpatient Databases (SID) for 19 HCUP participating States, referred to in this report as the National SID (for the final empirical analysis). The Florida SID consists of about 2 million discharges from over 200 hospitals, and was chosen because Florida is a large diverse State. The National SID consists of about 19 million discharges from over 2,300 hospitals. The National SID contains all-payer data on hospital inpatient stays from participating States (Arizona, California, Colorado, Connecticut, Florida, Illinois, Iowa, Kansas, Maryland, Massachusetts, Missouri, New Jersey, New York, Oregon, Pennsylvania, South Carolina, Tennessee, Washington, and Wisconsin). All discharges from participating States' community hospitals are included in the SID database, which defines community hospitals as non-Federal, short-term, general, and other specialty hospitals, excluding long-term hospitals and hospital units of long-term care institutions, psychiatric hospitals, and alcoholism and chemical dependency treatment facilities.

A complete description of the content of the SID, including details of the participating States' discharge abstracts, can be found on the Agency for Healthcare Research and Quality Web site (http://www.hcup-us.ahrq.gov/sidoverview.jsp). Because the Florida SID was used only for initial testing and development, the empirical results reported are from the National SID. Descriptive results from the Florida SID are reported for comparison to ensure that the hospital-level results were similar in both data sources. Differences between Florida and national results are pointed out in the text. The National SID data were also used for the construction of area measures, with data from the U.S. Census Bureau used to construct the denominator of these rates.

Reported patient safety indicators. Three sets of patient safety indicators were examined. First, the Accepted patient safety indicators met the face validity criteria established through the literature review and clinician panel review. Second, the Experimental patient safety indicators did not meet those criteria, but appeared to warrant further testing and evaluation. Third, several Accepted patient safety indicators were modified into *area* indicators, which were designed to assess the total incidence of the adverse event within geographic areas. For example, the project team constructed an indicator for "Transfusion reaction" at both the hospital and area levels. Transfusion reactions that occur after discharge from a hospitalization would result in a readmission. The area-level indicator includes these cases, while the provider level restricts the number of transfusion reactions to only those that occur during the same hospitalization that exposed the patient to this risk.

All potential indicators were examined empirically by developing and conducting statistical tests for precision, bias, and relatedness of indicators. For each indicator, the project team calculated five different estimates of provider level performance:

1. The raw indicator rate was calculated using the number of adverse events in the numerator divided by the number of discharges in the population at risk by hospital. For the area indicators, the denominator is the population of the Metropolitan Statistical Area (MSA), New England County Metropolitan Area (for the New England States) or county (for non-MSA areas) of the hospital.

2. The raw indicator was adjusted using a logistic regression to account for differences among hospitals (and areas) in demographics (specifically, age and gender). Age was modeled using a set of dummy

variables to represent 10-year categories except for young children, whose age categories are narrower (i.e., less than 1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 or more years), along with a parallel set of age-gender interactions. Because of sparse cells, certain age categories were combined or omitted for selected indicators, such as the obstetric indicators.

3. The raw indicator was adjusted to account for differences among hospitals in age, gender and modified DRG category (as described below).

4. The raw indicator was adjusted to account for differences among hospitals in age, gender, modified DRG, and comorbidities (defined using an adaptation of the AHRQ comorbidity software) of patients.

5. Multivariate signal extraction (MSX) methods were applied to adjust for reliability by estimating the amount of "noise" (i.e., variation due to random error) relative to the amount of "signal" (i.e., systematic variation in hospital performance or the 'reliability') for each indicator. This or similar "reliability adjustment" has been used in the literature for similar purposes.[136 137] Mutlivariate methods (taking into account correlations among indicators to extract additional signal) were applied to most of the accepted indicators. The exceptions were Death in Low Mortality DRGs and Failure to Rescue. Only univariate signal extraction methods (smoothing) were applied to these two indicators and to the experimental indicators, because these indicators possibly cover broader clinical concepts. Correlations between these indicators and other indicators may not reflect correlations due to quality of care, and thus inclusion of these indicators may adversely affect the MSX approximations.

For additional details on the empirical methods, refer to the companion EPC HCUP Quality Indicator Report, published by AHRQ (http://www.qualityindicators.ahrq.gov/downloads.htm). Additional details on the modifications made to the DRG and comorbidity categories are described below.

Hospital Fixed Effects. In the risk-adjustment models, hospital fixed effects were calculated using the standard method with logistic models of first estimating the predicted value for each discharge, then subtracting the actual outcome from the predicted, and averaging the difference for each hospital to get the hospital fixed effect estimate. In the Quality Indicator Report,[138] linear regression models were used with hospital fixed effects included, arguing that the logistic approach yielded biased estimates due to the omission of a variable (the hospital) correlated with both the dependent (e.g., in-hospital mortality) and the independent (e.g., age, gender, APR-DRG) variables in the model. Given the rare occurrence of many of the PSIs, however, the logistic approach may be more appropriate for this application. Linear methods assume that the error term is normally distributed. This assumption is violated when the outcome is dichotomous.

The QI means were generally an order of magnitude higher than the PSI means, so the assumption was not as problematic. However, the most appropriate method depends on the particular characteristics of each indicator, whether QI or PSI. To the extent that bias is a concern, accounting for the clustering of patients by using a hospital fixed effect is advantageous. To the extent that extreme values are a concern, imposing structure on the error term with logistic methods is advantageous. In the end, the two approaches can be compared in terms of how much difference it makes in the relative assessment of provider performance. This issue warrants further analysis to better understand the trade-offs and limitations of each approach, and under what conditions and for what indicators each approach might best apply.

Specifically, the risk-adjusted "raw" estimate of a hospital's performance is constructed in two steps. In the first step, if it is denoted whether or not the event associated with a particular indicator Y^k (k=1,…,K) was observed for a particular patient i in year t (t=1,…,T), then the regression to construct a

[136] Hofer TP, Hayward RA, Greenfield S, Wagner EH, Kaplan SH, Manning WG. The unreliability of individual physician "report cards" for assessing the costs and quality of care of a chronic disease JAMA 1999;28(22):2098-105.

[137] Christiansen CL, Morris CN. Improving the statistical approach to health care provider profiling. Ann Intern Med 1997;127(8 Pt 2):764-8).

[138] Davis et al. 2001.

risk-adjusted "raw" estimate of a particular patient's performance on each indicator can be written as:

(1) $Y^k_{it} = Z_{it}\ \Pi^k_t + \xi^k_{it}$, where

Y^k_{it} is the k^{th} PSI for patient i in year t (i.e., whether or not the event associated with the indicator occurred on that discharge).

Z_{it} is a vector of patient covariates for patient i in year t (i.e., the patient-level measures used as risk adjusters).

Π^k_t is a vector of parameters in each year t, giving the effect of each patient risk adjuster on indicator k (i.e., the magnitude of the risk adjustment associated with each patient measure).

ε^k_{it} is the unexplained residual in this patient-level model.

In the second step, the hospital effect was estimated by subtracting the resulting predictions from this patient-level regression from the actual observed patient-level outcomes, and taking the mean of this difference for each hospital. That is, for each hospital j (j=1,…,J),

(2) $M^k_{jt} = Y^k_{ijt} - (Z_{it}\ \Pi^k_t + \xi^k_{it})$, where

M^k_{jt} is the "raw" adjusted measure for indicator k for hospital j in year t (i.e., the hospital "fixed effect" in the patient-level regression).

Z_{it} is the vector of patient covariates for patient i in year t estimated in Step 1.

In addition to age, sex, and age*sex interactions as adjusters in the model, the project team also included a modified DRG and comorbidity category for the admission.

Modified DRG Categories. Two modifications were made to the Centers for Medicare and Medicaid Services (CMS, formerly Health Care Financing Administration) DRGs. First, adjacent DRG categories that were separated by the presence or absence of comorbidities or complications were collapsed. For example, DRGs 076 (Other Resp System Operating Room Procedures w CC) and 077 (Other Resp System Operating Room Procedures w/o CC) were grouped into one category. The purpose was to avoid adjusting for the complication the team was trying to measure. Second, most of the super-MDC DRG categories were excluded from the logistic models. Excluding these categories also avoids adjusting for the complications the team was trying to measure. For example, tracheostomies (DRG 482-483) often result from potentially preventable respiratory complications that require long-term mechanical ventilation. Similarly, operating room procedures unrelated to the principal diagnosis (DRG 468, 477) often result from potentially preventable complications that require surgical repair (i.e., fractures, lacerations).

In the companion technical report on quality indicators, the risk adjustment method implemented All Patient Refined (APR)-DRGs, a refinement of DRGs to capture different levels of complications. However, patient safety indicators, designed to detect potentially preventable complications, require a risk adjustment approach that does not inherently remove the differences between patients based on their complications. The APR-DRGs could be modified to remove applicable complications, on an indicator-by-indicator basis, but implementation of such an approach was beyond the scope of the current project. In this report, APR-DRG risk adjustment was not implemented.

Modified Comorbidity Software. To adjust for comorbidities, the project team used an updated adaptation of AHRQ Comorbidity Software (http://www.hcup-us.ahrq.gov/toolssoftware/comorbidity/comorbidity.jsp). The ICD-9-CM codes used to define the comorbidity categories were modified to address four main issues.

1. Comorbidity categories were excluded in the current software that include conditions likely to represent potentially preventable complications in certain settings, such as after elective surgery.

Specifically, three DRG categories (cardiac arrhythmia, coagulopathy, and fluid/electrolyte disorders) were removed from the comorbidity adjustment.

2. Most adaptations were designed to capture acute sequelae of chronic comorbidities, where both conditions are represented by a single ICD-9-CM code. For example, the definition of hypertension was broadened to include malignant hypertension, which usually arises in the setting of chronic hypertension. Unless these "acute on chronic" comorbidities are captured, some patients with especially severe comorbidities would be mislabeled as not having conditions of interest.

3. The comorbidity definitions did not include obstetric comorbidity codes, which are relevant for the obstetric indicators. Codes, when available, for these comorbidities in obstetric patients were added.

4. Slight updating was necessary based on recent ICD-9-CM code changes.

Low Mortality DRGs. In order to be included in the "Low Mortality DRG" indicator, the DRG had to have an overall in-hospital mortality rate (based on the National SID sample) of less than 0.5%. In addition, if a DRG category was split based on the presence of comorbidities or complications, then the category was included only if both DRGs (with and without comorbidities or complications) met the mortality threshold. Otherwise, the category was not included in the "Low mortality DRG" PSI. The indicator is reported as a single measure and stratified into medical (adult and pediatric), surgical (adult and pediatric), neonatal, obstetric and psychiatric DRGs.

Empirical Analysis Statistics

Using these methods, the project team constructed a set of statistical tests to examine precision, bias, and relatedness of indicators for all accepted hospital-level indicators, and precision and bias for all accepted area-level and experimental indicators. Each of the key statistical test results was summarized and explained in the overview section of the companion HCUP Quality Indicator report.[139] Tables B-1 through B-3 provide a summary of the statistical analyses and their interpretation.

[139] Davies et al., 2001.

Table B-1. Precision Tests

Measure	Statistic/Adjustments		Interpretation
Precision. Is most of the variation in an indicator at the level of the hospital? Do smoothed estimates of quality lead to more precise measures?			
a. Observed variation in indicator	Hospital-Level Standard Deviation Hospital -Level Skew Statistic	Unadjusted Age-gender adjusted Modified DRG adjusted Modified AHRQ comorbidity adjusted	Risk adjustment can either increase or decrease observed variation. If increase, then differences in patient characteristics mask provider differences. If decrease, then differences in patient characteristics account for provider differences.
b. MSX methods	Signal Standard Deviation Signal Share Signal Ratio	Reliability adjusted	Estimates what percentage of the observed variation between hospitals reflects systematic differences versus random noise. Signal share is a measure of how much of the total variation (patient and provider) is potentially subject to hospital control.

Table B-2. Bias Tests

Measure	Statistic	Interpretation
Bias. Does risk adjustment change our assessment of relative hospital performance, after accounting for reliability? Is the impact greatest among the best or worst performers, or overall? What is the magnitude of the change in performance?		
MSX methods: unadjusted vs. age, sex, modified DRG, comorbidity risk adjustment	Spearman Rank Correlation Coefficient (before and after risk adjustment)	Risk adjustment matters to the extent that it alters the assessment of relative hospital performance. This test determines the impact overall.
	Average absolute value of change relative to mean (after risk adjustment)	This test determines whether the absolute change in performance was large or small relative to the overall mean.
	Percentage of the top 10% of hospitals that remains the same (after risk adjustment)	This test measures the impact at the highest rates (in general, the worse performers).

Measure	Statistic	Interpretation
Bias. Does risk adjustment change our assessment of relative hospital performance, after accounting for reliability? Is the impact greatest among the best or worst performers, or overall? What is the magnitude of the change in performance?		
	Percentage of the bottom 10% of hospitals that remains the same (after risk adjustment)	This test measures the impact at the lowest rates (in general, the better performers).
	Percentage of hospitals that move more than two deciles in rank (up or down) (after risk adjustment)	This test determines the magnitude of the relative changes.

Table B-3. Relatedness Tests

Measure	Statistic	Interpretation
Relatedness of indicators. Is the indicator related to other indicators in a way that makes clinical sense? Do methods that remove noise and bias make the relationship clearer?		
a. Correlation of indicator with other indicators	Spearman correlation coefficient	Are indicators correlated with other indicators in the direction one might expect?
b. Factor loadings of indicator	Factor loadings, based on Spearman correlation, Principal Component Analysis	Do indicators load on factors with other indicators that one might expect?

Appendix C: Operating Room Procedures

50	IMPL CRT PACEMAKER SYS
51	IMPL CRT DEFIBRILLAT SYS
52	IMP/REP LEAD LF VEN SYS
53	IMP/REP CRT PACEMAKR GEN
54	IMP/REP CRT DEFIB GENAT
112	OPEN CEREB MENINGES BX
114	OPEN BRAIN BIOPSY
115	SKULL BIOPSY
118	OTHER BRAIN DX PROCEDURE
119	OTHER SKULL DX PROCEDURE
121	CRANIAL SINUS I & D
122	REMOV INTRACRAN STIMULAT
123	REOPEN CRANIOTOMY SITE
124	OTHER CRANIOTOMY
125	OTHER CRANIECTOMY
131	INCISE CEREBRAL MENINGES
132	LOBOTOMY & TRACTOTOMY
139	OTHER BRAIN INCISION
141	THALAMUS OPERATIONS
142	GLOBUS PALLIDUS OPS
151	EX CEREB MENINGEAL LES
152	HEMISPHERECTOMY
153	BRAIN LOBECTOMY
159	OTHER BRAIN EXCISION
16	EXCISE SKULL LESION
201	LINEAR CRANIECTOMY
202	ELEVATE SKULL FX FRAGMNT
203	SKULL FLAP FORMATION
204	BONE GRAFT TO SKULL
205	SKULL PLATE INSERTION
206	CRANIAL OSTEOPLASTY NEC
207	SKULL PLATE REMOVAL
211	SIMPLE SUTURE OF DURA
212	BRAIN MENINGE REPAIR NEC
213	MENINGE VESSEL LIGATION
214	CHOROID PLEXECTOMY
22	VENTRICULOSTOMY
231	VENTRICL SHUNT-HEAD/NECK
232	VENTRI SHUNT-CIRCULA SYS
233	VENTRICL SHUNT-THORAX
234	VENTRICL SHUNT-ABDOMEN
235	VENTRI SHUNT-UNINARY SYS
239	OTHER VENTRICULAR SHUNT
242	REPLACE VENTRICLE SHUNT
243	REMOVE VENTRICLE SHUNT
291	LYSIS CORTICAL ADHESION
292	BRAIN REPAIR
293	IMPLANT BRAIN STIMULATOR
294	INSERT/REPLAC SKULL TONG
299	SKULL & BRAIN OP NEC
301	REMOVAL FB SPINAL CANAL
302	REOPEN LAMINECTOMY SITE
309	SPINAL CANAL EXPLOR NEC
31	INTRASPIN NERVE ROOT DIV
321	PERCUTANEOUS CHORDOTOMY
329	OTHER CHORDOTOMY
332	SPINAL CORD/MENINGES BX
339	OTHER SPINAL DX PROC
34	EXCIS SPINAL CORD LESION
351	SPINE MENINGOCELE REPAIR
352	MYELOMENINGOCEL REPAIR
353	VERTEBRAL FX REPAIR
359	SPINAL STRUCT REPAIR NEC
36	SPINAL CORD ADHESIOLYSIS
371	SUBARACH-PERITON SHUNT
372	SUBARACH-URETERAL SHUNT
379	OTH SPINAL THECAL SHUNT
393	INSERT SPINAL STIMULATOR
394	REMOVE SPINAL STIMULATOR
397	REVISE SPINE THECA SHUNT
398	REMOVE SPINE THECA SHUNT
399	SPINE CANAL STRUC OP NEC
401	EXCISION ACOUSTC NEUROMA
402	TRIGEMINAL NERV DIVISION
403	PERIPH NERVE DIV NEC
404	PERIPH NERVE INCIS NEC
405	GASSERIAN GANGLIONECTOMY
406	PERIPH GANGLIONECT NEC
407	PERIPH NERV EXCISION NEC
412	OPEN PERIPH NERVE BIOPSY
419	PERIPH NERVE DX PROC NEC
43	PERIPHERAL NERVE SUTURE
441	DECOMPRESS TRIGEM ROOT
442	CRAN NERV ROOT DECOM NEC
443	CARPAL TUNNEL RELEASE
444	TARSAL TUNNEL RELEASE
449	PER NERVE ADHESIOLYS NEC
45	PERIPHERAL NERVE GRAFT
46	PERIPH NERVE TRANSPOSIT
471	HYPOGLOSS-FACIAL ANASTOM
472	ACCESSORY-FACIAL ANASTOM
473	ACCESS-HYPOGLOSS ANASTOM
474	PERIPH NERV ANASTOM NEC
475	POSTOP REVIS PER NERV OP
476	LATE REPAIR PER NERV INJ
479	OTHER NEUROPLASTY

491	NEURECTASIS
492	IMPLANT PERIPH STIMULAT
493	REMOVE PERIPH STIMULATOR
499	PERIPHERAL NERVE OPS NEC
50	SYMPATH NERVE DIVISION
511	SYMPATHETIC NERVE BIOPSY
519	SYMPATH NRV DX PROC NEC
521	SPHENOPALATIN GANGLIONEC
522	CERVICAL SYMPATHECTOMY
523	LUMBAR SYMPATHECTOMY
524	PRESACRAL SYMPATHECTOMY
525	PERIART SYMPATHECTOMY
529	OTHER SYMPATHECTOMY
581	SYMPATHETIC NERVE REPAIR
589	SYMPATHETIC NERVE OP NEC
59	OTHER NERVOUS SYSTEM OPS
602	REOPEN THYROID FIELD WND
609	INCIS THYROID FIELD NEC
612	OPEN THYROID GLAND BX
613	PARATHYROID BIOPSY
619	THYR/PARATHY DX PROC NEC
62	UNILAT THYROID LOBECTOMY
631	EXCISION THYROID LESION
639	PART THYROIDECTOMY NEC
64	COMPLETE THYROIDECTOMY
650	SUBSTERN THYROIDECT NOS
651	PART SUBSTERN THYROIDECT
652	TOT SUBSTERN THYROIDECT
66	LINGUAL THYROID EXCISION
67	THYROGLOSS DUCT EXCISION
681	TOTAL PARATHYROIDECTOMY
689	OTHER PARATHYROIDECTOMY
691	THYROID ISTHMUS DIVISION
692	THYROID VESSEL LIGATION
693	THYROID SUTURE
694	THYROID REIMPLANTATION
695	PARATHYROID REIMPLANT
698	OTHER THYROID OPERATIONS
699	OTHER PARATHYROID OPS
700	ADRENAL EXPLORATION NOS
701	UNILAT ADRENAL EXPLORAT
702	BILAT ADRENAL EXPLORAT
712	OPEN ADRENAL GLAND BX
713	TRANSFRONT PITUITARY BX
714	TRANSPHEN PITUITARY BX
715	PITUITARY BIOPSY NOS
716	THYMUS BIOPSY
717	PINEAL BIOPSY
719	ENDOCRINE DX PROC NEC
721	ADRENAL LESION EXCISION
722	UNILATERAL ADRENALECTOMY
729	PART ADRENALECTOMY NEC
73	BILATERAL ADRENALECTOMY
741	ADRENAL INCISION
742	ADRENAL NERVE DIVISION
743	ADRENAL VESSEL LIGATION
744	ADRENAL REPAIR
745	ADRENAL REIMPLANTATION
749	ADRENAL OPERATION NEC
751	PINEAL FIELD EXPLORATION
752	PINEAL GLAND INCISION
753	PARTIAL PINEALECTOMY
754	TOTAL PINEALECTOMY
759	PINEAL OPERATION NEC
761	EXC PITUIT LES-TRANSFRON
762	EXC PITUIT LES-TRANSPHEN
763	PART EXCIS PITUITARY NOS
764	TOT EXC PITUIT-TRANSFRON
765	TOT EXC PITUIT-TRANSPHEN
768	TOTAL EXC PITUITARY NEC
769	TOTAL EXC PITUITARY NOS
771	PITUITARY FOSSA EXPLORAT
772	PITUITARY GLAND INCISION
779	PITUITARY OPERATION NEC
780	THYMECTOMY NOS
781	PART EXCISION OF THYMUS
782	TOTAL EXCISION OF THYMUS
791	THYMUS FIELD EXPLORATION
792	INCISION OF THYMUS
793	REPAIR OF THYMUS
794	THYMUS TRANSPLANTATION
799	THYMUS OPERATION NEC
811	EYELID BIOPSY
820	REMOVE EYELID LESION NOS
821	CHALAZION EXCISION
822	EXCISE MINOR LES LID NEC
823	EXC MAJ LES LID PRT-THIC
824	EXC MAJ LES LID FUL-THIC
825	DESTRUCTION LID LESION
831	PTOSIS REP-FRONT MUS SUT
832	PTOSIS REP-FRON MUS SLNG
833	PTOSIS REP-LEVAT MUS ADV
834	PTOSIS REP-LEVAT MUS NEC
835	PTOS REP-TARSAL TECHNIQ
836	BLEPHAROPTOS REPAIR NEC
837	REDUC OVERCORRECT PTOSIS
838	CORRECT LID RETRACTION
841	THERMOCAUT/ENTROPION REP
842	SUTURE ENTROPION REPAIR
843	WEDG RESEC ENTROPION REP
844	LID RECONS ENTROPION REP
849	ENTROPION/ECTROP REP NEC
851	CANTHOTOMY
852	BLEPHARORRHAPHY

859	ADJUST LID POSITION NEC
861	LID RECONST W SKIN GRAFT
862	LID RECONST W MUC GRAFT
863	LID RECONST W HAIR GRAFT
864	LID RECON-TARSOCONJ FLAP
869	LID RECONSTR W GRAFT NEC
870	LID RECONSTRUCTION NOS
871	LID MARG RECON-PART THIC
872	LID RECONS-PART THIC NEC
873	LID MARG RECONS FUL THIC
874	LID RECONST-FUL THIC NEC
891	ELECTROSURG LID EPILAT
892	CRYOSURG LID EPILATION
893	EYELID EPILATION NEC
899	EYELID OPERATION NEC
90	LACRIMAL GLAND INCISION
911	LACRIMAL GLAND BIOPSY
912	LACRIMAL SAC BIOPSY
919	LACRIMAL SYS DX PROC NEC
920	EXC LACRIMAL GLAND NOS
921	EXCIS LES LACRIMAL GLAND
922	PART DACRYOADENECT NEC
923	TOTAL DACRYOADENECTOMY
93	OTHER LACRIMAL GLAND OPS
941	LACRIMAL PUNCTUM PROBE
942	LAC CANALICULI PROBE
943	NASOLACRIMAL DUCT PROBE
944	NASOLAC DUCT INTUBAT
949	LAC PASSAGE MANIP NEC
951	LAC PUNCTUM INCISION
952	LAC CANALICULI INCISION
953	LACRIMAL SAC INCISION
959	LACRIM PASSAGE INCIS NEC
96	LACRIM SAC/PASSAGE EXCIS
971	CORRECT EVERTED PUNCTUM
972	PUNCTUM REPAIR NEC
973	CANALICULUS REPAIR
981	DACRYOCYSTORHINOSTOMY
982	CONJUNCTIVOCYSTORHINOST
983	CONJUNCTIVORHINOS W TUBE
991	LAC PUNCTUM OBLITERATION
999	LACRIMAL SYSTEM OP NEC
100	INCISE/REMOV CONJUNCT FB
101	CONJUNCTIVA INCISION NEC
1021	CONJUNCTIVAL BIOPSY
1029	CONJUNCTIVA DX PROC NEC
1031	EXCISE CONJUNCTIV LESION
1032	DESTRUCT CONJUNC LES NEC
1033	OTH CONJUNC DESTRUC PROC
1041	SYMBLEPH REP W FREE GRFT
1042	GRAFT CONJUNC CUL-DE-SAC
1043	CONJUN CUL-DE-SAC RX NEC
1044	CONJUNC FREE GRAFT NEC
1049	CONJUNCTIVOPLASTY NEC
105	CONJUNC/LID ADHESIOLYSIS
106	REPAIR CONJUNCT LACERAT
1091	SUBCONJUNCTIVAL INJECT
1099	CONJUNCTIVAL OP NEC
110	MAGNET REMOVAL CORNEA FB
111	CORNEAL INCISION
1121	CORNEAL SCRAPE FOR SMEAR
1122	CORNEAL BIOPSY
1129	CORNEAL DX PROC NEC
1131	PTERYGIUM TRANSPOSITION
1132	PTERYG EXC W CORNEA GRFT
1139	PTERYGIUM EXCISION NEC
1141	MECH REMOV CORNEA EPITH
1142	THERMOCAUT CORNEA LESION
1143	CRYOTHERAP CORNEA LESION
1149	DESTRUCT CORNEA LES NEC
1151	SUTURE CORNEA LACERATION
1152	REP CORNEA POSTOP DEHISC
1153	RX CORNEA LAC W CONJ FLP
1159	CORNEAL REPAIR NEC
1160	CORNEAL TRANSPLANT NOS
1161	LAM KERATPLAST W AUTGRFT
1162	LAMELLAR KERATOPLAST NEC
1163	PERF KERATOPL W AUTOGRFT
1164	PERFORAT KERATOPLAST NEC
1169	CORNEAL TRANSPLANT NEC
1171	KERATOMILEUSIS
1172	KERATOPHAKIA
1173	KERATOPROSTHESIS
1174	THERMOKERATOPLASTY
1175	RADIAL KERATOTOMY
1176	EPIKERATOPHAKIA
1179	CORNEA RECONSTRUCT NEC
1191	CORNEAL TATTOOING
1192	REMOVE CORNEAL IMPLANT
1199	CORNEAL OPERATION NEC
1200	REMOV ANT SEGMNT FB NOS
1201	MAGNET REMOV ANT SEG FB
1202	NONMAG REMOV ANT SEG FB
1211	IRIDOTOMY W TRANSFIXION
1212	IRIDOTOMY NEC
1213	PROLAPSED IRIS EXCISION
1214	IRIDECTOMY NEC
1221	DX ASPIRAT-ANT CHAMBER
1222	IRIS BIOPSY
1229	ANT SEGMENT DX PROC NEC
1231	GONIOSYNECHIAE LYSIS
1232	ANT SYNECHIA LYSIS NEC
1233	POST SYNECHIAE LYSIS
1234	CORNEOVITREAL ADHESIOLYS

1235	COREOPLASTY
1239	IRIDOPLASTY NEC
1240	REMOV ANT SEGMNT LES NOS
1241	NONEXC DESTRUC IRIS LES
1242	EXCISION OF IRIS LESION
1243	NONEXC DESTR CIL BOD LES
1244	EXCISE CILIARY BODY LES
1251	GONIOPUNCTURE
1252	GONIOTOMY
1253	GONIOTOMY W GONIOPUNCTUR
1254	TRABECULOTOMY AB EXTERNO
1255	CYCLODIALYSIS
1259	FACILIT INTRAOC CIRC NEC
1261	TREPHIN SCLERA W IRIDECT
1262	THERMCAUT SCLER W IRIDEC
1263	IRIDENCLEISIS/IRIDOTASIS
1264	TRABECULECTOM AB EXTERNO
1265	SCLER FISTULIZ W IRIDECT
1266	POSTOP REVIS SCL FISTUL
1269	SCLER FISTULIZING OP NEC
1271	CYCLODIATHERMY
1272	CYCLOCRYOTHERAPY
1273	CYCLOPHOTOCOAGULATION
1274	CIL BODY DIMINUTION NOS
1279	GLAUCOMA PROCEDURE NEC
1281	SUTURE SCLERAL LACER
1282	SCLERAL FISTULA REPAIR
1283	REVIS ANT SEG OP WND NEC
1284	DESTRUCT SCLERAL LESION
1285	REPAIR STAPHYLOM W GRAFT
1286	REP SCLER STAPHYLOMA NEC
1287	GRAFT REINFORCE SCLERA
1288	SCLERA REINFORCEMENT NEC
1289	SCLERAL OPERATION NEC
1291	THERAPEUT EVAC ANT CHAMB
1292	ANTERIOR CHAMBER INJECT
1293	REMOV EPITHEL DOWNGROWTH
1297	IRIS OPERATION NEC
1298	CILIARY BODY OP NEC
1299	ANTERIOR CHAMBER OP NEC
1300	REMOVE FB LENS NOS
1301	MAGNET REMOVE FB LENS
1302	NONMAGNET REMOVE FB LENS
1311	TEMP-INF INTRCAP LENS EX
1319	INTRACAPSUL LENS EXT NEC
132	LINEAR EXTRACAP LENS EXT
133	SIMPL ASPIR LENS EXTRACT
1341	CATARAC PHACOEMULS/ASPIR
1342	POST CATARAC FRAG/ASPIR
1343	CATARACT FRAG/ASPIR NEC
1351	TEMP-INF XTRACAP LENS EX
1359	EXTRACAP LENS EXTRAC NEC
1361	EXTRACAP LENS EXTRAC NEC
1362	EXTRACAP LENS EXTRAC NEC
1363	EXTRACAP LENS EXTRAC NEC
1364	AFTER-CATAR DISCISSION
1365	AFTER-CATARACT EXCISION
1366	AFTER CATAR FRAGMNTATION
1369	CATARACT EXTRACTION NEC
1370	INSERT PSEUDOPHAKOS NOS
1371	INSERT LENS AT CATAR EXT
1372	SECONDARY INSERT LENS
138	IMPLANTED LENS REMOVAL
139	OTHER OPERATIONS ON LENS
1400	REMOV POST SEGMNT FB NOS
1401	MAGNET REMOV POST SEG FB
1402	NONMAG REMOV POST SEG FB
1411	DIAGNOST VITREOUS ASPIR
1419	DX PROC POST SEG NEC
1421	CHORIORET LES DIATHERMY
1422	CHORIORETIN LES CRYOTHER
1426	CHORIORET LES RADIOTHER
1427	CHORIORET LES RAD IMPLAN
1429	CHORIORET LES DESTR NEC
1431	RETINAL TEAR DIATHERMY
1432	RETINAL TEAR CRYOTHERAPY
1439	RETINAL TEAR REPAIR NEC
1441	SCLERAL BUCKLE W IMPLANT
1449	SCLERAL BUCKLING NEC
1451	DETACH RETINA-DIATHERMY
1452	DETACH RETINA-CRYOTHERAP
1453	DETACH RETINA XENON COAG
1454	DETACH RETINA LASER COAG
1455	DETACH RET PHOTOCOAG NOS
1459	REPAIR RETINA DETACH NEC
146	REMOV PROS MAT POST SEG
1471	ANTERIOR REMOV VITREOUS
1472	VITREOUS REMOVAL NEC
1473	ANTERIOR MECHAN VITRECT
1474	MECH VITRECTOMY NEC
1475	VITREOUS SUBSTITUT INJEC
1479	VITREOUS OPERATION NEC
149	OTHER POST SEGMENT OPS
1501	EXTRAOC MUSC-TEND BIOPSY
1509	EXTRAOC MUSC DX PROC NEC
1511	ONE EXTRAOC MUS RECESS
1512	1 EXTRAOC MUSCL ADVANCE
1513	1 EXTRAOC MUSCL RESECT
1519	XTRAOC MUS OP/DETACH NEC
1521	LENGTHEN 1 EXTRAOC MUSC
1522	SHORTEN 1 EXTRAOC MUSC
1529	OP ON 1 EXTRAOC MUSC NEC
153	TEMP DETACH >1 XTROC MUS
154	OTH OP ON >L EXTRAOC MUS

155	EXTRAOCUL MUS TRANSPOSIT
156	REVIS EXTRAOC MUSC SURG
157	EXTRAOC MUSC INJ REPAIR
159	OTH EXTRAOC MUS-TEND OP
1601	ORBITOTOMY W BONE FLAP
1602	ORBITOTOMY W IMPLANT
1609	ORBITOTOMY NEC
161	REMOVE PENETRAT FB EYE
1622	DIAGNOSTIC ASP OF ORBIT
1623	EYEBALL & ORBIT BIOPSY
1629	EYEBAL/ORBIT DX PROC NEC
1631	EYE EVISC W SYNCH IMPLAN
1639	EYEBALL EVISCERATION NEC
1641	EYE ENUC/IMPLAN/MUSC ATT
1642	EYE ENUC W IMPLANT NEC
1649	EYEBALL ENUCLEATION NEC
1651	RADICAL ORBITOMAXILLECT
1652	ORBIT EXENT W BONE REMOV
1659	ORBITAL EXENTERATION NEC
1661	2NDRY OCULAR IMP INSERT
1662	REVIS/REINSERT OCUL IMP
1663	REVIS ENUC SOCKET W GRFT
1664	ENUC SOCKET REVIS NEC
1665	2NDRY EXENT CAVITY GRAFT
1666	REVIS EXENTER CAVITY NEC
1669	2ND OP POST EYE REM NEC
1671	REMOVE OCULAR IMPLANT
1672	REMOVE ORBITAL IMPLANT
1681	REPAIR OF ORBITAL WOUND
1682	REPAIR EYEBALL RUPTURE
1689	EYE/ORBIT INJ REPAIR NEC
1692	EXCISION ORBITAL LESION
1693	EXCISION EYE LESION NOS
1698	OPERATION ON ORBIT NEC
1699	OPERATION ON EYEBALL NEC
1821	PREAURICULAR SINUS EXCIS
1831	RAD EXCIS EXT EAR LES
1839	EXCIS EXTERNAL EAR NEC
185	CORRECTION PROMINENT EAR
186	EXT AUDIT CANAL RECONSTR
1871	CONSTRUCTION EAR AURICLE
1872	REATTACH AMPUTATED EAR
1879	PLASTIC REP EXT EAR NEC
189	OTHER EXT EAR OPERATIONS
190	STAPES MOBILIZATION
1911	STAPEDECT W REPLAC INCUS
1919	STAPEDECTOMY NEC
1921	REV STAPDEC W INCUS REPL
1929	STAPEDECTOMY REVIS NEC
193	OSSICULAR CHAIN OP NEC
194	MYRINGOPLASTY
1952	TYPE 2 TYMPANOPLASTY
1953	TYPE 3 TYMPANOPLASTY
1954	TYPE 4 TYMPANOPLASTY
1955	TYPE 5 TYMPANOPLASTY
196	TYMPANOPLASTY REVISION
199	MIDDLE EAR REPAIR NEC
2001	MYRINGOTOMY W INTUBATION
2021	MASTOID INCISION
2022	PETRUS PYRAM AIR CEL INC
2023	MIDDLE EAR INCISION
2032	MID & INNER EAR BIOPSY
2039	MID/IN EAR DX PROC NEC
2041	SIMPLE MASTOIDECTOMY
2042	RADICAL MASTOIDECTOMY
2049	MASTOIDECTOMY NEC
2051	EXCISE MIDDLE EAR LESION
2059	MIDDLE EAR EXCISION NEC
2061	INNER EAR FENESTRATION
2062	REVIS INNER EAR FENESTRA
2071	ENDOLYMPHATIC SHUNT
2072	INNER EAR INJECTION
2079	INC/EXC/DESTR IN EAR NEC
2091	TYMPANOSYMPATHECTOMY
2092	MASTOIDECTOMY REVISION
2093	REPAIR OVAL/ROUND WINDOW
2095	ELECMAG HEAR DEV IMPLANT
2096	IMPLT COCHLEAR PROST NOS
2097	IMP/REP SCHAN COCH PROS
2098	IMP/REP MCHAN COCHL PROS
2099	MID-INNER EAR OPS NEC
2104	ETHMOID ART LIGAT-EPIST
2105	MAX ART LIG FOR EPISTAX
2106	EXT CAROT ART LIG-EPIST
2107	NASAL SEPT GRFT-EPISTAX
2109	EPISTAXIS CONTROL NEC
214	RESECTION OF NOSE
215	SUBMUC NASAL SEPT RESECT
2161	DIATHER/CRYO TURBINECTOM
2162	TURBINATE FRACTURE
2169	TURBINECTOMY NEC
2172	OPEN REDUCTION NASAL FX
2182	NASAL FISTULA CLOSURE
2183	TOT NASAL RECONSTRUCTION
2184	REVISION RHINOPLASTY
2185	AUGMENTATION RHINOPLASTY
2186	LIMITED RHINOPLASTY
2187	RHINOPLASTY NEC
2188	SEPTOPLASTY NEC
2189	NASAL REPAIR NEC
2199	NASAL OPERATION NEC
2212	OPEN BIOPSY NASAL SINUS
2231	RADICAL MAXILLARY ANTROT
2239	EXT MAXILLARY ANTROT NEC

2241	FRONTAL SINUSOTOMY
2242	FRONTAL SINUSECTOMY
2250	SINUSOTOMY NOS
2251	ETHMOIDOTOMY
2252	SPHENOIDOTOMY
2253	MULTIPLE SINUS INCISION
2260	SINUSECTOMY NOS
2261	C-LUC EXC MAX SINUS LES
2262	EXC MAX SINUS LESION NEC
2263	ETHMOIDECTOMY
2264	SPHENOIDECTOMY
2271	NASAL SINUS FISTULA CLOS
2279	NASAL SINUS REPAIR NEC
229	OTHER NASAL SINUS OPS
242	GINGIVOPLASTY
244	EXC OF DENTAL LES OF JAW
245	ALVEOLOPLASTY
2502	OPEN BIOPSY OF TONGUE
251	DESTRUCTION TONGUE LES
252	PARTIAL GLOSSECTOMY
253	COMPLETE GLOSSECTOMY
254	RADICAL GLOSSECTOMY
2559	REPAIR OF TONGUE NEC
2594	OTHER GLOSSOTOMY
2599	TONGUE OPERATION NEC
2612	OPEN BX SALIV GLAND/DUCT
2621	SALIVARY CYST MARSUPIAL
2629	SALIV LESION EXCIS NEC
2630	SIALOADENECTOMY NOS
2631	PARTIAL SIALOADENECTOMY
2632	COMPLETE SIALOADENECTOMY
2641	SUTURE OF SALIV GLND LAC
2642	SALIVARY FISTULA CLOSURE
2649	SALIVARY REPAIR NEC
2699	SALIVARY OPERATION NEC
270	DRAIN FACE & MOUTH FLOOR
271	INCISION OF PALATE
2721	BONY PALATE BIOPSY
2722	UVULA AND SOFT PALATE BX
2731	LOC EXC BONY PALATE LES
2732	WIDE EXC BONY PALATE LES
2742	WIDE EXCISION OF LIP LES
2743	EXCISION OF LIP LES NEC
2749	EXCISION OF MOUTH NEC
2753	CLOSURE OF MOUTH FISTULA
2754	REPAIR OF CLEFT LIP
2755	FULL-THICK GRFT TO MOUTH
2756	SKIN GRAFT TO MOUTH NEC
2757	PEDICLE ATTACH TO MOUTH
2759	MOUTH REPAIR NEC
2761	SUTURE OF PALATE LACERAT
2762	CLEFT PALATE CORRECTION
2763	REVIS CLEFT PALAT REPAIR
2769	OTH PLASTIC REPAIR PALAT
2771	INCISION OF UVULA
2772	EXCISION OF UVULA
2773	REPAIR OF UVULA
2779	OTHER UVULA OPERATIONS
2792	MOUTH INCISION NOS
2799	ORAL CAVITY OPS NEC
280	PERITONSILLAR I & D
2811	TONSIL&ADENOID BIOPSY
2819	TONSIL&ADENOID DX OP NEC
282	TONSILLECTOMY
283	TONSILLECTOMY/ADENOIDEC
284	EXCISION OF TONSIL TAG
285	EXCISION LINGUAL TONSIL
286	ADENOIDECTOMY
287	HEMORR CONTRL POST T & A
2891	INCIS TO REMOV TONSIL FB
2892	EXCIS TONSIL/ADENOID LES
2899	TONSIL/ADENOID OPS NEC
290	PHARYNGOTOMY
292	EXC BRANCHIAL CLEFT CYST
293	EXC BRANCHIAL CLEFT CYST
2931	CRICOPHARYNGEAL MYOTOMY
2932	PHARYNGEAL DIVERTICULEC
2933	PHARYNGECTOMY
2939	EXCIS/DESTR LES PHAR NEC
294	PLASTIC OP ON PHARYNX
2951	SUTURE OF PHARYNGEAL LAC
2952	CLOS BRANCH CLEFT FISTUL
2953	CLOS PHARYNX FISTULA NEC
2954	LYSIS PHARYNGEAL ADHES
2959	PHARYNGEAL REPAIR NEC
2992	DIVIS GLOSSOPHARYNG NERV
2999	PHARYNGEAL OPERATION NEC
3001	LARYNX CYST MARSUPIALIZ
3009	DESTRUCT LARYNX LES NEC
301	HEMILARYNGECTOMY
3021	EPIGLOTTIDECTOMY
3022	VOCAL CORDECTOMY
3029	OTHER PART LARYNGECTOMY
303	COMPLETE LARYNGECTOMY
304	RADICAL LARYNGECTOMY
3121	MEDIASTINAL TRACHEOSTOMY
3129	OTHER PERM TRACHEOSTOMY
313	INCIS LARYNX TRACHEA NEC
3145	OPN BX LARYNX OR TRACHEA
315	LOCAL DESTRUC TRACH LES
3161	SUTURE OF LARYNGEAL LAC
3162	LARYNGEAL FISTULA CLOS
3163	LARYNGOSTOMY REVISION
3164	LARYNGEAL FX REPAIR

3169	OTHER LARYNGEAL REPAIR
3171	SUTURE OF TRACHEAL LACER
3172	CLOSURE OF TRACHEOSTOMY
3173	TRACHEA FISTULA CLOS NEC
3174	REVISION OF TRACHEOSTOMY
3175	TRACHEAL RECONSTRUCTION
3179	OTHER TRACHEAL REPAIR
3191	LARYNGEAL NERV DIVISION
3192	LYSIS TRACH/LARYNX ADHES
3198	OTH LARYNGEAL OPERATION
3199	OTHER TRACHEAL OPERATION
320	OTHER TRACHEAL OPERATION
3209	OTHER DESTRUC BRONC LES
321	OTHER BRONCHIAL EXCISION
3221	EMPHYSEMA BLEB PLICATION
3222	LUNG VOL REDUCTION SURG
3229	DESTROY LOC LUNG LES NEC
323	SEGMENTAL LUNG RESECTION
324	LOBECTOMY OF LUNG
325	COMPLETE PNEUMONECTOMY
326	RAD DISSEC THORAC STRUCT
329	OTHER EXCISION OF LUNG
330	INCISION OF BRONCHUS
331	INCISION OF LUNG
3325	OPEN BRONCHIAL BIOPSY
3327	CLOS ENDOSCOPIC LUNG BX
3328	OPEN LUNG BIOPSY
3329	BRONCH/LUNG DX PROC NEC
3334	THORACOPLASTY
3339	SURG COLLAPS OF LUNG NEC
3341	BRONCHIAL LACERAT SUTURE
3342	BRONCHIAL FISTULA CLOS
3343	LUNG LACERATION CLOSURE
3348	BRONCHIAL REPAIR NEC
3349	LUNG REPAIR NEC
335	LUNG REPAIR NEC
3350	LUNG TRANSPLANT NOS
3351	UNILAT LUNG TRANSPLANT
3352	BILAT LUNG TRANSPLANT
336	COMB HEART/LUNG TRANSPLA
3392	BRONCHIAL LIGATION
3393	PUNCTURE OF LUNG
3398	BRONCHIAL OPERATION NEC
3399	LUNG OPERATION NEC
3402	EXPLORATORY THORACOTOMY
3403	REOPEN THORACOTOMY SITE
341	INCISION OF MEDIASTINUM
3421	TRANSPLEURA THORACOSCOPY
3422	MEDIASTINOSCOPY
3426	OPEN MEDIASTINAL BIOPSY
3427	BIOPSY OF DIAPHRAGM
3428	DX PROCEDURE THORAX NEC
3429	DX PROC MEDIASTINUM NEC
343	DESTRUCT MEDIASTIN LES
344	DESTRUCT CHEST WALL LES
3451	DECORTICATION OF LUNG
3459	OTHER PLEURAL EXCISION
346	SCARIFICATION OF PLEURA
3473	CLOS THORACIC FISTUL NEC
3474	PECTUS DEFORMITY REPAIR
3479	OTHER CHEST WALL REPAIR
3481	EXCISE DIAPHRAGM LESION
3482	SUTURE DIAPHRAGM LACERAT
3483	CLOSE DIAPHRAGM FISTULA
3484	OTHER DIAPHRAGM REPAIR
3485	IMPLANT DIAPHRA PACEMAKE
3489	DIAPHRAGM OPERATION NEC
3493	REPAIR OF PLEURA
3499	THORACIC OPERATION NEC
3500	CLOSED VALVOTOMY NOS
3501	CLOSED AORTIC VALVOTOMY
3502	CLOSED MITRAL VALVOTOMY
3503	CLOSED PULMON VALVOTOMY
3504	CLOSED TRICUSP VALVOTOMY
3510	OPEN VALVULOPLASTY NOS
3511	OPN AORTIC VALVULOPLASTY
3512	OPN MITRAL VALVULOPLASTY
3513	OPN PULMON VALVULOPLASTY
3514	OPN TRICUS VALVULOPLASTY
3520	REPLACE HEART VALVE NOS
3521	REPLACE AORT VALV-TISSUE
3522	REPLACE AORTIC VALVE NEC
3523	REPLACE MITR VALV-TISSUE
3524	REPLACE MITRAL VALVE NEC
3525	REPLACE PULM VALV-TISSUE
3526	REPLACE PULMON VALVE NEC
3527	REPLACE TRIC VALV-TISSUE
3528	REPLACE TRICUSP VALV NEC
3531	PAPILLARY MUSCLE OPS
3532	CHORDAE TENDINEAE OPS
3533	ANNULOPLASTY
3534	INFUNDIBULECTOMY
3535	TRABECUL CARNEAE CORD OP
3539	TISS ADJ TO VALV OPS NEC
3542	CREATE SEPTAL DEFECT
3550	PROSTH REP HRT SEPTA NOS
3551	PROS REP ATRIAL DEF-OPN
3552	PROS REPAIR ATRIA DEF-CL
3553	PROST REPAIR VENTRIC DEF
3554	PROS REP ENDOCAR CUSHION
3560	GRFT REPAIR HRT SEPT NOS
3561	GRAFT REPAIR ATRIAL DEF
3562	GRAFT REPAIR VENTRIC DEF
3563	GRFT REP ENDOCAR CUSHION

3570	HEART SEPTA REPAIR NOS
3571	ATRIA SEPTA DEF REP NEC
3572	VENTR SEPTA DEF REP NEC
3573	ENDOCAR CUSHION REP NEC
3581	TOT REPAIR TETRAL FALLOT
3582	TOTAL REPAIR OF TAPVC
3583	TOT REP TRUNCUS ARTERIOS
3584	TOT COR TRANSPOS GRT VES
3591	INTERAT VEN RETRN TRANSP
3592	CONDUIT RT VENT-PUL ART
3593	CONDUIT LEFT VENTR-AORTA
3594	CONDUIT ARTIUM-PULM ART
3595	HEART REPAIR REVISION
3596	PERC HEART VALVULOPLASTY
3598	OTHER HEART SEPTA OPS
3599	OTHER HEART VALVE OPS
3600	OTHER HEART VALVE OPS
3601	PTCA-1 VES/ATH W/O AGENT
3602	PTCA-1 VES/ATH W AGENT
3603	OPEN CORONRY ANGIOPLASTY
3605	PTCA-MULTIPLE VESSEL/ATH
3609	REM OF COR ART OBSTR NEC
3610	AORTOCORONARY BYPASS NOS
3611	AORTOCOR BYPAS-1 COR ART
3612	AORTOCOR BYPAS-2 COR ART
3613	AORTOCOR BYPAS-3 COR ART
3614	AORTCOR BYPAS-4+ COR ART
3615	1 INT MAM-COR ART BYPASS
3616	2 INT MAM-COR ART BYPASS
3617	ABD-CORON ARTERY BYPASS
3619	HRT REVAS BYPS ANAS NEC
362	ARTERIAL IMPLANT REVASC
363	ARTERIAL IMPLANT REVASC
3631	OPEN CHEST TRANS REVASC
3632	OTH TRANSMYO REVASCULAR
3639	OTH HEART REVASCULAR
3691	CORON VESS ANEURYSM REP
3699	HEART VESSEL OP NEC
3710	INCISION OF HEART NOS
3711	CARDIOTOMY
3712	PERICARDIOTOMY
3724	PERICARDIAL BIOPSY
3731	PERICARDIECTOMY
3732	HEART ANEURYSM EXCISION
3733	EXC/DEST HRT LESION OPEN
3734	EXC/DEST HRT LES OTHER
3735	PARTIAL VENTRICULECTOMY
374	HEART & PERICARD REPAIR
375	HEART & PERICARD REPAIR
3751	HEART TRANSPLANTATION (Oct 03)
3752	IMPLANT TOT REP HRT SYS
3753	REPL/REP THORAC UNIT HRT
3754	REPL/REP OTH TOT HRT SYS
3761	PULSATION BALLOON IMPLAN
3762	IMPLANT HRT ASST SYS NEC
3763	REPLACE HRT ASSIST SYST
3764	REMOVE HEART ASSIST SYS
3765	IMP EXT PUL HRT ASST SYS
3766	IMP IMP PUL HRT ASST SYS
3767	IMP CARDIOMYOSTIMUL SYS
3774	INT OR REPL LEAD EPICAR
3775	REVISION OF LEAD
3776	REPL TV ATRI-VENT LEAD
3777	REMOVAL OF LEAD W/O REPL
3779	REVIS OR RELOCATE POCKET
3780	INT OR REPL PERM PACEMKR
3785	REPL PACEM W 1-CHAM, NON
3786	REPL PACEM 1-CHAM, RATE
3787	REPL PACEM W DUAL-CHAM
3789	REVISE OR REMOVE PACEMAK
3791	OPN CHEST CARDIAC MASSAG
3794	IMPLT/REPL CARDDEFIB TOT
3795	IMPLT CARDIODEFIB LEADS
3796	IMPLT CARDIODEFIB GENATR
3797	REPL CARDIODEFIB LEADS
3798	REPL CARDIODEFIB GENRATR
3799	OTHER HEART/PERICARD OPS
3800	INCISION OF VESSEL NOS
3801	INTRACRAN VESSEL INCIS
3802	HEAD/NECK VES INCIS NEC
3803	UPPER LIMB VESSEL INCIS
3804	INCISION OF AORTA
3805	THORACIC VESSEL INC NEC
3806	ABDOMEN ARTERY INCISION
3807	ABDOMINAL VEIN INCISION
3808	LOWER LIMB ARTERY INCIS
3809	LOWER LIMB VEIN INCISION
3810	ENDARTERECTOMY NOS
3811	INTRACRAN ENDARTERECTOMY
3812	HEAD & NECK ENDARTER NEC
3813	UPPER LIMB ENDARTERECTOM
3814	ENDARTERECTOMY OF AORTA
3815	THORACIC ENDARTERECTOMY
3816	ABDOMINAL ENDARTERECTOMY
3818	LOWER LIMB ENDARTERECT
3821	BLOOD VESSEL BIOPSY
3829	BLOOD VESSEL DX PROC NEC
3830	VESSEL RESECT/ANAST NOS
3831	INTRACRAN VES RESEC-ANAS
3832	HEAD/NECK VES RESEC-ANAS
3833	ARM VESSEL RESECT/ANAST
3834	AORTA RESECTION & ANAST
3835	THOR VESSEL RESECT/ANAST
3836	ABD VESSEL RESECT/ANAST

3837	ABD VEIN RESECT & ANAST
3838	LEG ARTERY RESECT/ANAST
3839	LEG VEIN RESECT/ANASTOM
3840	VESSEL RESECT/REPLAC NOS
3841	INTRACRAN VES RESEC-REPL
3842	HEAD/NECK VES RESEC-REPL
3843	ARM VES RESECT W REPLACE
3844	RESECT ABDM AORTA W REPL
3845	RESECT THORAC VES W REPL
3846	ABD ARTERY RESEC W REPLA
3847	ABD VEIN RESECT W REPLAC
3848	LEG ARTERY RESEC W REPLA
3849	LEG VEIN RESECT W REPLAC
3850	VARICOSE V LIG-STRIP NOS
3851	INTCRAN VAR V LIG-STRIP
3852	HEAD/NECK VAR V LIG-STR
3853	ARM VARICOSE V LIG-STRIP
3855	THORAC VAR V LIG-STRIP
3857	ABD VARICOS V LIGA-STRIP
3859	LEG VARICOS V LIGA-STRIP
3860	EXCISION OF VESSEL NOS
3861	INTRACRAN VESSEL EXCIS
3862	HEAD/NECK VESSEL EXCIS
3863	ARM VESSEL EXCISION
3864	EXCISION OF AORTA
3865	THORACIC VESSEL EXCISION
3866	ABDOMINAL ARTERY EXCIS
3867	ABDOMINAL VEIN EXCISION
3868	LEG ARTERY EXCISION
3869	LEG VEIN EXCISION
387	INTERRUPTION VENA CAVA
3880	SURG VESSEL OCCLUS NEC
3881	OCCLUS INTRACRAN VES NEC
3882	OCCLUS HEAD/NECK VES NEC
3883	OCCLUDE ARM VESSEL NEC
3884	OCCLUDE AORTA NEC
3885	OCCLUDE THORACIC VES NEC
3886	OCCLUDE ABD ARTERY NEC
3887	OCCLUDE ABD VEIN NEC
3888	OCCLUDE LEG ARTERY NEC
3889	OCCLUDE LEG VEIN NEC
390	SYSTEMIC-PULM ART SHUNT
391	INTRA-ABD VENOUS SHUNT
3921	CAVAL-PULMON ART ANASTOM
3922	AORTA-SUBCLV-CAROT BYPAS
3923	INTRATHORACIC SHUNT NEC
3924	AORTA-RENAL BYPASS
3925	AORTA-ILIAC-FEMOR BYPASS
3926	INTRA-ABDOMIN SHUNT NEC
3927	DIALYSIS ARTERIOVENOSTOM
3928	EXTRACRAN-INTRACR BYPASS
3929	VASC SHUNT & BYPASS NEC
3930	SUTURE OF VESSEL NOS
3931	SUTURE OF ARTERY
3932	SUTURE OF VEIN
3941	POSTOP VASC OP HEM CONTR
3942	REVIS REN DIALYSIS SHUNT
3943	REMOV REN DIALYSIS SHUNT
3949	VASC PROC REVISION NEC
3950	ANGIO/ATH NON-CORO VES
3951	CLIPPING OF ANEURYSM
3952	ANEURYSM REPAIR NEC
3953	ARTERIOVEN FISTULA REP
3954	RE-ENTRY OPERATION
3955	REIMPLAN ABERR RENAL VES
3956	REPAIR VESS W TIS PATCH
3957	REP VESS W SYNTH PATCH
3958	REPAIR VESS W PATCH NOS
3959	REPAIR OF VESSEL NEC
397	PER CARDIOPULMON BYPASS
3971	ENDO IMPL GRFT ABD AORTA
3972	ENDOVASC REPAIR HEAD VES
3979	ENDO REPAIR OTHER VESSEL
398	VASCULAR BODY OPERATIONS
3991	FREEING OF VESSEL
3992	VEIN INJECT-SCLEROS AGNT
3993	INSERT VES-TO-VES CANNUL
3994	REPLAC VES-TO-VES CANNUL
3998	HEMORRHAGE CONTROL NOS
3999	VESSEL OPERATION NEC
400	INCIS LYMPHATIC STRUCTUR
4011	LYMPHATIC STRUCT BIOPSY
4019	LYMPHATIC DIAG PROC NEC
4021	EXCIS DEEP CERVICAL NODE
4022	EXCISE INT MAMMARY NODE
4023	EXCISE AXILLARY NODE
4024	EXCISE INGUINAL NODE
4029	SIMP EXC LYMPH STRUC NEC
403	REGIONAL LYMPH NODE EXC
4040	RAD NECK DISSECTION NOS
4041	UNILAT RAD NECK DISSECT
4042	BILAT RAD NECK DISSECT
4050	RAD NODE DISSECTION NOS
4051	RAD DISSEC AXILLARY NODE
4052	RAD DISSEC PERIAORT NODE
4053	RAD DISSECT ILIAC NODES
4054	RADICAL GROIN DISSECTION
4059	RAD NODE DISSECTION NEC
4061	THORAC DUCT CANNULATION
4062	THORACIC DUCT FISTULIZAT
4063	CLOSE THORACIC DUCT FIST
4064	LIGATE THORACIC DUCT
4069	THORACIC DUCT OP NEC
409	LYMPH STRUCTURE OP NEC

410	LYMPH STRUCTURE OP NEC
4100	BONE MARROW TRNSPLNT NOS
4101	AUTO BONE MT W/O PURG
4102	ALO BONE MARROW TRNSPLNT
4103	ALLOGRFT BONE MARROW NOS
4104	AUTO HEM STEM CT W/O PUR
4105	ALLO HEM STEM CT W/O PUR
4106	CORD BLD STEM CELL TRANS
4107	AUTO HEM STEM CT W PURG
4108	ALLO HEM STEM CT W PURG
4109	AUTO BONE MT W PURGING
412	SPLENOTOMY
4133	OPEN SPLEEN BIOPSY
4141	SPLENIC CYST MARSUPIAL
4142	EXC SPLENIC LESION/TISS
4143	PARTIAL SPLENECTOMY
415	TOTAL SPLENECTOMY
4193	EXC OF ACCESSORY SPLEEN
4194	SPLEEN TRANSPLANTATION
4195	REPAIR OF SPLEEN
4199	SPLEEN OPERATION NEC
4201	ESOPHAGEAL WEB INCISION
4209	ESOPHAGEAL INCISION NEC
4210	ESOPHAGOSTOMY NOS
4211	CERVICAL ESOPHAGOSTOMY
4212	ESOPH POUCH EXTERIORIZAT
4219	EXT FISTULIZAT ESOPH NEC
4221	ESOPHAGOSCOPY BY INCIS
4225	OPEN BIOPSY OF ESOPHAGUS
4231	LOC EXCIS ESOPH DIVERTIC
4232	LOCAL EXCIS ESOPHAG NEC
4239	DESTRUCT ESOPHAG LES NEC
4240	ESOPHAGECTOMY NOS
4241	PARTIAL ESOPHAGECTOMY
4242	TOTAL ESOPHAGECTOMY
4251	THORAC ESOPHAGOESOPHAGOS
4252	THORAC ESOPHAGOGASTROST
4253	THORAC SM BOWEL INTERPOS
4254	THORAC ESOPHAGOENTER NEC
4255	THORAC LG BOWEL INTERPOS
4256	THORAC ESOPHAGOCOLOS NEC
4258	THORAC INTERPOSITION NEC
4259	THORAC ESOPHAG ANAST NEC
4261	STERN ESOPHAGOESOPHAGOST
4262	STERN ESOPHAGOGASTROSTOM
4263	STERN SM BOWEL INTERPOS
4264	STERN ESOPHAGOENTER NEC
4265	STERN LG BOWEL INTERPOS
4266	STERN ESOPHAGOCOLOS NEC
4268	STERN INTERPOSITION NEC
4269	STERN ESOPHAG ANAST NEC
427	ESOPHAGOMYOTOMY
4282	SUTURE ESOPHAGEAL LACER
4283	ESOPHAGOSTOMY CLOSURE
4284	ESOPH FISTULA REPAIR NEC
4285	ESOPHAG STRICTURE REPAIR
4286	PROD SUBQ TUNNEL NO ANAS
4287	ESOPHAGEAL GRAFT NEC
4289	ESOPHAGEAL REPAIR NEC
4291	LIGATION ESOPH VARIX
430	GASTROTOMY
431	GASTROTOMY
432	OTHER GASTROSTOMY
433	PYLOROMYOTOMY
4342	LOCAL GASTR EXCISION NEC
4349	LOCAL GASTR DESTRUCT NEC
435	PROXIMAL GASTRECTOMY
436	DISTAL GASTRECTOMY
437	PART GASTREC W JEJ ANAST
4381	PART GAST W JEJ TRANSPOS
4389	PARTIAL GASTRECTOMY NEC
4391	TOT GAST W INTES INTERPO
4399	TOTAL GASTRECTOMY NEC
4400	VAGOTOMY NOS
4401	TRUNCAL VAGOTOMY
4402	HIGHLY SELECT VAGOTOMY
4403	SELECTIVE VAGOTOMY NEC
4411	TRANSABDOMIN GASTROSCOPY
4415	OPEN GASTRIC BIOPSY
442	GASTRIC DIAGNOS PROC NEC
4421	DILATE PYLORUS, INCISION
4429	OTHER PYLOROPLASTY
4431	HIGH GASTRIC BYPASS
4432	PERCU GASTROJEJUNOSTOMY
4439	GASTROENTEROSTOMY NEC
4440	SUTURE PEPTIC ULCER NOS
4441	SUT GASTRIC ULCER SITE
4442	SUTURE DUODEN ULCER SITE
445	REVISION GASTRIC ANASTOM
4461	SUTURE GASTRIC LACERAT
4463	CLOSE GASTRIC FISTUL NEC
4464	GASTROPEXY
4465	ESOPHAGOGASTROPLASTY
4466	CREAT ESOPHAGASTR SPHINC
4469	GASTRIC REPAIR NEC
4491	LIGATE GASTRIC VARICES
4492	INTRAOP GASTRIC MANIPUL
4499	GASTRIC OPERATION NEC
4500	INTESTINAL INCISION NOS
4501	DUODENAL INCISION
4502	SMALL BOWEL INCISION NEC
4503	LARGE BOWEL INCISION
4511	TRANSAB SM BOWEL ENDOSC
4515	OPEN SMALL BOWEL BIOPSY

4521	TRANSAB LG BOWEL ENDOSC
4526	OPEN LARGE BOWEL BIOPSY
4531	OTH EXCISE DUODENUM LES
4532	DESTRUCT DUODEN LES NEC
4533	LOCAL EXCIS SM BOWEL NEC
4534	DESTR SM BOWEL LES NEC
4541	EXCISE LG INTESTINE LES
4549	DESTRUC LG BOWEL LES NEC
4550	INTEST SEG ISOLAT NOS
4551	SM BOWEL SEGMENT ISOLAT
4552	LG BOWEL SEGMENT ISOLAT
4561	MULT SEG SM BOWEL EXCIS
4562	PART SM BOWEL RESECT NEC
4563	TOTAL REMOVAL SM BOWEL
4571	MULT SEG LG BOWEL EXCIS
4572	CECECTOMY
4573	RIGHT HEMICOLECTOMY
4574	TRANSVERSE COLON RESECT
4575	LEFT HEMICOLECTOMY
4576	SIGMOIDECTOMY
4579	PART LG BOWEL EXCIS NEC
458	TOT INTRA-ABD COLECTOMY
4590	INTESTINAL ANASTOM NOS
4591	SM-TO-SM BOWEL ANASTOM
4592	SM BOWEL-RECT STUMP ANAS
4593	SMALL-TO-LARGE BOWEL NEC
4594	LG-TO-LG BOWEL ANASTOM
4595	ANAL ANASTOMOSIS
4601	SM BOWEL EXTERIORIZATION
4602	RESECT EXT SEG SM BOWEL
4603	LG BOWEL EXTERIORIZATION
4604	RESECT EXT SEG LG BOWEL
4610	COLOSTOMY NOS
4611	TEMPORARY COLOSTOMY
4612	TEMPORARY COLOSTOMY
4613	PERMANENT COLOSTOMY
4620	ILEOSTOMY NOS
4621	TEMPORARY ILEOSTOMY
4622	CONTINENT ILEOSTOMY
4623	PERMANENT ILEOSTOMY NEC
4640	INTEST STOMA REVIS NOS
4641	SM BOWEL STOMA REVISION
4642	PERICOLOST HERNIA REPAIR
4643	LG BOWEL STOMA REVIS NEC
4650	INTEST STOMA CLOSURE NOS
4651	SM BOWEL STOMA CLOSURE
4652	LG BOWEL STOMA CLOSURE
4660	INTESTINAL FIXATION NOS
4661	SM BOWEL-ABD WALL FIXAT
4662	SMALL BOWEL FIXATION NEC
4663	LG BOWEL-ABD WALL FIXAT
4664	LARGE BOWEL FIXATION NEC
4671	DUODENAL LACERAT SUTURE
4672	DUODENAL FISTULA CLOSURE
4673	SMALL BOWEL SUTURE NEC
4674	CLOSE SM BOWEL FIST NEC
4675	SUTURE LG BOWEL LACERAT
4676	CLOSE LG BOWEL FISTULA
4679	REPAIR OF INTESTINE NEC
4680	INTRA-AB BOWEL MANIP NOS
4681	INTRA-ABD SM BOWEL MANIP
4682	INTRA-ABD LG BOWEL MANIP
4691	MYOTOMY OF SIGMOID COLON
4692	MYOTOMY OF COLON NEC
4693	REVISE SM BOWEL ANASTOM
4694	REVISE LG BOWEL ANASTOM
4697	TRANSPLANT OF INTESTINE
4699	INTESTINAL OP NEC
470	INTESTINAL OP NEC
4701	LAP APPENDECTOMY
4709	OTHER APPENDECTOMY
471	OTHER APPENDECTOMY
4711	LAP INCID APPENDECTOMY
4719	OTHER INCID APPENDECTOMY
472	DRAIN APPENDICEAL ABSC
4791	APPENDICOSTOMY
4792	CLOSE APPENDICEAL FISTUL
4799	APPENDICEAL OPS NEC
480	PROCTOTOMY
481	PROCTOSTOMY
4821	TRANSAB PROCTOSIGMOIDOSC
4825	OPEN RECTAL BIOPSY
4835	LOCAL EXCIS RECTAL LES
4841	SOAVE SUBMUC RECT RESECT
4849	PULL-THRU RECT RESEC NEC
485	ABD-PERINEAL RECT RESECT
4861	TRANSSAC RECTOSIGMOIDECT
4862	ANT RECT RESECT W COLOST
4863	ANTERIOR RECT RESECT NEC
4864	POSTERIOR RECT RESECTION
4865	DUHAMEL RECTAL RESECTION
4866	DUHAMEL RECTAL RESECTION
4869	RECTAL RESECTION NEC
4871	SUTURE OF RECTAL LACER
4872	CLOSURE OF PROCTOSTOMY
4873	CLOSE RECTAL FIST NEC
4874	RECTORECTOSTOMY
4875	ABDOMINAL PROCTOPEXY
4876	PROCTOPEXY NEC
4879	REPAIR OF RECTUM NEC
4881	PERIRECTAL INCISION
4882	PERIRECTAL EXCISION
4891	INCIS RECTAL STRICTURE
4892	ANORECTAL MYOMECTOMY

4893	REPAIR PERIRECT FISTULA
4899	RECTAL PERIRECT OP NEC
4901	INCIS PERIANAL ABSCESS
4902	PERIANAL INCISION NEC
4904	PERIANAL EXCISION NEC
4911	ANAL FISTULOTOMY
4912	ANAL FISTULECTOMY
493	ANAL/PERIAN DX PROC NEC
4939	OTHER DESTRUC ANUS LES
4944	HEMORRHOID CRYOTHERAPY
4945	HEMORRHOID LIGATION
4946	HEMORRHOIDECTOMY
4949	HEMORRHOID PROCEDURE NEC
4951	LEFT LAT SPHINCTEROTOMY
4952	POST SPHINCTEROTOMY
4959	ANAL SPHINCTEROTOMY NEC
496	EXCISION OF ANUS
4971	SUTURE ANAL LACERATION
4972	ANAL CERCLAGE
4973	CLOSURE OF ANAL FISTULA
4974	GRACILIS MUSC TRANSPLAN
4975	IMPL OR REV ART ANAL SPH
4976	REMOV ART ANAL SPHINCTER
4979	ANAL SPHINCT REPAIR NEC
4991	INCISION OF ANAL SEPTUM
4992	INSERT SUBQ ANAL STIMUL
4993	ANAL INCISION NEC
4994	REDUCTION ANAL PROLAPSE
4995	CONTROL ANAL HEMORRHAGE
4999	ANAL OPERATION NEC
500	HEPATOTOMY
5012	OPEN LIVER BIOPSY
5019	HEPATIC DX PROC NEC
5021	MARSUPIALIZAT LIVER LES
5022	PARTIAL HEPATECTOMY
5029	DESTRUC HEPATIC LES NEC
503	HEPATIC LOBECTOMY
504	TOTAL HEPATECTOMY
5051	AUXILIARY LIVER TRANSPL
5059	LIVER TRANSPLANT NEC
5061	CLOSURE LIVER LACERAT
5069	LIVER REPAIR NEC
5102	TROCAR CHOLECYSTOSTOMY
5103	CHOLECYSTOSTOMY NEC
5104	CHOLECYSTOTOMY NEC
5113	OPEN BILIARY TRACT BX
5119	BILIARY TR DX PROC NEC
5121	OTH PART CHOLECYSTECTOMY
5122	CHOLECYSTECTOMY
5123	LAPAROSCOPIC CHOLECYSTEC
5124	LAP PART CHOLECYSTECTOMY
5131	GB-TO-HEPAT DUCT ANAST
5132	GB-TO-INTESTINE ANASTOM
5133	GB-TO-PANCREAS ANASTOM
5134	GB-TO-STOMACH ANASTOMOS
5135	GALLBLADDER ANASTOM NEC
5136	CHOLEDOCHOENTEROSTOMY
5137	HEPATIC DUCT-GI ANASTOM
5139	BILE DUCT ANASTOMOS NEC
5141	CDE FOR CALCULUS REMOV
5142	CDE FOR OBSTRUCTION NEC
5143	CHOLEDOCHOHEPAT INTUBAT
5149	INCIS OBSTR BILE DUC NEC
5151	COMMON DUCT EXPLORATION
5159	BILE DUCT INCISION NEC
5161	EXCIS CYST DUCT REMNANT
5162	EXCIS AMPULLA OF VATER
5163	COMMON DUCT EXCIS NEC
5169	BILE DUCT EXCISION NEC
5171	SIMPLE SUT-COMMON DUCT
5172	CHOLEDOCHOPLASTY
5179	BILE DUCT REPAIR NEC
5181	SPHINCTER OF ODDI DILAT
5182	PANCREAT SPHINCTEROTOM
5183	PANCREAT SPHINCTEROPLAS
5189	SPHINCT OF ODDI OP NEC
5191	REPAIR GB LACERATION
5192	CLOSURE CHOLECYSTOSTOMY
5193	CLOS BILIARY FISTUL NEC
5194	REVIS BILE TRACT ANASTOM
5195	REMOVE BILE DUCT PROSTH
5199	BILIARY TRACT OP NEC
5201	CATH DRAIN-PANCREAT CYST
5209	PANCREATOTOMY NEC
5212	OPEN PANCREATIC BIOPSY
5219	PANCREATIC DX PROC NEC
522	PANCREATIC DX PROC NEC
5222	OTHER DESTRU PANCREA LES
523	PANCREAT CYST MARSUPIALI
524	INT DRAIN PANCREAT CYST
5251	PROXIMAL PANCREATECTOMY
5252	DISTAL PANCREATECTOMY
5253	RAD SUBTOT PANCREATECTOM
5259	PARTIAL PANCREATECT NEC
526	TOTAL PANCREATECTOMY
527	RAD PANCREATICODUODENECT
5280	PANCREAT TRANSPLANT NOS
5281	REIMPLANT PANCREATIC TIS
5282	PANCREATIC HOMOTRANSPLAN
5283	PANCREATIC HETEROTRANSPL
5291	TRNSPLNT ISLETS LANG NOS
5292	CANNULATION PANCREA DUC
5295	PANCREATIC REPAIR NEC
5296	PANCREATIC ANASTOMOSIS

5299	PANCREATIC OPERATION NEC
5300	UNILAT ING HERN REP NOS
5301	REPAIR DIRECT ING HERNIA
5302	REPAIR INDIR ING HERNIA
5303	DIR ING HERNIA REP-GRAFT
5304	IND ING HERNIA REP-GRAFT
5305	ING HERNIA REP-GRAFT NOS
5310	BILAT ING HERNIA REP NOS
5311	BILAT DIR ING HERN REP
5312	BILAT IND ING HERN REP
5313	BIL DIR/IND ING HRN REP
5314	BIL DIR ING HRN REP-GRFT
5315	BIL IND ING HRN REP-GRFT
5316	BIL DIR/IND ING HERN-PRO
5317	BIL ING HRN REP-GRFT NOS
5321	UNIL FEMOR HRN REP-GRFT
5329	UNIL FEMOR HERN REP NEC
5331	BIL FEM HERN REPAIR-GRFT
5339	BIL FEM HERN REPAIR NEC
5341	UMBIL HERNIA REPAIR-GRFT
5349	UMBIL HERNIA REPAIR NEC
5351	INCISIONAL HERNIA REPAIR
5359	ABD WALL HERN REPAIR NEC
5361	INCIS HERNIA REPAIR-GRFT
5369	ABD HERN REPAIR-GRFT NEC
537	ABD REPAIR-DIAPHR HERNIA
5380	THOR REP-DIAPH HERN NOS
5381	DIAPHRAGMATIC PLICATION
5382	PARASTERN HERNIA REPAIR
539	OTHER HERNIA REPAIR
540	ABDOMINAL WALL INCISION
5411	EXPLORATORY LAPAROTOMY
5412	REOPEN RECENT LAP SITE
5419	LAPAROTOMY NEC
5421	LAPAROSCOPY
5422	ABDOMINAL WALL BIOPSY
5423	PERITONEAL BIOPSY
5429	ABD REGION DX PROC NEC
543	DESTRUCT ABD WALL LESION
544	DESTRUCT PERITONEAL TISS
545	DESTRUCT PERITONEAL TISS
5451	LAP PERITON ADHESIOLYSIS
5459	OTH PERITON ADHESIOLYSIS
5461	RECLOSE POST OP DISRUPT
5462	DELAYED CLOS ABD WOUND
5463	ABD WALL SUTURE NEC
5464	PERITONEAL SUTURE
5471	REPAIR OF GASTROSCHISIS
5472	ABDOMEN WALL REPAIR NEC
5473	PERITONEAL REPAIR NEC
5474	OMENTAL REPAIR NEC
5475	MESENTERIC REPAIR NEC
5492	REMOVE FB FROM PERITON
5493	CREATE CUTANPERITON FIST
5494	CREAT PERITONEOVAS SHUNT
5495	PERITONEAL INCISION
5501	NEPHROTOMY
5502	NEPHROSTOMY
5503	PERCU NEPHROSTM W/O FRAG
5504	PERCU NEPHROSTMY W FRAG
5511	PYELOTOMY
5512	PYELOSTOMY
5524	OPEN RENAL BIOPSY
5529	RENAL DIAGNOST PROC NEC
5531	RENAL LES MARSUPIALIZAT
5539	LOC DESTR RENAL LES NEC
554	PARTIAL NEPHRECTOMY
5551	NEPHROURETERECTOMY
5552	SOLITARY KIDNEY NEPHRECT
5553	REJECTED KIDNEY NEPHRECT
5554	BILATERAL NEPHRECTOMY
5561	RENAL AUTOTRANSPLANT
5569	KIDNEY TRANSPLANT NEC
557	NEPHROPEXY
5581	SUTURE KIDNEY LACERATION
5582	CLOSE NEPHROST & PYELOST
5583	CLOSE RENAL FISTULA NEC
5584	REDUCE RENAL PEDICL TORS
5585	SYMPHYSIOTOMY
5586	RENAL ANASTOMOSIS
5587	CORRECT URETEROPELV JUNC
5589	RENAL REPAIR NEC
5591	RENAL DECAPSULATION
5597	IMPLANT MECHANIC KIDNEY
5598	REMOV MECHANICAL KIDNEY
5599	RENAL OPERATION NEC
560	TU REMOV URETER OBSTRUCT
561	URETERAL MEATOTOMY
562	URETEROTOMY
5634	OPEN URETERAL BIOPSY
5639	URETERAL DX PROCEDUR NEC
5640	URETERECTOMY NOS
5641	PARTIAL URETERECTOMY
5642	TOTAL URETERECTOMY
5651	FORM CUTAN ILEOURETEROST
5652	REVIS CUTAN ILEOURETEROS
5661	FORM CUTAN URETEROSTOMY
5662	REVIS CUTAN URETEROS NEC
5671	URIN DIVERSION TO BOWEL
5672	REVIS URETEROENTEROSTOMY
5673	NEPHROCYSTANASTOMOSI NOS
5674	URETERONEOCYSTOSTOMY
5675	TRANSURETEROURETEROSTOMY
5679	URETERAL ANASTOMOSIS NEC

5681	INTRALUM URETE ADHESIOLY
5682	SUTURE URETERAL LACERAT
5683	URETEROSTOMY CLOSURE
5684	CLOSE URETER FISTULA NEC
5685	URETEROPEXY
5686	REMOVE URETERAL LIGATURE
5689	REPAIR OF URETER NEC
5692	IMPLANT URETERAL STIMUL
5693	REPLACE URETERAL STIMUL
5694	REMOVE URETERAL STIMULAT
5695	LIGATION OF URETER
5699	URETERAL OPERATION NEC
5712	CYSTOTOMY & ADHESIOLYSIS
5718	OTHER SUPRAPU CYSTOSTOMY
5719	CYSTOTOMY NEC
5721	VESICOSTOMY
5722	REVISE CLO VESICOSTOMY
5733	CLOS TRANSURETH BLADD BX
5734	OPEN BLADDER BIOPSY
5739	BLADDER DIAGNOS PROC NEC
5741	TU ADHESIOLYSIS BLADDER
5749	TU DESTRUC BLADD LES NEC
5751	EXCISION OF URACHUS
5759	BLADDER LES DESTRUCT NEC
576	PARTIAL CYSTECTOMY
5771	RADICAL CYSTECTOMY
5779	TOTAL CYSTECTOMY NEC
5781	SUTURE BLADDER LACERAT
5782	CYSTOSTOMY CLOSURE
5783	ENTEROVESICO FIST REPAIR
5784	VESIC FISTULA REPAIR NEC
5785	CYSTOURETHROPLASTY
5786	BLADDER EXSTROPHY REPAIR
5787	BLADDER RECONSTRUCTION
5788	BLADDER ANASTOMOSIS NEC
5789	BLADDER REPAIR NEC
5791	BLADDER SPHINCTEROTOMY
5793	CONTROL BLADD HEMORRHAGE
5796	IMPLANT BLADDER STIMULAT
5797	REPLACE BLADDER STIMULAT
5798	REMOVE BLADDER STIMULAT
5799	BLADDER OPERATION NEC
580	URETHROTOMY
581	URETHRAL MEATOTOMY
5841	SUTURE URETHRAL LACERAT
5842	URETHROSTOMY CLOSURE
5843	CLOSE URETH FISTULA NEC
5844	URETHRAL REANASTOMOSIS
5845	HYPO-EPISPADIUS REPAIR
5846	URETH RECONSTRUCTION NEC
5847	URETHRAL MEATOPLASTY
5849	URETHRAL REPAIR NEC
585	URETH STRICTURE RELEASE
5891	PERIURETHRAL INCISION
5892	PERIURETHRAL EXCISION
5893	IMPLT ARTF URIN SPHINCT
5899	URETH/PERIURETH OP NEC
5900	RETROPERIT DISSECT NOS
5901	RETROPERIT DISSECT NOS
5902	PERIREN ADHESIOLYS NEC
5903	LAP LYS PERIREN/URET ADH
5909	PERIREN/URETER INCIS NEC
5911	OTH LYS PERIVES ADHESIO
5912	LAP LYS PERIVESURETH ADH
5919	PERIVESICAL INCISION NEC
5921	PERIREN/URETERAL BIOPSY
5929	PERIREN/URET DX PROC NEC
593	URETHROVES JUNCT PLICAT
594	SUPRAPUBIC SLING OP
595	RETROPUBIC URETH SUSPENS
596	PARAURETHRAL SUSPENSION
5971	LEVATOR MUSC SUSPENSION
5979	URIN INCONTIN REPAIR NEC
5991	PERIREN/VESICLE EXCISION
5992	PERIREN/VESICLE OP NEC
600	INCISION OF PROSTATE
6012	OPEN PROSTATIC BIOPSY
6014	OPEN SEMINAL VESICLES BX
6015	PERIPROSTATIC BIOPSY
6018	PROSTATIC DX PROCED NEC
6019	SEMIN VES DX PROCED NEC
602	SEMIN VES DX PROCED NEC
6021	TRANSURETH PROSTATECTOMY
6029	OTH TRANSURETH PROSTATEC
603	SUPRAPUBIC PROSTATECTOMY
604	RETROPUBIC PROSTATECTOMY
605	RADICAL PROSTATECTOMY
6061	LOS EXCIS PROSTATIC LES
6062	PERINEAL PROSTATECTOMY
6069	PROSTATECTOMY NEC
6072	SEMINAL VESICLE INCISION
6073	SEMINAL VESICLE EXCISION
6079	SEMINAL VESICLE OP NEC
6081	PERIPROSTATIC INCISION
6082	PERIPROSTATIC EXCISION
6093	REPAIR OF PROSTATE
6094	CONTROL PROSTATE HEMORR
6095	TRANS BAL DIL PROS URETH
6096	TU DESTR PROSTATE BY MT
6097	OTH TU DESTR PROS - RT
6099	PROSTATIC OPERATION NEC
612	EXCISION OF HYDROCELE
6142	SCROTAL FISTULA REPAIR
6149	SCROTUM/TUNIC REPAIR NEC

6192	EXCISION TUNICA LES NEC
6199	SCROTUM & TUNICA OP NEC
620	INCISION OF TESTES
6212	OPEN TESTICULAR BIOPSY
6219	TESTES DX PROCEDURE NEC
622	TESTICULAR LES DESTRUCT
623	UNILATERAL ORCHIECTOMY
6241	REMOVE BOTH TESTES
6242	REMOVE SOLITARY TESTIS
625	ORCHIOPEXY
6261	SUTURE TESTICULAR LACER
6269	TESTICULAR REPAIR NEC
627	INSERT TESTICULAR PROSTH
6299	TESTICULAR OPERATION NEC
6309	SPERMAT CORD/VAS DX NEC
631	EXC SPERMATIC VARICOCELE
632	EXCISE EPIDIDYMIS CYST
633	EXCISE CORD/EPID LES NEC
634	EPIDIDYMECTOMY
6351	SUTURE CORD & EPID LACER
6353	TRANSPLANT SPERMAT CORD
6359	CORD & EPIDID REPAIR NEC
6381	SUTURE VAS & EPIDID LAC
6382	POSTOP VAS RECONSTRUCT
6383	EPIDIDYMOVASOSTOMY
6385	REMOV VAS DEFERENS VALVE
6389	VAS & EPIDIDY REPAIR NEC
6392	EPIDIDYMOTOMY
6393	SPERMATIC CORD INCISION
6394	SPERM CORD ADHESIOLYSIS
6395	INSERT VALVE IN VAS DEF
6399	CORD/EPID/VAS OPS NEC
640	CIRCUMCISION
6411	PENILE BIOPSY
642	LOCAL EXCIS PENILE LES
643	AMPUTATION OF PENIS
6441	SUTURE PENILE LACERATION
6442	RELEASE OF CHORDEE
6443	CONSTRUCTION OF PENIS
6444	RECONSTRUCTION OF PENIS
6445	REPLANTATION OF PENIS
6449	PENILE REPAIR NEC
645	SEX TRANSFORMAT OP NEC
6492	INCISION OF PENIS
6493	DIVISION OF PENILE ADHES
6495	INS NONINFL PENIS PROSTH
6496	REMOVE INT PENILE PROSTH
6497	INS INFLATE PENIS PROSTH
6498	PENILE OPERATION NEC
6499	MALE GENITAL OP NEC
650	MALE GENITAL OP NEC
6501	LAPAROSCOPIC OOPHOROTOMY
6509	OTHER OOPHOROTOMY
6511	OVARIAN ASPIRAT BIOPSY
6512	OVARIAN BIOPSY NEC
6513	LAP BIOPSY OF OVARY
6514	OTH LAP DX PROC OVARIES
6519	OVARIAN DX PROCEDURE NEC
6521	OVARIAN CYST MARSUPIALIZ
6522	OVARIAN WEDGE RESECTION
6523	LAP MARSUP OVARIAN CYST
6524	LAP WEDGE RESECT OVARY
6525	OTH LAP LOC EXC DEST OVA
6529	LOCAL DESTR OVA LES NEC
653	LOCAL DESTR OVA LES NEC
6531	LAP UNILAT OOPHORECTOMY
6539	OTH UNILAT OOPHORECTOMY
654	OTH UNILAT OOPHORECTOMY
6541	LAP UNI SALPINGO-OOPHOR
6549	OTH UNI SALPINGO-OOPHOR
6551	OTH REMOVE BOTH OVARIES
6552	OTH REMOVE REMAIN OVARY
6553	LAP REMOVE BOTH OVARIES
6554	LAP REMOVE REMAIN OVARY
6561	OTH REMOVE OVARIES/TUBES
6562	OTH REMOVE REM OVA/TUBE
6563	LAP REMOVE OVARIES/TUBES
6564	LAP REMOVE REM OVA/TUBE
6571	OTH SIMPLE SUTURE OVARY
6572	OTH REIMPLANT OF OVARY
6573	OTH SALPINGO-OOPHOROPLAS
6574	LAP SIMPLE SUTURE OVARY
6575	LAP REIMPLANT OF OVARY
6576	LAP SALPINGO-OOPHOROPLAS
6579	REPAIR OF OVARY NEC
658	REPAIR OF OVARY NEC
6581	LAP ADHESIOLYS OVA/TUBE
6589	ADHESIOLYSIS OVARY/TUBE
6591	ASPIRATION OF OVARY
6592	TRANSPLANTATION OF OVARY
6593	MANUAL RUPT OVARIAN CYST
6594	OVARIAN DENERVATION
6595	OVARIAN TORSION RELEASE
6599	OVARIAN OPERATION NEC
660	OVARIAN OPERATION NEC
6601	SALPINGOTOMY
6602	SALPINGOSTOMY
6611	FALLOPIAN TUBE BIOPSY
6619	FALLOP TUBE DX PROC NEC
6621	BILAT ENDOSC CRUSH TUBE
6622	BILAT ENDOSC DIVIS TUBE
6629	BILAT ENDOS OCC TUBE NEC
6631	BILAT TUBAL CRUSHING NEC
6632	BILAT TUBAL DIVISION NEC

6639	BILAT TUBAL DESTRUCT NEC
664	TOTAL UNILAT SALPINGECT
6651	REMOVE BOTH FALLOP TUBES
6652	REMOVE SOLITARY FAL TUBE
6661	DESTROY FALLOP TUBE LES
6662	REMOV TUBE & ECTOP PREG
6663	BILAT PART SALPINGEC NOS
6669	PARTIAL SALPINGECTOM NEC
6671	SIMPL SUTURE FALLOP TUBE
6672	SALPINGO-OOPHOROSTOMY
6673	SALPINGO-SALPINGOSTOMY
6674	SALPINGO-UTEROSTOMY
6679	FALLOP TUBE REPAIR NEC
6692	UNILAT FALLOP TUBE DESTR
6693	IMPL FALLOP TUBE PROSTH
6694	REMOV FALLOP TUBE PROSTH
6695	BLOW THERAPEUT INTO TUBE
6696	FALLOPIAN TUBE DILATION
6697	BURY FIMBRIAE IN UTERUS
6699	FALLOPIAN TUBE OP NEC
6711	ENDOCERVICAL BIOPSY
6712	CERVICAL BIOPSY NEC
6719	CERVICAL DX PROCEDUR NEC
672	CONIZATION OF CERVIX
6731	CERVICAL CYST MARSUPIAL
6732	CERVICAL LES CAUTERIZAT
6733	CERVICAL LES CRYOTHERAPY
6739	CERVICAL LES DESTRUC NEC
674	AMPUTATION OF CERVIX
675	AMPUTATION OF CERVIX
6751	TRANSAB CERCLAGE CERVIX
6759	OTH REP INT CERVICAL OS
6761	SUTURE CERVICAL LACERAT
6762	CERVICAL FISTULA REPAIR
6769	CERVICAL REPAIR NEC
680	HYSTEROTOMY
6813	OPEN UTERINE BIOPSY
6814	OPEN UTERINE LIGAMENT BX
6815	CLOS UTERINE LIGAMENT BX
6816	CLOSED UTERINE BIOPSY
6819	UTERUS/ADNEX DX PROC NEC
6821	ENDOMET SYNECHIAE DIVIS
6822	INCISION UTERINE SEPTUM
6823	ENDOMETRIAL ABLATION
6829	UTERINE LES DESTRUCT NEC
683	UTERINE LES DESTRUCT NEC
6831	LAP SCERVIC HYSTERECTOMY
6839	OTH SUBTOT ABD HYSTERECT (Oct 03)
684	TOTAL ABD HYSTERECTOMY
685	TOTAL ABD HYSTERECTOMY
6851	LAP AST VAG HYSTERECTOMY
6859	OTHER VAG HYSTERECTOMY
686	RADICAL ABD HYSTERECTOMY
687	RADICAL VAG HYSTERECTOMY
688	PELVIC EVISCERATION
689	HYSTERECTOMY NEC/NOS
6901	D & C FOR PREG TERMINAT
6902	D & C POST DELIVERY
6909	D & C NEC
6911	D & C NEC
6919	DESTRUC UTER SUPPORT NEC
6921	INTERPOSIT OP UTERIN LIG
6922	UTERINE SUSPENSION NEC
6923	VAG REPAIR INVERS UTERUS
6929	UTERUS/ADNEXA REPAIR NEC
693	PARACERV UTERINE DENERV
6941	SUTURE UTERINE LACERAT
6942	CLOSURE UTERINE FISTULA
6949	UTERINE REPAIR NEC
6951	ASPIRAT CURET-PREG TERMI
6952	ASPIRAT CURET-POST DELIV
6995	INCISION OF CERVIX
6997	REMOVE PENETRAT CERV FB
6998	UTERINE SUPPORT OP NEC
6999	UTERINE OPERATION NEC
7012	CULDOTOMY
7013	INTRALUM VAG ADHESIOLYS
7014	VAGINOTOMY NEC
7023	CUL-DE-SAC BIOPSY
7024	VAGINAL BIOPSY
7029	VAGIN/CUL-DE-SAC DX NEC
7031	HYMENECTOMY
7032	EXCIS CUL-DE-SAC LESION
7033	EXCISION VAGINAL LESION
704	VAGINAL OBLITERATION
7050	CYSTOCEL/RECTOCEL REPAIR
7051	CYSTOCELE REPAIR
7052	RECTOCELE REPAIR
7061	VAGINAL CONSTRUCTION
7062	VAGINAL RECONSTRUCTION
7071	SUTURE VAGINA LACERATION
7072	REPAIR COLOVAGIN FISTULA
7073	REPAIR RECTOVAG FISTULA
7074	REP VAGINOENT FISTUL NEC
7075	REPAIR VAG FISTULA NEC
7076	HYMENORRHAPHY
7077	VAGINAL SUSPENS & FIXAT
7079	VAGINAL REPAIR NEC
708	VAGINAL VAULT OBLITERAT
7091	VAGINAL OPERATION NEC
7092	CUL-DE-SAC OPERATION NEC
7101	VULVAR ADHESIOLYSIS
7109	INCIS VULVA/PERINEUM NEC
7111	VULVAR BIOPSY

7119	VULVAR DIAGNOS PROC NEC
7122	INCISE BARTHOLIN"S GLAND
7123	BARTHOLIN GLAND MARSUP
7124	DESTRUC BARTHOLIN GLAND
7129	BARTHOLIN"S GLAND OP NEC
713	LOCAL VULVAR EXCIS NEC
714	OPERATIONS ON CLITORIS
715	RADICAL VULVECTOMY
7161	UNILATERAL VULVECTOMY
7162	BILATERAL VULVECTOMY
7171	SUTURE VULVAR LACERATION
7172	REPAIR VULVAR FISTULA
7179	VULVAR/PERIN REPAIR NEC
718	OTHER VULVAR OPERATIONS
719	OTHER FEMALE GENITAL OPS
7394	PUBIOTOMY TO ASSIST DEL
7399	OPS ASSISTING DELIV NEC
740	CLASSICAL C-SECTION
741	LOW CERVICAL C-SECTION
742	EXTRAPERITONEAL C-SECT
743	REM EXTRATUB ECTOP PREG
744	CESAREAN SECTION NEC
7491	HYSTEROTOMY TO TERMIN PG
7499	CESAREAN SECTION NOS
7536	CORRECTION FETAL DEFECT
7550	REPAIR OB LAC UTERUS NOS
7551	REPAIR OB LACERAT CERVIX
7552	REPAIR OB LAC CORP UTERI
7561	REPAIR OB LAC BLAD/URETH
7593	SURG CORR INVERT UTERUS
7599	OBSTETRIC OPERATION NEC
7601	FACIAL BONE SEQUESTRECT
7609	FACIAL BONE INCISION NEC
7611	FACIAL BONE BIOPSY
7619	FACIAL BONE DX PROC NEC
762	DESTRUCT FACIAL BONE LES
7631	PARTIAL MANDIBULECTOMY
7639	PART FACIAL OSTECTOM NEC
7641	TOT MANDIBULEC W RECONST
7642	TOTAL MANDIBULECTOMY NEC
7643	MANDIBULAR RECONST NEC
7644	TOT FACE OSTECT W RECONS
7645	TOT FACE BONE OSTECT NEC
7646	FACIAL BONE RECONSTR NEC
765	TEMPOROMAND ARTHROPLASTY
7661	CL OSTEOPLASTY MAND RAMI
7662	OPEN OSTEOPLAS MAND RAMI
7663	OSTEOPLASTY MANDIBLE BDY
7664	MAND ORTHOGNATHIC OP NEC
7665	SEG OSTEOPLASTY MAXILLA
7666	TOT OSTEOPLASTY MAXILLA
7667	REDUCTION GENIOPLASTY
7668	AUGMENTATION GENIOPLASTY
7669	FACIAL BONE REPAIR NEC
7670	REDUCTION FACIAL FX NOS
7672	OPN REDUCT MALAR/ZYGO FX
7674	OPEN REDUCT MAXILLARY FX
7676	OPEN REDUCT MANDIBLE FX
7677	OPEN REDUCT ALVEOLAR FX
7679	OPEN REDUCT FACE FX NEC
7691	BONE GRAFT TO FACE BONE
7692	SYN IMPLANT TO FACE BONE
7694	OPEN REDUCT TM DISLOCAT
7697	REMOVE INT FIX FACE BONE
7699	FACIAL BONE/JNT OP NEC
7700	SEQUESTRECTOMY NOS
7701	CHEST CAGE SEQUESTREC
7702	HUMERUS SEQUESTRECTOMY
7703	RADIUS & ULNA SEQUESTREC
7704	METACARP/CARP SEQUESTREC
7705	FEMORAL SEQUESTRECTOMY
7706	PATELLAR SEQUESTRECTOMY
7707	TIBIA/FIBULA SEQUESTREC
7708	METATAR/TAR SEQUESTREC
7709	SEQUESTRECTOMY NEC
7710	OTHER BONE INCISION NOS
7711	OTHER CHEST CAGE INCIS
7712	OTHER HUMERUS INCISION
7713	OTHER RADIUS/ULNA INCIS
7714	OTH METACARP/CARP INCIS
7715	OTHER FEMORAL INCISION
7716	OTHER PATELLAR INCISION
7717	OTHER TIBIA/FIBULA INCIS
7718	OTH METATARS/TARS INCIS
7719	BONE INCIS W/O DIV NEC
7720	WEDGE OSTEOTOMY NOS
7721	CHEST CAGE WEDG OSTEOTOM
7722	HUMERUS WEDGE OSTEOTOMY
7723	RADIUS/ULNA WEDG OSTEOTO
7724	METACAR/CAR WEDG OSTEOTO
7725	FEMORAL WEDGE OSTEOTOMY
7726	PATELLAR WEDGE OSTEOTOMY
7727	TIBIA/FIBUL WEDG OSTEOT
7728	METATAR/TAR WEDG OSTEOT
7729	WEDGE OSTEOTOMY NEC
7730	OTHER BONE DIVISION NOS
7731	CHEST CAGE BONE DIV NEC
7732	HUMERUS DIVISION NEC
7733	RADIUS/ULNA DIVISION NEC
7734	METACAR/CAR DIVISION NEC
7735	FEMORAL DIVISION NEC
7736	PATELLAR DIVISION NEC
7737	TIBIA/FIBULA DIV NEC
7738	METATAR/TAR DIVISION NEC

7739	BONE DIVISION NEC
7740	BONE BIOPSY NOS
7741	CHEST CAGE BONE BIOPSY
7742	HUMERUS BIOPSY
7743	RADIUS & ULNA BIOPSY
7744	METACARPAL/CARPAL BIOPSY
7745	FEMORAL BIOPSY
7746	PATELLAR BIOPSY
7747	TIBIA & FIBULA BIOPSY
7748	METATARSAL/TARSAL BIOPSY
7749	BONE BIOPSY NEC
7751	BUNIONECT/SFT/OSTEOTOMY
7752	BUNIONECT/SFT/ARTHRODES
7753	OTH BUNIONECT W SFT CORR
7754	EXC CORRECT BUNIONETTE
7756	REPAIR OF HAMMER TOE
7757	REPAIR OF CLAW TOE
7758	OTH EXC, FUS, REPAIR TOE
7759	BUNIONECTOMY NEC
7760	LOC EXC BONE LESION NOS
7761	EXC CHEST CAGE BONE LES
7762	LOC EXC BONE LES HUMERUS
7763	LOC EXC LES RADIUS/ULNA
7764	LOC EXC LES METACAR/CAR
7765	LOC EXC BONE LES FEMUR
7766	LOC EXC BONE LES PATELLA
7767	LOC EXC LES TIBIA/FIBULA
7768	LOC EXC LES METATAR/TAR
7769	LOC EXC BONE LESION NEC
7770	EXCISE BONE FOR GRFT NOS
7771	EX CHEST CAGE BONE-GFT
7772	EXCISE HUMERUS FOR GRAFT
7773	EXCIS RADIUS/ULNA-GRAFT
7774	EXCIS METACAR/CAR-GRAFT
7775	EXCISE FEMUR FOR GRAFT
7776	EXCISE PATELLA FOR GRAFT
7777	EXCISE TIB/FIB FOR GRAFT
7778	EXCIS METATAR/TAR-GRAFT
7779	EXCISE BONE FOR GFT NEC
7780	OTH PART OSTECTOMY NOS
7781	OTH CHEST CAGE OSTECTOMY
7782	PARTIAL HUMERECTOMY NEC
7783	PART OSTECT-RADIUS/ULNA
7784	PART OSTECT-METACAR/CAR
7785	PART OSTECTOMY-FEMUR
7786	PARTIAL PATELLECTOMY
7787	PART OSTECT-TIBIA/FIBULA
7788	PART OSTECT-METATAR/TAR
7789	PARTIAL OSTECTOMY NEC
7790	TOTAL OSTECTOMY NOS
7791	TOT CHEST CAGE OSTECTOMY
7792	TOTAL OSTECTOMY-HUMERUS
7793	TOT OSTECT-RADIUS/ULNA
7794	TOT OSTECT-METACARP/CARP
7795	TOT OSTECTOMY-FEMUR
7796	TOTAL PATELLECTOMY
7797	TOT OSTECT-TIBIA/FIBULA
7798	TOT OSTECT-METATARS/TARS
7799	TOTAL OSTECTOMY NEC
7800	BONE GRAFT NOS
7801	BONE GRAFT TO CHEST CAGE
7802	BONE GRAFT TO HUMERUS
7803	BONE GRAFT-RADIUS/ULNA
7804	BONE GRFT TO METACAR/CAR
7805	BONE GRAFT TO FEMUR
7806	BONE GRAFT TO PATELLA
7807	BONE GRAFT-TIBIA/FIBULA
7808	BONE GRAFT-METATAR/TAR
7809	BONE GRAFT NEC
7810	APPLIC EXT FIX DEV NOS
7811	APPL EXT FIX-CHEST CAGE
7812	APPLIC EXT FIX-HUMERUS
7813	APPL EXT FIX-RADIUS/ULNA
7814	APPL EXT FIX-METACAR/CAR
7815	APPLIC EXT FIX DEV-FEMUR
7816	APPL EXT FIX DEV-PATELLA
7817	APPL EXT FIX-TIB/FIBULA
7818	APPL EXT FIX-METATAR/TAR
7819	APPLIC EXT FIX DEV NEC
7820	LIMB SHORTEN PROC NOS
7822	LIMB SHORT PROC-HUMERUS
7823	LIMB SHORTEN-RADIUS/ULNA
7824	LIMB SHORTEN-METACAR/CAR
7825	LIMB SHORT PROC-FEMUR
7827	LIMB SHORTEN-TIB/FIBULA
7828	LIMB SHORTEN-METATAR/TAR
7829	LIMB SHORTEN PROC NEC
7830	LIMB LENGTHEN PROC NOS
7831	LIMB LENGTHEN PROC NOS
7832	LIMB LENGTH PROC-HUMERUS
7833	LIMB LENGTH-RADIUS/ULNA
7834	LIMB LENGTH-METACAR/CAR
7835	LIMB LENGTH PROC-FEMUR
7837	LIMB LENGTHEN-TIB/FIBULA
7838	LIMB LENGTHN-METATAR/TAR
7839	LIMB LENGTHEN PROC NEC
7840	OTH BONE REPAIR/PLAST OP
7841	OTH CHEST CAGE REP/PLAST
7842	OTH HUMERUS REPAIR/PLAST
7843	OTH RAD/ULN REPAIR/PLAST
7844	OTH METAC/CARP REP/PLAST
7845	OTH FEMUR REPAIR/PLASTIC
7846	OTH PATELLA REPAIR/PLAST
7847	OTH TIB/FIB REPAIR/PLAST

7848	OTH META/TAR REPA/PLAST
7849	OTH BONE REPA/PLAST NEC
7850	INT FIX W/O FX REDUC NOS
7851	INT FIXATION-CHEST CAGE
7852	INT FIXATION-HUMERUS
7853	INT FIXATION-RADIUS/ULNA
7854	INT FIXATION-METACAR/CAR
7855	INTERNAL FIXATION-FEMUR
7856	INTERNAL FIX-PATELLA
7857	INT FIXATION-TIBIA/FIBUL
7858	INT FIXATION-METATAR/TAR
7859	INT FIX-NO FX REDUCT NEC
7860	REMOVE IMP DEVICE NOS
7861	REMOV IMP DEV-CHEST CAGE
7862	REMOVE IMPL DEV-HUMERUS
7863	REMOV IMP DEV-RADIUS/ULN
7864	REMOV IMP DEV-METAC/CARP
7865	REMOVE IMP DEVICE-FEMUR
7866	REMOV IMP DEVICE-PATELLA
7867	REMOV IMP DEV-TIB/FIBULA
7868	REMOVE IMP DEV-METAT/TAR
7869	REMOVE IMPL DEVICE NEC
7870	OSTEOCLASIS NOS
7871	OSTEOCLASIS-CHEST CAGE
7872	OSTEOCLASIS-HUMERUS
7873	OSTEOCLASIS-RADIUS/ULNA
7874	OSTEOCLASIS-METACAR/CAR
7875	OSTEOCLASIS-FEMUR
7876	OSTEOCLASIS-PATELLA
7877	OSTEOCLASIS-TIBIA/FIBULA
7878	OSTEOCLASIS-METATAR/TAR
7879	OSTEOCLASIS NEC
7880	OTHER BONE DX PROC NOS
7881	OTH DX PROCED-CHEST CAGE
7882	OTH DX PROCED-HUMERUS
7883	OTH DX PROC-RADIUS/ULNA
7884	OTH DX PROC-METACAR/CAR
7885	OTH DX PROCED-FEMUR
7886	OTH DX PROCED-PATELLA
7887	OTH DX PROC-TIBIA/FIBULA
7888	OTH DX PROC-METATAR/TAR
7889	OTHER BONE DX PROC NEC
7890	INSERT BONE STIMUL NOS
7891	INSERT BONE STIMUL-CHEST
7892	INSERT BONE STIM-HUMERUS
7893	INSER BONE STIM-RAD/ULNA
7894	INSER BONE STIM-META/CAR
7895	INSERT BONE STIM-FEMUR
7896	INSERT BONE STIM-PATELLA
7897	INSER BONE STIM-TIB/FIB
7898	INSER BONE STIM-META/TAR
7899	INSERT BONE STIMUL NEC
7910	CL FX REDUC-INT FIX NOS
7911	CLOS RED-INT FIX HUMERUS
7912	CL RED-INT FIX RAD/ULNA
7913	CL RED-INT FIX METAC/CAR
7914	CLOSE RED-INT FIX FINGER
7915	CLOSED RED-INT FIX FEMUR
7916	CL RED-INT FIX TIB/FIBU
7917	CL RED-INT FIX METAT/TAR
7918	CLOSE RED-INT FIX TOE FX
7919	CL FX REDUC-INT FIX NEC
7920	OPEN FX REDUCTION NOS
7921	OPEN REDUC-HUMERUS FX
7922	OPEN REDUC-RADIUS/ULN FX
7923	OPEN REDUC-METAC/CAR FX
7924	OPEN REDUCTION-FINGER FX
7925	OPEN REDUCTION-FEMUR FX
7926	OPEN REDUC-TIBIA/FIB FX
7927	OPEN REDUC-METAT/TARS FX
7928	OPEN REDUCTION-TOE FX
7929	OPEN FX REDUCTION NEC
7930	OPN FX RED W INT FIX NOS
7931	OPEN RED-INT FIX HUMERUS
7932	OP RED-INT FIX RAD/ULNA
7933	OP RED-INT FIX METAC/CAR
7934	OPEN RED-INT FIX FINGER
7935	OPEN REDUC-INT FIX FEMUR
7936	OP RED-INT FIX TIB/FIBUL
7937	OP RED-INT FIX METAT/TAR
7938	OPEN REDUCT-INT FIX TOE
7939	OPN FX RED W INT FIX NEC
7940	CLS REDUC-SEP EPIPHY NOS
7941	CLOSE RED-HUMERUS EPIPHY
7942	CLS RED-RADIUS/UL EPIPHY
7945	CLOSE REDUC-FEMUR EPIPHY
7946	CLS RED-TIBIA/FIB EPIPHY
7949	CLS REDUC-SEP EPIPHY NEC
7950	OPEN RED-SEP EPIPHY NOS
7951	OPN RED-SEP EPIPHY-HUMER
7952	OP RED-RADIUS/ULN EPIPHY
7955	OPN RED-SEP EPIPHY-FEMUR
7956	OP RED-TIBIA/FIB EPIPHYS
7959	OPEN RED-SEP EPIPHY NEC
7960	OPEN FX SITE DEBRIDE NOS
7961	DEBRID OPEN FX-HUMERUS
7962	DEBRID OPN FX-RADIUS/ULN
7963	DEBRID OPN FX-METAC/CAR
7964	DEBRID OPN FX-FINGER
7965	DEBRID OPN FX-FEMUR
7966	DEBRID OPN FX-TIBIA/FIB
7967	DEBRID OPN FX-METAT/TAR
7968	DEBRID OPN FX-TOE
7969	OPEN FX SITE DEBRIDE NEC

7980	OPEN REDUC-DISLOCAT NOS
7981	OPN REDUC DISLOC-SHOULDR
7982	OPEN REDUC-ELBOW DISLOC
7983	OPEN REDUC-WRIST DISLOC
7984	OPN REDUC DISLOC-HAND
7985	OPEN REDUC-HIP DISLOCAT
7986	OPEN REDUC-KNEE DISLOCAT
7987	OPEN REDUC-ANKLE DISLOC
7988	OPN REDUC DISLOC-FT/TOE
7989	OPEN REDUC-DISLOCAT NEC
7990	UNSPEC OP BONE INJ NOS
7991	HUMERUS INJURY OP NOS
7992	RADIUS/ULNA INJ OP NOS
7993	METACARP/CARP INJ OP NOS
7994	FINGER INJURY OP NOS
7995	FEMUR INJURY OP NOS
7996	TIBIA/FIBULA INJ OP NOS
7997	METATARS/TARS INJ OP NOS
7998	TOE INJURY OPERATION NOS
7999	UNSPEC OP-BONE INJ NEC
8000	ARTHROT & PROS REMOV NOS
8001	ARTHROT/PROS REMOV-SHLDR
8002	ARTHROT/PROS REMOV-ELBOW
8003	ARTHROT/PROS REMOV-WRIST
8004	ARTHROT/PROS REMOV-HAND
8005	ARTHROT/PROS REMOV-HIP
8006	ARTHROT/PROS REMOV-KNEE
8007	ARTHROT/PROS REMOV-ANKLE
8008	ARTHROT/PROS REMOV-FOOT
8009	ARTHROT & PROS REMOV NEC
8010	OTHER ARTHROTOMY NOS
8011	OTH ARTHROTOMY-SHOULDER
8012	OTH ARTHROTOMY-ELBOW
8013	OTH ARTHROTOMY-WRIST
8014	OTH ARTHROTOMY-HAND/FNGR
8015	OTH ARTHROTOMY-HIP
8016	OTH ARTHROTOMY-KNEE
8017	OTH ARTHROTOMY-ANKLE
8018	OTH ARTHROTOMY-FOOT/TOE
8019	OTHER ARTHROTOMY NEC
8020	ARTHROSCOPY NOS
8021	SHOULDER ARTHROSCOPY
8022	ELBOW ARTHROSCOPY
8023	WRIST ARTHROSCOPY
8024	HAND & FINGER ARTHROSCOP
8025	HIP ARTHROSCOPY
8026	KNEE ARTHROSCOPY
8027	ANKLE ARTHROSCOPY
8028	FOOT & TOE ARTHROSCOPY
8029	ARTHROSCOPY NEC
8040	JT STRUCTUR DIVISION NOS
8041	SHOULDER STRUCT DIVISION
8042	ELBOW STRUCTURE DIVISION
8043	WRIST STRUCTURE DIVISION
8044	HAND JOINT STRUCT DIVIS
8045	HIP STRUCTURE DIVISION
8046	KNEE STRUCTURE DIVISION
8047	ANKLE STRUCTURE DIVISION
8048	FOOT JOINT STRUCT DIVIS
8049	JT STRUCTUR DIVISION NEC
805	JT STRUCTUR DIVISION NEC
8050	EXC/DEST INTVRT DISC NOS
8051	EXCISION INTERVERT DISC
8059	OTH EXC/DEST INTVRT DISC
806	EXCIS KNEE SEMILUN CARTL
8070	SYNOVECTOMY-SITE NOS
8071	SHOULDER SYNOVECTOMY
8072	ELBOW SYNOVECTOMY
8073	WRIST SYNOVECTOMY
8074	HAND SYNOVECTOMY
8075	HIP SYNOVECTOMY
8076	KNEE SYNOVECTOMY
8077	ANKLE SYNOVECTOMY
8078	FOOT SYNOVECTOMY
8079	SYNOVECTOMY-SITE NEC
8080	DESTRUCT JOINT LES NOS
8081	DESTRUC-SHOULDER LES NEC
8082	DESTRUC-ELBOW LESION NEC
8083	DESTRUC-WRIST LESION NEC
8084	DESTRUC-HAND JT LES NEC
8085	DESTRUCT-HIP LESION NEC
8086	DESTRUCT-KNEE LESION NEC
8087	DESTRUC-ANKLE LESION NEC
8088	DESTRUC-FOOT JT LES NEC
8089	DESTRUCT JOINT LES NEC
8090	EXCISION OF JOINT NOS
8091	EXCISION OF SHOULDER NEC
8092	EXCISION OF ELBOW NEC
8093	EXCISION OF WRIST NEC
8094	EXCISION HAND JOINT NEC
8095	EXCISION OF HIP NEC
8096	EXCISION OF KNEE NEC
8097	EXCISION OF ANKLE NEC
8098	EXCISION FOOT JOINT NEC
8099	EXCISION OF JOINT NEC
8100	SPINAL FUSION NOS
8101	ATLAS-AXIS FUSION
8102	OTHER CERVICAL FUS ANT
8103	OTHER CERVICAL FUS POST
8104	DORSAL/DORSOLUM FUS ANT
8105	DORSAL/DORSOLUM FUS POST
8106	LUMBAR/LUMBOSAC FUS ANT
8107	LUMBAR/LUMBOSAC FUS LAT
8108	LUMBAR/LUMBOSAC FUS POST

8109 LUMBAR/LUMBOSAC FUS POST
8111 ANKLE FUSION
8112 TRIPLE ARTHRODESIS
8113 SUBTALAR FUSION
8114 MIDTARSAL FUSION
8115 TARSOMETATARSAL FUSION
8116 METATARSOPHALANGEAL FUS
8117 OTHER FUSION OF FOOT
8118 OTHER FUSION OF FOOT
8120 ARTHRODESIS NOS
8121 ARTHRODESIS OF HIP
8122 ARTHRODESIS OF KNEE
8123 ARTHRODESIS OF SHOULDER
8124 ARTHRODESIS OF ELBOW
8125 CARPORADIAL FUSION
8126 METACARPOCARPAL FUSION
8127 METACARPOPHALANGEAL FUS
8128 INTERPHALANGEAL FUSION
8129 ARTHRODESIS NEC
8130 SPINAL REFUSION NOS
8131 REFUSION OF ATLAS-AXIS
8132 REFUSION OF OTH CERV ANT
8133 REFUS OF OTH CERV POST
8134 REFUSION OF DORSAL ANT
8135 REFUSION OF DORSAL POST
8136 REFUSION OF LUMBAR ANT
8137 REFUSION OF LUMBAR LAT
8138 REFUSION OF LUMBAR POST
8139 REFUSION OF SPINE NEC
8140 REPAIR OF HIP, NEC
8141 REPAIR OF HIP, NEC
8142 FIVE-IN-ONE KNEE REPAIR
8143 TRIAD KNEE REPAIR
8144 PATELLAR STABILIZATION
8145 CRUCIATE LIG REPAIR NEC
8146 COLLATERL LIG REPAIR NEC
8147 OTHER REPAIR OF KNEE
8148 OTHER REPAIR OF KNEE
8149 OTHER REPAIR OF ANKLE
8151 TOTAL HIP REPLACEMENT
8152 PARTIAL HIP REPLACEMENT
8153 REVISE HIP REPLACEMENT
8154 TOTAL KNEE REPLACEMENT
8155 REVISE KNEE REPLACEMENT
8156 TOTAL ANKLE REPLACEMENT
8157 REPL JOINT OF FOOT, TOE
8159 REV JT REPL LOW EXT NEC
8161 360 SPINAL FUSION
8162 FUS/REFUS 2-3 VERTEBRAE
8163 FUS/REFUS 4-8 VERTEBRAE
8164 FUS/REFUS 9 VERTEBRAE
8171 ARTHROPLAS METACARP WIT
8172 ARTHROPLASTY METACAR W/O
8173 TOTAL WRIST REPLACEMENT
8174 ARTHROPLASTY CARPAL WIT
8175 ARTHROPLASTY CARPAL W/O
8179 OTH REPAIR HAN/FIN/WRIS
8180 TOTAL SHOULDER REPLACE
8181 PARTIAL SHOULDER REPLACE
8182 REP RECUR SHLDER DISLOC
8183 SHOULDER ARTHROPLAST NEC
8184 TOTAL ELBOW REPLACEMENT
8185 ELBOW ARTHROPLASTY NEC
8186 ELBOW ARTHROPLASTY NEC
8187 ELBOW ARTHROPLASTY NEC
8193 SUTUR CAPSUL/LIGAMEN ARM
8194 SUTURE CAPSUL/LIG ANK/FT
8195 SUTUR CAPSUL/LIG LEG NEC
8196 OTHER REPAIR OF JOINT
8197 REV JT REPL UPPER EXTREM
8198 OTHER JOINT DX PROCEDURE
8199 JOINT STRUCTURE OP NEC
8201 EXPLOR TEND SHEATH-HAND
8202 MYOTOMY OF HAND
8203 BURSOTOMY OF HAND
8209 INC SOFT TISSUE HAND NEC
8211 TENOTOMY OF HAND
8212 FASCIOTOMY OF HAND
8219 DIV SOFT TISSUE HAND NEC
8221 EXC LES TEND SHEATH HAND
8222 EXCISION HAND MUSCLE LES
8229 EXC LES SFT TISS HND NEC
8231 BURSECTOMY OF HAND
8232 EXCIS HAND TEND FOR GRFT
8233 HAND TENONECTOMY NEC
8234 EXC HND MUS/FAS FOR GRFT
8235 HAND FASCIECTOMY NEC
8236 OTHER MYECTOMY OF HAND
8239 HAND SOFT TISSUE EXC NEC
8241 SUTURE TENDN SHEATH HAND
8242 DELAY SUT FLEX TEND HAND
8243 DELAY SUT HAND TEND NEC
8244 SUTUR FLEX TEND HAND NEC
8245 SUTURE HAND TENDON NEC
8246 SUTURE HAND MUSCLE/FASC
8251 HAND TENDON ADVANCEMENT
8252 HAND TENDON RECESSION
8253 HAND TENDON REATTACHMENT
8254 HAND MUSCLE REATTACHMENT
8255 CHNG HND MUS/TEN LNG NEC
8256 TRANSPLANT HAND TEND NEC
8257 TRANSPOSIT HAND TEND NEC
8258 TRANSPLANT HAND MUSC NEC
8259 TRANSPOSIT HAND MUSC NEC

8261 POLLICIZATION OPERATION
8269 THUMB RECONSTRUCTION NEC
8271 HAND TEND PULLEY RECONST
8272 PLAST OP HND-MUS/FAS GRF
8279 PLAST OP HAND W GRFT NEC
8281 TRANSFER OF FINGER
8282 REPAIR OF CLEFT HAND
8283 REPAIR OF MACRODACTYLY
8284 REPAIR OF MALLET FINGER
8285 OTHER TENODESIS OF HAND
8286 OTHER TENOPLASTY OF HAND
8289 HAND PLASTIC OP NEC
8291 LYSIS OF HAND ADHESIONS
8299 HAND MUS/TEN/FAS/OPS NEC
8301 TENDON SHEATH EXPLORAT
8302 MYOTOMY
8303 BURSOTOMY
8309 SOFT TISSUE INCISION NEC
8311 ACHILLOTENOTOMY
8312 ADDUCTOR TENOTOMY OF HIP
8313 OTHER TENOTOMY
8314 FASCIOTOMY
8319 SOFT TISSUE DIVISION NEC
8321 SOFT TISSUE BIOPSY
8329 SOFT TISSUE DX PROC NEC
8331 EXCIS LES TENDON SHEATH
8332 EXCIS LESION OF MUSCLE
8339 EXC LES SOFT TISSUE NEC
8341 TENDON EXCISION FOR GRFT
8342 OTHER TENONECTOMY
8343 MUSC/FASC EXCIS FOR GRFT
8344 OTHER FASCIECTOMY
8345 OTHER MYECTOMY
8349 OTHER SOFT TISSUE EXCIS
835 BURSECTOMY
8361 TENDON SHEATH SUTURE
8362 DELAYED TENDON SUTURE
8363 ROTATOR CUFF REPAIR
8364 OTHER SUTURE OF TENDON
8365 OTHER MUSCLE/FASC SUTURE
8371 TENDON ADVANCEMENT
8372 TENDON RECESSION
8373 TENDON REATTACHMENT
8374 MUSCLE REATTACHMENT
8375 TENDON TRNSFR/TRANSPLANT
8376 OTHER TENDON TRANSPOSIT
8377 MUSCLE TRNSFR/TRANSPLANT
8379 OTHER MUSCLE TRANSPOSIT
8381 TENDON GRAFT
8382 MUSCLE OR FASCIA GRAFT
8383 TENDON PULLEY RECONSTRUC
8384 CLUBFOOT RELEASE NEC
8385 MUSC/TEND LNG CHANGE NEC
8386 QUADRICEPSPLASTY
8387 OTHER PLASTIC OPS MUSCLE
8388 OTHER PLASTIC OPS TENDON
8389 OTHER PLASTIC OPS FASCIA
8391 ADHESIOLYSIS MUS/TEN/FAS
8392 INSERT SKEL MUSC STIMULA
8393 REMOV SKEL MUSC STIMULAT
8399 MUS/TEN/FAS/BUR OP NEC
8400 UPPER LIMB AMPUTAT NOS
8401 FINGER AMPUTATION
8402 THUMB AMPUTATION
8403 AMPUTATION THROUGH HAND
8404 DISARTICULATION OF WRIST
8405 AMPUTATION THRU FOREARM
8406 DISARTICULATION OF ELBOW
8407 AMPUTATION THRU HUMERUS
8408 SHOULDER DISARTICULATION
8409 FOREQUARTER AMPUTATION
8410 LOWER LIMB AMPUTAT NOS
8411 TOE AMPUTATION
8412 AMPUTATION THROUGH FOOT
8413 DISARTICULATION OF ANKLE
8414 AMPUTAT THROUGH MALLEOLI
8415 BELOW KNEE AMPUTAT NEC
8416 DISARTICULATION OF KNEE
8417 ABOVE KNEE AMPUTATION
8418 DISARTICULATION OF HIP
8419 HINDQUARTER AMPUTATION
8421 THUMB REATTACHMENT
8422 FINGER REATTACHMENT
8423 FOREARM/WRIST/HAND REATT
8424 UPPER ARM REATTACHMENT
8425 TOE REATTACHMENT
8426 FOOT REATTACHMENT
8427 LOWER LEG/ANKLE REATTACH
8428 THIGH REATTACHMENT
8429 REATTACHMENT NEC
843 AMPUTATION STUMP REVIS
8440 IMPLNT/FIT PROS LIMB NOS
8444 IMPLANT ARM PROSTHESIS
8448 IMPLANT LEG PROSTHESIS
8491 AMPUTATION NOS
8492 SEPARAT EQUAL JOIN TWIN
8493 SEPARAT UNEQUL JOIN TWIN
8499 MUSCULOSKELETAL OP NEC
8512 OPEN BREAST BIOPSY
8520 BREAST TISSU DESTRUC NOS
8521 LOCAL EXCIS BREAST LES
8522 QUADRANT RESECT BREAST
8523 SUBTOTAL MASTECTOMY
8524 EXC ECTOPIC BREAST TISSU

8525	EXCISION OF NIPPLE
8531	UNILAT REDUCT MAMMOPLAST
8532	BILAT REDUCT MAMMOPLASTY
8533	UNIL SUBQ MAMMECT-IMPLNT
8534	UNILAT SUBQ MAMMECT NEC
8535	BIL SUBQ MAMMECT-IMPLANT
8536	BILAT SUBQ MAMMECTOM NEC
8541	UNILAT SIMPLE MASTECTOMY
8542	BILAT SIMPLE MASTECTOMY
8543	UNILAT EXTEN SIMP MASTEC
8544	BILAT EXTEND SIMP MASTEC
8545	UNILAT RADICAL MASTECTOM
8546	BILAT RADICAL MASTECTOMY
8547	UNIL EXT RAD MASTECTOMY
8548	BIL EXTEN RAD MASTECTOMY
8550	AUGMENT MAMMOPLASTY NOS
8553	UNILAT BREAST IMPLANT
8554	BILATERAL BREAST IMPLANT
856	MASTOPEXY
857	TOTAL BREAST RECONSTRUCT
8582	BREAST SPLIT-THICK GRAFT
8583	BREAST FULL-THICK GRAFT
8584	BREAST PEDICLE GRAFT
8585	BREAST MUSCLE FLAP GRAFT
8586	TRANSPOSITION OF NIPPLE
8587	NIPPLE REPAIR NEC
8589	MAMMOPLASTY NEC
8593	BREAST IMPLANT REVISION
8594	BREAST IMPLANT REMOVAL
8595	INSER BREAST TISSU EXPAN
8596	REMOV BREAST TISSU EXPAN
8599	BREAST OPERATION NEC
8606	INSERT INFUSION PUMP
8621	EXCISION OF PILONID CYST
8622	EXC WOUND DEBRIDEMENT
8625	DERMABRASION
864	RADICAL EXCIS SKIN LES
8660	FREE SKIN GRAFT NOS
8661	FULL-THICK HAND SKIN GRF
8662	HAND SKIN GRAFT NEC
8663	FULL-THICK SKIN GRFT NEC
8665	HETEROGRAFT TO SKIN
8666	HOMOGRAFT TO SKIN
8667	DERMAL REGENER GRAFT
8669	FREE SKIN GRAFT NEC
8670	PEDICLE GRAFT/FLAP NOS
8671	CUT & PREP PEDICLE GRAFT
8672	PEDICLE GRAFT ADVANCEMEN
8673	ATTACH PEDICLE TO HAND
8674	ATTACH PEDICLE GRAFT NEC
8675	REVISION OF PEDICLE GRFT
8681	REPAIR FACIAL WEAKNESS
8682	FACIAL RHYTIDECTOMY
8683	SIZE REDUCT PLASTIC OP
8684	RELAXATION OF SCAR
8685	SYNDACTYLY CORRECTION
8686	ONYCHOPLASTY
8689	SKIN REPAIR & PLASTY NEC
8691	SKIN EXCISION FOR GRAFT
8693	INSERT TISSUE EXPANDER
8753	INTRAOPER CHOLANGIOGRAM
9504	ANESTHETIZED EYE EXAM

Appendix D: Log of Revisions to PSI Documentation and Software Version 2.1, Revision 2

The following table summarizes the revisions made to the PSI software, software documentation and the Guide to Patient Safety Indicators (Guide) document in release version 2.1, revision 2. The table lists the component(s) affected by the change and a short summary of the changes that were made.

Component	Changes
Guide	1. Modified documentation to reflect changes in indicators associated with ICD-9-CM coding updates for FY 2004 (effective 10-1-2003). See separate documentation for specific details.[140] 2. Changed syntax of "hospital-level" to "provider-level" throughout the documentation. 3. Added PSI number to each Indicator name. 4. Updated empirical results for Table 1, and limited contents to Provider-level PSIs. 5. Added Table 2, listing Area-level PSIs. 6. Added caption for Table 3, Indicators and Use of External Cause-of-Injury Codes. 7. Modified PSI #2 (death in low mortality DRGs). The indicator is reported as a single measure, but also stratified by type of DRG: adult medical, pediatric medical, adult surgical (with OR procedure), adult surgical (without OR procedure), pediatric surgical (with OR procedure), pediatric surgical (without OR procedure), obstetric and psychiatric. A list of low mortality DRGs by type is included PSI Guide. Impact: Among the low mortality DRGs, about 25% of the discharges and 60% of the deaths are “adult medical” DRGs. Psychiatric DRGs also have a higher share of deaths (10%) than discharges (6%). Death among the other DRG types is very rare (0.1% or less). Few low mortality surgical DRGs do not have an operating room procedure, so the adult or pediatric surgical DRG (without OR procedure) will generally be missing or zero for most hospitals.Modified PSI #2, Death in Low-mortality DRG, to split the adult and pediatric surgical strata into separate strata for cases with operating room procedures and cases without operating room procedures. 8. Modified PSI #14, Postoperative Wound Dehiscence, to include only OR procedures in the definition of abdominopelvic surgery. Impact: Small (less than 1%) decrease in the denominator and resulting small increase in the rate due to exclusion of a low-risk procedure. 9. Modified PSI #17, Birth Trauma, to exclude preterm infants with subdural or cerebral hemorrhage or osteogenesis imperfecta infants with injury to skeleton from the numerator only. NOTE: The infants remain in the population at risk for other types of birth trauma.

[140] Updates to Version 2.1, Revision 2 – ICD-9-CM Coding Updates," http://www.qualityindicators.ahrq.gov/psi_download.htm

Component	Changes
	Impact: Small (less than 1%) increase in the denominator and resulting small decrease or no impact in the rate (i.e. the risk of other types of birth trauma for these two populations is less than or no different than for other births). 10. Added three new Indicators #27-29, to include third-degree lacerations for each of three types of delivery: Vaginal with and without instruments, and Cesarean. Impact: The rate for OB Trauma is generally 5-10% higher when including 3rd degree lacerations 11. Limited the surgical DRG inclusion criteria to major OR procedures for PSI #1, 8-13, all of which deal with postoperative illness or injury. Impact: Medium (1-4%) decrease in the denominator. The impact on the rate varies by indicator. PSIs 1, 8 and 9 have a medium (1-3%) increase in the rate. PSIs 10 and 12 have a small (less than 1%) decrease in the rate. PSIs 11 and 13 have a medium (3-4%) decrease in the rate. 12. Modified PSIs #1, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15. 16 to exclude discharges with a PSI-defining secondary diagnosis and a different PSI-defining principal diagnosis (but within the same PSI definition). Impact: Small (less than 1%) decrease in the denominator. The impact on the rate varies by indicator. PSIs 1, 3, 6, 7, 8, 10, 11, 13 and 16 have a small (less than 1%) increase in the rate. PSI 9 has a small (less than 1%) decrease in the rate. PSI 15 has a medium (2-3%) decrease in the rate. PSIs 5 and 12 have a large (5-9%) decrease in the rate. 13. Modified PSIs #8, 9, 11, 12 to exclude discharges where the only OR procedure is a PSI-related procedure. Impact: Small (less than 1%) decrease in the denominator. The impact on the rate varies by indicator. PSI 11 has a small (less than 1%) decrease in the rate. PSI 9 has a medium (1-2%) decrease in the rate. PSIs 8 and 12 have a large (15-65%) decrease in the rate. 14. Modified PSIs #8, 9, 11, 12, 14 to exclude discharges where a PSI-related procedure precedes the denominator-defining OR procedure. Impact: Small (less than 1%) decrease in the denominator. The impact on the rate varies by indicator. PSI 9 has a large (65-70%) increase in the rate. PSIs 11 and 12 have a small (less than 1%) decrease in the rate. PSI 8 has a medium (3-4%) decrease in the rate. PSI 14 has a large (8-9%) decrease in the rate. 15. Modified Area level PSI #24, Postoperative Wound Dehiscence, to drop the requirement that the wound reclosure occurs in a discharge with a procedure code of abdominopelvic surgery. Impact: Numerator increases by about 40%. 16. Added code 72.79 to the definition of instrument-assisted delivery in PSI #18, 19. Impact: Transfers about 33% of the denominator from PSI 19 to PSI 18. Because the OB Trauma rate for these cases is higher than average for PSI 19 and lower

Component	Changes
	than average for PSI 18, and because the OB Trauma rate for PSI 19 is lower than PSI 18, the rate for both indicators decreases by 3-10%.
Software (SAS and SPSS)	1. Implemented syntax changes associated with ICD-9-CM coding updates from FY 2004 (effective 10-1-2003). See separate documentation on ICD-9 coding updates for specific details. 2. Implemented all syntax changes required to implement the indicator modifications (noted above under Guide) and incorporated the related documentation in the Software manuals. 3. Modified the age, DRG and co morbidity aggregations used in the risk-adjustment to reflect the new rates and to group the DRGs by MDC (including an MDC-specific other category). 4. Added the calculation and reporting of the expected rate at the stratification level selected by the user. The SAS (PSSASP3.SAS) and SPSS (PSSPSP3.SPS) software now calculates the risk-adjusted rate, the expected rate and the smoothed rate. The rates are saved in the output file. The user also has the option to print the rates or save the rates in a comma-delimited ASCII file.
Software (SAS)	1. Inserted “PS” in format names for age, sex, DRG and co morbidity aggregations in SAS programs to distinguish these formats from similarly named formats used by other indicator software.

Appendix E: ICD-9-CM and DRG Coding Updates in PSI Release Version 2.1, Revision 2

The following changes were implemented in version 2.1, revision 2 of the Patient Safety Indicator PSI software code (both SAS and SPSS) and reflect changes to indicator definitions based on updates to ICD-9-CM and DRG codes for Fiscal Year 2004 (effective 10-1-2003). All changes noted below have been incorporated into the software syntax, software documentation and the Guide to Patient Safety Indicators. With this software update, the PSI software definitions now incorporate ICD-9-CM codes valid from October 1, 1994 through September 30, 2004.

Indicator Name (#)	***Component***	***Change***
Failure to Rescue (PSI #4)	Denominator (exclusion, viral pneumonia)	Added new (FY 2004) code 480.3 "Pneumonia due to SARS-associated coronavirus" to the viral pneumonia exclusion criteria (for FTR - pneumonia) Expected impact on rate: negligible
Failure to Rescue (PSI #4)	Denominator (inclusion, shock or cardiac arrest)	Added new (FY 2004) code 785.52, "Septic shock" to the denominator inclusion criteria (for FTR - shock or cardiac arrest) Expected impact on rate: negligible
Iatrogenic Pneumothorax (PSI #6)	Denominator (exclusion, cardiac surgery)	Added new (FY 2003) DRG code 525 "Heart assist system implant" to the cardiac surgery exclusion criteria. Expected impact on rate: negligible
Postoperative Wound Dehiscence (PSI #14)	Denominator (inclusion, abdominopelvic surgery)	Added new (FY 2004) code 68.39 "Other subtotal abdominal hysterectomy, NOS" to denominator inclusion criteria for abdominopelvic surgery. Expected impact on rate: negligible
Birth Trauma (PSI #17)	Numerator (inclusion, birth trauma)	Added new (FY 2004) code 767.11 "Epicranial subaponeurotic hemorrhage (massive)" to numerator inclusion criteria for birth trauma. Expected impact on rate: may increase slightly
Birth Trauma (PSI #17)	Denominator (inclusion, liveborn)	Added new (FY 2004) codes 767.11 “Epicranial subaponeurotic hemorrhage (massive)” and 767.19 “Other injuries to scalp” and new categories 766.2x, Disorders relating to long gestation and high birth weight; 770.8x, Other respiratory conditions of fetus and newborn (FY 2003); 771.8x, Infections specific to the perinatal period (FY 2003); 772.1x, Fetal and neonatal hemorrhage (FY 2002); and 779.8x, Other and ill-defined conditions originating in the perinatal period (FY 2003). Expected impact on rate: negligible
Multiple Indicators	Shock exclusion	Added new (FY 2004) code 785.52, “Septic shock” to the Shock exclusion criteria for the applicable PSIs Expected impact on rate: negligible

Indicator Name (#)	*Component*	*Change*
Multiple Indicators	Trauma exclusion	Added new (FY 2004) codes 850.11 “Concussion-brief coma < 31 minutes” and 850.12 “Concussion - brief coma 31-59 minutes” to the Trauma exclusion criteria for the applicable PSIs Expected impact on rate: negligible
Multiple Indicators	Immunocompro-mised state exclusion	Added new (FY 2004) code 37.51, "Heart transplantation" to the immunocompromised state exclusion criteria for the applicable PSIs Expected impact on rate: negligible
Multiple Indicators	Surgical discharges denominator inclusion	Added new (FY 2004) DRG codes 528-540 to the surgical discharges inclusion criteria for the applicable PSIs. Expected impact on rate: negligible; may decrease rates on FY04 data from Revision 1
Multiple Indicators	Cancer discharges denominator exclusion	Added new (FY 2004) DRG codes 539-540, Lymphoma & leukemia with major operating room procedure with and without complications, respectively, to the cancer exclusion criteria for the applicable PSIs. Expected impact on rate: negligible