ICD-10-PCS PROCEDURE CODING IN HCUP DATA: COMPARISONS WITH ICD-9-CM AND PRECAUTIONS FOR TREND ANALYSES

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EXECUTIVE SUMMARY

This document examines challenges in creating consistently defined groupings of inpatient procedure codes for trend analyses that incorporate procedure codes from both the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) and International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS). The analysis uses Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) data from 24 State Inpatient Databases (SID) in 2013, 2014, and 2015 to track and compare procedure volume across the two coding systems.

Main Findings

- Starting on October 1, 2015, there were 72,589 valid ICD-10-PCS procedure codes, representing a nearly 20-fold increase from the 3,824 valid ICD-9-CM procedure codes. ICD-10-PCS procedure codes are structured differently from ICD-9-CM codes, provide more details, and do not always rely on conventional procedural or surgical terminology to describe the procedures in each code.
- Grouping individual ICD-9-CM and ICD-10-PCS codes into broad categories of related procedures may not solve the discrepancies in the two coding systems. For example, many Clinical Classifications Software (CCS) categories exhibit stark differences in trends following the transition to ICD-10-PCS coding, even though they were designed to capture similar types of hospital procedures.
- Appendices to this document provide a comprehensive assessment of the notable differences in counts of procedures across the coding periods. These tables identify procedures where changes in the coding system mean that individual ICD codes should be examined.
- Of the 231 CCS procedure categories, only 40 had changes in frequencies that were less than 5 percent across the ICD-9-CM to ICD-10-PCS coding transition period. For 22 CCS procedures, frequencies decreased by more than 50 percent, while frequencies increased by more than 50 percent for 48 CCS categories. For 60 CCS categories, frequencies changed by 20 to 49 percent. For 53 CCS categories, frequencies changed by 5 to 19 percent. For the remaining 8 CCS categories, no ICD-10-PCS codes could be defined.
- There are numerous reasons for differences in observed procedure trends across the ICD-9-CM to ICD-10-PCS transition, including but not limited to removal of diagnostic information from ICD-10-PCS codes, changes in the terminology used to capture the salient concept of a procedure or the conventional terminology for a given specialty, underlying changes to the ICD body part and chapter assignments, and use of multiple ICD-10-PCS codes for procedures that previously were represented with a single code in ICD-9-CM.

ICD-10-PCS is undergoing continuous revisions, modifications, and improvements. It will take time for professional coders, surgeons, hospital staff, and researchers to become familiar with the new system. In addition, changes are expected as professional coding guidelines and coding assistance software continue to evolve.

It will be important to develop new categorization schemes under ICD-10-PCS to enable researchers to group clinically meaningful procedures for analysis. Specifically, it is recommended that a clinical procedure grouping scheme be developed that maps ICD-10-PCS codes into groupings that reflect clinical, procedural, and surgical terminology. Initial efforts could focus on a select group of surgical procedures (e.g., hysterectomy, laminectomy, coronary artery bypass graft, colorectal resection) that have high volumes and high aggregate costs.

When using HCUP data that include both ICD-9-CM and ICD-10-CM/PCS codes, researchers are encouraged to examine the frequency of individual procedure codes reported by quarter to determine whether it is advisable to combine data across the two coding time periods to study trends. In many cases, it may not be possible to study trends over the ICD-10-CM/PCS transition.

INTRODUCTION

The purpose of this document is to provide users of Agency for Healthcare Research and Quality (AHRQ) Healthcare Cost and Utilization Project (HCUP) data with examples of how transitioning from the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) to the International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) may affect analyses of inpatient data.

It is important to note that the examples provided in this document are for illustrative purposes only and are not comprehensive of all instances in which the transition to the ICD-10-PCS coding system affects the ability to follow trends in hospital inpatient procedures using individual ICD codes or categorization schemes such as the Clinical Classifications Software (CCS).

AHRQ encourages additional research on the topic to bring the issue to the forefront and speed the rate at which useful guidance and identification of unforeseen problems with the new coding system can be discovered and disseminated.

In this document, we provide some examples of discontinuities when examining trends across ICD-9-CM and ICD-10-PCS procedure codes. We present an approach to examining trends with the CCS categories by exploring individual codes within the procedure categories. Our goal is to alert users about the impact of the new coding system on research and data analytics.

Brief Overview of ICD-9-CM Versus ICD-10-PCS

On October 1, 2015, the United States transitioned from using ICD-9-CM to ICD-10-CM/PCS code sets to report medical diagnoses and inpatient procedures. ICD-10 consists of two parts:

- ICD-10-CM: diagnosis coding on inpatient and outpatient billing and claims data
- ICD-10-PCS: procedure coding on inpatient billing and claims data.

An overview of key differences between ICD-9-CM and ICD-10-CM diagnoses is available on the HCUP-US Web site under ICD-10-CM/PCS Resources. A more detailed comparison of the ICD-9-CM and ICD-10-CM diagnosis codes is available in the HCUP Methods Series Report #2016-02, Impact of ICD 10-CM/PCS on Research Using Administrative Databases. This document focuses on differences between the ICD-9-CM and ICD-10-PCS procedure coding systems.

Brief Description of the HCUP State Inpatient Databases

The State Inpatient Databases (SID) include discharge-level data on inpatient stays from most, if not all, hospitals in the State. The SID include all types of inpatient stays, including transfers from another acute care hospital and stays that originated in the hospital emergency department (ED). The SID can be used to investigate questions unique to one State, to compare data from two or more States, to conduct market-area variation analyses, and to identify State-specific trends in inpatient care utilization, access, charges, and outcomes.

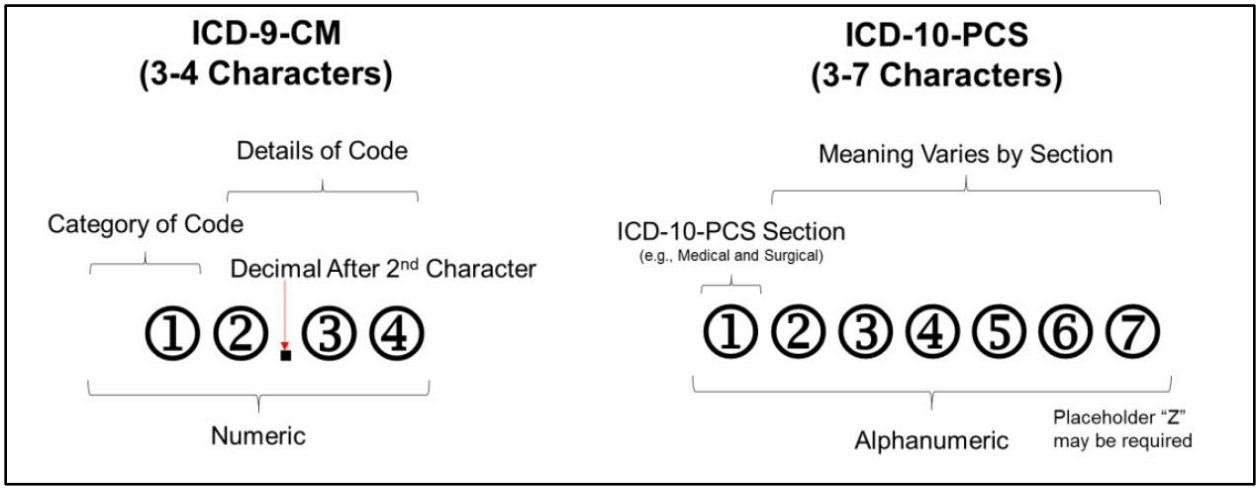
Starting on October 1, 2015, the SID include ICD-10-CM/PCS diagnosis and procedure codes. Thus, in the 2015 data year, three quarters of data were coded using ICD-9-CM and the last quarter was coded using ICD-10-CM/PCS.

CODING OF PROCEDURES UNDER ICD-10-PCS

Comparison of the ICD-9-CM and ICD-10-PCS Code Structure

Figure 1 and Table 1 compare the ICD-9-CM and ICD-10-PCS procedure coding systems with respect to organization and structure, code composition, and level of detail in procedure codes.

Figure 1. ICD-9-CM and ICD-10-PCS Procedure Coding Systems



Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System.

Source: Gibson T, Casto A, Young J, et al. Impact of ICD-10-CM/PCS on Research Using Administrative Databases. HCUP Methods Series Report #2016-02. Rockville, MD: Agency for Healthcare Research and Quality; 2016. http://www.hcup-us.ahrq.gov/reports/methods/methods.jsp

Table 1. Brief Comparison of ICD-9-CM and ICD-10-PCS Procedures, October 1, 2015

ICD-9-CM	ICD-10-PCS
3,824 codes	72,589 codes
Chapters organized by body system	Multiaxial structure to chapters
3–4 characters	7 characters must be used
All characters are numeric	Each character can be alpha (A–H, J–N, P–Z) or numeric (0–9)
Decimals after 2 characters	No decimal
No placeholder character	The placeholder "Z" is used when a code contains fewer than 6 characters
Includes combination codes in which procedures that typically are performed together are combined into one procedure code	Does not include combination codes; may require multiple codes to capture what a surgeon considers a single procedure
Lacks information on laterality	Designates the left or the right side of the body when describing the location of procedures
Lacks descriptions of methodology and approach	Provides detailed descriptions of methodology and approach
Generic terms for body parts	Specific terms for body parts
Generic terms for device used	Specific terms for device used
May contain diagnostic information (i.e., diagnoses and procedures may be linked)	Does not contain diagnostic information (i.e., diagnoses and procedures are not linked)
Contains code options for "not otherwise specified" and "not elsewhere classified"	No explicit "not otherwise specified" codes and limited use of "not elsewhere classified"
Limited space for adding new codes	Flexible for adding new codes
Uses conventional medical terminology	Introduces a novel approach to describing procedures that does not rely on conventional procedural and surgical terms[a]

Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System.

[a] Examples are provided in Table 3.

Source: Casto AB (ed). ICD-10-PCS Code Book, 2016. Chicago, IL: American Health Information Management Association; 2016.

The different characters of the ICD-10-PCS codes have specific meanings.[1] Table 2 provides a list of available character values for each position. The character "Z" is used in any position as a placeholder if another meaningful character is not used. The fourth, sixth, and seventh characters exhibit considerable variation across the full range of ICD-10-PCS codes. In the interest of space, the complete set of values for those characters is not listed here. Please see the American Health Information Management Association ICD-10-PCS Code Book for additional details. Definitions for each root operation are provided in Appendix A.

Table 2. ICD-10-PCS Character Values

First Character – Section	
(0) Medical and Surgical	(9) Chiropractic
(1) Obstetrics	(B) Imaging
(2) Placement	(C) Nuclear Medicine
(3) Administration	(D) Radiation Therapy
(4) Measurement and Monitoring	(F) Physical Rehabilitation and Diagnostic Audiology
(5) Extracorporeal Assistance and Performance	(G) Mental Health
(6) Extracorporeal Therapies	(H) Substance Abuse Treatment
(7) Osteopathic	(X) New Technology
(8) Other Procedure	(Z) Used as a placeholder if another meaningful character is not used
Second Character – Body System	
(0) Central Nervous System and Cranial Nerves	(L) Tendons
(1) Peripheral Nervous System	(M) Bursae & Ligaments
(2) Heart and Great Vessels	(N) Head & Facial Bones
(3) Upper Arteries	(P) Upper Bones
(4) Lower Arteries	(Q) Lower Bones
(5) Upper Veins	(R) Upper Joints
(6) Lower Veins	(S) Lower Joints
(7) Lymphatic & Hemic Systems	(T) Urinary System
(8) Eye	(U) Female Reproductive System
(9) Ear/Nose/Sinus	(V) Male Reproductive System
(B) Respiratory System	(W) Anatomical Regions/General
(C) Mouth & Throat	(X) Anatomical Regions/Upper Extremities
(D) Gastrointestinal System	(Y) Anatomical Regions/Lower Extremities
(F) Hepatobiliary System & Pancreas	(L) Tendons
(G) Endocrine System	(M) Bursae & Ligaments
(H) Skin & Breast	(N) Head & Facial Bones
(J) Subcutaneous Tissue & Fascia	(P) Upper Bones
(K) Muscles	(Z) Used as a placeholder if another meaningful character is not used
Third Character – Root Operation[a]	

[1] Information about ICD-10-PCS characters was obtained from Casto AB (ed). ICD-10-PCS Code Book, 2016. Chicago, IL: American Health Information Management Association; 2016.

(0) Alteration	(J) Inspection
(1) Bypass	(K) Map
(2) Change	(L) Occlusion
(3) Control	(M) Reattachment
(4) Creation	(N) Release
(5) Destruction	(P) Removal
(6) Detachment	(Q) Repair
(7) Dilation	(R) Replacement
(8) Division	(S) Reposition
(9) Drainage	(T) Resection
(B) Excision	(U) Supplement
(C) Extirpation	(V) Restriction
(D) Extraction	(W) Revision
(F) Fragmentation	(X) Transfer
(G) Fusion	(Y) Transplantation
(H) Insertion	(Z) Used as a placeholder if another meaningful character is not used
Fourth Character – Body Part	
Body part values are specific to the root operation and can vary by body system. Please see the ICD-10-PCS Code Book for additional details.	
Fifth Character – Approach	
(0) Open	(8) Via Natural or Artificial Opening Endoscopic
(3) Percutaneous	(F) Via Natural or Artificial Opening Percutaneous Endoscopic
(4) Percutaneous Endoscopic	(X) External
(7) Via Natural or Artificial Opening	(Z) Used as a placeholder if another meaningful character is not used
Sixth Character – Device	
Includes only devices that remain after the procedure is completed such as electronic appliances, grafts, prostheses, implants, and simple or mechanical appliances. Please see the ICD-10-PCS Code Book for additional details.	
Seventh Character – Qualifier With Values Specific to the Root Operation	
There is considerable variation in the seventh character across root operations. For example, the seventh character for the procedure codes 02100ZC and 02100ZF identify whether the open approach coronary artery bypass was for the thoracic artery or abdominal artery, respectively. Please see the ICD-10-PCS Code Book for additional details.	

Abbreviation: ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System.

[a] Definitions for root operations are provided in Appendix A.

Source: Casto AB (ed). ICD-10-PCS Code Book, 2016. Chicago, IL: American Health Information Management Association; 2016.

ICD-10-PCS Code Description Terminology

The ICD-10-PCS coding system does not always rely on conventional procedural or surgical terminology to describe the procedures in each code. This change presents an obstacle for

researchers and analysts attempting to identify relevant codes without the assistance of a professional medical coder. Table 3 provides examples of some of the differences in the terms used to describe procedures in the ICD-9-CM and ICD-10-PCS coding systems.

Table 3. Examples of ICD-10-PCS Description of Procedures Compared With ICD-9-CM Terminology

ICD-9-CM Procedure Term	ICD-10-PCS Procedure Term
Amputation	Detachment
Amniocentesis	Drainage
Cystoscopy	Inspection
Closed Reduction	Reposition
Debridement	Excision, Irrigation, Extirpation
Total or Complete Removal	Resection
Subtotal or Partial Removal	Excision
Tracheostomy	Bypass
Cesarean Section	Extraction of Products of Conception
Incision	(No ICD-10 term)

Abbreviations: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System.

Source: Romano PS. ICD-10 Implementation: Opportunities and Challenges for Health Data Organizations. National Association of Health Data Organizations Annual Meeting Podium Presentation. Minneapolis, MN; October 27, 2016.

How the CCS for ICD-10-PCS Was Developed

The initial mapping for the CCS ICD-10-PCS categories was completed by linking ICD-10-PCS codes to the current CCS AHRQ classification assignments via General Equivalence Mappings (GEMs) available from the Centers for Medicare & Medicaid Services (CMS) Web site.[2] No dually coded data were available at the time the CCS categories were translated to ICD-10-PCS. The translation was based on forward and backward mapping using the GEMs. The initial GEMs were reviewed by credentialed coders trained in both ICD-9-CM and ICD-10-PCS to ensure the validity of the maps for use in formulating the CCS categories. Two coders reviewed each code set. When the coders did not initially map a code to the same CCS category, the team reviewed the discrepancies and came to consensus for the CCS assignment, with the help of a third coder if necessary. Initial maps were completed in September 2011. The accuracy of the initial assessment was verified by reviewing a 20 percent sample of the coding assignments. In 2013, reverse mapping validation of 100 percent of the

[2] For additional information on GEMS, please see 2014 ICD-10-CM and GEMS. Centers for Medicare & Medicaid Services Web site. Last modified June 2, 2016. http://www.cms.gov/Medicare/Coding/ICD10/2014-ICD-10-CM-and-GEMs.html

ICD-10-PCS CCS assignments was conducted to verify the accuracy of the CCS mapped categories.[3]

METHODS

This document presents analyses using information from the SID for States that had 2015 data processed at the time of this report. A complete list of HCUP Partner Organizations is available in Appendix B. Records were limited to stays at community hospitals that are not rehabilitation or long-term acute care hospitals—a definition consistent with how HCUP identifies hospitals for the National Inpatient Sample.

The data sources included SID data from 24 States: Arizona, California, Colorado, Florida, Hawaii, Iowa, Illinois, Kansas, Kentucky, Minnesota, Missouri, Montana, Nebraska, New Jersey, New Mexico, Nevada, North Dakota, Ohio, Oregon, South Dakota, Tennessee, Vermont, Washington, and Wisconsin.

The analysis consisted of calculating trends based on the number of stays involving various procedures in discharge quarter 4 (Q4) for 3 consecutive calendar years:

- Q4 2013 – October 1 to December 31, 2013 (ICD-9-CM)
- Q4 2014 – October 1 to December 31, 2014 (ICD-9-CM)
- Q4 2015 – October 1 to December 31, 2015 (ICD-10-PCS).

The data presented in this document are based on all-listed procedures. Individual codes were selected and reviewed by professional medical coders for both ICD-9-CM and ICD-10-PCS coding systems.

CCS categories were excluded from the analysis on the basis of the following criteria:

- There were fewer than 1,000 hospital stays in the category in all quarters analyzed.
- The CCS categories represented noninvasive diagnostic procedures (e.g., computed tomography scans and other non-operating-room diagnostic procedures).
- The CCS categories represented minor bedside procedures (e.g., insertion of nasogastric tube) that often are undercoded in administrative data such as HCUP.

When analyzing CCS categories or individual ICD-9-CM codes, we calculated percentage changes across two time periods: (1) from Q4 2013 to Q4 2014 and (2) from Q4 2014 to Q4 2015.[4] Change from Q4 2014 to Q4 2015 may represent changes associated with the introduction of ICD-10-PCS as well as continuation of an existing trend. Therefore, the percentage change from Q4 2013 to Q4 2014 was used as a baseline to evaluate the change

[3] For additional information on the detailed process used to create and validate the CCS for ICD-10-PCS, please see Beta Clinical Classifications Software (CCS) for ICD-10-CM/PCS. Healthcare Cost and Utilization Project Web site. October 2017. https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp

[4] Percentage change in frequency was calculated as the cumulative change in frequencies from period one to period two, divided by the frequency in period one.

from 2014 to 2015. The results presented in this document may shift with additional quarters and years of data as experience increases with the ICD-10-PCS system.

The prevalence of select CCS categories was calculated at each time point as the number of inpatient stays with at least one procedure falling into the CCS category in each quarter and year. If the CCS category was reported more than once on a record, the category was counted only once. The same process was used to de-duplicate individual ICD-9-CM and ICD-10-PCS codes. Therefore, the total frequencies of individual codes could be higher than frequencies of CCS categories as a whole because a single hospitalization may have multiple distinct procedure codes in the same CCS category during the stay.

Links to files that provide a complete listing of the ICD-9-CM and ICD-10-PCS codes constituting the CCS categories can be obtained from the following HCUP Web pages:

- ICD-9-CM: https://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp#download
- ICD-10-PCS: https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/ccs10.jsp#download.

For additional information about doing analyses with ICD-10-CM/PCS data, please see the HCUP Data Innovations – ICD-10-CM/PCS Resources Web site at ICD-10-CM/PCS Resources.

RESULTS

Results are presented below by CCS procedure category and by individual ICD-9-CM and ICD-10-PCS codes within select CCS categories. Four types of analyses are presented.

(1) CCS procedure categories with **high volumes** prior to ICD-10-PCS
(2) CCS procedure categories with large **decreases in volume** in ICD-10-PCS
(3) CCS procedure categories with large **increases in volume** in ICD-10-PCS
(4) CCS procedure categories with **relatively stable volumes** between ICD-9-CM and ICD-10-PCS.

A complete list of results by CCS procedure category is available in Appendices C and D. Appendix C lists the results sorted numerically by CCS procedure category number; thus, the findings are grouped by body system. Appendix D lists the results sorted in descending order by the percent change in the volume of records in CCS procedure categories across the transition period. Shaded rows indicate those CCS procedure categories that changed by less than 5 percent with the introduction of ICD-10-PCS.

There were a total of 231 CCS procedure categories:

- For 70 CCS procedure categories, frequencies changed (increased or decreased) by more than 50 percent across the ICD-9-CM to ICD-10-PCS coding transition period.
- For 60 categories, frequencies changed by 20 to 49 percent.
- For 53 categories, frequencies changed by 5 to 19 percent.
- Only 40 categories changed by less than 5 percent.
- For 8 categories, no ICD-10-PCS codes could be defined.

CCS Procedure Categories With High Volumes Prior to ICD-10-PCS

Table 4 presents frequencies for a select group of CCS procedure categories with high volumes of operating room procedures in the United States prior to the introduction of ICD-10-PCS coding. Selection of the procedure categories in Table 4 was based on the query results from HCUP Fast Stats[5] for the most common operating room procedures during inpatient stays in the United States in 2013 and in 2014.[6] Shaded rows indicate those CCS procedure categories that changed by less than 5 percent with the introduction of ICD-10-PCS.

[5] HCUP Fast Stats. Healthcare Cost and Utilization Project (HCUP). August 2017. Rockville, MD: Agency for Healthcare Research and Quality. www.hcup-us.ahrq.gov/faststats/national/inpatientcommonprocedures.jsp

[6] In Fast Stats, operating room procedures in 2013 and 2014 are identified using procedure classes that categorize each ICD-9-CM procedure code as major therapeutic, major diagnostic, minor therapeutic, or minor diagnostic. More information on procedure classes is available at https://www.hcup-us.ahrq.gov/toolssoftware/procedure/procedure.jsp

Table 4. Frequency of Inpatient Stays With High-Volume Surgical Procedures Prior to ICD-10-PCS (2013 and 2014), by CCS Procedure Category

All-Listed Procedure CCS Category[a,b]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
134: Cesarean section	151,050	150,935	148,040	–0.1	–1.9
61: Other OR procedures on vessels other than head and neck	122,308	121,929	83,964	–0.3	–31.1
115: Circumcision	111,225	112,678	109,061	1.3	–3.2
152: Arthroplasty knee	101,711	101,575	104,815	–0.1	3.2
153: Hip replacement; total and partial	67,295	70,760	73,138	5.1	3.4
158: Spinal fusion	55,486	57,310	58,335	3.3	1.8
45: Percutaneous transluminal coronary angioplasty (PTCA) [ICD-9-CM label] 45: Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement [ICD-10-PCS label]	57,293	56,706	57,066	–1.0	0.6
3: Laminectomy; excision intervertebral disc [ICD-9-CM label] 3: Excision, destruction or resection of intervertebral disc [ICD-10-PCS label]	55,169	55,262	37,013	0.2	–33.0
84: Cholecystectomy and common duct exploration	50,176	48,563	46,959	–3.2	–3.3
142: Partial excision bone	42,551	44,819	28,120	5.3	–37.3
90: Excision; lysis peritoneal adhesions	39,838	39,024	30,339	–2.0	–22.3
78: Colorectal resection	38,127	37,851	25,280	–0.7	–33.2
160: Other therapeutic procedures on muscles and tendons	36,694	37,676	104,382	2.7	177.1

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; Q, quarter; OR, operating room.

[a] Shaded rows indicate CCS procedure categories that changed by less than 5 percent with the introduction of ICD-10-PCS.

[b] Selection of CCS categories was based on the query results for the *Most Common Operations During Inpatient Stays* in 2013 and 2014 from HCUP Fast Stats. A complete set of results for all CCS categories is available in Appendices C and D.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

The frequencies of stays for most CCS categories in Table 4 were relatively similar in Q4 2013 and Q4 2014—the baseline period. The percentage change in the number of stays in the baseline period ranged from –3.2 to 5.3.

Although the percentage change from Q4 2013 to Q4 2014 was relatively small for every procedure, there was much greater variation in the percentage change from Q4 2014 to Q4 2015—the ICD transition period. Among the 13 high-volume CCS categories in Table 4, six procedures (nearly half) increased or decreased more than 20 percent during the transition period. For the remaining seven procedures, the percentage change was less than 5 percent in absolute value. However, it is advisable to proceed with caution when analyzing trends in administrative data across the change in coding schemes, even when the summary statistics appear to indicate that the transition to ICD-10-PCS did not affect observed frequencies or rates.

As an example, we examined one CCS category from this list in detail. We show the individual ICD-9-CM and ICD-10-PCS codes for CCS category 3, *Laminectomy; excision intervertebral disc*. The frequency of reporting codes for this category decreased by 33.0 percent during the ICD transition, compared with a negligible 0.2 percent increase from 2013 to 2014. Results are shown in Table 5.

Table 5. Frequency of Inpatient Stays With a Laminectomy Procedure

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
CCS 3: Laminectomy; excision intervertebral disc	**55,169**	**55,262**	
CCS 3: Excision, destruction or resection of intervertebral disc			**37,013**
ICD-9-CM codes			
0302: Reopen Laminectomy Site	574	520	
0309: Other Exploration and Decompression of Spinal Canal	19,460	19,569	
8050: Excision/Destruction Intervertebral Disc NOS (Begin 1986)	205	266	
8051: Excision Intervertebral Disc (Begin 1986)	37,583	37,631	
8459: Insert Other Spinal Device (Begin 2004)	236	140	
8462: Insert Total Disc Prosthesis Cervical (Begin 2004)	388	473	
8465: Insert Total Disc Prosthesis Lumbosacral (Begin 2004)	140	106	
8480: Insert/Replace Interspine Device (Begin 2007)	276	355	
8482: Insert/Replace Pedicle Stabilization Device (Begin 2007)	187	230	
ICD-10-PCS codes			
0RB30ZZ: Excision of Cervical Vertebral Disc, Open			7,994
0RB50ZZ: Excision of Cervicothoracic Vertebral Disc, Open			265
0RB90ZZ: Excision of Thoracic Vertebral Disc, Open			298
0RBB0ZZ: Excision of Thoracolumbar Vertebral Disc, Open			120
0RT30ZZ: Resection of Cervical Vertebral Disc, Open			6,533
0RT50ZZ: Resection of Cervicothoracic Vertebral Disc, Open			247
0RT90ZZ: Resection of Thoracic Vertebral Disc, Open			178
0SB00ZZ: Excision of Lumbar Vertebral Joint, Open			999

0SB20ZZ: Excision of Lumbar Vertebral Disc, Open			8,761
0SB40ZZ: Excision of Lumbosacral Disc, Open			4,258
0ST20ZZ: Resection of Lumbar Vertebral Disc, Open			6,556
0ST40ZZ: Resection of Lumbosacral Disc, Open			3,285

Abbreviations: CCS, Clinical Classifications Software; NOS, not otherwise specified; Q, quarter.

[a] Only ICD-9-CM and ICD-10-PCS codes with at least 100 stays in each cell are displayed in the table. Please see https://www.hcup-us.ahrq.gov/tools_software.jsp for a full list of codes included in the Clinical Classifications Software categories.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

Table 4 raises concerns that laminectomy cases were being underidentified using CCS category 3 in the fourth quarter of 2015. Table 5 shows that in 2013 and 2014 there were approximately 19,000 reported occurrences of ICD-9-CM code 0309, *Other exploration and decompression of spinal canal*. Coding rules for 0309 under ICD-9-CM included laminectomy:

03.09 Other exploration and decompression of spinal canal

- Decompression:
  - Laminectomy
  - Laminotomy
- Expansile laminoplasty
- Exploration of spinal nerve root
- Foraminotomy
- Code also any synchronous insertion, replacement and revision of posterior
- spinal motion preservation device(s), if performed (84.80–84.85)
- *Excludes:*
  - *Drainage of spinal fluid by anastomosis (03.71–03.79)*
  - *Laminectomy with excision of intervertebral disc (80.51)*
  - *Spinal tap (03.31)*

Interestingly, the number of cases in CCS 3, *Laminectomy; excision intervertebral disc* was 19,000 fewer under ICD-10-PCS, and there were 19,460 and 19,569 cases coded using 0309 *Other exploration and decompression of spinal canal* in 2013 and 2014, respectively.

In ICD-10-PCS, code 00JU0ZZ, *Inspection of spinal canal, open approach* was reported for some laminectomy procedures. This code is assigned to CCS 7: *Other diagnostic nervous system procedures* and is reported when a laminectomy is performed for the purpose of exploration.[7] There is additional complexity in the coding guidelines that would not have been taken into account in the ICD-9-CM version of the CCS, but may need to be taken into account in the ICD-10-PCS version of the CCS. Laminectomy is not reported separately in ICD-10-PCS when performed as part of a disc excision procedure. Instead, it is considered part of the operative approach and becomes a component of the excision or resection of the vertebral disc procedures.

[7] Leon-Chisen, N. ICD-10-CM and ICD-10-PCS Coding Handbook, revised ed. Chicago, IL: American Hospital Association; 2016.

Therefore, the decrease in volume for the laminectomy procedure under ICD-10-PCS is due to a change in coding guidelines and the CCS classification rules. In Q4 2015, CCS 3 includes the ICD-10-PCS equivalent of ICD-9-CM code 8051, but not 0309. It appears that the new coding guidelines for ICD-10-PCS accounts for the missing volume for CCS 3 under ICD-10-PCS.

CCS Procedure Categories With Large Decreases in Volume in ICD-10-PCS

Table 6 presents frequencies of inpatient stays with procedures where the volume by CCS category decreased by at least 50 percent from Q4 2014 to Q4 2015, after the introduction of ICD-10-PCS coding. This table includes procedures that have at least 1,000 cases in the fourth quarter of 2013 or 2014 (the baseline period).

Table 6. CCS Procedure Categories With a Decrease in Frequency of at Least 50 Percent During the Transition From ICD-9-CM to ICD-10-PCS

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
106: Genitourinary incontinence procedures	4,124	2,928	306	–29.0	–89.5
35: Tracheoscopy and laryngoscopy with biopsy	8,910	9,517	2,105	6.8	–77.9
75: Small bowel resection	11,672	11,841	2,880	1.4	–75.7
63: Other non-OR therapeutic cardiovascular procedures	85,032	85,210	22,768	0.2	–73.3
217: Other respiratory therapy	14,669	14,843	4,172	1.2	–71.9
103: Nephrotomy and nephrostomy	6,459	6,756	2,057	4.6	–69.6
215: Other physical therapy and rehabilitation	27,494	26,833	11,005	–2.4	–59.0
86: Other hernia repair	29,488	29,482	13,142	0.0	–55.4
76: Colonoscopy and biopsy	53,602	53,437	25,468	–0.3	–52.3
213: Physical therapy exercises; manipulation; and other procedures	27,515	28,005	13,986	1.8	–50.1
140: Repair of current obstetric laceration	168,717	174,255	0	3.3	NA
169: Debridement of wound; infection or burn	34,278	35,770	0	4.4	NA

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NA, not applicable; OR, operating room; Q, quarter.

[a] The select CCS categories in the table are those with at least 1,000 stays in Q4 2013 or 2014 and do not represent noninvasive diagnostic procedures or minor bedside procedures that often are undercoded in HCUP data. A complete set of results for all CCS categories is available in Appendices C and D.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

Prior to the transition to ICD-10-PCS coding, these procedure categories exhibited very stable trends. An exception was the genitourinary incontinence procedures category, which had a 29

percent decrease in frequency from 2013 to 2014. However, during the transition period to ICD-10-PCS, frequencies in each of these procedure categories decreased by more than half of the total volume (i.e., a 50 percent decrease).

Some of the categories decreased because ICD-10-PCS codes do not include diagnostic information and the category itself is based on a specific diagnosis—genitourinary incontinence procedures, repair of current obstetric laceration, and debridement of wound/infection/burn.

Some of the categories are catch-all groupings that combine "other" types of similar procedures. It may be the case that the specificity of the related ICD-10-PCS codes results in their mapping to one of the more specific CCS categories.

As an example, we examined one CCS category from this list in detail. Table 7 presents the individual ICD-9-CM and ICD-10-PCS codes for CCS category 75, *Small bowel resection* across the three time periods. Frequencies in this procedure category decreased by 75.7 percent with the introduction of ICD-10-PCS.

Table 7. Frequency of Inpatient Stays With a Small Bowel Resection Procedure

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
CCS 75: Small bowel resection	**11,672**	**11,841**	**2,880**
ICD-9-CM codes			
4561: Multi Segment Small Bowel Excision	568	552	
4562: Partial Small Bowel Resection NEC	11,105	11,300	
ICD-10-PCS codes			
0DT80ZZ: Resection of Small Intestine, Open			1,218
0DT84ZZ: Resection of Small Intestine, Perq Endoscopic			141
0DT90ZZ: Resection of Duodenum, Open			405
0DTA0ZZ: Resection of Jejunum, Open			231
0DTB0ZZ: Resection of Ileum, Open			628
0DTB4ZZ: Resection of Ileum, Perq Endoscopic			153

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NEC, not elsewhere classified; Perq, percutaneous; Q, quarter.

[a] Only ICD-9-CM and ICD-10-PCS codes with at least 100 stays in each cell are displayed in the table. Please see https://www.hcup-us.ahrq.gov/tools_software.jsp for a full list of codes included in the Clinical Classifications Software categories.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

Terminology has strict meanings in ICD-10-PCS coding. This is a good example of how the ICD-10-PCS root operations and their definitions have an impact on the assignment of procedure codes and CCS categories. The three root operations utilized for removal of small bowel are the following:

- Resection – **cutting** out or off, without replacement, **all of a body part**
- Excision – **cutting** out or off, without replacement, **a portion of a body part**

- Destruction – **physical eradication** of **all or a portion of a body** part by the direct use of energy, force, or a destructive agent.

These definitions do not necessarily correlate with the terms that surgeons use for procedures. For example, when the physician documents *small bowel resection* it could be interpreted by an inexperienced coder as the removal of the entire small intestine. It also could be interpreted this way by computer-assisted coding software.

ICD-10-PCS Coding guideline A11 states:

> Many of the terms used to construct PCS codes are defined within the system. It is the coder's responsibility to determine what the documentation in the medical record equates to in the PCS definitions. The physician is not expected to use the terms used in PCS code descriptions, nor is the coder required to query the physician when the correlation between the documentation and the defined PCS terms is clear. Example: When the physician documents "partial resection" the coder can independently correlate "partial resection" to the root operation Excision without querying the physician for clarification (CMS, ICD-10-PCS Official Guidelines for Coding and Reporting, 2018, 2017).

Therefore, according to this coding guideline, the coder should not code *small bowel resection* based solely on the procedure description indicated on the operative report. Instead, the coder should read the entire operative report to determine whether the surgeon removed the entire small intestine or only a portion of the small intestine. Additionally, the coder should determine whether the body part was removed via destruction or by cutting. If only a portion of the small intestine was removed, the coder should choose the root operation *Excision* instead of the root operation *Resection*. If energy, force, or a destructive agent was utilized for the removal, then the coder should choose *Destruction* as the root operation. The most frequent ICD-9-CM code in this CCS category was labeled *Partial Small Bowel Resection NEC*. Given that *Resection* means total removal in ICD-10-PCS, the decrease in volume observed in Tables 6 and 7 for this CCS category likely was the result of differences in the coding vocabulary, especially if the case was coded by an inexperienced coder with the help of coding assistance software.

ICD-9-CM did not distinguish between specific portions of the small intestine (duodenum, jejunum, ileum, ileocecal value), but ICD-10-PCS includes separate codes for these anatomical sections. If the entire body part was removed, *Resection* would be coded as the root operation. If a portion of the body part was removed, *Excision* would be chosen. If energy, force, or a destructive agent was used, then *Destruction* is the root operation.

When mapping for the CCS categories, ICD-10-PCS followed the root operation definitions. Therefore, the only ICD-10-PCS codes placed in CCS 75 were *Resection* codes where the entire body part was removed. *Excision* and *Destruction* codes were placed into other digestive system categories (i.e., CCS 70: Upper gastrointestinal endoscopy; biopsy; CCS 92: Other bowel diagnostic procedures; CCS 93: Other non-operating-room upper gastrointestinal therapeutic procedures; CCS 94: Other operating room upper GI therapeutic procedures; and CCS 96: Other operating room lower gastrointestinal therapeutic procedures). In these other CCS categories, the number of records with *Destruction* of small bowel body parts totaled 3,805

and the number of records with the *Excision* of small bowel body parts totaled 40,493. However, this count far exceeds the number of stays with a partial small bowel removal captured by ICD-9-CM code 4562 in 2013 and 2014. Even if the related ICD-10-PCS *Excision* and *Destruction* codes were mapped to CCS 75, the number of stays for "small bowel resection" (as surgeons would use the term), do not maintain a consistent trend from ICD-9-CM to ICD-10-PCS.

This example suggests that a classification system needs to be developed for researchers that maps ICD-10-PCS codes into procedures that reflect conventional surgical terminology.

CCS Procedure Categories With Large Increases in Volume in ICD-10-PCS

Table 8 presents frequencies of inpatient stays with procedures where the volume by CCS category increased by at least 50 percent from Q4 2014 to Q4 2015, after the introduction of ICD-10-PCS coding. This table includes procedures that have at least 1,000 cases in the fourth quarter of 2013, 2014, or 2015.

Table 8. CCS Procedure Categories With an Increase in Frequency of at Least 50 Percent During the Transition From ICD-9-CM to ICD-10-PCS

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
79: Local excision of large intestine lesion (not endoscopic) [ICD-9-CM label] 79: Excision (partial) of large intestine (not endoscopic) [ICD-10-PCS label]	392	400	9,238	2.0	2,209.5
6: Decompression peripheral nerve	2,024	2,050	14,148	1.3	590.1
156: Injections and aspirations of muscles; tendons; bursa; joints and soft tissue	1,812	2,014	11,783	11.1	485.1
125: Other excision of cervix and uterus	4,425	4,605	24,983	4.1	442.5
132: Other OR therapeutic procedures; female organs	10,764	9,267	47,547	–13.9	413.1
175: Other OR therapeutic procedures on skin and breast [ICD-9-CM label] 175: Other OR therapeutic procedures on skin, subcutaneous tissue and fascia [ICD-10-PCS label]	11,145	10,228	45,105	–8.2	341.0
123: Other operations on fallopian tubes	6,528	9,181	38,388	40.6	318.1
160: Other therapeutic procedures on muscles and tendons	36,694	37,676	104,382	2.7	177.1
170: Excision of skin lesion [ICD-9-CM label] 170: Excision of skin [ICD-10-PCS label]	7,116	6,935	14,859	–2.5	114.3
94: Other OR upper GI therapeutic procedures	19,123	19,232	40,477	0.6	110.5

162: Other OR therapeutic procedures on joints	18,933	18,846	37,065	–0.5	96.7
99: Other OR gastrointestinal therapeutic procedures	28,429	27,836	48,864	–2.1	75.5
127: Dilatation and curettage (D&C); aspiration after delivery or abortion	3,864	3,883	6,556	0.5	68.8
60: Embolectomy and endarterectomy of lower limbs	5,711	5,922	9,764	3.7	64.9

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System OR, operating room; Q, quarter.

[a] The select CCS categories in the table are those with at least 1,000 stays in at least one quarter and do not represent noninvasive diagnostic procedures or minor bedside procedures that often are undercoded in HCUP. A complete set of results for all CCS categories is available in Appendices C and D.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

Frequencies of inpatient stays in CCS categories listed in Table 8 increased between 51.0 and 2,209.5 percent during the transition period. Eight of the 14 categories in Table 8 are catch-all categories with labels starting with *Other*, which could account for some of the variation. However, prior to the transition to ICD-10-CM coding, all but three of the categories in Table 8 exhibited very stable trends, with a baseline change in the number of stays less than 10 percent.

As an example, we examined one CCS category from this list in detail. Table 9 presents the individual ICD-9-CM and ICD-10-PCS codes for CCS category 175, *Other operating room therapeutic procedures on skin and breast* in each quarter. The frequencies increased by 341 percent (more than four-fold) during the 2014–2015 transition.

Table 9. Frequency of Inpatient Stays With a Procedure From the CCS Category Other Operating Room Therapeutic Procedure on Skin and Breast

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
CCS 175: Other OR therapeutic procedures on skin and breast	**11,110**	**10,185**	
CCS 175: Other OR therapeutic procedures on skin, subcutaneous tissue, fascia and breast			**41,602**
ICD-9-CM codes			
8531: Unilateral Reduction Mammoplasty	128	101	—
8532: Bilat Reduction Mammoplasty	250	214	—
8534: Unilateral SubQ Mammectomy NEC	358	307	—
8536: Bilat SubQ Mammectomy NEC	673	678	—
8553: Unilateral Breast Implant	373	300	—
8554: Bilateral Breast Implant	525	427	—
856 : Mastopexy	239	201	—
8571: LDM Flap (Begin 2008)	694	716	—
8572: TRAM Flap	252	203	—

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
8573: TRAM Flap	291	314	—
8574: DIEAP Flap	633	630	—
8584: Breast Pedicle Graft	142	164	—
8589: Mammoplasty NEC	1,574	1,299	—
8594: Breast Implant Removal	752	677	—
8595: Insert Breast Tiss Expander (Begin 1987)	3,073	2,752	—
8596: Remove Breast Tiss Expander (Begin 1987)	594	577	—
8606: Insert Infusion Pump (Begin 1987)	756	748	—
8621: Excision of Pilonidal Cyst	177	174	—
8683: Size Reduction Plastic Op	1,454	1,323	—
8684: Relaxation of Scar	308	290	—
8686: Onychoplasty	251	246	—
8687: Fat Graft Skin/SubQ Tiss (Begin 2010)	1,042	1,089	—
8689: Skin Repair & Plasty NEC	605	471	—
ICD-10-PCS codes			
0H99XZZ: Drainage of Perineum Skin, External	—	—	293
0HHT0NZ: Insertion of Tiss Expander into R Breast, Open	—	—	405
0HHU0NZ: Insertion of Tiss Expander into L Breast, Open	—	—	432
0HHV0NZ: Insertion of Tiss Expander into Bilat Breast, Open	—	—	1,422
0HN7XZZ: Release Ab Skin, External	—	—	116
0HPT0JZ: Removal of Synth Subst from R Breast, Open	—	—	395
0HPT0NZ: Removal of Tiss Expander from R Breast, Open	—	—	395
0HPU0JZ: Removal of Synth Subst from L Breast, Open	—	—	442
0HPU0NZ: Removal of Tiss Expander from L Breast, Open	—	—	416
0HQQXZZ: Repair Finger Nail, External	—	—	192
0HRT075: Replace R Breast using LDM Flap, Open	—	—	141
0HRT077: Replace R Breast using DIEAP Flap, Open	—	—	164
0HRT0JZ: Replace of R Breast with Synth Subst, Open	—	—	144
0HRU075: Replace L Breast using LDM Flap, Open	—	—	123
0HRU077: Replace L Breast using DIEAP Flap, Open	—	—	200
0HRU0JZ: Replace of L Breast with Synth Subst, Open	—	—	125
0HRV076: Replace Bilat Breast using TRAM Flap, Open	—	—	110
0HRV077: Replace Bilat Breast using DIEAP Flap, Open	—	—	393
0HRV0JZ: Replace of Bilat Breast with Synth Subst, Open	—	—	440
0HRVXKZ: Replace Bilat Breast w Nonautolog Tiss Subst, External	—	—	147
0HUV0JZ: Suppl Bilat Breast with Synth Subst, Open	—	—	102
0J8G0ZZ: Division of R Lower Arm SubQ Tiss & Fasc, Open	—	—	143
0J8H0ZZ: Division of L Lower Arm SubQ Tiss & Fasc, Open	—	—	155
0J8N0ZZ: Division of R Lower Leg SubQ Tiss & Fasc, Open	—	—	617
0J8P0ZZ: Division of L Lower Leg SubQ Tiss & Fasc, Open	—	—	666

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
0JB00ZZ: Excision of Scalp SubQ Tiss & Fasc, Open	—	—	254
0JB10ZZ: Excision of Face SubQ Tiss & Fasc, Open	—	—	336
0JB40ZZ: Excision of Anterior Neck SubQ Tiss & Fasc, Open	—	—	251
0JB50ZZ: Excision of Posterior Neck SubQ Tiss & Fasc, Open	—	—	187
0JB60ZZ: Excision of Chest SubQ Tiss & Fasc, Open	—	—	758
0JB70ZZ: Excision of Back SubQ Tiss & Fasc, Open	—	—	1,799
0JB80ZZ: Excision of Ab SubQ Tiss & Fasc, Open	—	—	3,118
0JB90ZZ: Excision of Butt SubQ Tiss & Fasc, Open	—	—	1,678
0JBB0ZZ: Excision of Perineum SubQ Tiss & Fasc, Open	—	—	774
0JBC0ZZ: Excision of Pelvic Region SubQ Tiss & Fasc, Open	—	—	707
0JBD0ZZ: Excision of R Upper Arm SubQ Tiss & Fasc, Open	—	—	401
0JBF0ZZ: Excision of L Upper Arm SubQ Tiss & Fasc, Open	—	—	386
0JBG0ZZ: Excision of R Lower Arm SubQ Tiss & Fasc, Open	—	—	560
0JBH0ZZ: Excision of L Lower Arm SubQ Tiss & Fasc, Open	—	—	696
0JBJ0ZZ: Excision of R Hand SubQ Tiss & Fasc, Open	—	—	649
0JBK0ZZ: Excision of L Hand SubQ Tiss & Fasc, Open	—	—	601
0JBL0ZZ: Excision of R Upper Leg SubQ Tiss & Fasc, Open	—	—	1,383
0JBM0ZZ: Excision of L Upper Leg SubQ Tiss & Fasc, Open	—	—	1,310
0JBN0ZZ: Excision of R Lower Leg SubQ Tiss & Fasc, Open	—	—	1,998
0JBP0ZZ: Excision of L Lower Leg SubQ Tiss & Fasc, Open	—	—	2,052
0JBQ0ZZ: Excision of R Foot SubQ Tiss & Fasc, Open	—	—	3,315
0JBR0ZZ: Excision of L Foot SubQ Tiss & Fasc, Open	—	—	3,173
0JD10ZZ: Extract of Face SubQ Tiss & Fasc, Open	—	—	108
0JD60ZZ: Extract of Chest SubQ Tiss & Fasc, Open	—	—	270
0JD70ZZ: Extract of Back SubQ Tiss & Fasc, Open	—	—	472
0JD80ZZ: Extract of Ab SubQ Tiss & Fasc, Open	—	—	545
0JD83ZZ: Extract of Ab SubQ Tiss & Fasc, Perq	—	—	194
0JD90ZZ: Extract of Butt SubQ Tiss & Fasc, Open	—	—	210
0JDB0ZZ: Extract of Perineum SubQ Tiss & Fasc, Open	—	—	151
0JDC0ZZ: Extract of Pelvic Region SubQ Tiss & Fasc, Open	—	—	166
0JDD0ZZ: Extract of R Upper Arm SubQ Tiss & Fasc, Open	—	—	129
0JDF0ZZ: Extract of L Upper Arm SubQ Tiss & Fasc, Open	—	—	149
0JDG0ZZ: Extract of R Lower Arm SubQ Tiss & Fasc, Open	—	—	202
0JDH0ZZ: Extract of L Lower Arm SubQ Tiss & Fasc, Open	—	—	251
0JDJ0ZZ: Extract of R Hand SubQ Tiss & Fasc, Open	—	—	262
0JDK0ZZ: Extract of L Hand SubQ Tiss & Fasc, Open	—	—	249
0JDL0ZZ: Extract of R Upper Leg SubQ Tiss & Fasc, Open	—	—	350
0JDM0ZZ: Extract of L Upper Leg SubQ Tiss & Fasc, Open	—	—	348
0JDN0ZZ: Extract of R Lower Leg SubQ Tiss & Fasc, Open	—	—	684
0JDN3ZZ: Extract of R Lower Leg SubQ Tiss & Fasc, Perq	—	—	105

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
0JDP0ZZ: Extract of L Lower Leg SubQ Tiss & Fasc, Open	—	—	664
0JDP3ZZ: Extract of L Lower Leg SubQ Tiss & Fasc, Perq	—	—	130
0JDQ0ZZ: Extract of R Foot SubQ Tiss & Fasc, Open	—	—	640
0JDQ3ZZ: Extract of R Foot SubQ Tiss & Fasc, Perq	—	—	111
0JDR0ZZ: Extract of L Foot SubQ Tiss & Fasc, Open	—	—	657
0JDR3ZZ: Extract of L Foot SubQ Tiss & Fasc, Perq	—	—	111
0JH80VZ: Insertion of Infusion Pump into Ab SubQ Tiss & Fasc, Open	—	—	324
0JN80ZZ: Release Ab SubQ Tiss & Fasc, Open	—	—	857
0JN83ZZ: Release Ab SubQ Tiss & Fasc, Perq	—	—	324
0JNC0ZZ: Release Pelvic Region SubQ Tiss & Fasc, Open	—	—	774
0JNC3ZZ: Release Pelvic Region SubQ Tiss & Fasc, Perq	—	—	171
0JR107Z: Replace Face SubQ Tiss & Fasc w Autolog Tiss Subst, Open	—	—	116
0JUC0JZ: Suppl Pelv Region SubQ Tiss & Fasc w Synth Subst, Open	—	—	311
0JUC0KZ: Suppl Pelv Reg SubQ & Fasc w Nonautolog Tiss Subst, Open	—	—	101
0JUC3JZ: Suppl Pelv Region SubQ Tiss & Fasc w Synth Subst, Perq	—	—	120
0JX80ZC: Transfer Ab SubQ Tiss & Fasc w Skin, SubQ & Fasc, Open	—	—	181
0JX80ZZ: Transfer Ab SubQ Tiss & Fasc, Open	—	—	135
0JX90ZC: Transfer Butt SubQ Tiss & Fasc w Skin, SubQ & Fasc, Open	—	—	112
0W0F0ZZ: Alteration of Abdominal Wall, Open	—	—	258
0W920ZZ: Drainage of Face, Open	—	—	107
0W9600Z: Drainage of Neck with Drainage Device, Open	—	—	192
0W960ZZ: Drainage of Neck, Open	—	—	239
0W963ZZ: Drainage of Neck, Perq	—	—	106
0WB60ZZ: Excision of Neck, Open	—	—	109
0WQ0XZZ: Repair Head, External	—	—	243
0WQ2XZZ: Repair Face, External	—	—	402

Abbreviations: Ab, abdomen; Bilat, bilateral; Butt, buttock; CCS, Clinical Classifications Software; DIEAP, deep inferior epigastric artery perforator; Extract, extraction; Fasc, fascia; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; L, left; LDM, latissimus dorsi myocutaneous; NEC, not elsewhere classified; Perq, percutaneous; Q, quarter; R, right; Replace, replacement; SubQ, subcutaneous; Synth, synthetic; Subst, substitute; Suppl, supplement; Tiss, tissue; TRAM, transverse rectus abdominis myocutaneous.

[a] Only ICD-9-CM and ICD-10-PCS codes with at least 100 stays in each cell are included in the table. Please see https://www.hcup-us.ahrq.gov/tools_software.jsp for a full list of codes included in the Clinical Classifications Software categories.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

The title of the ICD-9-CM version of CCS 175 is *Other operating room therapeutic procedures on skin and breast*. The title of the ICD-10-PCS version of CCS 175, *Other operating room*

therapeutic procedures on skin, subcutaneous tissue, fascia, and breast,[8] was modified to include two new body parts. The increase in volume for CCS 175 in quarter 4 2015 likely is due to the new inclusion of excision and extraction of subcutaneous tissue and fascia.

In ICD-9-CM, the body part, fascia, was included in Chapter 14, *Operations on the Musculoskeletal System* and the body part, subcutaneous tissue, was included in Chapter 15, *Operations on the Integumentary System*. Therefore, under ICD-9-CM, procedures that included fascia were included in musculoskeletal CCS categories, and subcutaneous tissue procedures were included in integumentary CCS categories.

The ICD-10-PCS code set combined fascia and subcutaneous tissue into one category. Therefore, the corresponding ICD-10-PCS codes (that begin with the characters 0J) were included in the integumentary system CCS categories, and the titles were modified as warranted to include subcutaneous tissue and fascia.

CCS Procedure Categories With Stable Volumes Between ICD-9-CM and ICD-10-PCS

Table 10 presents high-volume CCS procedure categories that were relatively stable in frequency from ICD-9-CM to ICD-10-PCS, changing by no more than 20 percent after the transition to ICD-10-PCS coding. This table includes CCS procedure categories that have at least 1,000 cases in the fourth quarter of 2013, 2014, or 2015.

Table 10. High-Volume CCS Procedure Categories in the SID That Changed in Frequency by No More Than 20 Percent From ICD-9-CM to ICD-10-PCS

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
43: Heart valve procedures	16,995	18,766	20,394	10.4	8.7
44: Coronary artery bypass graft (CABG)	24,430	24,506	23,844	0.3	–2.7
80: Appendectomy	32,468	30,453	28,365	–6.2	–6.9
115: Circumcision	111,225	112,678	109,061	1.3	–3.2
119: Oophorectomy; unilateral and bilateral	23,871	22,866	20,092	–4.2	–12.1
124: Hysterectomy; abdominal and vaginal	32,315	30,206	27,840	–6.5	–7.8
158: Spinal fusion	55,486	57,310	58,335	3.3	1.8

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System Q, quarter; SID, State Inpatient Databases.

[a] The select CCS categories in the table have at least 1,000 stays in at least one quarter and do not represent noninvasive diagnostic procedures or minor bedside procedures that often are undercoded in HCUP. A complete set of results for all CCS categories is available in Appendices C and D.

[8] A complete list of CCS categories with revised labels in ICD-10-PCS can be found at https://www.hcup-us.ahrq.gov/toolssoftware/ccs10/CCSLabelChangesforICD-9CCS2014.pdf.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

One common factor among the procedures listed in Table 9 is that they are all specific clinical procedure groups with well-defined code sets and few definitional changes between ICD-9-CM and ICD-10-PCS. The frequencies in each procedure category in Q4 were very similar across all 3 years. Regardless, a closer examination of CCS categories at the code level revealed that there still can be differences in the groups that are important for researchers. We examined two CCS categories from this list in detail to illustrate relevant differences between ICD-9-CM and ICD-10-PCS coding.

Table 11 presents counts of inpatient stays by discharge quarter for the individual ICD-9-CM and ICD-10-PCS codes for CCS category 44, *Coronary artery bypass graft*. The codes in this table have been grouped to demonstrate the set of ICD-10-PCS codes that would map to each ICD-9-CM code.

Table 11. Frequency of Inpatient Stays With a Coronary Artery Bypass Graft (CABG) Procedure

Code and Description[a]	ICD-9 Codes		ICD-10 Codes
	Q4 2013, N	Q4 2014, N	Q4 2015, N
CCS 44: Coronary artery bypass graft (CABG)	**24,430**	**24,506**	**23,844**
3611: Aortocoronary Bypass-1 Cor Art	5,296	5,462	—
021009W: Bypass Cor Art, One Site from Aorta w AVT, Open	—	—	4,375
02100AW: Bypass Cor Art, One Site from Aorta w AAT, Open	—	—	682
ICD-10-PCS subtotal[b]	—	—	5,116
3612: Aortocoronary Bypass-2 Cor Art	8,652	8,781	—
021109W: Bypass Cor Art, Two Sites from Aorta w AVT, Open	—	—	7,115
02110AW: Bypass Cor Art, Two Sites from Aorta w AAT, Open	—	—	241
ICD-10-PCS subtotal[b]	—	—	7,396
3613: Aortocoronary Bypass-3 Cor Art	6,464	6,288	—
021209W: Bypass Cor Art, Three Sites from Aorta w AVT, Open	—	—	4,374
ICD-10-PCS subtotal[b]	—	—	4,500
3614: Aortocoronary Bypass-4+ Cor Art	2,587	2,517	—
021309W: Bypass Cor Art, Four or More Sites from Aorta w AVT, Open	—	—	1,354
ICD-10-PCS subtotal[b]	—	—	1,399
3615: 1 Internal Mammary-Cor Art Bypass - single	20,200	20,454	—
0210099: Bypass Cor Art, One Site from Lt Int Mammary w AVT, Open	—	—	1,066
02100A8: Bypass Cor Art, One Site from Rt Int Mammary w AAT, Open	—	—	185
02100A9: Bypass Cor Art, One Site from Lt Int Mammary w AAT, Open	—	—	1,939
02100Z8: Bypass Cor Art, One Site from Right Internal Mammary, Open	—	—	689
02100Z9: Bypass Cor Art, One Site from Left Internal Mammary, Open	—	—	15,932
02100ZC: Bypass Cor Art, One Site from Thoracic Art, Open Approach	—	—	214
ICD-10-PCS subtotal[b]	—	—	20,295
3616: 2 Internal Mammary-Cor Art Bypass - double	808	875	—
0211099: Bypass Cor Art, Two Site from Lt Int Mammary w AVT, Open	—	—	172
02110A9: Bypass Cor Art, Two Sites from Lt Int Mammary w AAT, Open	—	—	135

Code and Description[a]	ICD-9 Codes		ICD-10 Codes
	Q4 2013, N	Q4 2014, N	Q4 2015, N
02110Z9: Bypass Cor Art, Two Sites from Left Internal Mammary, Open	—	—	550
0212099: Bypass Cor Art, Three Sites from Lt Int Mammary w AVT, Open	—	—	153
02120Z9: Bypass, Cor Art, Three Sites from Lt Internal Mammary, Open	—	—	119
0213099: Bypass Cor Art, Four or More Sites from Lt Int Mammary w AVT, Open	—	—	103
ICD-10-PCS subtotal[b]	—	—	1,527
3619: Heart Revascularization Bypass Anastomosis NEC	492	510	—
0210093: Bypass Cor Art, One Site from Cor Art w AVT, Open	—	—	683
02100A3: Bypass Cor Art, One Site from Cor Art w AAT, Open	—	—	163
02100Z3: Bypass Cor Art, One Site from Cor Art, Open	—	—	215
0211093: Bypass Cor Art, Two Sites from Cor Art w AVT, Open	—	—	926
02110Z3: Bypass Cor Art, Two Sites from Cor Art, Open	—	—	220
0212093: Bypass Cor Art, Three Sites from Cor Art w AVT, Open	—	—	561
02120Z3: Bypass, Cor Art, Three Sites from Cor Art, Open	—	—	142
0213093: Bypass Cor Art, Four or More Sites from Cor Art w AVT, Open	—	—	202
ICD-10-PCS subtotal[b]	—	—	3,293
3631: Open Chest Transmyocardial Revascularization (Begin 1998)	185	164	—
ICD-10-PCS subtotal[b]	—	—	NA[c]

Abbreviations: Art, artery; CCS, Clinical Classifications Software; Cor, coronary; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NA, not applicable; NEC, not elsewhere classified; Q, quarter.

[a] Only ICD-9-CM and ICD-10-PCS codes with at least 100 stays in each cell are included in the table. Please see https://www.hcup-us.ahrq.gov/tools_software.jsp for a full list of codes included in the Clinical Classifications Software categories.

[b] The ICD-10-PCS subtotals include ICD-10-PCS codes that did not have at least 100 stays in the quarter and were not displayed in the table.

[c] The relevant ICD-10-PCS for this subgroup were assigned to CCS 49: *Other Operating Room Heart Procedures* and were not displayed in the table.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

Table 11 shows that there were a greater number of possible ICD-10-PCS codes in this category because of the increased specificity enabled by the coding system. Each ICD-10-PCS code describes the number and location of sites involved and specifies the approach used. Even though the total CCS volume only decreased 3.7 percent in the transition period, more variation was evident when comparing counts by individual codes. Many of the more frequently

used ICD-9-CM codes mapped to ICD-10-PCS codes with decreased volume. However, some ICD-9-CM codes (e.g., 3619 *Heart Revascularization Bypass Anastomosis NEC*) had much higher volume under ICD-10-PCS.

Table 12 presents counts of inpatient stay by discharge quarter for the individual ICD-9-CM and ICD-10-PCS codes for CCS category 124, *Hysterectomy; abdominal and vaginal*.

Table 12. Frequency of Inpatient Stays With a Hysterectomy Procedure

Code and Description[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N
CCS 124: Hysterectomy; abdominal and vaginal	**32,315**	**30,206**	**27,840**
ICD-9-CM codes			
6831: Laparoscopic Supracervical Hysterectomy (LSH) (Begin 20	1,508	519	
6839: Other Subtotal Abdominal Hysterectomy; NOS (Begin 2003)	2,643	2,773	
6841: Laparoscopic Total Abdominal Hysterectomy (Begin 2006)	4,348	3,831	
6849: Total Abdominal Hysterectomy NEC/NOS (Begin 2006)	15,129	16,332	
6851: Laparoscopic Assist Vaginal Hysterectomy (Begin 1996)	3,230	2,581	
6859: Other Vaginal Hysterectomy (Begin 1996)	4,258	3,003	
6861: Lap Radical Abdominal Hysterectomy (Begin 2006)	453	439	
6869: Radical Abdominal Hysterectomy NEC/NOS (Begin 2006)	581	582	
ICD-10-PCS codes			
0UT90ZZ: Resection of Uterus, Open Approach			18,631
0UT94ZZ: Resection of Uterus, Percutaneous Endoscopic			3,638
0UT97ZZ: Resection of Uterus, Via Natural or Artificial Opening			2,439
0UT98ZZ: Resection of Uterus, Via Natural or Artificial Opening Endoscopic			174
0UT9FZZ: Resection of Uterus, Via Natural or Artificial Opening With Percutaneous Endoscopic Assist			2,989

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NEC, not elsewhere classified; NOS, not otherwise specified; Q, quarter.

[a] Only ICD-9 and ICD-10 codes with at least 100 stays in each cell are included in the table. Please see https://www.hcup-us.ahrq.gov/tools_software.jsp for a full list of codes included in the Clinical Classifications Software categories.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

The coding for hysterectomy changed substantially under ICD-10-PCS. Because ICD-10-PCS is driven by body part designation and the code set established separate body parts for the uterus and cervix, there were numerous questions from the coding community about how to code total hysterectomy. Some coders believed that only one code was needed to report hysterectomy because the cervix technically is part of the uterus. However, other coders believed that because the body parts are separated in PCS, two codes were needed for hysterectomy: one for the *Resection of uterus* and one for *Resection of cervix*. The American Hospital Association (AHA) Coding Clinic™ for ICD-10-PCS published two scenarios that

supported the reporting of two codes for hysterectomy.[9] Therefore, at the implementation of ICD-10-PCS in Fiscal Year (FY) 2016, the correct way to report total hysterectomy was to separately code *Resection of uterus* and *Resection of cervix*. If a supracervical hysterectomy is performed, then only the code for *Resection of uterus* was reported.

The FY 2018 ICD-10-PCS update introduced a change in coding for hysterectomies. The coding change was influenced by the concept that the cervix technically is part of the uterus. The seventh character qualifier *supracervical* was added to the Female Reproductive System Resection table (0UT). Therefore, if a supracervical hysterectomy is performed, then a *Resection of the uterus* code with the seventh character for supracervical (L) is reported. If a total hysterectomy is performed, then a *Resection of the uterus* code with the seventh character for no qualifier (Z) is reported. It is no longer required or correct for the coder to report an additional code for the *Resection of the cervix*, and reference to this code has been removed in the ICD-10-PCS Index. It is expected that the AHA Coding Clinic™ will discuss this coding change in the fourth quarter, 2017 edition.

Because the CCS categories do not have conditional logic (i.e., each individual code is assigned to one CCS category), CCS 124 only includes the *Resection of uterus* codes. Resection of cervix codes are in CCS 125, *Other excision of cervix and uterus*. Therefore, for FY 2016 and FY 2017, total hysterectomy encounters should have both CCS 124 and CCS 125 identified on the inpatient stay record. This will change for FY 2018 CCS, when total hysterectomies will be included only under CCS 124. This change likely will result in notable shifts in volumes for both CCS 124 and CCS 125 for that data year.

CCS Categories That Are No Longer Populated Under ICD-10-PCS

Some CCS categories no longer contain any codes under ICD-10-PCS. Table 13 uses the 2015 SID to present select examples of instances in which CCS procedure categories have no inpatient stays in the fourth quarter of 2015 using ICD-10-PCS.

Table 13. CCS Procedure Categories With No Cases in Quarter 4 2015 With ICD-10-PCS

CCS Procedure Category	Explanation for Why the CCS Is Not Populated in ICD-10-PCS
57: Creation; revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis	• The CCS category as originally defined under ICD-9-CM includes diagnostic information that was contained in some ICD-9-CM procedure codes. • ICD-10-PCS does not include any diagnostic information. Fistulas and cannulas are coded in ICD-10-PCSn but not specifically for dialysis.
68: Injection or ligation of esophageal varices	• The CCS category as originally defined under ICD-9-CM includes diagnostic information that was contained in some ICD-9-CM procedure codes. • ICD-10-PCS does not include any diagnostic

[9] AHA Coding Clinic support statements for the coding of hysterectomy were published in AHA Coding Clinic, 3Q 2013, p. 28, and 1Q 2015, pp. 33–34. Chicago, IL: American Hospital Association.

	information. Injections and ligations are coded in ICD-10-PCS, but not specifically for esophageal varices.
140: Repair of current obstetric laceration	• The CCS category as originally defined under ICD-9-CM includes diagnostic information that was contained in some ICD-9-CM procedure codes. • ICD-10-PCS does not include any diagnostic information. Lacerations are coded in ICD-10-PCS but not specifically for pregnancy/delivery.
143: Bunionectomy or repair of toe deformities	• The CCS category as originally defined under ICD-9-CM includes diagnostic information that was contained in some ICD-9-CM procedure codes. • ICD-10-PCS does not include any diagnostic information. Repairs are coded in ICD-10-PCS but not specifically for bunions or toe deformities.
151: Excision of semilunar cartilage of knee	• Cartilage is not a specified body part in ICD-10-PCS; rather, cartilage is considered a component of the knee joint. • Excision of knee joint codes could represent partial removal of body parts other than cartilage and are not specific to this procedure.
169: Debridement of wound; infection or burn	• The CCS category as originally defined under ICD-9-CM includes diagnostic information that was contained in some ICD-9-CM procedure codes. • ICD-10-PCS does not include any diagnostic information. Debridements are coded in ICD-10-PCS but not specifically for wounds, infections, or burns.
206: Microscopic examination (bacterial smear; culture; toxicology)	• Microscopic examination codes are not included in the ICD-10-PCS code set. • Microscopic examination services should be reported via the chargemaster with revenue codes and associated charges for inpatient reimbursement submission. For data collection, Current Procedural Terminology codes often are used in the chargemaster for these services.

Abbreviations: CCS, Clinical Classifications Software; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System.

Source: Gibson T, Casto A, Young J, et al. Impact of ICD-10-CM/PCS on Research Using Administrative Databases. HCUP Methods Series Report #2016-02. Rockville, MD: Agency for Healthcare Research and Quality; 2016. http://www.hcup-us.ahrq.gov/reports/methods/methods.jsp

CONCLUSION

Researchers often rely on the grouping of individual ICD-9-CM procedure codes into broad, meaningful categories to examine trends in procedures across time. The grouping of codes is expected to be even more critical to the ability to track longitudinal trends following the transition from ICD-9-CM to the ICD-10-PCS coding system. The Clinical Classifications Software (CCS) for ICD-10-PCS is one tool designed to capture categories of hospital procedures that are similar to the CCS categories used for ICD-9-CM. However, except for a relatively small group

of procedures, using the CCS for procedures will not enable trending over the ICD-9-CM to ICD-10-PCS transition period.

Many CCS categories exhibit stark differences in trends following the transition to ICD-10-PCS coding. Of the 231 CCS procedure categories, only 40 changed by less than 5 percent across the ICD-9-CM to ICD-10-PCS coding transition period. The use of CCS categories as a categorization tool in this document is illustrative, and similar problems with other approaches to procedure grouping should be expected and examined.

ICD-10-PCS is undergoing continuous revisions, modifications, and improvements. However, compared with the guidelines available for ICD-10-CM diagnosis coding, ICD-10-PCS has significantly fewer coding rules currently available to assist coders in accurately assigning procedure codes. Therefore, researchers should be aware of the potential for temporal variation in how a specific procedure is coded in practice.

This preliminary look at existing ICD-10-PCS-coded HCUP data indicates that a new categorization approach may be necessary. Development of a new categorization scheme designed specifically for ICD-10-PCS coding may be required to enable researchers to group clinically meaningful procedures for analysis. Initial development of such a coding system should focus on a select group surgical procedures (e.g., hysterectomy, laminectomy, coronary artery bypass graft, and colorectal resection) that have high volumes and high aggregate costs. Ideally, researchers, clinicians, and coders will work together to develop clinically meaningful groupings of ICD-10-PCS codes that reflect clinical, procedural, and surgical terminology. As such groupings are defined, it would be helpful to create an online catalog of code groupings to be used for reporting, research, and other secondary applications.

APPENDIX A: ICD-10-PCS ROOT OPERATION DEFINITIONS

Root Operation	Definition
(0) Alteration	Modifying the anatomic structure of a body part without affecting the function of the body part
(1) Bypass	Altering the route of passage of the contents of a tubular body part
(2) Change	Taking out or off a device from a body part and putting back an identical or similar device in or on the same body part without cutting or puncturing the skin or a mucous membrane
(3) Control	Stopping, or attempting to stop, postprocedural bleeding
(4) Creation	Making a new genital structure that does not take over the function of a body part
(5) Destruction	Physical eradication of all or a portion of a body part by the direct use of energy, force, or a destructive agent
(6) Detachment	Cutting off all or a portion of the upper or lower extremities
(7) Dilation	Expanding an orifice or the lumen of a tubular body part
(8) Division	Cutting into a body part, without draining fluids and/or gases from the body part, in order to separate or transect a body part
(9) Drainage	Taking or letting out fluids and/or gases from a body part
(B) Excision	Cutting out or off, without replacement, a portion of a body part
(C) Extirpation	Taking or cutting out solid matter from a body part
(D) Extraction	Pulling or stripping out or off all or a portion of a body part by the use of force
(F) Fragmentation	Breaking solid matter in a body part into pieces
(G) Fusion	Joining together portions of an articular body part rendering the articular body part immobile
(H) Insertion	Putting in a nonbiological appliance that monitors, assists, performs, or prevents a physiological function but does not physically take the place of a body part
(J) Inspection	Visually and/or manually exploring a body part
(K) Map	Locating the route of passage of electrical impulses and/or locating functional areas in a body part
(L) Occlusion	Completely closing an orifice or the lumen of a tubular body part
(M) Reattachment	Putting back in or on all or a portion of a separated body part to its normal location or other suitable location
(N) Release	Freeing a body part from an abnormal physical constraint by cutting or by the use of force
(P) Removal	Taking out or off a device from a body part
(Q) Repair	Restoring, to the extent possible, a body part to its normal anatomic structure and function
(R) Replacement	Putting in or on biological or synthetic material that physically takes the place and/or function of all or a portion of a body part
(S) Reposition	Moving to its normal location, or other suitable location, all or a portion of a body part
(T) Resection	Cutting out or off, without replacement, all of a body part
(U) Supplement	Putting in or on biological or synthetic material that physically reinforces and/or augments the function of a portion of a body part

(V) Restriction	Partially closing an orifice or the lumen of a tubular body part
(W) Revision	Correcting, to the extent possible, a portion of a malfunctioning device or the position of a displaced device
(X) Transfer	Moving, without taking out, all or a portion of a body part to another location to take over the function of all or a portion of a body part
(Y) Transplantation	Putting in or on all or a portion of a living body part taken from another individual or animal to physically take the place and/or function of all or a portion of a similar body part
(Z) placeholder	Used if another meaningful character is not used

Abbreviation: ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification.

Source: Casto AB (ed). ICD-10-PCS Code Book, 2016. Chicago, IL: American Health Information Management Association; 2016.

APPENDIX B: HEALTHCARE COST AND UTILIZATION PROJECT PARTNER ORGANIZATIONS

Alaska Department of Health and Social Services
Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi State Department of Health
Missouri Hospital Industry Data Institute
Montana Hospital Association
Nebraska Hospital Association
Nevada Department of Health and Human Services
New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information

Washington State Department of Health
West Virginia Department of Health and Human Resources, West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

APPENDIX C: CHANGES IN CCS PROCEDURE CATEGORIES FROM ICD-9-CM TO ICD-10-PCS, SORTED BY CCS NUMBER (BODY SYSTEM)

Shaded rows indicate those Clinical Classifications Software (CCS) procedure categories that changed by less than 5 percent with the introduction of the International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS).

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
1: Incision and excision of CNS	15,136	15,956	15,402	5.4	–3.5
2: Insertion; replacement; or removal of extracranial ventricular shunt	4,265	4,115	4,328	–3.5	5.2
3: Laminectomy; excision intervertebral disc [ICD-9-CM label] 3: Excision, destruction or resection of intervertebral disc [ICD-10-PCS label]	55,169	55,262	37,013	0.2	–33.0
4: Diagnostic spinal tap	37,156	37,957	33,015	2.2	–13.0
5: Insertion of catheter or spinal stimulator and injection into spinal canal	34,551	32,872	28,107	–4.9	–14.5
6: Decompression peripheral nerve	2,024	2,050	14,148	1.3	590.1
7: Other diagnostic nervous system procedures	1,947	2,076	5,632	6.6	171.3
8: Other non-OR or closed therapeutic nervous system procedures	27,779	26,788	26,912	–3.6	0.5
9: Other OR therapeutic nervous system procedures	24,199	24,372	25,418	0.7	4.3
10: Thyroidectomy; partial or complete	4,056	3,231	2,845	–20.3	–11.9
11: Diagnostic endocrine procedures	957	915	1,218	–4.4	33.1
12: Other therapeutic endocrine procedures	4,624	4,700	3,659	1.6	–22.1
13: Corneal transplant	32	37	41	15.6	10.8
14: Glaucoma procedures [ICD-9-CM label] 14: Procedures typically performed for glaucoma [ICD-10-PCS label]	66	88	138	33.3	56.8
15: Lens and cataract procedures	120	146	103	21.7	–29.5
16: Repair of retinal tear; detachment [ICD-9-CM label] 16: Repair of retina [ICD-10-PCS label]	110	112	126	1.8	12.5
17: Destruction of lesion of retina and choroid	307	237	98	–22.8	–58.6
18: Diagnostic procedures on eye	242	223	419	–7.9	87.9
19: Other therapeutic procedures on eyelids; conjunctiva; cornea	3,583	3,635	2,188	1.5	–39.8
20: Other intraocular therapeutic procedures	554	532	367	–4.0	–31.0
21: Other extraocular muscle and orbit therapeutic procedures	754	785	316	4.1	–59.7
22: Tympanoplasty	122	84	60	–31.1	–28.6
23: Myringotomy	910	955	900	4.9	–5.8
24: Mastoidectomy	308	280	133	–9.1	–52.5

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
25: Diagnostic procedures on ear [ICD-9-CM label] 25: Diagnostic procedures on ear, nose and sinus [ICD-10-PCS label]	197	169	1,280	–14.2	657.4
26: Other therapeutic ear procedures [ICD-9-CM label] 26: Other therapeutic procedures on the ear, nose and sinus [ICD-10-PCS label]	1,939	1,932	5,604	–0.4	190.1
27: Control of epistaxis [ICD-9-CM label] 27: Placement of packing material in the nasal region [ICD-10-PCS label]	3,061	3,065	1,998	0.1	–34.8
28: Plastic procedures on nose	1,974	1,947	230	–1.4	–88.2
29: Dental procedures	3,717	3,962	3,718	6.6	–6.2
30: Tonsillectomy and/or adenoidectomy	2,006	1,953	1,530	–2.6	–21.7
31: Diagnostic procedures on nose; mouth and pharynx [ICD-9-CM label] 31: Diagnostic procedures on mouth and throat [ICD-10-PCS label]	3,490	3,681	9,939	5.5	170.0
32: Other non-OR therapeutic procedures on nose; mouth and pharynx [ICD-9-CM label] 32: Other non-OR therapeutic procedures on mouth and throat [ICD-10-PCS label]	6,881	7,649	6,212	11.2	–18.8
33: Other OR therapeutic procedures on nose; mouth and pharynx [ICD-9-CM label] 33: Other OR therapeutic procedures on mouth and throat [ICD-10-PCS label]	9,386	9,599	8,422	2.3	–12.3
34: Tracheostomy; temporary and permanent	12,418	12,212	12,378	–1.7	1.4
35: Tracheoscopy and laryngoscopy with biopsy	8,910	9,517	2,105	6.8	–77.9
36: Lobectomy or pneumonectomy	10,063	10,159	8,212	1.0	–19.2
37: Diagnostic bronchoscopy and biopsy of bronchus	49,248	48,952	44,350	–0.6	–9.4
38: Other diagnostic procedures on lung and bronchus	1,395	1,191	1,312	–14.6	10.2
39: Incision of pleura; thoracentesis; chest drainage	59,217	61,029	60,164	3.1	–1.4
40: Other diagnostic procedures of respiratory tract and mediastinum [ICD-9-CM label] 40: Other diagnostic procedures on the respiratory system and mediastinum [ICD-10-PCS label]	6,705	6,610	9,028	–1.4	36.6
41: Other non-OR therapeutic procedures on respiratory system [ICD-9-CM label] 41: Other non-OR therapeutic procedures on the respiratory system and mediastinum [ICD-10-PCS label]	13,311	13,328	30,575	0.1	129.4
42: Other OR Rx procedures on respiratory system and mediastinum	12,465	12,508	20,677	0.3	65.3
43: Heart valve procedures	16,995	18,766	20,394	10.4	8.7
44: Coronary artery bypass graft (CABG)	24,430	24,506	23,844	0.3	–2.7

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
45: Percutaneous transluminal coronary angioplasty (PTCA) [ICD-9-CM label] 45: Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement [ICD-10-PCS label]	57,293	56,706	57,066	–1.0	0.6
46: Coronary thrombolysis	506	543	1,373	7.3	152.9
47: Diagnostic cardiac catheterization; coronary arteriography	131,241	130,945	136,754	–0.2	4.4
48: Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator	30,027	30,654	26,179	2.1	–14.6
49: Other OR heart procedures	24,309	24,679	34,134	1.5	38.3
50: Extracorporeal circulation auxiliary to open heart procedures	35,773	36,687	37,163	2.6	1.3
51: Endarterectomy; vessel of head and neck	10,291	10,012	11,737	–2.7	17.2
52: Aortic resection; replacement or anastomosis	6,381	6,479	833	1.5	–87.1
53: Varicose vein stripping; lower limb	65	49	38	–24.6	–22.4
54: Other vascular catheterization; not heart	259,171	259,026	247,828	–0.1	–4.3
55: Peripheral vascular bypass	6,944	7,053	10,897	1.6	54.5
56: Other vascular bypass and shunt; not heart	1,921	2,087	1,481	8.6	–29.0
57: Creation; revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis	5,037	4,599	0	–8.7	NA
58: Hemodialysis	96,558	99,827	96,487	3.4	–3.3
59: Other OR procedures on vessels of head and neck	6,673	7,053	10,647	5.7	51.0
60: Embolectomy and endarterectomy of lower limbs	5,711	5,922	9,764	3.7	64.9
61: Other OR procedures on vessels other than head and neck	122,308	121,929	83,964	–0.3	–31.1
62: Other diagnostic cardiovascular procedures	9,661	8,990	14,682	–6.9	63.3
63: Other non-OR therapeutic cardiovascular procedures	85,032	85,210	22,768	0.2	–73.3
64: Bone marrow transplant	2,223	2,422	2,442	9.0	0.8
65: Bone marrow biopsy	11,129	11,347	10,784	2.0	–5.0
66: Procedures on spleen	3,053	3,030	3,043	–0.8	0.4
67: Other therapeutic procedures; hemic and lymphatic system [ICD-9-CM label] 67: Other procedures; hemic and lymphatic systems [ICD-10-PCS label]	35,748	35,833	37,424	0.2	4.4
68: Injection or ligation of esophageal varices	19	17	0	–10.5	NA
69: Esophageal dilatation	4,235	4,186	4,347	–1.2	3.8
70: Upper gastrointestinal endoscopy; biopsy	133,748	134,871	123,262	0.8	–8.6
71: Gastrostomy; temporary and permanent	24,731	24,888	23,572	0.6	–5.3
72: Colostomy; temporary and permanent	6,316	6,376	8,219	0.9	28.9
73: Ileostomy and other enterostomy	7,625	7,494	9,485	–1.7	26.6

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
74: Gastrectomy; partial and total	12,742	14,917	17,897	17.1	20.0
75: Small bowel resection	11,672	11,841	2,880	1.4	–75.7
76: Colonoscopy and biopsy	53,602	53,437	25,468	–0.3	–52.3
77: Proctoscopy and anorectal biopsy	8,635	8,846	7,855	2.4	–11.2
78: Colorectal resection	38,127	37,851	25,280	–0.7	–33.2
79: Local excision of large intestine lesion (not endoscopic) [ICD-9-CM label] 79: Excision (partial) of large intestine (not endoscopic) [ICD-10-PCS label]	392	400	9,238	2.0	2,209.5
80: Appendectomy	32,468	30,453	28,365	–6.2	–6.9
81: Hemorrhoid procedures	953	1,056	535	10.8	–49.3
82: Fluoroscopy of the biliary and pancreatic ducts (ERCP, ERC and ERP)	3,733	3,773	11,293	1.1	199.3
83: Biopsy of liver	8,713	8,848	10,789	1.5	21.9
84: Cholecystectomy and common duct exploration	50,176	48,563	46,959	–3.2	–3.3
85: Inguinal and femoral hernia repair	4,975	4,971	4,820	–0.1	–3.0
86: Other hernia repair	29,488	29,482	13,142	0.0	–55.4
87: Laparoscopy (GI only)	7,179	6,983	9,361	–2.7	34.1
88: Abdominal paracentesis	37,139	38,691	34,093	4.2	–11.9
89: Exploratory laparotomy	3,199	3,568	1,876	11.5	–47.4
90: Excision; lysis peritoneal adhesions	39,838	39,024	30,339	–2.0	–22.3
91: Peritoneal dialysis	4,443	4,697	4,815	5.7	2.5
92: Other bowel diagnostic procedures	2,105	2,022	42,415	–3.9	1,997.7
93: Other non-OR upper GI therapeutic procedures	26,535	26,832	16,286	1.1	–39.3
94: Other OR upper GI therapeutic procedures	19,123	19,232	40,477	0.6	110.5
95: Other non-OR lower GI therapeutic procedures	23,253	23,547	15,130	1.3	–35.7
96: Other OR lower GI therapeutic procedures	33,235	33,409	41,962	0.5	25.6
97: Other gastrointestinal diagnostic procedures	11,774	11,800	26,718	0.2	126.4
98: Other non-OR gastrointestinal therapeutic procedures	29,150	29,589	30,375	1.5	2.7
99: Other OR gastrointestinal therapeutic procedures	28,429	27,836	48,864	–2.1	75.5
100: Endoscopy and endoscopic biopsy of the urinary tract	20,468	19,386	12,943	–5.3	–33.2
101: Transurethral excision; drainage; or removal urinary obstruction	12,803	12,863	11,430	0.5	–11.1
102: Ureteral catheterization	26,524	27,230	25,536	2.7	–6.2
103: Nephrotomy and nephrostomy	6,459	6,756	2,057	4.6	–69.6
104: Nephrectomy; partial or complete	8,315	8,558	8,604	2.9	0.5
105: Kidney transplant	2,263	2,172	2,197	–4.0	1.2
106: Genitourinary incontinence procedures	4,124	2,928	306	–29.0	–89.5
107: Extracorporeal lithotripsy; urinary	1,443	1,433	1,690	–0.7	17.9

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
108: Indwelling catheter	22,951	23,676	18,568	3.2	–21.6
109: Procedures on the urethra	3,780	3,728	5,846	–1.4	56.8
110: Other diagnostic procedures of urinary tract	4,747	4,805	5,565	1.2	15.8
111: Other non-OR therapeutic procedures of urinary tract	21,440	22,011	10,890	2.7	–50.5
112: Other OR therapeutic procedures of urinary tract	10,956	10,710	19,229	–2.2	79.5
113: Transurethral resection of prostate (TURP)	4,148	3,652	3,539	–12.0	–3.1
114: Open prostatectomy	7,602	7,907	9,205	4.0	16.4
115: Circumcision	111,225	112,678	109,061	1.3	–3.2
116: Diagnostic procedures; male genital	451	417	862	–7.5	106.7
117: Other non-OR therapeutic procedures; male genital	1,832	1,836	2,525	0.2	37.5
118: Other OR therapeutic procedures; male genital	2,814	2,804	5,072	–0.4	80.9
119: Oophorectomy; unilateral and bilateral	23,871	22,866	20,092	–4.2	–12.1
120: Other operations on ovary	4,824	4,755	4,851	–1.4	2.0
121: Ligation or occlusion of fallopian tubes	29,415	28,851	19,531	–1.9	–32.3
122: Removal of ectopic pregnancy	1,180	1,191	1,179	0.9	–1.0
123: Other operations on fallopian tubes	6,528	9,181	38,388	40.6	318.1
124: Hysterectomy; abdominal and vaginal	32,315	30,206	27,840	–6.5	–7.8
125: Other excision of cervix and uterus	4,425	4,605	24,983	4.1	442.5
126: Abortion (termination of pregnancy)	190	151	663	–20.5	339.1
127: Dilatation and curettage (D&C); aspiration after delivery or abortion [ICD-9-CM label] 127: Dilatation and curettage (D&C) [ICD-10-PCS label]	3,864	3,883	6,556	0.5	68.8
128: Diagnostic dilatation and curettage (D&C)	1,789	1,673	1,000	–6.5	–40.2
129: Repair of cystocele and rectocele; obliteration of vaginal vault	5,442	3,821	144	–29.8	–96.2
130: Other diagnostic procedures; female organs	2,282	2,243	5,541	–1.7	147.0
131: Other non-OR therapeutic procedures; female organs	2,591	2,685	93,249	3.6	3,373.0
132: Other OR therapeutic procedures; female organs	10,764	9,267	47,547	–13.9	413.1
133: Episiotomy	27,260	24,775	26,158	–9.1	5.6
134: Cesarean section	151,050	150,935	148,040	–0.1	–1.9
135: Forceps; vacuum; and breech delivery	28,432	27,607	19,318	–2.9	–30.0
136: Artificial rupture of membranes to assist delivery	112,570	110,602	114,707	–1.7	3.7
137: Other procedures to assist delivery	267,785	272,705	281,373	1.8	3.2
138: Diagnostic amniocentesis	488	386	426	–20.9	10.4

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
139: Fetal monitoring [ICD-9-CM label] 139: Fetal measurement and monitoring [ICD-10-PCS label]	88,295	92,251	75,173	4.5	–18.5
140: Repair of current obstetric laceration	168,717	174,255	0	3.3	NA
141: Other therapeutic obstetrical procedures	11,879	12,393	14,587	4.3	17.7
142: Partial excision bone	42,551	44,819	28,120	5.3	–37.3
143: Bunionectomy or repair of toe deformities	411	438	0	6.6	NA
144: Treatment; facial fracture or dislocation	3,356	3,339	4,765	–0.5	42.7
145: Treatment; fracture or dislocation of radius and ulna	8,003	7,807	7,809	–2.4	0.0
146: Treatment; fracture or dislocation of hip and femur	38,522	39,047	38,977	1.4	–0.2
147: Treatment; fracture or dislocation of lower extremity (other than hip or femur)	24,428	24,040	23,737	–1.6	–1.3
148: Other fracture and dislocation procedure	21,602	21,455	21,300	–0.7	–0.7
149: Arthroscopy	1,280	1,264	326	–1.3	–74.2
150: Division of joint capsule; ligament or cartilage [ICD-9-CM label] 150: Division or release of joint capsule; ligament or cartilage [ICD-10-PCS label]	1,868	1,884	1,710	0.9	–9.2
151: Excision of semilunar cartilage of knee	964	880	0	–8.7	NA
152: Arthroplasty knee	101,711	101,575	104,815	–0.1	3.2
153: Hip replacement; total and partial	67,295	70,760	73,138	5.1	3.4
154: Arthroplasty other than hip or knee	14,093	14,837	15,938	5.3	7.4
155: Arthrocentesis	9,343	9,668	6,036	3.5	–37.6
156: Injections and aspirations of muscles; tendons; bursa; joints and soft tissue	1,812	2,014	11,783	11.1	485.1
157: Amputation of lower extremity	15,650	16,439	17,881	5.0	8.8
158: Spinal fusion	55,486	57,310	58,335	3.3	1.8
159: Other diagnostic procedures on musculoskeletal system	8,272	8,958	19,096	8.3	113.2
160: Other therapeutic procedures on muscles and tendons	36,694	37,676	104,382	2.7	177.1
161: Other OR therapeutic procedures on bone	17,094	17,458	23,549	2.1	34.9
162: Other OR therapeutic procedures on joints	18,933	18,846	37,065	–0.5	96.7
163: Other non-OR therapeutic procedures on musculoskeletal system	19,778	19,680	13,944	–0.5	–29.1
164: Other OR therapeutic procedures on musculoskeletal system	5,355	5,586	7,572	4.3	35.6
165: Breast biopsy and other diagnostic procedures on breast	946	895	1,336	–5.4	49.3
166: Lumpectomy; quadrantectomy of breast	1,047	919	1,325	–12.2	44.2
167: Mastectomy	5,601	4,493	3,712	–19.8	–17.4

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
168: Incision and drainage; skin and subcutaneous tissue [ICD-9-CM label] 168: Incision and drainage; skin, subcutaneous tissue and fascia [ICD-10-PCS label]	28,789	28,552	26,410	–0.8	–7.5
169: Debridement of wound; infection or burn	34,278	35,770	0	4.4	NA
170: Excision of skin lesion [ICD-9-CM label] 170: Excision of skin [ICD-10-PCS label]	7,116	6,935	14,859	–2.5	114.3
171: Suture of skin and subcutaneous tissue [ICD-9-CM label] 171: Repair of skin, subcutaneous tissue and fascia [ICD-10-PCS label]	20,941	21,501	29,810	2.7	38.6
172: Skin graft	12,211	12,725	9,430	4.2	–25.9
173: Other diagnostic procedures on skin and subcutaneous tissue [ICD-9-CM label] 173: Other diagnostic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	4,797	4,772	9,859	–0.5	106.6
174: Other non-OR therapeutic procedures on skin and breast [ICD-9-CM label] 174: Other non-OR therapeutic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	28,023	27,850	30,766	–0.6	10.5
175: Other OR therapeutic procedures on skin and breast [ICD-9-CM label] 175: Other OR therapeutic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	11,145	10,228	45,105	–8.2	341.0
176: Organ transplantation (other than bone marrow, corneal or kidney)	1,404	1,572	1,502	12.0	–4.5
177: Computerized axial tomography (CT) scan head [ICD-9-CM label] 177: CT of head and neck [ICD-10-PCS label]	16,371	13,910	7,166	–15.0	–48.5
178: CT scan chest	15,546	14,965	4,705	–3.7	–68.6
179: CT scan abdomen	18,272	16,660	9,737	–8.8	–41.6
180: Other CT scan	7,668	7,163	6,065	–6.6	–15.3
181: Myelogram	621	636	1,474	2.4	131.8
182: Mammography	73	65	38	–11.0	–41.5
183: Routine chest X-ray	835	712	2,572	–14.7	261.2
184: Intraoperative cholangiogram	14,779	13,827	1,724	–6.4	–87.5
185: Upper gastrointestinal X-ray	1,120	1,149	1,693	2.6	47.3
186: Lower gastrointestinal X-ray	71	104	113	46.5	8.7
187: Intravenous pyelogram	598	613	9,594	2.5	1,465.1
188: Cerebral arteriogram [ICD-9-CM label] 188: Cerebral and neck arteriogram [ICD-10-PCS label]	12,213	12,272	9,200	0.5	–25.0
189: Contrast aortogram	19,882	20,543	17,967	3.3	–12.5
190: Contrast arteriogram of femoral and lower	19,867	20,115	15,364	1.2	–23.6

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
extremity arteries					
191: Arterio– or venogram (not heart and head) [ICD-9-CM label] 191: Arterio– or venogram (not heart and head/neck) [ICD-10-PCS label]	28,452	28,195	30,831	–0.9	9.3
192: Diagnostic ultrasound of head and neck	3,892	3,402	27,901	–12.6	720.1
193: Diagnostic ultrasound of heart (echocardiogram)	96,545	96,333	76,943	–0.2	–20.1
194: Diagnostic ultrasound of gastrointestinal tract	3,579	3,764	2,537	5.2	–32.6
195: Diagnostic ultrasound of urinary tract	2,119	2,226	1,849	5.0	–16.9
196: Diagnostic ultrasound of abdomen or retroperitoneum	5,184	4,921	3,321	–5.1	–32.5
197: Other diagnostic ultrasound	12,963	12,907	66,498	–0.4	415.2
198: Magnetic resonance imaging	21,353	18,981	12,138	–11.1	–36.1
199: Electroencephalogram (EEG)	7,744	8,574	22,868	10.7	166.7
200: Nonoperative urinary system measurements [ICD-9-CM label] 200: Nonoperative urinary system measurement and monitoring [ICD-10-PCS label]	746	1,044	655	39.9	–37.3
201: Cardiac stress tests	6,661	6,180	4,483	–7.2	–27.5
202: Electrocardiogram	3,826	3,764	11,660	–1.6	209.8
203: Electrographic cardiac monitoring	7,550	8,191	6,694	8.5	–18.3
204: Swan–Ganz catheterization for monitoring	5,308	5,470	16,427	3.1	200.3
205: Arterial blood gases	5,036	5,185	4,416	3.0	–14.8
206: Microscopic examination (bacterial smear; culture; toxicology)	919	554	0	–39.7	NA
207: Nuclear medicine imaging of bone	474	373	173	–21.3	–53.6
208: Nuclear medicine imaging of pulmonary	1,437	1,159	650	–19.3	–43.9
209: Non–imaging nuclear medicine probe or assay	5,409	4,368	64	–19.2	–98.5
210: Other nuclear medicine imaging	969	800	3,222	–17.4	302.8
211: Radiation therapy	6,575	6,236	4,135	–5.2	–33.7
212: Diagnostic physical therapy	4,507	3,596	3,225	–20.2	–10.3
213: Physical therapy exercises; manipulation; and other procedures	27,515	28,005	13,986	1.8	–50.1
214: Traction; splints; and other wound care	15,416	15,570	13,520	1.0	–13.2
215: Other physical therapy and rehabilitation	27,494	26,833	11,005	–2.4	–59.0
216: Respiratory intubation and mechanical ventilation	204,313	215,448	203,809	5.4	–5.4
217: Other respiratory therapy	14,669	14,843	4,172	1.2	–71.9
218: Psychological and psychiatric evaluation and therapy	21,269	19,847	20,811	–6.7	4.9
219: Alcohol and drug rehabilitation/detoxification	40,450	41,883	43,067	3.5	2.8
220: Ophthalmologic and otologic diagnosis and treatment	36,145	43,477	42,018	20.3	–3.4

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
221: Nasogastric tube	15,147	15,165	9,347	0.1	–38.4
222: Blood transfusion	286,847	266,165	201,995	–7.2	–24.1
223: Enteral and parenteral nutrition	62,242	62,006	48,715	–0.4	–21.4
224: Cancer chemotherapy	29,496	30,033	26,664	1.8	–11.2
225: Conversion of cardiac rhythm	32,981	34,628	33,797	5.0	–2.4
226: Other diagnostic radiology and related techniques	37,538	39,093	44,598	4.1	14.1
227: Other diagnostic procedures	39,378	40,868	31,283	3.8	–23.5
228: Prophylactic vaccinations and inoculations	227,737	232,329	253,225	2.0	9.0
229: Nonoperative removal of foreign body	3,393	3,361	7,294	–0.9	117.0
230: Extracorporeal shock wave other than urinary	≤10	15	0	NA	NA
231: Other therapeutic procedures	200,155	197,718	178,870	–1.2	–9.5

Abbreviations: CCS, Clinical Classifications Software; ERC, ERCP, ERP, endoscopic retrograde cholangio-pancreatography; GI, gastrointestinal; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NA, not applicable; Q, quarter.

[a] Shaded rows indicate CCS procedure categories that changed by less than 5 percent with the introduction of ICD-10-PCS.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.

APPENDIX D: CHANGES IN CCS PROCEDURE CATEGORIES FROM ICD-9-CM TO ICD-10-PCS, SORTED BY PERCENTAGE CHANGE FROM 2014 TO 2015

Shaded rows indicate those Clinical Classifications Software (CCS) procedure categories that changed by less than 5 percent with the introduction of the International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS).

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
131: Other non-OR therapeutic procedures; female organs	2,591	2,685	93,249	3.6	3,373.0
79: Local excision of large intestine lesion (not endoscopic) [ICD-9-CM label] 79: Excision (partial) of large intestine (not endoscopic) [ICD-10-PCS label]	392	400	9,238	2.0	2,209.5
92: Other bowel diagnostic procedures	2,105	2,022	42,415	–3.9	1,997.7
187: Intravenous pyelogram	598	613	9,594	2.5	1,465.1
192: Diagnostic ultrasound of head and neck	3,892	3,402	27,901	–12.6	720.1
25: Diagnostic procedures on ear [ICD-9-CM label] 25: Diagnostic procedures on ear, nose and sinus [ICD-10-PCS label]	197	169	1,280	–14.2	657.4
6: Decompression peripheral nerve	2,024	2,050	14,148	1.3	590.1
156: Injections and aspirations of muscles; tendons; bursa; joints and soft tissue	1,812	2,014	11,783	11.1	485.1
125: Other excision of cervix and uterus	4,425	4,605	24,983	4.1	442.5
197: Other diagnostic ultrasound	12,963	12,907	66,498	–0.4	415.2
132: Other OR therapeutic procedures; female organs	10,764	9,267	47,547	–13.9	413.1
175: Other OR therapeutic procedures on skin and breast [ICD-9-CM label] 175: Other OR therapeutic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	11,145	10,228	45,105	–8.2	341.0
126: Abortion (termination of pregnancy)	190	151	663	–20.5	339.1
123: Other operations on fallopian tubes	6,528	9,181	38,388	40.6	318.1
210: Other nuclear medicine imaging	969	800	3,222	–17.4	302.8
183: Routine chest X-ray	835	712	2,572	–14.7	261.2
202: Electrocardiogram	3,826	3,764	11,660	–1.6	209.8
204: Swan-Ganz catheterization for monitoring	5,308	5,470	16,427	3.1	200.3
82: Fluoroscopy of the biliary and pancreatic ducts (ERCP, ERC and ERP)	3,733	3,773	11,293	1.1	199.3
26: Other therapeutic ear procedures [ICD-9-CM label] 26: Other therapeutic procedures on the ear, nose and sinus [ICD-10-PCS label]	1,939	1,932	5,604	–0.4	190.1
160: Other therapeutic procedures on muscles and tendons	36,694	37,676	104,382	2.7	177.1

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
7: Other diagnostic nervous system procedures	1,947	2,076	5,632	6.6	171.3
31: Diagnostic procedures on nose; mouth and pharynx [ICD-9-CM label] 31: Diagnostic procedures on mouth and throat [ICD-10-PCS label]	3,490	3,681	9,939	5.5	170.0
199: Electroencephalogram (EEG)	7,744	8,574	22,868	10.7	166.7
46: Coronary thrombolysis	506	543	1,373	7.3	152.9
130: Other diagnostic procedures; female organs	2,282	2,243	5,541	–1.7	147.0
181: Myelogram	621	636	1,474	2.4	131.8
41: Other non-OR therapeutic procedures on respiratory system [ICD-9-CM label] 41: Other non-OR therapeutic procedures on the respiratory system and mediastinum [ICD-10-PCS label]	13,311	13,328	30,575	0.1	129.4
97: Other gastrointestinal diagnostic procedures	11,774	11,800	26,718	0.2	126.4
229: Nonoperative removal of foreign body	3,393	3,361	7,294	–0.9	117.0
170: Excision of skin lesion [ICD-9-CM label] 170: Excision of skin [ICD-10-PCS label]	7,116	6,935	14,859	–2.5	114.3
159: Other diagnostic procedures on musculoskeletal system	8,272	8,958	19,096	8.3	113.2
94: Other OR upper GI therapeutic procedures	19,123	19,232	40,477	0.6	110.5
116: Diagnostic procedures; male genital	451	417	862	–7.5	106.7
173: Other diagnostic procedures on skin and subcutaneous tissue [ICD-9-CM label] 173: Other diagnostic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	4,797	4,772	9,859	–0.5	106.6
162: Other OR therapeutic procedures on joints	18,933	18,846	37,065	–0.5	96.7
18: Diagnostic procedures on eye	242	223	419	–7.9	87.9
118: Other OR therapeutic procedures; male genital	2,814	2,804	5,072	–0.4	80.9
112: Other OR therapeutic procedures of urinary tract	10,956	10,710	19,229	–2.2	79.5
99: Other OR gastrointestinal therapeutic procedures	28,429	27,836	48,864	–2.1	75.5
127: Dilatation and curettage (D&C); aspiration after delivery or abortion [ICD-9-CM label] 127: Dilatation and curettage (D&C) [ICD-10-PCS label]	3,864	3,883	6,556	0.5	68.8
42: Other OR Rx procedures on respiratory system and mediastinum	12,465	12,508	20,677	0.3	65.3
60: Embolectomy and endarterectomy of lower limbs	5,711	5,922	9,764	3.7	64.9
62: Other diagnostic cardiovascular procedures	9,661	8,990	14,682	–6.9	63.3

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
14: Glaucoma procedures [ICD-9-CM label] 14: Procedures typically performed for glaucoma [ICD-10-PCS label]	66	88	138	33.3	56.8
109: Procedures on the urethra	3,780	3,728	5,846	–1.4	56.8
55: Peripheral vascular bypass	6,944	7,053	10,897	1.6	54.5
59: Other OR procedures on vessels of head and neck	6,673	7,053	10,647	5.7	51.0
165: Breast biopsy and other diagnostic procedures on breast	946	895	1,336	–5.4	49.3
185: Upper gastrointestinal X-ray	1,120	1,149	1,693	2.6	47.3
166: Lumpectomy; quadrantectomy of breast	1,047	919	1,325	–12.2	44.2
144: Treatment; facial fracture or dislocation	3,356	3,339	4,765	–0.5	42.7
171: Suture of skin and subcutaneous tissue [ICD-9-CM label] 171: Repair of skin, subcutaneous tissue and fascia [ICD-10-PCS label]	20,941	21,501	29,810	2.7	38.6
49: Other OR heart procedures	24,309	24,679	34,134	1.5	38.3
117: Other non-OR therapeutic procedures; male genital	1,832	1,836	2,525	0.2	37.5
40: Other diagnostic procedures of respiratory tract and mediastinum [ICD-9-CM label] 40: Other diagnostic procedures on the respiratory system and mediastinum [ICD-10-PCS label]	6,705	6,610	9,028	–1.4	36.6
164: Other OR therapeutic procedures on musculoskeletal system	5,355	5,586	7,572	4.3	35.6
161: Other OR therapeutic procedures on bone	17,094	17,458	23,549	2.1	34.9
87: Laparoscopy (GI only)	7,179	6,983	9,361	–2.7	34.1
11: Diagnostic endocrine procedures	957	915	1,218	–4.4	33.1
72: Colostomy; temporary and permanent	6,316	6,376	8,219	0.9	28.9
73: Ileostomy and other enterostomy	7,625	7,494	9,485	–1.7	26.6
96: Other OR lower GI therapeutic procedures	33,235	33,409	41,962	0.5	25.6
83: Biopsy of liver	8,713	8,848	10,789	1.5	21.9
74: Gastrectomy; partial and total	12,742	14,917	17,897	17.1	20.0
107: Extracorporeal lithotripsy; urinary	1,443	1,433	1,690	–0.7	17.9
141: Other therapeutic obstetrical procedures	11,879	12,393	14,587	4.3	17.7
51: Endarterectomy; vessel of head and neck	10,291	10,012	11,737	–2.7	17.2
114: Open prostatectomy	7,602	7,907	9,205	4.0	16.4
110: Other diagnostic procedures of urinary tract	4,747	4,805	5,565	1.2	15.8
226: Other diagnostic radiology and related techniques	37,538	39,093	44,598	4.1	14.1
16: Repair of retinal tear; detachment [ICD-9-CM label] 16: Repair of retina [ICD-10-PCS label]	110	112	126	1.8	12.5
13: Corneal transplant	32	37	41	15.6	10.8

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
174: Other non-OR therapeutic procedures on skin and breast [ICD-9-CM label] 174: Other non-OR therapeutic procedures on skin, subcutaneous tissue, fascia and breast [ICD-10-PCS label]	28,023	27,850	30,766	–0.6	10.5
138: Diagnostic amniocentesis	488	386	426	–20.9	10.4
38: Other diagnostic procedures on lung and bronchus	1,395	1,191	1,312	–14.6	10.2
191: Arterio- or venogram (not heart and head) [ICD-9-CM label] 191: Arterio– or venogram (not heart and head/neck) [ICD-10-PCS label]	28,452	28,195	30,831	–0.9	9.3
228: Prophylactic vaccinations and inoculations	227,737	232,329	253,225	2.0	9.0
157: Amputation of lower extremity	15,650	16,439	17,881	5.0	8.8
43: Heart valve procedures	16,995	18,766	20,394	10.4	8.7
186: Lower gastrointestinal X-ray	71	104	113	46.5	8.7
154: Arthroplasty other than hip or knee	14,093	14,837	15,938	5.3	7.4
133: Episiotomy	27,260	24,775	26,158	–9.1	5.6
2: Insertion; replacement; or removal of extracranial ventricular shunt	4,265	4,115	4,328	–3.5	5.2
218: Psychological and psychiatric evaluation and therapy	21,269	19,847	20,811	–6.7	4.9
67: Other therapeutic procedures; hemic and lymphatic system [ICD-9-CM label] 67: Other procedures; hemic and lymphatic systems [ICD-10-PCS label]	35,748	35,833	37,424	0.2	4.4
47: Diagnostic cardiac catheterization; coronary arteriography	131,241	130,945	136,754	–0.2	4.4
9: Other OR therapeutic nervous system procedures	24,199	24,372	25,418	0.7	4.3
69: Esophageal dilatation	4,235	4,186	4,347	–1.2	3.8
136: Artificial rupture of membranes to assist delivery	112,570	110,602	114,707	–1.7	3.7
153: Hip replacement; total and partial	67,295	70,760	73,138	5.1	3.4
152: Arthroplasty knee	101,711	101,575	104,815	–0.1	3.2
137: Other procedures to assist delivery	267,785	272,705	281,373	1.8	3.2
219: Alcohol and drug rehabilitation/detoxification	40,450	41,883	43,067	3.5	2.8
98: Other non-OR gastrointestinal therapeutic procedures	29,150	29,589	30,375	1.5	2.7
91: Peritoneal dialysis	4,443	4,697	4,815	5.7	2.5
120: Other operations on ovary	4,824	4,755	4,851	–1.4	2.0
158: Spinal fusion	55,486	57,310	58,335	3.3	1.8
34: Tracheostomy; temporary and permanent	12,418	12,212	12,378	–1.7	1.4
50: Extracorporeal circulation auxiliary to open heart procedures	35,773	36,687	37,163	2.6	1.3
105: Kidney transplant	2,263	2,172	2,197	–4.0	1.2

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
64: Bone marrow transplant	2,223	2,422	2,442	9.0	0.8
45: Percutaneous transluminal coronary angioplasty (PTCA) [ICD-9-CM label] 45: Percutaneous transluminal coronary angioplasty (PTCA) with or without stent placement [ICD-10-PCS label]	57,293	56,706	57,066	–1.0	0.6
104: Nephrectomy; partial or complete	8,315	8,558	8,604	2.9	0.5
8: Other non-OR or closed therapeutic nervous system procedures	27,779	26,788	26,912	–3.6	0.5
66: Procedures on spleen	3,053	3,030	3,043	–0.8	0.4
145: Treatment; fracture or dislocation of radius and ulna	8,003	7,807	7,809	–2.4	0.0
146: Treatment; fracture or dislocation of hip and femur	38,522	39,047	38,977	1.4	–0.2
148: Other fracture and dislocation procedure	21,602	21,455	21,300	–0.7	–0.7
122: Removal of ectopic pregnancy	1,180	1,191	1,179	0.9	–1.0
147: Treatment; fracture or dislocation of lower extremity (other than hip or femur)	24,428	24,040	23,737	–1.6	–1.3
39: Incision of pleura; thoracentesis; chest drainage	59,217	61,029	60,164	3.1	–1.4
134: Cesarean section	151,050	150,935	148,040	–0.1	–1.9
225: Conversion of cardiac rhythm	32,981	34,628	33,797	5.0	–2.4
44: Coronary artery bypass graft (CABG)	24,430	24,506	23,844	0.3	–2.7
85: Inguinal and femoral hernia repair	4,975	4,971	4,820	–0.1	–3.0
113: Transurethral resection of prostate (TURP)	4,148	3,652	3,539	–12.0	–3.1
115: Circumcision	111,225	112,678	109,061	1.3	–3.2
84: Cholecystectomy and common duct exploration	50,176	48,563	46,959	–3.2	–3.3
58: Hemodialysis	96,558	99,827	96,487	3.4	–3.3
220: Ophthalmologic and otologic diagnosis and treatment	36,145	43,477	42,018	20.3	–3.4
1: Incision and excision of CNS	15,136	15,956	15,402	5.4	–3.5
54: Other vascular catheterization; not heart	259,171	259,026	247,828	–0.1	–4.3
176: Organ transplantation (other than bone marrow, corneal or kidney)	1,404	1,572	1,502	12.0	–4.5
65: Bone marrow biopsy	11,129	11,347	10,784	2.0	–5.0
71: Gastrostomy; temporary and permanent	24,731	24,888	23,572	0.6	–5.3
216: Respiratory intubation and mechanical ventilation	204,313	215,448	203,809	5.4	–5.4
23: Myringotomy	910	955	900	4.9	–5.8
29: Dental procedures	3,717	3,962	3,718	6.6	–6.2
102: Ureteral catheterization	26,524	27,230	25,536	2.7	–6.2
80: Appendectomy	32,468	30,453	28,365	–6.2	–6.9

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
168: Incision and drainage; skin and subcutaneous tissue [ICD-9-CM label] 168: Incision and drainage; skin, subcutaneous tissue and fascia [ICD-10-PCS label]	28,789	28,552	26,410	–0.8	–7.5
124: Hysterectomy; abdominal and vaginal	32,315	30,206	27,840	–6.5	–7.8
70: Upper gastrointestinal endoscopy; biopsy	133,748	134,871	123,262	0.8	–8.6
150: Division of joint capsule; ligament or cartilage [ICD-9-CM label] 150: Division or release of joint capsule; ligament or cartilage [ICD-10-PCS label]	1,868	1,884	1,710	0.9	–9.2
37: Diagnostic bronchoscopy and biopsy of bronchus	49,248	48,952	44,350	–0.6	–9.4
231: Other therapeutic procedures	200,155	197,718	178,870	–1.2	–9.5
212: Diagnostic physical therapy	4,507	3,596	3,225	–20.2	–10.3
101: Transurethral excision; drainage; or removal urinary obstruction	12,803	12,863	11,430	0.5	–11.1
77: Proctoscopy and anorectal biopsy	8,635	8,846	7,855	2.4	–11.2
224: Cancer chemotherapy	29,496	30,033	26,664	1.8	–11.2
88: Abdominal paracentesis	37,139	38,691	34,093	4.2	–11.9
10: Thyroidectomy; partial or complete	4,056	3,231	2,845	–20.3	–11.9
119: Oophorectomy; unilateral and bilateral	23,871	22,866	20,092	–4.2	–12.1
33: Other OR therapeutic procedures on nose; mouth and pharynx [ICD-9-CM label] 33: Other OR therapeutic procedures on mouth and throat [ICD-10-PCS label]	9,386	9,599	8,422	2.3	–12.3
189: Contrast aortogram	19,882	20,543	17,967	3.3	–12.5
4: Diagnostic spinal tap	37,156	37,957	33,015	2.2	–13.0
214: Traction; splints; and other wound care	15,416	15,570	13,520	1.0	–13.2
5: Insertion of catheter or spinal stimulator and injection into spinal canal	34,551	32,872	28,107	–4.9	–14.5
48: Insertion; revision; replacement; removal of cardiac pacemaker or cardioverter/defibrillator	30,027	30,654	26,179	2.1	–14.6
205: Arterial blood gases	5,036	5,185	4,416	3.0	–14.8
180: Other CT scan	7,668	7,163	6,065	–6.6	–15.3
195: Diagnostic ultrasound of urinary tract	2,119	2,226	1,849	5.0	–16.9
167: Mastectomy	5,601	4,493	3,712	–19.8	–17.4
203: Electrographic cardiac monitoring	7,550	8,191	6,694	8.5	–18.3
139: Fetal monitoring [ICD-9-CM label] 139: Fetal measurement and monitoring [ICD-10-PCS label]	88,295	92,251	75,173	4.5	–18.5
32: Other non-OR therapeutic procedures on nose; mouth and pharynx [ICD-9-CM label] 32: Other non-OR therapeutic procedures on mouth and throat [ICD-10-PCS label]	6,881	7,649	6,212	11.2	–18.8
36: Lobectomy or pneumonectomy	10,063	10,159	8,212	1.0	–19.2

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
193: Diagnostic ultrasound of heart (echocardiogram)	96,545	96,333	76,943	–0.2	–20.1
223: Enteral and parenteral nutrition	62,242	62,006	48,715	–0.4	–21.4
108: Indwelling catheter	22,951	23,676	18,568	3.2	–21.6
30: Tonsillectomy and/or adenoidectomy	2,006	1,953	1,530	–2.6	–21.7
12: Other therapeutic endocrine procedures	4,624	4,700	3,659	1.6	–22.1
90: Excision; lysis peritoneal adhesions	39,838	39,024	30,339	–2.0	–22.3
53: Varicose vein stripping; lower limb	65	49	38	–24.6	–22.4
227: Other diagnostic procedures	39,378	40,868	31,283	3.8	–23.5
190: Contrast arteriogram of femoral and lower extremity arteries	19,867	20,115	15,364	1.2	–23.6
222: Blood transfusion	286,847	266,165	201,995	–7.2	–24.1
188: Cerebral arteriogram [ICD-9-CM label] 188: Cerebral and neck arteriogram [ICD-10-PCS label]	12,213	12,272	9,200	0.5	–25.0
172: Skin graft	12,211	12,725	9,430	4.2	–25.9
201: Cardiac stress tests	6,661	6,180	4,483	–7.2	–27.5
22: Tympanoplasty	122	84	60	–31.1	–28.6
56: Other vascular bypass and shunt; not heart	1,921	2,087	1,481	8.6	–29.0
163: Other non-OR therapeutic procedures on musculoskeletal system	19,778	19,680	13,944	–0.5	–29.1
15: Lens and cataract procedures	120	146	103	21.7	–29.5
135: Forceps; vacuum; and breech delivery	28,432	27,607	19,318	–2.9	–30.0
20: Other intraocular therapeutic procedures	554	532	367	–4.0	–31.0
61: Other OR procedures on vessels other than head and neck	122,308	121,929	83,964	–0.3	–31.1
121: Ligation or occlusion of fallopian tubes	29,415	28,851	19,531	–1.9	–32.3
196: Diagnostic ultrasound of abdomen or retroperitoneum	5,184	4,921	3,321	–5.1	–32.5
194: Diagnostic ultrasound of gastrointestinal tract	3,579	3,764	2,537	5.2	–32.6
3: Laminectomy; excision intervertebral disc [ICD-9-CM label] 3: Excision, destruction or resection of intervertebral disc [ICD-10-PCS label]	55,169	55,262	37,013	0.2	–33.0
78: Colorectal resection	38,127	37,851	25,280	–0.7	–33.2
100: Endoscopy and endoscopic biopsy of the urinary tract	20,468	19,386	12,943	–5.3	–33.2
211: Radiation therapy	6,575	6,236	4,135	–5.2	–33.7
27: Control of epistaxis [ICD-9-CM label] 27: Placement of packing material in the nasal region [ICD-10-PCS label]	3,061	3,065	1,998	0.1	–34.8
95: Other non-OR lower GI therapeutic procedures	23,253	23,547	15,130	1.3	–35.7
198: Magnetic resonance imaging	21,353	18,981	12,138	–11.1	–36.1
142: Partial excision bone	42,551	44,819	28,120	5.3	–37.3

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
200: Nonoperative urinary system measurements [ICD-9-CM label] 200: Nonoperative urinary system measurement and monitoring [ICD-10-PCS label]	746	1,044	655	39.9	–37.3
155: Arthrocentesis	9,343	9,668	6,036	3.5	–37.6
221: Nasogastric tube	15,147	15,165	9,347	0.1	–38.4
93: Other non-OR upper GI therapeutic procedures	26,535	26,832	16,286	1.1	–39.3
19: Other therapeutic procedures on eyelids; conjunctiva; cornea	3,583	3,635	2,188	1.5	–39.8
128: Diagnostic dilatation and curettage (D&C)	1,789	1,673	1,000	–6.5	–40.2
182: Mammography	73	65	38	–11.0	–41.5
179: CT scan abdomen	18,272	16,660	9,737	–8.8	–41.6
208: Nuclear medicine imaging of pulmonary	1,437	1,159	650	–19.3	–43.9
89: Exploratory laparotomy	3,199	3,568	1,876	11.5	–47.4
177: Computerized axial tomography (CT) scan head [ICD-9-CM label] 177: CT of head and neck [ICD-10-PCS label]	16,371	13,910	7,166	–15.0	–48.5
81: Hemorrhoid procedures	953	1,056	535	10.8	–49.3
213: Physical therapy exercises; manipulation; and other procedures	27,515	28,005	13,986	1.8	–50.1
111: Other non-OR therapeutic procedures of urinary tract	21,440	22,011	10,890	2.7	–50.5
76: Colonoscopy and biopsy	53,602	53,437	25,468	–0.3	–52.3
24: Mastoidectomy	308	280	133	–9.1	–52.5
207: Nuclear medicine imaging of bone	474	373	173	–21.3	–53.6
86: Other hernia repair	29,488	29,482	13,142	0.0	–55.4
17: Destruction of lesion of retina and choroid	307	237	98	–22.8	–58.6
215: Other physical therapy and rehabilitation	27,494	26,833	11,005	–2.4	–59.0
21: Other extraocular muscle and orbit therapeutic procedures	754	785	316	4.1	–59.7
178: CT scan chest	15,546	14,965	4,705	–3.7	–68.6
103: Nephrotomy and nephrostomy	6,459	6,756	2,057	4.6	–69.6
217: Other respiratory therapy	14,669	14,843	4,172	1.2	–71.9
63: Other non-OR therapeutic cardiovascular procedures	85,032	85,210	22,768	0.2	–73.3
149: Arthroscopy	1,280	1,264	326	–1.3	–74.2
75: Small bowel resection	11,672	11,841	2,880	1.4	–75.7
35: Tracheoscopy and laryngoscopy with biopsy	8,910	9,517	2,105	6.8	–77.9
52: Aortic resection; replacement or anastomosis	6,381	6,479	833	1.5	–87.1
184: Intraoperative cholangiogram	14,779	13,827	1,724	–6.4	–87.5
28: Plastic procedures on nose	1,974	1,947	230	–1.4	–88.2
106: Genitourinary incontinence procedures	4,124	2,928	306	–29.0	–89.5
129: Repair of cystocele and rectocele;	5,442	3,821	144	–29.8	–96.2

All-Listed Procedure CCS[a]	Q4 2013, N	Q4 2014, N	Q4 2015, N	Percentage Change	
				2013–2014 (Baseline)	2014–2015 (Transition)
obliteration of vaginal vault					
209: Non-imaging nuclear medicine probe or assay	5,409	4,368	64	–19.2	–98.5
57: Creation; revision and removal of arteriovenous fistula or vessel-to-vessel cannula for dialysis	5,037	4,599	0	–8.7	NA
68: Injection or ligation of esophageal varices	19	17	0	–10.5	NA
140: Repair of current obstetric laceration	168,717	174,255	0	3.3	NA
143: Bunionectomy or repair of toe deformities	411	438	0	6.6	NA
151: Excision of semilunar cartilage of knee	964	880	0	–8.7	NA
169: Debridement of wound; infection or burn	34,278	35,770	0	4.4	NA
206: Microscopic examination (bacterial smear; culture; toxicology)	919	554	0	–39.7	NA
230: Extracorporeal shock wave other than urinary	≤10	15	0	NA	NA

Abbreviations: CCS, Clinical Classifications Software; ERC, ERCP, ERP, endoscopic retrograde cholangio-pancreatography; GI, gastrointestinal; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-PCS, International Classification of Diseases, Tenth Revision, Procedure Coding System; NA, not applicable; Q, quarter.

[a] Shaded rows indicate CCS procedure categories that changed by less than 5 percent with the introduction of ICD-10-PCS.

Source: Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) from 24 States.