

# H·CUP

HEALTHCARE COST AND UTILIZATION PROJECT

## HCUP Methods Series



Agency for Healthcare  
Research and Quality



U.S. Department of Health and Human Services  
Agency for Healthcare Research and Quality

**Contact Information:**  
**Healthcare Cost and Utilization Project (HCUP)**  
**Agency for Healthcare Research and Quality**  
**540 Gaither Road**  
**Rockville, MD 20850**  
**<http://www.hcup-us.ahrq.gov>**

**For Technical Assistance with HCUP Products:**

**Email: [hcup@ahrq.gov](mailto:hcup@ahrq.gov)**

**or**

**Phone: 1-866-290-HCUP**

Recommended Citation: Busch J, Steiner C. Evaluation of the State Ambulatory Surgery Databases Available through the HCUP Central Distributor, 2004. HCUP Methods Series Report #2007-04. Online April 9, 2007 U.S. Agency for Healthcare Research and Quality. Available:<http://www.hcup-us.ahrq.gov/reports/methods.jsp>.

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## INTRODUCTION

Ambulatory surgeries have become more common over the past two decades, and the number of ambulatory surgical centers has reflected similar growth. For example, between 1988 and 2002, the number of surgeries reported by Colorado, New Jersey, and New York rose from 0.9 million to 2.1 million.<sup>1</sup> In addition, the last two decades have witnessed a steep rise in the number of ambulatory surgical centers: these facilities have increased from 336 in 1985 to 3,567 in 2003.<sup>2</sup> This dramatic growth in ambulatory surgeries and surgical centers was fueled by cost concerns and new medical technologies that made ambulatory surgery more practical.

In 1997, the Agency for Healthcare Research and Quality (AHRQ) began collecting ambulatory surgery data as part of the Healthcare Cost and Utilization Project (HCUP) and making public versions of these databases available via the HCUP Central Distributor. This report describes the 2004 State Ambulatory Surgery Databases (SASD) for each of the 9 states that provide ambulatory surgery data to HCUP and make the data available via the HCUP Central Distributor. The report also describes the completeness of the 2004 SASD with respect to ambulatory surgical facilities. The method used to accomplish this evaluation was to compare the SASD counts of ambulatory surgery facilities and visits to corresponding numbers reported in the 2004 American Hospital Association (AHA) Annual Survey Database and the 2004 Freestanding Outpatient Surgery Center (FOSC) file maintained by Verispan. This report also describes the number of surgeries by body system and illustrates how some states use two types of coding systems in their classification of procedures.

The 9 states that contributed data to the HCUP Central Distributor SASD (hereafter SASD-CD) are Colorado, Florida, Kentucky, Maryland, Michigan, Nebraska, New Jersey, North Carolina, and Wisconsin.

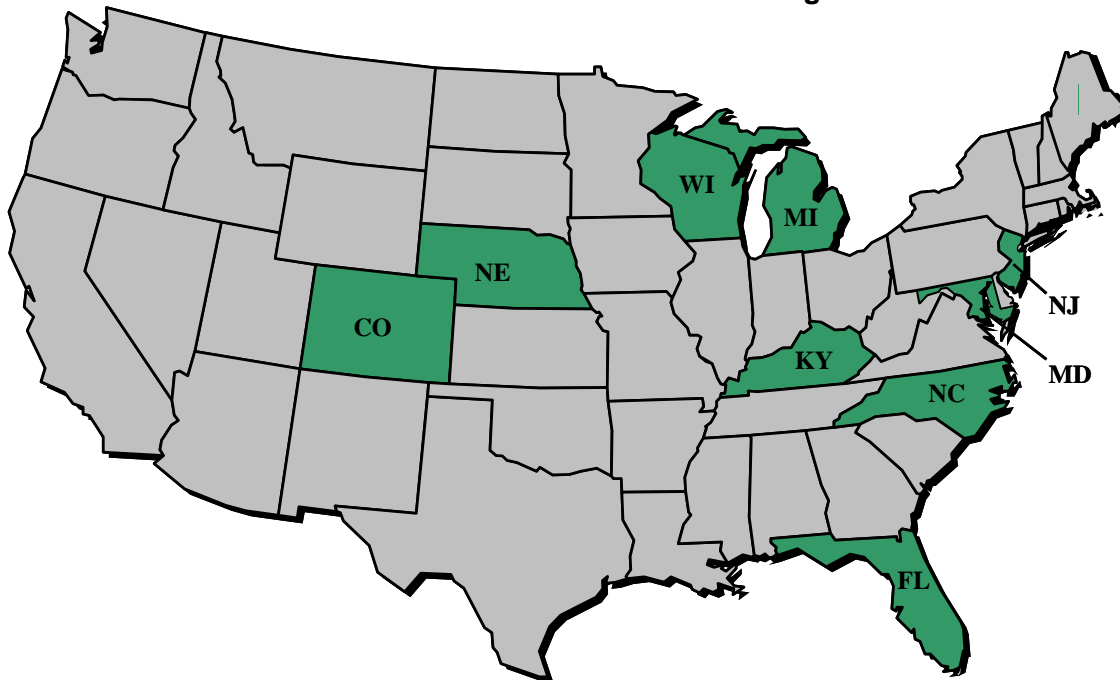
The first section of this report contains an overview of the 2004 SASD-CD. In the second section, alternative sources of comparative data are considered and it is determined that the two above-mentioned sources, the AHA Annual Survey Database and the FOSC file, are the best comparative databases for our purposes. Consequently, the third section compares the SASD-CD counts to the counts reported in the AHA and the FOSC for the 9 states participating in the SASD-CD. The fourth section provides the frequencies of ambulatory surgeries contained in the SASD-CD, by body system. The final section offers some conclusions on the usefulness and potential research value of the 2004 SASD available through the HCUP Central Distributor.

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<sup>1</sup>Number of records in HCUP SASD files. Accessed at <http://www.hcup-us.ahrq.gov/> on May 24, 2006.

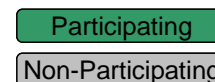
<sup>2</sup>Centers for Medicare & Medicaid Services. "CMS Benefit Payments by Major Program Service Categories, Fiscal Year 2001." *2003 CMS Data Compendium*. November 2003. Accessed at [http://www.cms.hhs.gov/DataCompendium/02\\_2003\\_Data\\_Compendium.asp](http://www.cms.hhs.gov/DataCompendium/02_2003_Data_Compendium.asp) on January 12, 2006.

## HCUP States with 2004 SASD Databases Available Through the HCUP Central Distributor



Note: Alaska and Hawaii do not participate in the SASD

Key



### 2004 HCUP STATE AMBULATORY SURGERY DATABASES (SASD) AVAILABLE THROUGH THE HCUP CENTRAL DISTRIBUTOR

Ambulatory surgery visit data have been disseminated via the HCUP Central Distributor beginning in data year 1997. For 2004, nine standardized state databases were constructed and made available to the researchers via the HCUP Central Distributor. These nine databases contain all of the ambulatory surgery records publicly available through HCUP and include approximately 7.5 million surgeries. The types of facilities contained in the publicly-available SASD varied across states. States supplied ambulatory surgery records from hospital-based and hospital-affiliated ambulatory surgery centers. Select states also supplied ambulatory surgery records from freestanding facilities.

Table 1 presents the number of hospital-based and freestanding facilities included in each HCUP Central Distributor state SASD file. The HCUP SASD-CD definition of a hospital-based facility is used. Namely, SASD facilities that could be matched to a facility contained in the 2004 American Hospital Association Annual Survey Database (discussed in the next section) were considered to be hospital-based; all others were considered freestanding. In the 2004 SASD-CD, 975 ambulatory surgical facilities were hospital-based (72 percent) and 385 were freestanding facilities (28 percent). The two states with the greatest number of ambulatory surgical facilities in the 2004 SASD-CD were Florida and Wisconsin.

The 2004 SASD-CD are defined in a substantially different way than is the case for other data years. In an attempt to create uniformly defined outpatient databases, AHRQ approved screening the outpatient data provided by the HCUP Partners and assigning records to the SASD-CD or State Emergency Department Databases (SEDD) based on information coded on the record. For the SASD-CD, the criteria for identifying ambulatory surgery records include a

range of International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) and Current Procedural Terminology (CPT) procedures codes indicating surgery, in addition to a one-day limit on the length of stay. Records satisfying the ambulatory surgery criteria were assigned to the SASD-CD without regard for their origin in an ambulatory surgery or emergency department file. Those records that satisfied both ambulatory surgery and emergency department criteria were included in the SASD-CD files.

**Table 1: Number of Hospital-Based and Freestanding Facilities by State Available Through the HCUP Central Distributor, 2004 SASD-CD**

State	Number of Hospital-based Facilities	Number of Freestanding Facilities	Total Number of Facilities
Colorado	71	0	71
Florida	206	311	517
Kentucky	100	2	102
Maryland	48	0	48
Michigan	132	0	132
Nebraska	84	0	84
New Jersey	85	0	85
North Carolina	120	34	154
Wisconsin	129	38	167
<b>Total</b>	<b>975</b>	<b>385</b>	<b>1,360</b>

## POTENTIAL COMPARATIVE AMBULATORY SURGERY DATABASES

In order to describe the completeness of the 2004 SASD-CD, three potential comparative databases were identified. These databases are: 1) the Provider of Services (POS) file maintained by the Centers for Medicare and Medicaid Services (CMS), 2) the Freestanding Outpatient Surgery Center (FOSC) file maintained by Verispan, and 3) the Annual Survey Database, fielded and maintained by the American Hospital Association (AHA). All three databases contain only summarized, facility-level data; none contains visit-level data.

Each database encompasses a slightly different set of facilities, as shown in Table 2. In this table, facilities are defined as *hospital-based* only if they are physically connected to main hospital facilities. All other facilities are considered to be *freestanding*. Regardless of setting, facilities may be operated either by a hospital or by a third party.

**Table 2: Comparison of Types of Ambulatory Surgery (AS) Facilities in Each Information Source**

Type of Facility	FOSC	POS <sup>3</sup>	AHA
AS facility – hospital-based and controlled	No	Yes	Yes
AS facility – hospital-based, third-party control	Yes	Yes	Yes
AS facility – freestanding, hospital affiliation	Yes	Yes	Yes
AS facility – freestanding, with no hospital affiliation	Yes	Yes	No
Services originating at other sites, such as physician offices	No	Yes	No

<sup>3</sup>Note: Coverage is limited to providers reimbursed for Medicare covered services.

### Provider of Services (POS) File

The Centers for Medicare and Medicaid Services (CMS) Provider of Services (POS) file lists facilities certified for Medicare participation. It contains facility name and location information and specifies the type of provider, but omits service count information. The POS is used for claim adjudication; Medicare reimbursements are made only to listed facilities. Quarterly updates are available with little or no lag time.

While the POS file lists facilities that provide outpatient surgery in all settings, the information is limited to participating Medicare facilities and does not contain counts of surgeries. Consequently, this file was not used for assessing the completeness of the SASD-CD.

### Freestanding Outpatient Surgery Center (FOSC) Data

The FOSC profiles freestanding ambulatory surgery centers on an annual basis. Data are collected by Verispan through an annual survey of freestanding outpatient surgery centers and all data are self-reported by the facilities. Verispan attempts to survey all except the most recently opened outpatient surgery centers. In 2003, Verispan estimated that they were able to obtain responses from 75% of existing outpatient surgical centers.

The FOSC file does not include identifiers compatible to those on the HCUP or AHA files, so a manual comparison was employed to assign a linkable variable to the FOSC data. Because the FOSC file includes only information on freestanding facilities, and only a subset of states (Florida, North Carolina, Utah, and Wisconsin) collect data from such facilities, manual matching was limited to only these states.

### AHA Annual Survey Database

The AHA Annual Survey Database identifies hospital-associated ambulatory surgery facilities. These survey-based data include hospital descriptors and counts of outpatient surgeries from nearly all hospital-affiliated facilities nationwide. Annual updates are generally available toward the end of the year following the survey. AHA data exclude freestanding outpatient surgery facilities lacking a hospital affiliation.

## **COMPARISONS BETWEEN THE SASD-CD, THE AHA ANNUAL SURVEY, AND FOSC DATA**

Table 3 compares 2004 SASD-CD surgery counts from the 2004 AHA and FOSC data for nine states. The definition of “surgeries” is determined by each individually-reporting state. For the purposes of this report, all encounters that were defined by a state as ambulatory surgery encounters are referred to as *surgeries*. For each state, the table presents the number of facilities and the number of surgeries for each combination of data sources. As an example, for Colorado, the first row shows no facilities were matched to all three data sources. In the case of Florida, the first row reveals that five facilities were present in all three data sources. For those facilities combined, the SASD-CD reports 10,175 surgeries, the AHA reports 7,959 surgeries and the FOSC reports zero surgeries. The low frequency of facilities matched in all three data sources in Florida was consistent with the frequency found in other states.

The “Totals” portion of Table 3 also demonstrates how the SASD-CD and the AHA files compare. For facilities matched between these two files (the row labeled “SASD&AHA Total” near the bottom of the table), a higher number of SASD-CD surgery counts (9,032,338) than AHA surgery counts (4,203,926) are noted. In comparing the three files, the highest number of



facility matches was between the SASD-CD and the AHA file, which contains facilities that are hospital-based or hospital-affiliated.

Despite efforts to match facilities between the SASD-CD and the FOSC files, no facilities were found with exclusive matches between these two files. Similarly, there were no facilities matched exclusively between the AHA file and the FOSC file. Hence, Table 3 does not present rows for matches exclusively between the SASD-CD and the FOSC or exclusively between the AHA and the FOSC.

Comparing the total number of surgeries reported for the SASD-CD (“SASD Total” row) with the number of surgeries in both the AHA and SASD-CD (“SASD&AHA Total” row) implies that the vast majority of SASD-CD surgeries occurred in hospital-based or hospital-affiliated facilities. Of the 7,513,743 surgeries in the SASD, 9,032,338 (83%) were contained in the 959 facilities matched to the AHA file.

It is important to recognize that the facility and discharge totals might possibly double- or even triple-count some units contained in multiple files that could not be matched for some reason.

**Table 3: Number of Facilities and Surgeries by State and Data Source Available through the HCUP Central Distributor, 2004 SASD**

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
Colorado	SASD + AHA +FOSC	-	-	-	-
	SASD+AHA	69	389,286	195,119	0
	SASD only	2	3,466	0	0
	AHA only	20	0	11,352	0
	FOSC only	10	0	0	23,251
	Total	101	392,752	206,471	23,251
Florida	SASD + AHA +FOSC	1	10,175	7,959	0
	SASD+AHA	200	1,526,912	797,341	0
	SASD only	316	1,210,410	0	0
	AHA only	62	0	35,144	0
	FOSC only	84	0	0	369,305
	Total	663	2,747,497	840,444	369,305
Kentucky	SASD + AHA +FOSC	1	22,188	4,923	0
	SASD+AHA	99	691,086	357,838	0
	SASD only	2	9,358	0	0
	AHA only	26	0	12,760	0
	FOSC only	6	0	0	27,310
	Total	134	722,632	375,521	27,310
Maryland	SASD + AHA + FOSC	1	21,612	2,842	0
	SASD+AHA	47	864,436	358,915	0
	SASD only				
	AHA only	26	0	11,241	0
	FOSC only	39	0	0	92,738
	Total	113	886,048	372,998	92,738
Michigan	SASD + AHA + FOSC	-	-	-	-
	SASD+AHA	131	1,519,925	757,543	0
	SASD only	1	3,851	0	0
	AHA only	44		37,190	0
	FOSC only	14	0	0	59,890

State	Data Source	Number of Facilities	Number of SASD Surgeries	Number of AHA Surgeries	Number of FOSC Surgeries
	Total	190	1,523,776	794,733	59,890
Nebraska	SASD + AHA + FOSC	-	-	-	-
	SASD+AHA	83	172,424	124,259	0
	SASD only	1	2,866	0	0
	AHA only	10	0	6,723	0
	FOSC only	3	0	0	6,100
	Total	97	175,290	130,982	6,100
New Jersey	SASD + AHA + FOSC	1	10,045	11,253	0
	SASD+AHA	83	340,032	412,016	0
	SASD only	1	37	0	0
	AHA only	23	0	2,200	0
	FOSC only	23	0	0	109,929
	Total	131	350,114	425,489	109,929
North Carolina	SASD + AHA + FOSC	1	4,418	2,802	0
	SASD+AHA	118	1,254,457	599,709	0
	SASD only	35	140,320	0	0
	AHA only	32	0	22,546	0
	FOSC only	12	0	0	86,100
	Total	198	1,399,195	625,057	86,100
Wisconsin	SASD + AHA + FOSC	2	6,051	3,421	0
	SASD+AHA	122	680,696	422,811	0
	SASD only	43	148,287	0	0
	AHA only	22	0	6,019	0
	FOSC only	5	0	0	14,454
	Total	194	835,034	432,251	14,454
Totals	SASD + AHA + FOSC	7	74,489	33,200	0
	SASD+AHA	952	7,439,254	4,025,551	0
	SASD&AHA Total	959	7,513,743	4,058,751	0
	SASD only	401	1,518,595	0	0
	SASD Total	1,360	9,032,338	4,058,751	0
	AHA only	265	0	145,175	0
	FOSC only	196	0	0	789,077
	Total	1,821	9,032,338	4,203,926	789,077

Note: an entry of “-” indicates that the information required to calculate this value was not available. The state does not collect data from freestanding facilities so the crosswalk required to compare the FOSC and other data was not prepared. Rows for FOSC and SASD-CD or FOSC and AHA are suppressed in the table because no exclusive matches existed.

## TYPES OF SURGERIES CAPTURED BY THE SASD

Table 4 offers some insight into the nature of the visit data captured in the 2004 SASD-CD. This table presents the number of surgeries classified by 16 major body systems. This classification was accomplished using AHRQ’s Clinical Classification Software (CCS). There are two versions of the software, one for ICD-9-CM procedure codes and another for CPT procedure codes. The ICD CCS program aggregates procedure codes into 231 mutually exclusive procedure categories. The CPT CCS program aggregates procedure codes into the same 231 categories

plus six additional, CPT-specific categories. For this report, these categories were grouped into 16 major body systems. Table 4 provides the number of surgeries by these two coding systems. For both coding systems, all listed procedures are examined. Missing values are ignored.

**Table 4: Number of ICD-9-CM and CPT Surgeries by CCS Procedure Category Available through the HCUP Central Distributor, 2004 SASD**

Description	ICD-9-CM		CPT CCS	
	Number of Procedure Codes	Percent	Number of Procedure Codes	Percent
Digestive System	2,220,590	22.9	433,354	6.0
Miscellaneous Diagnostics and Therapeutic	1,336,038	13.8	3,741,652	51.6
Integumentary System	1,091,663	11.2	262,452	3.6
Musculoskeletal System	1,066,769	11.0	220,143	3.0
Eye	767,584	7.9	134,544	1.9
Nervous System	678,902	7.0	147,181	2.0
Cardiovascular System	609,653	6.3	109,045	1.5
Nose, Mouth, and Pharynx	506,662	5.2	89,293	1.2
Female Genital System	421,644	4.3	84,860	1.2
Urinary System	314,990	3.2	61,155	0.8
Ear	217,572	2.2	36,938	0.5
Respiratory System	114,505	1.2	37,241	0.5
Obstetrical	111,762	1.2	45,221	0.6
Male Genital System	90,661	0.9	19,383	0.3
Heme and Lymphatic System	61,865	0.6	12,168	0.2
Endocrine System	27,661	0.3	4,192	0.1
HCPCS	-	-	1,746,633	24.1
Invalid or Inconsistent	71,605	0.7	70,203	1.0
<b>Total</b>	<b>9,710,126</b>	<b>100</b>	<b>7,255,658</b>	<b>100</b>

\* HCPCS refers to Health Care Procedure Coding System National Level II codes, which are often used with CPT codes to enhance their scope. They are not used to categorize procedures in this table because no mapping to CCS exists at the present time.

As shown in Table 4, the rank orderings of the surgery categories are similar, with two notable exceptions. One exception, Miscellaneous Diagnostics and Therapeutic procedures, represents almost 14 percent of the ICD-9-CM procedures compared with more than 51 percent of the CPT procedures. This result probably reflects the greater emphasis placed on these types of procedures in the CPT system. The second exception, the “HCPCS” category, includes codes focusing on supplies, materials, injections, and services. Although some overlap exists between HCPCS and CPT codes, it is likely that a preponderance of this category represents information not captured by the CPT or ICD-9-CM.

Table 4 demonstrates that ambulatory surgery care is strongly concentrated in treatments for only a few body systems. Surgeries related to the digestive system account for more than 24 percent. The top three body systems account for more than 45 percent of procedures and the top five for 60 percent of procedures.

Appendix A contains a large table presenting CCS statistics derived from the ICD-9-CM and CPT procedures for all the HCUP SASD-CD states by body system. In this table, the range of CCS categories included in each column is shown under each column heading. Two additional

categories not related to body systems are also presented as columns: HCPCS codes, which are only encountered in conjunction with CPT codes, and Invalid or Inconsistent. This latter category includes only those records with no valid codes and one or more invalid or inconsistent codes. The rows of this table, organized by state, capture the number of times each body system CCS code appears on a record. Because a single record can have more than one procedure, it is important to note that more than one body system code can appear on a single record. The percentages represent the proportion of records from a specific state that included one or more body system codes in a category in relation to the total number of records for that state. Because there may be more than one code per record, the sum of the percentages for each state does not add to one.

Appendix A reflects the diversity in the use of both ICD-9-CM and CPT coding by state in the SASD. Some States, such as Kentucky and New Jersey, use only ICD-9-CM coding in their SASD-CD data. One state, Maryland, uses only CPT coding. Hence, some states in Appendix A will not have observations for a particular coding system. The remaining states, which use both coding systems, have body system values for each coding system. Appendix B contains more details on the states that use both coding systems.

States that use ICD-9-CM codes on more than half their records generally have a greater number of observations for ICD-9-CM than CPT codes for a particular body system. For the digestive system, for example, Wisconsin has 299,679 procedure codes using the ICD-9-CM coding system compared to 55,532 codes using the CPT coding system. Other states such as Florida have more CPT codes than ICD-9-CM codes for a particular body system category: more than 60% of Florida records use only the CPT coding system. Florida has more CPT codes than ICD-9 codes for all 16 body system categories.

The influence of the reporting practices and capabilities of the states may be seen by comparing the percentages reported between coding systems for a single category. For example, in Colorado where the ICD-9-CM and CPT systems each have 15 fields on a record, and where the hospitals are encouraged to provide both coding systems, the percentage of records with digestive codes are nearly equal (25 percent ICD-9-CM vs. 22 percent CPT). In contrast, in Florida where there is only a single ICD-9-CM field and 15 CPT fields, the percentage of records with digestive codes differs greatly between the two systems (10 percent ICD-9-CM vs. 32 percent CPT).

Appendix A shows how the use of these coding systems by state. In addition, the high percentages of HCPCS codes in some states mean that even using both ICD-9-CM and CPT codes may not completely characterize care provided in these states. Analysts should be aware of the utilization of different procedure coding systems in their analyses of SASD-CD data.

## **COMPARISONS BETWEEN ICD-9-CM CODES AND CPT CODES**

Appendix B provides additional information for analysts who are interested in working with SASD-CD data. Comparisons are made between the ICD-9-CM and CPT codes, including direct, record-level comparisons for states that use both systems. The states that use each coding system are identified, and the number of SASD-CD records using each system are presented. Similarities and differences between the ICD-9-CM and CPT coding systems are illustrated by comparing CCS categories for both coding systems. The level of agreement between the two systems based on data from states that use both coding systems is also evaluated.

The number of codes reported depends on the file type from which they were obtained. The lowest average number of codes on a record was reported using ICD-9-CM. More CPT codes

were used, with the average number being higher for the states where these codes were included in the line item charge detail files. These consist of files with records providing detailed information about individual charges. For these states, there is no upper limit on the number of codes per record.

To obtain a complete view of the procedures performed during a visit, it is generally necessary to refer to both the ICD-9-CM and CPT codes. In one state (North Carolina) every record with ICD-9-CM codes also includes CPT codes. For the remainder of the states providing codes in both systems, the coding frequencies are mixed: some records contain only ICD-9-CM codes, some records contain only CPT codes, and some records contain both types of codes.

When ICD-9-CM and CPT codes are both present on a record, they often provide different information. The frequency with which the information provided in the two systems translates to the same set of CCS categories varies widely, ranging from 13 percent to 85 percent, depending on the state.

For records with only a single ICD-9-CM and CPT code, the CCS categories matched more than 80 percent of the time for 2 of 9 states, but fell to less than 20 percent in the state with the lowest match rate. Eight of the top 10 CCS categories were the same for both systems and there was a high degree of agreement between the CCS categories derived from both systems. The CCS CPT matched the ICD-9-CM CPT more than 90 percent of the time in 8 of 10 categories, and the ICD-9-CM CPT matched the CCS CPT over 90 percent of the time in 7 of 10 categories.

## **CONCLUSION**

The types of facilities covered by the 2004 SASD-CD vary substantially across states. By matching SASD-CD facilities with those reported in the AHA and FOSC survey data, it was possible to classify most of the SASD-CD facilities as either hospital-based or freestanding. The SASD-CD from some states appear to be limited mainly to hospital-based facilities, while the SASD-CD from other states also includes a substantial number of freestanding facilities.

In terms of the types of surgeries recorded in the SASD-CD files, the greatest proportions of ambulatory surgeries are related to the digestive system, the integumentary system, and the musculoskeletal system.

Overall, the pattern of use by body system appears relatively consistent among states. However, for states like Florida, which have little overlap between ICD-9-CM and CPT coding, reporting of use is split between the two systems. Especially in these cases, information from both coding systems must be utilized to obtain a complete picture of the procedures performed.

Substantial variability exists in the utilization for particular body systems. A notable example is found in the unusually high utilization of procedures on female genital system and on the musculoskeletal system. The cause of this variation is unclear and might serve as an interesting research topic in the future.

The disparity in utilization displayed for the category Diagnostic and Therapeutic Procedures that might be expected given the differing emphasis accorded this category of procedures by the coding systems was evident in the data. The percentage of codes reported using ICD-9-CM were in the 3 to 23 percent range, while CPT codes reached 80 percent in the most extreme state. Even those states with substantial coding in both systems, like Florida, reflected CPT coding in the 35 percent range.

Using the CCS as a means to compare and combine information from the ICD-9-CM and CPT codes proved to be a fruitful approach. Using it as a grouper allowed consistent comparisons without encountering the problems associated with attempting to translate directly between incompatible coding systems.

In sum, this report demonstrated that although a substantial amount of information is duplicated between the two coding systems, there is still an appreciable amount of information that is unique to one or the other set of codes. This is especially important for the Diagnostic and Therapeutic category.

In conclusion, the 2004 SASD-CD is a rich source of ambulatory surgery data, providing information on 9,032,338 encounters in 1,360 facilities in 9 states. These files can be useful to a broad range of researchers and policy analysts, especially for state-specific analyses.

**APPENDIX A: COMPARISON OF ICD-9-CM AND CPT PROCEDURE CODE USE BY BODY SYSTEM IN SELECT STATES**

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2004 SASD**

State	Measure	Nervous System (1-9)		Endocrine System (10-12)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	36,371	33,231	2,101	1,060
	Percent of State Total	9.26	8.46	0.53	0.27
Florida	Number of Codes	56,873	278,670	7,706	8,190
	Percent of State Total	2.07	10.14	0.28	0.30
Kentucky	Number of Codes	51,019	N/A	2,680	N/A
	Percent of State Total	7.06	N/A	0.37	N/A
Maryland	Number of Codes	N/A	35,241	N/A	1,104
	Percent of State Total	N/A	3.98	N/A	0.12
Michigan	Number of Codes	89,601	66,998	4,212	2,128
	Percent of State Total	5.88	4.40	0.28	0.14
Nebraska	Number of Codes	11,641	16,044	591	682
	Percent of State Total	6.64	9.15	0.34	0.39
New Jersey	Number of Codes	21,739	N/A	513	N/A
	Percent of State Total	6.21	N/A	0.15	N/A
North Carolina	Number of Codes	3,093	95,442	4,780	3,026
	Percent of State Total	0.22	6.82	0.34	0.22
Wisconsin	Number of Codes	102,575	26,094	2,804	68
	Percent of State Total	12.28	3.12	0.34	0.01

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Eye (13-21)		Ear (22-26)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	22,058	16,691	6,247	4,533
	Percent of State Total	5.62	4.25	1.59	1.15
Florida	Number of Codes	46,381	363,870	10,527	37,941
	Percent of State Total	1.69	13.24	0.38	1.38
Kentucky	Number of Codes	35,035	N/A	15,206	N/A
	Percent of State Total	4.85	N/A	2.10	N/A
Maryland	Number of Codes	N/A	26,889	N/A	6,559
	Percent of State Total	N/A	3.03	N/A	0.74
Michigan	Number of Codes	96,136	71,174	31,562	21,574
	Percent of State Total	6.31	4.67	2.07	1.42
Nebraska	Number of Codes	5,655	8,407	2,718	5,228
	Percent of State Total	3.23	4.80	1.55	2.98
New Jersey	Number of Codes	28,033	N/A	9,838	N/A
	Percent of State Total	8.01	N/A	2.81	N/A
North Carolina	Number of Codes	116,067	102,799	32,190	29,705
	Percent of State Total	8.30	7.35	2.30	2.12
Wisconsin	Number of Codes	78,153	23,005	18,695	4,832
	Percent of State Total	9.36	2.75	2.24	0.58



**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Nose, Mouth, and Pharynx (27-33)		Respiratory System (34-42)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	24,553	14,591	6,288	4,512
	Percent of State Total	6.25	3.72	1.60	1.15
Florida	Number of Codes	29,061	80,899	23,596	45,713
	Percent of State Total	1.06	2.94	0.86	1.66
Kentucky	Number of Codes	26,828	N/A	8,693	N/A
	Percent of State Total	3.71	N/A	1.20	N/A
Maryland	Number of Codes	N/A	16,308	N/A	18,817
	Percent of State Total	N/A	1.84	N/A	2.12
Michigan	Number of Codes	71,251	44,043	20,766	19,318
	Percent of State Total	4.68	2.89	1.36	1.27
Nebraska	Number of Codes	6,258	8,656	1,689	2,363
	Percent of State Total	3.57	4.94	0.96	1.35
New Jersey	Number of Codes	23,767	N/A	4,102	N/A
	Percent of State Total	6.79	N/A	1.17	N/A
North Carolina	Number of Codes	69,891	60,755	18,745	17,407
	Percent of State Total	5.00	4.34	1.34	1.24
Wisconsin	Number of Codes	39,838	5,804	10,172	950
	Percent of State Total	4.77	0.70	1.22	0.11

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Cardiovascular System (43-63)		Heme and Lymphatic System (64-67)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	17,914	5,781	4,223	3,031
	Percent of State Total	4.56	1.47	1.08	0.77
Florida	Number of Codes	61,172	129,759	7,244	18,450
	Percent of State Total	2.23	4.72	0.26	0.67
Kentucky	Number of Codes	32,276	N/A	4,352	N/A
	Percent of State Total	4.47	N/A	0.60	N/A
Maryland	Number of Codes	N/A	29,768	N/A	5,598
	Percent of State Total	N/A	3.36	N/A	0.63
Michigan	Number of Codes	77,852	45,824	12,340	8,298
	Percent of State Total	5.11	3.01	0.81	0.54
Nebraska	Number of Codes	5,126	7,284	1,101	1,563
	Percent of State Total	2.92	4.16	0.63	0.89
New Jersey	Number of Codes	14,032	N/A	4,985	N/A
	Percent of State Total	4.01	N/A	1.42	N/A
North Carolina	Number of Codes	64,586	66,584	10,177	7,002
	Percent of State Total	4.62	4.76	0.73	0.50
Wisconsin	Number of Codes	35,617	2,431	7,099	437
	Percent of State Total	4.27	0.29	0.85	0.05

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Digestive System (68-99)		Urinary System (100-112)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	97,662	85,951	11,502	9,734
	Percent of State Total	24.87	21.88	2.93	2.48
Florida	Number of Codes	279,550	889,776	38,431	107,105
	Percent of State Total	10.17	32.38	1.40	3.90
Kentucky	Number of Codes	177,554	N/A	21,320	N/A
	Percent of State Total	24.57	N/A	2.95	N/A
Maryland	Number of Codes	N/A	114,801	N/A	24,170
	Percent of State Total	N/A	12.96	N/A	2.73
Michigan	Number of Codes	449,969	367,595	58,058	42,217
	Percent of State Total	29.53	24.12	3.81	2.77
Nebraska	Number of Codes	31,449	46,558	4,108	6,505
	Percent of State Total	17.94	26.56	2.34	3.71
New Jersey	Number of Codes	71,624	N/A	22,102	N/A
	Percent of State Total	20.46	N/A	6.31	N/A
North Carolina	Number of Codes	374,349	368,800	46,569	44,909
	Percent of State Total	26.75	26.36	3.33	3.21
Wisconsin	Number of Codes	299,679	55,532	31,818	3,156
	Percent of State Total	35.89	6.65	3.81	0.38

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Male Genital System (113-118)		Female Genital System (119-121, 123-132)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	4,778	3,993	15,834	13,854
	Percent of State Total	1.22	1.02	4.03	3.53
Florida	Number of Codes	12,087	43,606	43,810	103,505
	Percent of State Total	0.44	1.59	1.59	3.77
Kentucky	Number of Codes	6,768	N/A	27,194	N/A
	Percent of State Total	0.94	N/A	3.76	N/A
Maryland	Number of Codes	N/A	8,530	N/A	35,288
	Percent of State Total	N/A	0.96	N/A	3.98
Michigan	Number of Codes	18,634	15,346	73,359	58,662
	Percent of State Total	1.22	1.01	4.81	3.85
Nebraska	Number of Codes	917	1,507	3,505	5,437
	Percent of State Total	0.52	0.86	2.00	3.10
New Jersey	Number of Codes	9,754	N/A	43,947	N/A
	Percent of State Total	2.79	N/A	12.55	N/A
North Carolina	Number of Codes	13,200	11,947	55,441	54,360
	Percent of State Total	0.94	0.85	3.96	3.89
Wisconsin	Number of Codes	11,370	1,733	30,867	5,277
	Percent of State Total	1.36	0.21	3.70	0.63

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT  
CCS Classification Available through the HCUP Central Distributor, 2004 SASD  
(continued)**

State	Measure	Obstetrical (122, 133-141)		Musculoskeletal System (142-164)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	6,328	5,197	54,088	48,111
	Percent of State Total	1.61	1.32	13.77	12.25
Florida	Number of Codes	20,338	65,962	78,657	240,896
	Percent of State Total	0.74	2.40	2.86	8.77
Kentucky	Number of Codes	9,610	N/A	56,345	N/A
	Percent of State Total	1.33	N/A	7.80	N/A
Maryland	Number of Codes	N/A	26,035	N/A	53,683
	Percent of State Total	N/A	2.94	N/A	6.06
Michigan	Number of Codes	41,213	21,493	176,208	135,998
	Percent of State Total	2.70	1.41	11.56	8.93
Nebraska	Number of Codes	617	1,462	13,892	17,263
	Percent of State Total	0.35	0.83	7.93	9.85
New Jersey	Number of Codes	644	N/A	58,680	N/A
	Percent of State Total	0.18	N/A	16.76	N/A
North Carolina	Number of Codes	20,070	19,494	145,635	196,644
	Percent of State Total	1.43	1.39	10.41	14.05
Wisconsin	Number of Codes	5,975	939	107,117	20,157
	Percent of State Total	0.72	0.11	12.83	2.41

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2004 SASD**  
(continued)

State	Measure	Integumentary System (165-175)		Miscellaneous Diagnostics and Therapeutic (176-231)	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	98,652	84,140	41,352	31,578
	Percent of State Total	25.12	21.42	10.53	8.04
Florida	Number of Codes	146,654	290,875	85,790	956,498
	Percent of State Total	5.34	10.59	3.12	34.81
Kentucky	Number of Codes	85,889	N/A	260,957	N/A
	Percent of State Total	11.89	N/A	36.11	N/A
Maryland	Number of Codes	N/A	56,030	N/A	733,345
	Percent of State Total	N/A	6.32	N/A	82.77
Michigan	Number of Codes	273,752	227,854	171,380	235,102
	Percent of State Total	17.97	14.95	11.25	15.43
Nebraska	Number of Codes	20,260	16,429	22,886	7,177
	Percent of State Total	11.56	9.37	13.06	4.09
New Jersey	Number of Codes	44,323	N/A	36,976	N/A
	Percent of State Total	12.66	N/A	10.56	N/A
North Carolina	Number of Codes	181,002	208,411	335,124	290,718
	Percent of State Total	12.94	14.90	23.95	20.78
Wisconsin	Number of Codes	82,344	10,294	81,556	15,223
	Percent of State Total	9.86	1.23	9.77	1.82

**Table A-1: Number of Procedure Codes by State and Body System, ICD CCS and CPT CCS Classification Available through the HCUP Central Distributor, 2004 SASD**  
(continued)

State	Measure	HCPCS		Invalid or Inconsistent	
		ICD-9	CPT	ICD-9	CPT
Colorado	Number of Codes	0	17,524	4	29
	Percent of State Total	0.00	4.46	0.00	0.01
Florida	Number of Codes	0	275,303	1,170	42
	Percent of State Total	0.00	10.02	0.04	0.00
Kentucky	Number of Codes	0	N/A	1,548	N/A
	Percent of State Total	0.00	N/A	0.21	N/A
Maryland	Number of Codes	N/A	163,659	N/A	18
	Percent of State Total	N/A	18.47	N/A	0.00
Michigan	Number of Codes	0	112,250	246	11
	Percent of State Total	0.00	7.37	0.02	0.00
Nebraska	Number of Codes	0	2,854	12	13
	Percent of State Total	0.00	1.63	0.01	0.01
New Jersey	Number of Codes	0	N/A	4	N/A
	Percent of State Total	0.00	N/A	0.00	N/A
North Carolina	Number of Codes	0	26,655	18	8,656
	Percent of State Total	0.00	1.91	0.00	0.62
Wisconsin	Number of Codes	0	3,330	192	2
	Percent of State Total	0.00	0.40	0.02	0.00

## **APPENDIX B: COMPARISON OF ICD-9-CM AND CPT PROCEDURE CODE USE IN SELECT STATES**

The main body of this report concentrates on comparisons between the SASD-CD and other data sources that collect information on the number of facilities and on the number of records. This appendix is concerned with comparisons between ICD-9-CM procedure codes and CPT procedure codes among states that employ both coding systems.

The International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) codes were originally developed as a modification of the World Health Organization (WHO) ICD system for statistical and epidemiological research. Eventually they became a means to calculate diagnosis related groups (DRGs) for inpatient prospective payment systems. The ICD-9-CM procedure codes are used to classify surgical procedures and some diagnostic procedures in the inpatient setting. The procedures are organized by body system (e.g., nervous, endocrine, respiratory, digestive, obstetrical procedures, musculoskeletal, etc.). Procedures are coded using approximately 3,500 codes comprised of two main digits followed by a decimal and one or two additional digits.

Current Procedural Terminology (CPT), developed by the American Medical Association (AMA), is a collection of terms and codes to describe medical, surgical, and diagnostic services and procedures performed by physicians in the outpatient setting. Because they were created for physician billing purposes, the CPT codes are significantly more detailed than the ICD-9-CM codes. In addition to a surgery section which parallels the ICD-9-CM procedure codes, the CPT codes are also used for evaluation and management, anesthesia, radiology, lab and pathology, and medicine. CPT codes comprise a major portion of the Health Care Procedure Coding System (HCPCS). Procedures are coded using approximately 8,000 codes comprised of five digits, to which two-digit modifiers may be added to explain unusual circumstances. CPT or HCPCS codes are becoming the standard for outpatient data because they are required for ambulatory patient classification systems, such as the Ambulatory Payment Classification (APC) and the Ambulatory Patient Grouper (APG).

HCUP Central Distributor States that use both coding systems include Colorado, Florida, North Carolina, Nebraska, Utah, and Wisconsin. For users of the SASD, understanding which coding system a state uses is important because there are subtle differences between the two systems.

Table B-1 lists the states that use each coding system. There are two types of records that contain CPT codes: the "core" files and the "charge detail" files. The core file supplies a fixed number of CPT code variables on a single record for each encounter. In contrast, the charge detail file may include a CPT code for each individual charge. A single encounter is represented by as many records as necessary to supply all of the charge information. As shown in Table B-1, most states that supply CPT codes supply them in a "core" file along with diagnostic and demographic information.



**Table B-1: Use of ICD-9-CM and the CPT Procedure Codes Available through the HCUP Central Distributor, by State**

State	ICD-9-CM Procedures	Core File CPT Variables	Charge Detail File CPT Records
Colorado	X	X	N/A
Florida	X	X	N/A
Kentucky	X	N/A	N/A
Maryland	N/A	X	X
Michigan	X	X	-
Nebraska	X	X	X
New Jersey	X	N/A	N/A
North Carolina	X	X	N/A
Wisconsin	X	X	N/A

For states that use both coding systems, the average number of ICD-9-CM codes is 1.1 compared with 1.9 CPT codes in the core file and 3.8 CPT codes in the charge detail file. Thus, there tend to be more CPT codes than ICD-9-CM codes, especially if the CPT codes are derived from the charge detail file.

Among states that employ both coding systems, Table B-2 shows the percentage of records that have 1) both CPT codes and ICD-9-CM codes, 2) only ICD-9-CM codes, and 3) only CPT codes. For example, in Colorado, 85 percent of the records employ both systems and 15 percent employ only the ICD-9-CM system.

**Table B-2: Percent of Records by Coding System, ICD-9-CM and CPT Available through the HCUP Central Distributor, by State, 2004 SASD, among all records**

State	Number of Records	Percent Both ICD-9-CM and CPT	Percent ICD-9-CM Only	Percent CPT Only
Colorado	392,752	84.53	15.19	0.21
Florida	2,747,497	34.54	0	65.46
Michigan	1,523,776	77.08	19.03	0.89
North Carolina	1,399,195	99.83	0.17	0
Nebraska	175,290	46.44	14.47	39
Wisconsin	835,034	19.38	80.62	0

From this point forward the comparisons between the ICD-9-CM and CPT coding systems are performed by comparing CCS categories. This approach is used because it is not possible to directly compare, or even unambiguously map codes, between the ICD-9-CM and CPT coding systems. The CCS categories serve as a bridge because the categories have the same meaning regardless of the coding system.

Table B-3 shows the percentage of CCS categories that match between the two systems among encounters that code procedures using both coding systems (dual coding). As an example, in Colorado 62 percent of the ICD CCS categories had matching CPT CCS categories on dually coded records. Conversely, 79 percent of the CPT CCS categories had matching ICD CCS categories on dually coded records. The numerator (number of matches) is the same for both coding systems. However, there are fewer CPT codes than ICD-9-CM codes. Therefore, the denominator (number of CPT CCS categories) is smaller, causing a higher match rate for CPT CCS categories compared with ICD CCS categories. This effect is particularly evident for Florida, where each record accommodates 15 CPT codes, but only one ICD-9-CM code.

These percentages indicate the extent to which the procedure information overlaps between the two coding systems. For example, Colorado and Nebraska both collect dual-coded data from their hospitals and show similar match rates between the two systems. In contrast, Florida mandates submission of only CPT codes. Consequently, there is often not a matching ICD-9-CM code for each CPT code.

**Table B-3: Percent of Records with Matching CCS Categories from Among All Records with Dual Coding Available through the HCUP Central Distributor, by State, 2004 SASD**

State	Percent of ICD CCS Matched	Percent of CPT CCS Matched
Colorado	62.26	77.47
Florida	83.57	13.58
Michigan	60.46	68.88
North Carolina	74.15	75.73
Nebraska	52.54	50.09
Wisconsin	14.52	79.08

To reiterate, among records that contain both types of codes, the number of codes differs between the two systems, especially when the CPT codes are derived from the charge detail file. Because no standards exist for the ordering of outpatient procedure codes, from this point forward, all of the comparisons between the ICD-9-CM system and the CPT system are based on the subset of encounters that contain exactly one CPT procedure code and one ICD-9-CM procedure code. This subset of records was selected to eliminate as much ambiguity as possible when comparing the consistency of procedure coding between the two systems. Although this simplification is necessary to allow direct comparisons of codes, the conclusions reached may not apply to observations where multiple ICD-9-CM and CPT codes appear on a record.

Table B-4 gives the rates of CCS matches among only those records that have a single ICD-9-CM code and a single CPT code. The CCS categories match when the ICD CCS category matches the CPT CCS category for that record.

Of the six states in Table B-4, two states (Colorado and Wisconsin) have match rates in excess of 80 percent, although all states have match rates exceeding 70 percent.

**Table B-4: Percent of Records with Matching CCS Categories from Among Records with a Single Procedure Code of Each Type Available through the HCUP Central Distributor, 2004 SASD**

State	Number of Records with a Single Procedure Code of Each Type	Percent Records with Matching CCS ICD-9-CM and CCS CPT
Colorado	185,691	80.66
Florida	245,558	78.9
Michigan	599,582	78.45
Nebraska	38,115	78.52
North Carolina	872,752	71.68
Wisconsin	101,685	81.68

The nature of the disagreements between the ICD-9-CM codes and the CPT codes on single-procedure records, were investigated further by comparing the CPT CCS categories that were paired with the 10 most frequent ICD CCS categories. For these analyses, data from the intramural SASD files was used in order to produce more robust estimates than those obtained from the subset of databases available through the HCUP Central Distributor.

For each of the top 10 ICD CCS groups, Table B-5 presents the top five CPT CCS groups that are paired with it. For example, the most common ICD CCS group was CCS 76: *colonoscopy and biopsy*. The same CPT CCS group, CCS 76, was paired with it 90 percent of the time. Other paired CPT CCS groups were *other bowel diagnostic procedures* (5.8 percent), *proctoscopy and anorectal biopsy* (3.9 percent), *upper gastrointestinal endoscopy* (under 1 percent), and *biopsy and pathology* (under 1 percent).

Of the 10 most frequent ICD CCS groups, seven were paired with the matching CPT CCS category over 90 percent of the time. This implies that despite the difficulty of directly translating between the two procedure coding systems, there is a strong agreement between the two systems based on the broader CCS classes.

The largest discrepancy occurred for ICD CCS category 95: *other non-OR lower GI therapeutic procedures*, which was paired with CPT CCS category 76: *colonoscopy and biopsy* 93 percent of the time. In addition, the ICD CCS category 214: *traction and splints, and other wound care*, was paired with the matching CPT CCS category only 49 percent of the time. The ICD CCS category 214 was also paired with the CPT CCS category 144: *treatment, facial fracture or dislocation* 44 percent of the time. Finally, the ICD CCS category 160: *other therapeutic procedures on muscles and tendons* was paired with the matching CPT CCS category 80 percent of the time.

**Table B-5: Pairing Between ICD CCS and CPT CCS Categories for Top 10 ICD-9-CM Categories, Records with a Single ICD-9-CM Code and a Single CPT Code Available through the HCUP Central Distributor, 2004 SASD**

ICD-CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
1	332,349	76	76: Colonoscopy and biopsy	1	76	76: Colonoscopy and biopsy	91.894
				2	92	92: Other bowel diagnostic procedures	4.803
				3	77	77: Proctoscopy and anorectal biopsy	2.983
				4	231	231: Other therapeutic procedures	0.194
				5	234	234: Pathology	0.074
				6	70	70: Upper gastrointestinal endoscopy, biopsy	0.022
				7	96	96: Other O.R. lower GI therapeutic procedures	0.007
				8	233	233: Laboratory - Chemistry and Hematology	0.007
				9	229	229: Nonoperative removal of foreign body	0.004
				10	232	232: Anesthesia	0.002
2	155,692	70	70: Upper gastrointestinal endoscopy, biopsy	1	70	70: Upper gastrointestinal endoscopy, biopsy	99.305
				2	76	76: Colonoscopy and biopsy	0.129
				3	71	71: Gastrostomy, temporary and permanent	0.127
				4	231	231: Other therapeutic procedures	0.088
				5	234	234: Pathology	0.084
				6	96	96: Other O.R. lower GI therapeutic procedures	0.057
				7	69	69: Esophageal dilatation	0.050
				8	94	94: Other O.R. upper GI therapeutic procedures	0.047
				9	82	82: Endoscopic cannulation of pancreas (ERCP)	0.024
				10	206	206: Microscopic examination (bacterial smear, culture, toxicology)	0.017
3	148,768	171	171: Suture of skin and subcutaneous tissue	1	171	171: Suture of skin and subcutaneous tissue	99.780
				2	175	175: Other O.R. therapeutic procedures on skin and breast	0.088
				3	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.051
				4	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.045
				5	214	214: Traction, splints, and other wound care	0.014
				6	168	168: Incision and drainage, skin and subcutaneous tissue	0.007
				7	231	231: Other therapeutic procedures	0.003

ICD-CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				8	170	170: Excision of skin lesion	0.002
				9	172	172: Skin graft	0.002
				10	169	169: Debridement of wound, infection or burn	0.001
4	145798	95	95: Other non-O.R. lower GI therapeutic procedures	1	76	76: Colonoscopy and biopsy	93.333
				2	77	77: Proctoscopy and anorectal biopsy	5.387
				3	96	96: Other O.R. lower GI therapeutic procedures	0.443
				4	234	234: Pathology	0.314
				5	231	231: Other therapeutic procedures	0.202
				6	70	70: Upper gastrointestinal endoscopy, biopsy	0.174
				7	95	95: Other non-O.R. lower GI therapeutic procedures	0.062
				8	186	186: Lower gastrointestinal X-ray	0.022
				9	170	170: Excision of skin lesion	0.017
				10	99	99: Other O.R. gastrointestinal therapeutic procedures	0.014
5	59311	214	214: Traction, splints, and other wound care	1	144	144: Treatment, facial fracture or dislocation	83.203
				2	214	214: Traction, splints, and other wound care	14.156
				3	148	148: Other fracture and dislocation procedure	2.180
				4	147	147: Treatment, fracture or dislocation of lower extremity (other than hip or femur)	0.200
				5	145	145: Treatment, fracture or dislocation of radius and ulna	0.182
				6	169	169: Debridement of wound, infection or burn	0.043
				7	146	146: Treatment, fracture or dislocation of hip and femur	0.014
				8	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.007
				9	174	174: Other non-O.R. therapeutic procedures on skin and breast	0.005
				10	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.004
6	54596	231	231: Other therapeutic procedures	1	231	231: Other therapeutic procedures	94.497
				2	156	156: Injections and aspirations of muscles, tendons, bursa, joints and soft tissue	1.958
				3	5	5: Insertion of catheter or spinal stimulator and injection into spinal canal	0.576
				4	63	63: Other non-O.R. therapeutic cardiovascular procedures	0.526
				5	54	54: Other vascular catheterization, not heart	0.333
				6	9	9: Other O.R. therapeutic nervous system procedures	0.325
				7	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	0.258

ICD-CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				8	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.247
				9	70	70: Upper gastrointestinal endoscopy, biopsy	0.212
				10	61	61: Other O.R. procedures on vessels other than head and neck	0.153
7	44886	160	160: Other therapeutic procedures on muscles and tendons	1	160	160: Other therapeutic procedures on muscles and tendons	80.201
				2	162	162: Other O.R. therapeutic procedures on joints	5.107
				3	169	169: Debridement of wound, infection or burn	3.574
				4	164	164: Other O.R. therapeutic procedures on musculoskeletal system	2.923
				5	170	170: Excision of skin lesion	2.810
				6	154	154: Arthroplasty other than hip or knee	1.798
				7	168	168: Incision and drainage, skin and subcutaneous tissue	0.856
				8	171	171: Suture of skin and subcutaneous tissue	0.787
				9	142	142: Partial excision bone	0.677
				10	150	150: Division of joint capsule, ligament or cartilage	0.446
8	42514	174	174: Other non-O.R. therapeutic procedures on skin and breast	1	174	174: Other non-O.R. therapeutic procedures on skin and breast	57.979
				2	168	168: Incision and drainage, skin and subcutaneous tissue	10.961
				3	175	175: Other O.R. therapeutic procedures on skin and breast	10.344
				4	170	170: Excision of skin lesion	9.165
				5	165	165: Breast biopsy and other diagnostic procedures on breast	7.070
				6	231	231: Other therapeutic procedures	1.400
				7	62	62: Other diagnostic cardiovascular procedures	1.221
				8	171	171: Suture of skin and subcutaneous tissue	0.410
				9	61	61: Other O.R. procedures on vessels other than head and neck	0.295
				10	173	173: Other diagnostic procedures on skin and subcutaneous tissue	0.263
9	41333	139	139: Fetal monitoring	1	139	139: Fetal monitoring	90.715
				2	137	137: Other procedures to assist delivery	8.142
				3	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.540
				4	206	206: Microscopic examination (bacterial smear, culture, toxicology)	0.426
				5	200	200: Nonoperative urinary system measurements	0.092
				6	197	197: Other diagnostic ultrasound	0.048
				7	233	233: Laboratory - Chemistry and Hematology	0.017

ICD-CCS				CPT-CCS			
Rank	N	CCS Group	Description	Rank of CPT Code	CCS Group	Description	Percent
				8	108	108: Indwelling catheter	0.007
				9	132	132: Other O.R. therapeutic procedures, female organs	0.002
				10	138	138: Diagnostic amniocentesis	0.002
10	39225	30	30: Tonsillectomy and/or adenoidectomy	1	30	30: Tonsillectomy and/or adenoidectomy	98.445
				2	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	0.956
				3	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.566
				4	27	27: Control of epistaxis	0.008
				5	234	234: Pathology	0.008
				6	200	200: Nonoperative urinary system measurements	0.005
				7	23	23: Myringotomy	0.003
				8	41	41: Other non-O.R. therapeutic procedures on respiratory system	0.003
				9	54	54: Other vascular catheterization, not heart	0.003
				10	76	76: Colonoscopy and biopsy	0.003



For each of the top 10 CPT CCS categories, Table B-6 presents the top five ICD-9-CM CCS categories that are paired with it. Once again this table includes only those records with a single ICD-9-CM code and a single CPT code. In Table B-6, seven of the top 10 CPT CCS classifications were paired with the same ICD-9-CM classification at least 90 percent of the time. For the remaining three categories, the CPT CCS category matched the ICD CCS category the majority of the time.

The top three CPT CCS categories shown in Table B-6 are the same as the top three ICD CCS categories shown in Table B-5. However, the fourth most frequent CPT CCS category, 169: *debridement of wound; infection or burn* was the tenth most common ICD CCS category in Table B-5. The fifth most frequent CPT CCS classification, 5: *Insertion of a catheter or spinal stimulator and injection into the spinal canal* was the seventh most common category on the list of ICD CCS categories.

**Table B-6: Pairing Between CPT CCS and ICD CCS Categories for Top 10 CPT Categories, Records with a Single ICD-9-CM Code and a Single CPT Code Available through the HCUP Central Distributor, 2004 SASD**

CPT-CCS				ICD-CCS			
Rank	N	Code	Description	Rank of CPT Code	Code	Description	Percent
1	471,003	76	76: Colonoscopy and biopsy	1	76	76: Colonoscopy and biopsy	67.893
				2	95	95: Other non-O.R. lower GI therapeutic procedures	30.908
				3	77	77: Proctoscopy and anorectal biopsy	0.917
				4	92	92: Other bowel diagnostic procedures	0.187
				5	70	70: Upper gastrointestinal endoscopy, biopsy	0.045
				6	96	96: Other O.R. lower GI therapeutic procedures	0.030
				7	231	231: Other therapeutic procedures	0.011
				8	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.002
				9	69	69: Esophageal dilatation	0.001
				10	79	79: Local excision of large intestine lesion (not endoscopic)	0.001
2	174,543	171	171: Suture of skin and subcutaneous tissue	1	171	171: Suture of skin and subcutaneous tissue	84.906
				2	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	6.351
				3	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	5.150
				4	28	28: Plastic procedures on nose	1.482
				5	26	26: Other therapeutic ear procedures	1.144
				6	175	175: Other O.R. therapeutic procedures on skin and breast	0.248
				7	160	160: Other therapeutic procedures on muscles and tendons	0.203
				8	132	132: Other O.R. therapeutic procedures, female organs	0.120
				9	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.117
				10	118	118: Other O.R. therapeutic procedures, male genital	0.083
3	169,662	70	70: Upper gastrointestinal endoscopy, biopsy	1	70	70: Upper gastrointestinal endoscopy, biopsy	98.061
				2	93	93: Other non-O.R. upper GI therapeutic procedures	1.408
				3	95	95: Other non-O.R. lower GI therapeutic procedures	0.161
				4	229	229: Nonoperative removal of foreign body	0.089
				5	231	231: Other therapeutic procedures	0.072
				6	92	92: Other bowel diagnostic procedures	0.065

CPT-CCS				ICD-CCS			
Rank	N	Code	Description	Rank of CPT Code	Code	Description	Percent
				7	76	76: Colonoscopy and biopsy	0.045
				8	94	94: Other O.R. upper GI therapeutic procedures	0.033
				9	97	97: Other gastrointestinal diagnostic procedures	0.009
				10	227	227: Other diagnostic procedures (interview, evaluation, consultation)	0.007
4	52,723	231	231: Other therapeutic procedures	1	231	231: Other therapeutic procedures	96.706
				2	76	76: Colonoscopy and biopsy	1.212
				3	174	174: Other non-O.R. therapeutic procedures on skin and breast	0.585
				4	95	95: Other non-O.R. lower GI therapeutic procedures	0.567
				5	70	70: Upper gastrointestinal endoscopy, biopsy	0.262
				6	156	156: Injections and aspirations of muscles, tendons, bursa, joints and soft tissue	0.240
				7	189	189: Contrast aortogram	0.104
				8	222	222: Blood transfusion	0.033
				9	61	61: Other O.R. procedures on vessels other than head and neck	0.031
				10	228	228: Prophylactic vaccinations and inoculations	0.031
5	50,431	144	144: Treatment, facial fracture or dislocation	1	214	214: Traction, splints, and other wound care	92.821
				2	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	4.632
				3	144	144: Treatment, facial fracture or dislocation	1.755
				4	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.746
				5	9	9: Other O.R. therapeutic nervous system procedures	0.028
				6	164	164: Other O.R. therapeutic procedures on musculoskeletal system	0.014
				7	148	148: Other fracture and dislocation procedure	0.002
				8	163	163: Other non-O.R. therapeutic procedures on musculoskeletal system	0.002
6	50,376	170	170: Excision of skin lesion	1	170	170: Excision of skin lesion	64.899
				2	166	166: Lumpectomy, quadrantectomy of breast	16.082
				3	174	174: Other non-O.R. therapeutic procedures on skin and breast	4.409
				4	160	160: Other therapeutic procedures on muscles and tendons	2.794
				5	26	26: Other therapeutic ear procedures	2.167
				6	132	132: Other O.R. therapeutic procedures, female organs	2.070
				7	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	1.757
				8	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	1.671

CPT-CCS				ICD-CCS			
Rank	N	Code	Description	Rank of CPT Code	Code	Description	Percent
				9	32	32: Other non-O.R. therapeutic procedures on nose, mouth and pharynx	1.434
				10	96	96: Other O.R. lower GI therapeutic procedures	0.917
7	43,349	169	169: Debridement of wound, infection or burn	1	169	169: Debridement of wound, infection or burn	92.149
				2	160	160: Other therapeutic procedures on muscles and tendons	4.082
				3	142	142: Partial excision bone	1.512
				4	164	164: Other O.R. therapeutic procedures on musculoskeletal system	0.893
				5	148	148: Other fracture and dislocation procedure	0.280
				6	26	26: Other therapeutic ear procedures	0.206
				7	19	19: Other therapeutic procedures on eyelids, conjunctiva, cornea	0.165
				8	166	166: Lumpectomy, quadrantectomy of breast	0.127
				9	172	172: Skin graft	0.122
				10	147	147: Treatment, fracture or dislocation of lower extremity (other than hip or femur)	0.092
8	42,902	30	30: Tonsillectomy and/or adenoidectomy	1	30	30: Tonsillectomy and/or adenoidectomy	99.917
				2	33	33: Other O.R. therapeutic procedures on nose, mouth and pharynx	0.078
				3	231	231: Other therapeutic procedures	0.005
9	41,175	160	160: Other therapeutic procedures on muscles and tendons	1	160	160: Other therapeutic procedures on muscles and tendons	94.979
				2	162	162: Other O.R. therapeutic procedures on joints	3.137
				3	99	99: Other O.R. gastrointestinal therapeutic procedures	0.776
				4	42	42: Other O.R. therapeutic procedures on respiratory system	0.351
				5	150	150: Division of joint capsule, ligament or cartilage	0.195
				6	161	161: Other O.R. therapeutic procedures on bone	0.158
				7	143	143: Bunionectomy or repair of toe deformities	0.087
				8	6	6: Decompression peripheral nerve	0.066
				9	170	170: Excision of skin lesion	0.063
				10	154	154: Arthroplasty other than hip or knee	0.040
10	40,413	139	139: Fetal monitoring	1	139	139: Fetal monitoring	99.947
				2	231	231: Other therapeutic procedures	0.027
				3	137	137: Other procedures to assist delivery	0.005
				4	141	141: Other therapeutic obstetrical procedures	0.005

CPT-CCS				ICD-CCS			
Rank	N	Code	Description	Rank of CPT Code	Code	Description	Percent
				5	110	110: Other diagnostic procedures of urinary tract	0.003
				6	131	131: Other non-O.R. therapeutic procedures, female organs	0.003
				7	138	138: Diagnostic amniocentesis	0.003
				8	146	146: Treatment, fracture or dislocation of hip and femur	0.003
				9	161	161: Other O.R. therapeutic procedures on bone	0.003
				10	197	197: Other diagnostic ultrasound	0.003

## Summary

All but one of the states in the SASD-CD use ICD-9-CM procedure codes. Most states employ both ICD-9-CM and CPT codes, and one state—Maryland—uses only CPT codes. Among states that employ both coding systems, varying levels of agreement exist between the two. CPT codes may be supplied in the core file or in the charge detail file. The number of CPT codes averages higher than the number of ICD-9-CM codes. Also, the number of CPT codes in the charge detail file averages higher than the number of CPT codes in the core file.

Among records with a single ICD-9-CM code and a single CPT code, there tends to be a high level of agreement between the CCS categories generated by the two coding systems. However, there are subtle differences between the two systems that result in slightly different classifications for some procedures using the two types of codes. Consequently, analysts should exercise care when combining SASD data across states that use different procedure coding systems.