



H·CUP
HEALTHCARE COST AND UTILIZATION PROJECT

USER GUIDE:

**PROCEDURE CLASSES FOR ICD-10-PCS, v2021.1
(BETA VERSION)**

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District of Columbia Hospital Association

Florida Agency for Health Care Administration

Georgia Hospital Association

Hawaii Laulima Data Alliance

Illinois Department of Public Health

Indiana Hospital Association

Iowa Hospital Association

Kansas Hospital Association

Kentucky Cabinet for Health and Family Services

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Maine Health Data Organization

Maryland Health Services Cost Review Commission

Massachusetts Center for Health Information and Analysis

Michigan Health & Hospital Association

Minnesota Hospital Association (provides data for Minnesota and North Dakota)

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

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Ohio Hospital Association

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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

WHAT'S NEW IN v2021.1 OF THE PROCEDURE CLASSES FOR ICD-10-PCS (BETA VERSION)?

- Added ICD-10-PCS procedure codes valid starting in fiscal year 2021 so the tool now includes any code valid from October 2015 through September 2021.
- Aligned the identification of major surgeries with the definition of operating room procedures in the Agency for Healthcare Research and Quality (AHRQ) Quality Indicator (QI) software for codes valid from October 2015 through September 2020.¹
 - Similar information on fiscal year (FY) 2021 codes (October 2020 - September 2021) was unavailable from the QI software, so identification of major surgeries is based on the list of operating room procedures used for the Medicare Severity-Diagnosis Related Groups (MS-DRGs) v38.² When the FY 2021 codes are added to the AHRQ QI software, the procedure classes for ICD-10-PCS (beta version) will be updated.
- Corrected the identification of over 100 procedure codes as diagnostic or therapeutic.

¹ Information on the list of operating room procedure codes in the AHRQ QI software v2020 is available in Appendix A of the Patient Safety Indicator (PSI) module at https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2020/TechSpecs/PSI_Appendix_A.pdf. Accessed 10/25/20.

² Information on the MS-DRG identification of operating room procedures is available in Appendix E of the MS-DRG Definitions Manual for v38 at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/MS-DRG-Classifications-and-Software>. Accessed 10/25/20.

INTRODUCTION

This report provides technical documentation for the Healthcare Cost and Utilization Project (HCUP) Procedure Classes for International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) (beta version). Starting on October 1, 2015, procedures for hospital inpatient stays in the United States are reported using the ICD-10-PCS coding system. ICD-10-PCS consists of more than 80,000 procedure codes.

The Procedure Classes for ICD-10-PCS (beta version) facilitates health services research by allowing the researcher to readily determine (1) whether a procedure is diagnostic or therapeutic and (2) whether a procedure is expected to be performed in an operating room. The Procedure Classes for ICD-10-PCS (beta version) assign all ICD-10-PCS procedure codes to one of four categories:

- Minor Diagnostic—Nonoperating room procedures that are diagnostic (e.g., B244ZZZ, Ultrasonography of Right Heart)
- Minor Therapeutic—Nonoperating room procedures that are therapeutic (e.g., 02HQ33Z, Insertion of Infusion Device into Right Pulmonary Artery, Percutaneous Approach)
- Major Diagnostic—Procedures that are considered operating room procedures that are performed for diagnostic reasons (e.g., 02BV0ZX, Excision of Superior Vena Cava, Open Approach, Diagnostic)
- Major Therapeutic—Procedures that are considered operating room procedures that are performed for therapeutic reasons (e.g., 0210093, Bypass Coronary Artery, One Site from Coronary Artery with Autologous Venous Tissue, Open Approach).

Background on the development of the Procedure Classes for ICD-10-PCS (beta version) is provided in [Appendix A](#). In 2021, AHRQ expects to conduct additional empirical analyses of the beta version of the tool and transition it out of beta status. User feedback on v2021.1 is appreciated and will be taken into consideration. Comments can be sent to hcup@ahrq.gov.

The Procedure Classes for ICD-10-PCS (beta version) is updated annually to coincide with fiscal year updates to the ICD-10-PCS coding system and retains procedure codes valid from the start of ICD-10-PCS in October 2015. For this reason, it is advisable to always use the most recent version of the tool.

Files containing the mapping of ICD-10-PCS codes to their corresponding procedure class can be downloaded from the [HCUP User Support \(HCUP-US\)](#) website.³

³ The HCUP User Support website can be found at www.hcup-us.ahrq.gov/.

DESCRIPTION OF THE PROCEDURE CLASSES FOR ICD-10-PCS (BETA VERSION)

Identification of Minor Versus Major Procedures

The Procedures Classes for ICD-10-PCS, v2021.1 (beta version) includes all ICD-10-PCS codes valid from October 1, 2015 through September 20, 2021. The identification of a major surgery is tied to the expectation that the procedure would be performed in an operating room. The identification of a major procedure varies by fiscal year (FY) as follows:

- From October 2015 through September 2020, procedure codes are identified as major based on the ICD-10-PCS list of operating room procedures included in the AHRQ Quality Indicator (QI) software.⁴ The AHRQ QI software begins with the latest fiscal year version of the Medicare Severity-Diagnosis Related Groups (MS-DRGs) and does further clinical review to identify major surgeries. There is slight variation between the MS-DRG identification of major surgeries (for v2020.1, 68.2 percent of ICD-10-PCS codes are identified as major operating room procedures in both schemas, 0.6 percent of ICD-10-PCS codes are identified as major only in QI software, 1.3 percent of ICD-10-PCS codes are identified as major only in the MS-DRG grouper, and 29.9 percent of ICD-10-PCS codes are not identified as major operating room procedures in both schemas).
- At the time of the release of v2021.1 of the Procedure Classes for ICD-10-PCS (beta version), the AHRQ QI review of additional operating procedures was not yet complete, so identification of additional FY 2021 ICD-10-PCS codes as major surgeries is based on the list of operating room procedures used the latest version of the Medicare Severity-Diagnosis Related Groups (MS-DRGs) v38 for FY 2021.⁵

Any procedure not identified as major is assigned to be a minor procedure.

Identification of Therapeutic versus Diagnostic Procedures

The identification of diagnostic and therapeutic procedures was determined in part by the taxonomy of the ICD-10-PCS code and, if not identifiable by the taxonomy, were reviewed by ICD-10-PCS clinical coding experts. For example, the following codes are always diagnostic:

- Medical/surgical codes (with a first character of 0) and a seventh digit of X
- Administration codes (with a first character of 3) and a seventh digit of X.

⁴ Information on the list of operating room procedure codes in the AHRQ QI software v2020 is available in Appendix A of the Patient Safety Indicator (PSI) module at https://www.qualityindicators.ahrq.gov/Downloads/Modules/PSI/V2020/TechSpecs/PSI_Appendix_A.pdf. Accessed 10/25/20.

⁵ Information on the MS-DRG identification of operating room procedures is available in Appendix E of the MS-DRG Definitions Manual for v38 at <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/MS-DRG-Classifications-and-Software>. Accessed 10/25/20.

In contrast, administration codes (with a first character of 3) and a root operation (third character) of 0 for introduction can mean putting in or on a therapeutic, diagnostic, nutritional, physiological, or prophylactic substance except blood or blood products.

USING THE DOWNLOADABLE PROCEDURE CLASSES FOR ICD-10-PCS (BETA VERSION) FILES

System Requirements

Using the Procedure Classes for ICD-10-PCS (beta version) tool requires a program to decompress or “unzip” files.⁶ Approximately 9.0 megabytes of disk space available on one’s hard drive also will be needed to accommodate all the Procedure Classes for ICD-10-PCS (beta version) files. Additional space is necessary for saving the Procedure Classes for ICD-10-PCS (beta version) output files.

Downloadable Files

The Procedure Classes for ICD-10-PCS (beta version) zip file contains the following:

1. One translation table in comma separated values (CSV) file format that assigns procedure classes for data sets that contain ICD-10-PCS codes. The procedure classes have the following values:
 - Minor diagnostic (value 1)
 - Minor therapeutic (value 2)
 - Major diagnostic (value 3)
 - Major therapeutic (value 4)
2. SAS program to apply the tool to the user’s data
3. Procedure Classes for ICD-10-PCS User Guide (PDF)
4. Change log detailing changes between v2021.1 and v2020.1.

Table 1 includes detail on the names and purposes of each file contained in the Procedure Classes for ICD-10-PCS (beta version) zip file.

⁶ Third-party zip utilities are available from the following reputable vendors on their official websites: ZIP Reader (Windows) (free download offered by PKWARE, Inc.), SecureZIP® for Mac or Windows (free evaluation and licensed/fee software offered by PKWARE, Inc.), WinZip (Windows) (evaluation and fee versions offered by the Corel Corporation), Stuffit Expander® (Mac) (free evaluation and licensed/fee software offered by Smith Micro Software Inc.).

Table 1. Contents of the Procedure Classes for ICD-10-PCS Zip File

File Name	Purpose
PClass_ICD10PCS_vyyyy-r.csv where yyyy represents the fiscal year and <i>r</i> represents a release number within the fiscal year ^a	The CSV mapping file lists all ICD-10-PCS procedure codes along with a description for each code, the procedure class assignment (value 1, 2, 3, or 4), and the description of the procedure class (e.g., major therapeutic). This file can be converted to Excel, where a filter can be applied to examine individual ICD-10-PCS codes and procedure class value.
PClass_ICD10PCS_Mapping_Program_vyyyy-r.sas where yyyy represents fiscal year and <i>r</i> represents a release number within fiscal year ^a	SAS mapping program applies the Procedure Classes for ICD-10-PCS to the user's data.
PC-ICD10PCS-User-Guide-vyyyy-r.pdf where yyyy represents fiscal year and <i>r</i> represents a release number within fiscal year ^a	This document (i.e., User Guide for the Procedure Classes for ICD-10-PCS in PDF format).
PC_ICD10PCSChgLg_vyyyy-vyyyy-r.xlsx	A log (Microsoft® Excel) comparing two versions of the Procedure Classes for ICD-10-PCS tool including a list of changes and assignment of ICD-10-PCS codes to a procedure class value.

Abbreviations: CSV, comma separated values

^aFor example, the first mapping file release to include codes valid through fiscal year 2021 is named PClass_ICD10PCS_v2021-1.csv.

Running the SAS Program to Add Procedure Classes to Data

To download, modify, and run the software to apply the Procedure Classes for ICD-10-PCS to an input dataset, follow these steps:

1. Users should download and extract the contents of the zip file containing the Procedure Classes for ICD-10-PCS tool to a saved location on their computer. Files included in the zip file are described in Table 1 and referenced below.
2. Users must set up the SAS program (PClass_ICD10PCS_Mapping_Program_vyyyy-r.sas) to run on their data. They must specify or modify where appropriate:
 - a. Change the paths in the SAS program to point to the computer location(s) of
 - i. The CSV mapping file (PClass_ICD10PCS_vyyyy-r.csv)
 - ii. The input dataset
 - iii. The output dataset
 - b. Set the macro variables in the SAS program to match the data element names and file structure of the input dataset (Table 2).

Table 2. Modifiable Macro Variables and Directory Paths

Description of Macro Variables and Directory Paths	SAS Program Syntax
File Location	
Specify the location of the CSV mapping file	FILENAME INRAW1
Specify the location of the input dataset	LIBNAME IN1
Specify the location of the output dataset	LIBNAME OUT1
File Names	
Specify the file name of the input dataset	%LET CORE=YOUR_SAS_FILE
Specify the file name of the output dataset	%LET OUT1=OUTPUT_SAS_FILE
Input Data Characteristics	
Specify the prefix used to name the ICD-10-PCS procedure data element array in the input dataset. In this example the procedure data elements would be named I10_PR1, I10_PR2, etc., similar to the naming of ICD-10-PCS data elements in HCUP databases.	%LET PRPREFIX=I10_PR;
Specify the maximum number of procedure codes on any record in the input file. In this example the maximum number of procedure codes on any record is 15. The value of NUMPR must be numeric and greater than or equal to 1; otherwise, the program will not read in any procedure codes for procedure class assignment.	%LET NUMPR=15;
Specify the number of observations to use from the input dataset. Use MAX to use all observations; use a smaller value for testing the program.	%LET OBS = MAX

Abbreviation: CSV, comma-separate values

Procedure Class Data Elements in the Output File

The SAS program assumes the input file includes one or more ICD-10-PCS procedure codes in an array. The output file includes all data elements from the input file, in addition to an array of procedure class data elements (**PCLASSn**) with a one-to-one correspondence to the array of ICD-10-PCS codes. For example, PCLASS1 includes the procedure class for the ICD-10-PCS code in the first position of the ICD-10-PCS procedure code array. The values of the data elements PCLASSn indicate whether the corresponding ICD-10-PCS code is one of the following:

- Minor diagnostic (value 1)
- Minor therapeutic (value 2)
- Major diagnostic (value 3)
- Major therapeutic (value 4).

In v2021.1, codes that are not valid ICD-10-PCS procedure codes from October 1, 2015 through September 30, 2021 are assigned a SAS missing value (.) for the procedure class.

An additional data element, **ORPROC**, indicates if any ICD-10-PCS code on the record is a major (i.e., operating room) procedure. It works by scanning the array of procedure class data elements (PCLASSn) created by the program. The ORPROC data element will have the value 1 if any procedure was in class 3 or 4, major diagnostic or therapeutic, respectfully.

APPENDIX A: BACKGROUND ON THE DEVELOPMENT OF THE PROCEDURE CLASSES FOR ICD-10-PCS

The [Procedure Classes for ICD-9-CM](#) was used as the starting point for the Procedure Classes for ICD-10-PCS. In preparation for the October 2015 implementation of ICD-10-CM/PCS, the Healthcare Cost and Utilization Project (HCUP) tools were converted to the new coding system. The initial mapping was completed in 2014 (prior to ICD-10-PCS-coded data being available) by linking the procedure class designation of ICD-9-CM codes to ICD-10-PCS codes via the General Equivalence Mappings (GEMs) available from the Centers for Medicare & Medicaid Services (CMS) website.⁷ The determination of major procedures was based on the Medicare Severity Diagnosis Related Group (MS-DRG) identification of operating room procedures that is documented each year in Appendix E of the [MS-DRG Definitions Manual](#). Appendix E identifies operating room procedures that impact the MS-DRG assignment during the grouping process. If the ICD-10-PCS was listed in Appendix E for the fiscal year, it was considered a major procedure; all other PCS codes were assigned as minor procedures in the tool. The resultant first iteration of the ICD-10-PCS classification was considered a beta version.

Beta version v2016.1 through v2020.1 continued to use the MS-DRG designation of an operating room procedure. In v2021.1, AHRQ decided to align the definition of a major procedure with the AHRQ Quality Indicators (QI) software. The AHRQ QI software uses the identification of any possible operating room procedure for the denominator or population at risk of some of the quality indicators (e.g., select Patient Safety Indicators (PSIs) and Pediatric Quality Indicators (PDI)). In contrast, the MS-DRG software uses the identification of select operating room procedures for the purpose of assigning discharges into a surgical versus medical MS-DRG category. The underlying premise of the QI software was better aligned with the purpose of the Procedure Classes.⁸

Additional analysis of the updated coding in v2021.1 of the tool is needed to see how the procedure classes align with utilization and costs before the tool is moved out of beta status. User feedback on v2021.1 is appreciated and will be taken into consideration. Comments can be sent to hcup@ahrq.gov.

⁷ Information on the GEMS is available at <http://www.cms.gov/Medicare/Coding/ICD10/2014-ICD-10-CM-and-GEMs.html>. Accessed 10/25/2020.

⁸ The identification of major surgeries in v2021.1 aligned with the definition of operating room procedures in the AHRQ QI software v2020 for codes valid from October 2015 through September 2020. Similar information on fiscal year 2021 codes (October 2020 - September 2021) was unavailable from the QI software, so identification of major surgeries was based on the list of operating room procedures used for the MS-DRGs v38. When the FY 2021 codes are added to the AHRQ QI software, the procedure classes for ICD-10-PCS (beta version) will be updated.