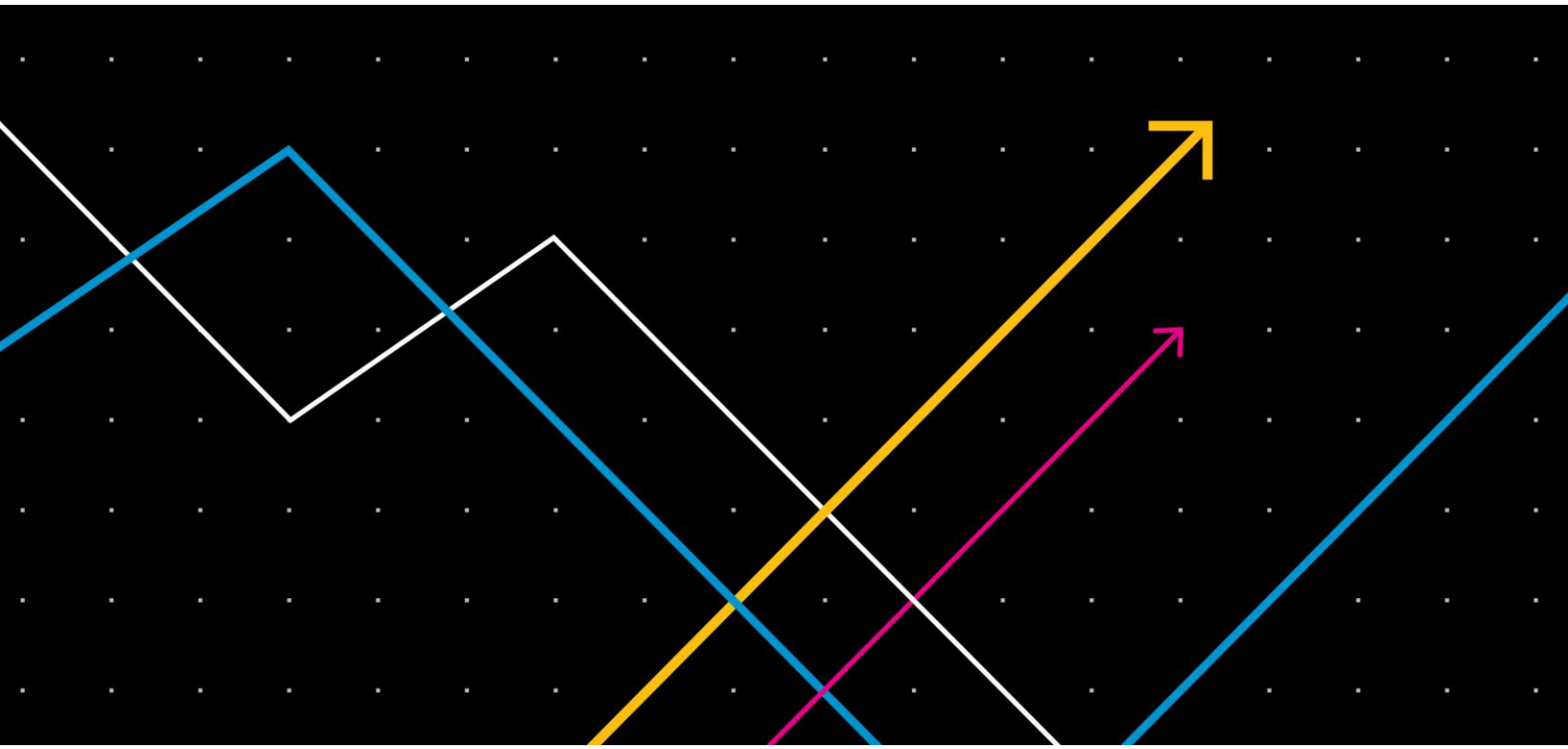

RESEARCH REPORT

Development and Structure of BETOS 2.0 with Illustrative Data

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We would like to express our gratitude to Divvy Upadhyay, Will Narracci, and Michelle McCrea for their indispensable support in working through the details of more than 10,000 codes in revising the BETOS taxonomy. We also would like to thank Roslyn Murray who contributed both extensive statistical analysis and programming and who supported the drafting of the data analysis.

Preface

This report represents a composite of two reports developed for the Medicare Payment Advisory Commission (MedPAC), the first in 2017 and the second in 2019. The work to develop a major reconfiguration of the Berenson-Eggers Type of Service (BETOS) classification addressed problems that developed over 30 years in the original BETOS (BETOS 1.0), used to classify service codes in the Medicare physician fee schedule (MPFS). Though staff from the Centers for Medicare & Medicaid Services (CMS) had done a conscientious job of updating BETOS coding for new and revised codes, they had never performed a more fundamental review to determine whether the structure and assumptions that comprised BETOS 1.0 had become outmoded. This report explains both the problems that emerged over three decades and how they were resolved in the reconfigured classification, BETOS 2.0.

MedPAC staff and we had expected that CMS would accept the 2.0 revision and be willing to maintain it while also providing public access to the code file on its website, as it had long done for BETOS 1.0. However, CMS decided to expand consideration of the revised fee schedule–based BETOS to include how other Part B services, including drugs and durable medical equipment, would be classified as part of a comprehensive classification. CMS wants to expand the classification to include all Part B services. That review is taking place now and will likely be completed in the near future. It is likely, though not confirmed, that BETOS 2.0 for the MPFS will be retained as a core of the broader classification (likely with a name change), albeit with some marginal changes.

The original 2017 MedPAC report, included in this report, based the 2.0 restructuring on codes in use through 2017. In that same report, the MPFS spending distribution was for 2015. In the second 2019 MedPAC report, we updated the taxonomy for new and revised codes through 2019 and provided a spending distribution for 2017. In this report, we explain the work we performed using the 2015 spending data and 2017 codes but have updated the tables using 2017 data and 2019 codes. Two more years have passed since this work was completed; we have not assigned new and revised codes for 2020 into BETOS categories. Users should have little trouble assigning high spending codes into their appropriate categories and subcategories to update the system.

In addition to explaining BETOS restructuring, we illustrate its use by using the revised classification to analyze spending in the Medicare physician fee schedule.

Acronyms

AMA	American Medical Association
BETOS	Berenson-Eggers Type of Service classification system
BETOS 1.0	Previous versions of BETOS
BETOS 2.0	Revised version of BETOS
CCS	Clinical Classifications Software
CMS	Centers for Medicare & Medicaid Services
CPT	Current Procedural Terminology
EM	Evaluation and Management broad category
HCPCS	Healthcare Common Procedure Coding System
HCUP	Healthcare Cost and Utilization Project
MedPAC	Medicare Payment Advisory Commission
PFS	Medicare physician fee schedule
PSPS	Physician Supplier Procedure Summary
RBRVS	Resource-Based Relative Value Scale
RUC	AMA Relative Value Scale Update Committee
RVS	Relative value scale
RVU	Relative value unit

Development and Structure of BETOS 2.0 with Illustrative Data

BETOS 2.0 Revision

Background

The Berenson-Eggers Type of Service (BETOS) classification system, developed to facilitate analysis of spending under the Medicare Physician Fee Schedule (PFS), has been widely used since its formulation by the Urban Institute on contract with the Centers for Medicare & Medicaid Services (CMS) in the late 1980s (Berenson and Holahan 1992). Over the years, CMS (1) expanded the original BETOS to include additional Part B services; (2) expanded the number of clinically based service categories; (3) annually modified the BETOS file; and (4) provided annual crosswalks to account for new, revised, and deleted Healthcare Common Procedure Coding System (HCPCS) codes. We refer to the CMS version of BETOS as BETOS 1.0.

The Medicare Payment Advisory Commission (MedPAC) has for many years used BETOS 1.0 to analyze Medicare PFS trends in service use. This analysis provided an annual summary of volume by major categories and documented trends within the broad categories of Evaluation and Management, Major Procedures, Other Procedures, Imaging, and Tests. MedPAC also analyzed some of the higher-spending BETOS subcategories, focusing on changes in units of service and volume per beneficiary (MedPAC 2017). Maintenance and updating of the BETOS categories, however, became increasingly burdensome for CMS over time and, effective January 2016, CMS temporarily stopped updating the BETOS file; thus, BETOS could not be used to analyze PFS spending after 2015 until it decided to resume updating BETOS in 2017. CMS is currently undertaking a comprehensive review of BETOS with the objective of expanding it to include most Part B services, including spending in the outpatient prospective payment system and to "modernize" the structure of the entire BETOS coding, using this BETOS 2.0 as a model.

Preparation for this BETOS revision effort included a literature review that confirmed the value of the BETOS taxonomy as an analytic and research tool. Despite its broad use, however, there was growing concern that BETOS 1.0 had become outdated during the almost 30 years since its original formulation. The original BETOS that was developed by the Urban Institute was based largely on judgment and consultation with physicians. BETOS 1.0 needed updating to address codes that have

become irrelevant or inaccurate over time and to reflect current and evolving trends in physician services.

A review performed for MedPAC in 2008–09 noted the following limitations of BETOS (MedPAC 2011):

- Spending allocations seemed accurate to within one or two percentage points at the broad category level, but subcategory allocations were often misleading because the taxonomy at the subcategory level was flawed.
- Many of the subcategories, especially in the broad category of Procedures, had lost their salience, and new, likely high-spending subcategories were not identified. Many of the Procedural subcategories were not considered clinically meaningful, complicating their aggregation into the Major and Other Procedure categories.
- Concerns about the accuracy and usefulness of BETOS 1.0 mostly reflected the need for revision of the taxonomy, rather than misassignment of HCPCS codes to BETOS subcategories; this indicates that CMS maintained BETOS 1.0 conscientiously.
- Nevertheless, there were assignment errors because of the lack of clear assignment rules when the HCPCS code description itself permitted assignment to multiple locations in the taxonomy.
- A thorough review and major revision of the BETOS 1.0 structure and taxonomy was needed.

The increasing irrelevance of BETOS subcategories is evident in published data and was a cause for concern for the American Medical Association (AMA). The published Medicare Part B Physician/Supplier Data by BETOS CY 2015 report[1] showed that spending in many subcategories was so small (e.g., less than 0.01 percent of total allowed charges) as to make those subcategories obsolete, and that disproportionately high spending occurred in "other" and "miscellaneous" categories. In recent years, the AMA RVS Update Committee (RUC), which had been asked by CMS to provide technical assistance on individual BETOS code assignments, expressed concerns to CMS about BETOS classification inaccuracies.

The BETOS structure had become frozen in time, at best reflecting patterns of clinical activity and spending in the 1980s, but without any built-in or automatic process for reflecting changes in clinical activity and spending. In addition, BETOS 1.0 was based on outdated spending considerations and did not contain subcategories that reflect current policy interests. For example, BETOS 1.0 lists M6—Consultations, even though CMS no longer recognizes consultation codes for payment, and it fails to

reflect important policy initiatives, such as annual wellness visits and chronic care management codes, which could become subcategories tracked to assess their impact.

Based on these concerns and CMS's decision to discontinue maintenance of the BETOS file, MedPAC contracted with the Urban Institute to review and restructure the BETOS 1.0 taxonomy. MedPAC's specific objectives were to create a BETOS 2.0 that

- consists of readily understood clinical categories,
- uses categories that permit objective assignment of HCPCS codes,
- is stable over time,
- is relatively unaffected by minor changes in technology or practice patterns, and
- can be used with BETOS 1.0 for trend analysis.

In addition, MedPAC asked the Urban Institute to address specific problems in the current BETOS system: the broad categories contain errors in service assignment, the subcategories need to be reviewed because of changes in medical care, new subcategories may be needed for rapidly growing services, and clear criteria must be established to distinguish between Major procedures and Other procedures.

The BETOS redesign discussed in this document (BETOS 2.0) was created to analyze spending under the PFS, not all Part B services. The PFS consists primarily of the Current Procedural Terminology (CPT) HCPCS Level 1 codes, but also includes some HCPCS Level 2 codes.

BETOS 2.0 Development Process

BETOS Revision Team

The BETOS revision was guided by (1) the project's Principal Investigator, Robert Berenson, MD; (2) Braid-Forbes Health Research, a subcontractor with CMS payment policy and claims data experience; and (3) a technical expert panel. While still in clinical practice, Dr. Berenson was one of the architects of the original BETOS taxonomy and the author of the 2008–09 memo to MedPAC. He currently is a Fellow at the Urban Institute and Principal Investigator of this BETOS revision project. Thus, he came to the project forearmed with a thorough understanding of the problems in the taxonomy, misclassification areas, and ambiguous classification rules. To provide the data to guide the

restructuring and assignment of HCPCS codes to the appropriate new BETOS codes, the Urban Institute subcontracted with Mary Jo Braid-Forbes, MPH, president of Braid-Forbes Health Research. Braid-Forbes Health Research has modeled Medicare payment methodologies for inpatient/outpatient hospital and physician practice expenses and has extensive experience working with CMS data.

To construct a comprehensive view of the issues surrounding the BETOS revision, the Principal Investigator formed a technical expert panel composed of people with a range of professional expertise and specialty perspectives:

- Robert Berenson (chair): internist; institute fellow, the Urban Institute; former senior official, CMS
- Thomas Ault: former principal, Health Policy Alternatives; former senior official, CMS
- Julie Bynum: internist; associate professor, Dartmouth Institute for Health Policy and Clinical Practice
- David Levin: radiologist; professor and chairman emeritus of the department of radiology, Thomas Jefferson University Hospital
- John O'Shea: general surgeon; senior fellow in the Center for Health Policy Studies at the Heritage Foundation in Washington, DC; former senior health policy advisor to the US House Committee on Energy and Commerce
- William Rich: ophthalmologist; outgoing president of the American Academy of Ophthalmologists; former chair of the Relative Value Update Committee
- Paul Rudolf: internist; partner, Arnold and Porter; former senior medical officer, CMS
- Ken Simon: vascular surgeon; accreditation and credentialing surveyor for the Joint Commission; former senior medical officer, CMS
- Kevin Hayes (ex officio): former principal policy analyst, Medicare Payment Advisory Commission
- Ariel Winter (ex officio): principal policy analyst and project officer, Medicare Payment Advisory Commission
- Ryan Howe (ex officio): director of practitioner services, hospital and ambulatory policy group, CMS
- Karen Nakano (ex officio): medical officer, CMS
- Songhai Barclift (ex officio): medical officer, CMS

Preliminary Work

Before embarking on the revision effort, the technical expert panel explored whether an alternative taxonomy could satisfactorily substitute for BETOS. The Healthcare Cost and Utilization Project (HCUP) produced a classification tool called Clinical Classifications Software for Services and Procedures (CCS–Services and Procedures).[2] The CCS–Services and Procedures collapses more than 9,000 HCPCS Level I CPT codes and 6,000 Level II HCPCS codes into 244 clinically meaningful categories. However, CCS–Services and Procedures was not considered a viable substitute because it does not (1) take spending into account in its clinical categories; (2) arrange its 244 categories into broad categories, which MedPAC and many other researchers use BETOS for; (3) sort procedures into Major and Other categories; or (4) identify "families" of codes that are variations of the same service, which provides useful information that cannot be gleaned by analyzing spending on broader service categories. In short, BETOS fills a gap that no other taxonomy is suited to fill.

Refocused on revising BETOS, the panel agreed that it was necessary to retain and refine the established broad categories, affirmed the concept of families (discussed below) with identification based on a spending threshold, and provided advice on differentiating Major from Other procedures. The panel also affirmed that many of the BETOS 1.0 subcategories were no longer relevant and that too much spending was subcategorized as "other," and strongly recommended that more relevant subcategories be created. Next, the project team and the technical expert panel identified strengths and weaknesses to kick off the BETOS revision effort (table 1).

TABLE 1

Initial Assessment of BETOS 1.0 Strengths and Weaknesses for Use in Revision Strategy

Strengths	Weaknesses
▪ BETOS is the only classification system that provides a catalog of spending for about 9,000 current HCPCS Level I CPT codes and nearly 200 HCPCS level II codes recognized for payment under the PFS. It sorts individual codes into clinically meaningful types of service categories. ▪ BETOS is the only coding system with clinically meaningful categories that permit analysis of spending patterns. BETOS enables users to break down different types of services, which MedPAC has found useful for both long- and short-term analysis. ▪ BETOS has been widely used in research and policy analysis for many years and is the standard tool for analyzing Medicare physician spending by type of service. Users consider the broad categories of Evaluation and Management, Procedures, Imaging, and Tests and the differentiation of Major and non-Major procedures useful and unique to BETOS.	▪ Many of the subcategories are no longer clinically meaningful and defy reliable categorization. ▪ BETOS 1.0 lacks a consistent approach to grouping services. Some of the code groupings contain a narrow group of codes that essentially are the same service with small variations; others contain broad sets of services that have a common element, such as the same organ system for procedures or the same technical modality for imaging, but are very different services (as reflected in their code definitions). The different kinds of subcategories are mixed without inherent logic. ▪ BETOS 1.0 subcategories were developed over 30 years ago and do not reflect current clinical practice. Thus, prominent service categories responsible for significant and rising PFS spending are not identified in BETOS 1.0. ▪ The lack of objective criteria and assignment rules often results in misassignment of codes and make it unclear which broad category a HCPCS code should be assigned to (e.g., a single HCPCS code may describe both a procedure and the work involved in producing an image for interpretation).

Source: MedPAC, "Physician and Other Health Professional Services," chap. 4 in *Report to the Congress: Medicare Payment Policy* (Washington, DC: MedPAC, 2017), 112–13.

Data Sources

BETOS 2.0 development was supported by data sources including (1) the 2015 Physician Supplier Procedure Summary (PSPS) file, which includes specialty and place of service; (2) physician work components with associated time estimates from the 2017 final physician payment rule files; (3) total and work RVUs per HCPCS code; (4) the CPT manual, HCPCS Level I; and (5) the AMA's online resource-based relative value scale (RBRVS) data manager (RUC database), which provides information about most HCPCS codes, including clinical descriptions and vignettes.

Objectives

BETOS redesign was guided by the following objectives:

- Develop a revised BETOS structure and taxonomy for analysis of PFS spending.
- Use spending from the most recent available CMS claims data file as a primary source for creating named subcategories of like services, ensuring that most subcategories remain stable over time (i.e., reflecting substantial spending).
- Assign each HCPCS code to a single BETOS code, with clear decision rules to guide the assignment.
- Maintain the current broad categories, with the one exception of distinguishing Procedures and Treatments. In BETOS 1.0, treatments extending over time, such as renal dialysis, are categorized as Procedures. Treatments become a separate, broad category.
- Identify subcategories that are clinically meaningful and reflect current spending and reduce the amount of spending in "other" or "miscellaneous" subcategories.
- Use objective and stable data for assigning services to broad categories and subcategories and into Major and Other procedures.
- Account for all PFS spending and present it clearly in tabulations under appropriate categories and subcategories.
- Identify and track subcategories for services that primarily reflect substantial spending but can also track services reflecting policy interests.
- Identify and correct current errors in the assignment of HCPCS codes to BETOS categories, and alter other code assignments based on clarified definitions and assignment rules.
- Establish a crosswalk from BETOS 1.0 to BETOS 2.0 (using 2011–2017 HCPCS codes) to permit continuity in MedPAC's trend analysis.
- Maintain a similar distribution of spending across the Major procedures subcategory and the Other procedures subcategory in BETOS 2.0 and BETOS 1.0. This would support consistency between the two versions of BETOS.

Structural Redesign

The structural redesign resulted in a BETOS 2.0 code with five digits representing four levels. These mutually exclusive broad categories and subcategories enhance the value of BETOS, ensuring that each HCPCS code is assigned to a single location in the taxonomy. Design considerations at each level are discussed below.

FIGURE 1

BETOS 2.0 Five-Digit Structure

Digit 1	Digit 2	Digit 3	Digit 4	Digit 5
Broad category	Subcategory	First digit of family code	Second digit of family code	Procedure classification

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

BROAD CATEGORIES (DIGIT 1)

The first digit of the BETOS 2.0 taxonomy represents the broad category of service and is similar to the broad categories in BETOS 1.0.

Assigning codes to one broad category presented some challenges in developing a coherent taxonomy in which all HCPCS codes can be reliably assigned to a single location. CPT HCPCS Level I provides a code description of the activity to which each code is applied, sometimes involving mixed modalities or types of services. For example, (1) procedures often include activities that, if separately coded, would be considered Evaluation and Management (EM) services; (2) certain procedures may require imaging services; and (3) a procedure may be performed to facilitate performance of a test rather than to produce a specific therapeutic outcome.

The concept of broad categories persisted into BETOS 2.0, with the following modifications:

- Changing Anesthesia from a subcategory of Procedures to its own broad category.
- Splitting the BETOS 1.0 broad category of Procedures into two different broad categories—Procedures and Treatments. Procedures refer to surgical or other interventions occurring at a single time and place, and Treatments refer to interventions that typically extend over time (e.g., dialysis and radiation therapy).
- Providing decision rules to support assignment into the broad categories.
- Resolving the dilemma of multiple possible broad category assignments by basing the assignment on the primary purpose of the intervention. This decision is made by considering whether the code is essential to permit initiation or continuation of the intervention or it

could be viewed as a stand-alone service. For dialysis, radiation oncology, and rehabilitative therapies, for example, the specific codes that describe cognitive activities are essential and intrinsic to the treatment and therefore should be considered part of the broad category of Treatment, not EM.

FIGURE 2

BETOS 2.0 Broad Categories (Digit 1)

E	P	R	I	T	A
Evaluation and management (EM)	Procedure	Treatment	Imaging	Test	Anesthesia

Source: Robert A. Berenson and Mary Jo Braid-Forbes

SUBCATEGORIES (DIGIT 2)

The second digit describes the subcategory within the broad category. The first and second digit together are a unique code. We identified the following problems in BETOS 1.0 subcategories:

- The distinction between "ambulatory" procedures (typically performed in an ambulatory surgical center) and "minor" procedures (able to be performed in an office setting) were not viewed as meaningful, were subject to rapid change, and lacked clear, reliable distinctions for making consistent code assignments.
- The subcategory of "endoscopic" procedures is not useful and includes dissimilar services. When BETOS was first introduced, endoscopic procedures were relatively new and infrequent, but today endoscopic surgical and nonsurgical procedures are ubiquitous, such that the use of an endoscope is no longer a useful attribute for distinguishing between services.
- Under Imaging, the original BETOS designation of "advanced imaging" is no longer meaningful. The advanced imaging concept was adopted when computed tomography (CT) and magnetic resonance (MR) were relatively new. Now there is no commonly accepted use of the term "advanced imaging."
- The broad category of Tests includes some subcategories unrelated to spending and needs to be reconsidered. This category is challenging because MedPAC is interested in tests that involve physician work and are not otherwise payable under the clinical laboratory fee schedule, but CMS does not make this distinction in BETOS 1.0.

As in BETOS 1.0, the distinct clinical attributes of the broad categories were the basis for the stable subcategories in BETOS 2.0. However, substantial changes were made to some of the subcategories to better reflect current clinical practice (table 2).

TABLE 2

Subcategory Change Decisions Reflected in BETOS 2.0

Broad category	Subcategory change decisions
Evaluation and management (EM)	▪ Subcategory distinctions remain based primarily on place of service. ▪ Most EM spending is in "visits," with substantial variation by place of service. ▪ Certain EM activities described by HCPCS codes specific to a clinical domain (e.g., ophthalmology and behavioral health) were retained. ▪ Recent policy interest in new EM activities that do not require in-person patient encounters and are being recognized for PFS payments gave rise to a subcategory for care coordination/management activities. As such codes increase in number, they may need to be grouped into subcategories and families in the future.
Procedures and Treatment	▪ Neither technical modality (e.g., endoscopy) nor service location (e.g., office, ambulatory surgical center) were deemed clinically important distinctions for creating subcategories. ▪ In BETOS 1.0, some subcategories were based on organ system, largely consistent with CPT, but others were not. For BETOS 2.0, organ system became the sole basis for subcategories for Procedures, and type of treatment became the basis for Treatment subcategories. ▪ Procedure subcategories identify specific organ systems whose component codes generated more than $1 billion in spending (a little more than 1 percent of total allowed PFS charges); codes for services in lower-spending organ systems are combined into an "other" subcategory. ▪ The CPT numbering system is useful for placing sets of codes into the appropriate organ system. We follow the CPT classification with some exceptions to reflect that some services can be assigned to more than one organ system; for example, procedures on the spine reasonably can be considered either musculoskeletal or central nervous system.
Imaging	▪ The current BETOS 1.0 Imaging subcategories continue to effectively present the different imaging modalities. ▪ The concept of "advanced" imaging is no longer meaningful and will be dropped.
Tests	▪ A combination of clinical domain and spending thresholds was used to create the subcategories. ▪ BETOS 2.0 has more subcategories relevant to the PFS than BETOS 1.0 did. BETOS 2.0 identifies anatomic pathology and physician-fee-schedule-based clinical laboratory as a prominent subcategory but does not include laboratory tests without physician work and paid under the clinical laboratory fee schedule.
Anesthesia	▪ Spending was not analyzed inside this broad category, and no subcategory or family designations were created.

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Given the BETOS taxonomy's dependence on CPT coding, the CPT structure and organization of surgical procedures largely determined which codes should be assigned to which organ system subcategories in the broad category of Procedures in BETOS 2.0. A summary guide to the CPT basis for assigning codes to organ system–based subcategories is given in table 3. Table 4 provides the identified broad categories and subcategories created.

TABLE 3

Use of CPT Codes in Determining Procedure Subcategories

Procedure subcategory	CPT codes
PC—Cardiovascular	33010–33999
PV—Vascular	34001–37799
PG—Digestive/gastrointestinal	41000–49999
PM—Musculoskeletal	Spine and peripheral nervous system: 20005–29999 (except 22900–22905) Spine and spinal cord: 62263–63746 Extracranial, peripheral, and autonomic nerves: 64000–64999
PS—Skin	10030–17999 Lips 40490–40799
PE—Eye and ocular adnexa	65091–68899
PO—Other organ systems	General: 10021–10022 Breast: 19000–19499 Abdomen wall: 22900–22905 Hemic and lymphatic: 38100–39561 Urinary: 50010–53899 Male genital: 54000–55899 Female genital: 56405–58999 Central nervous system; skull, meninges, brain: 61000–62258 Auditory: 69000–69979

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

TABLE 4

BETOS 2.0 Broad Categories and Subcategories (Digits 1 and 2)

E Evaluation and management	P Procedure	R Treatment	I Imaging	T Test	A Anesthesia
EV—Office/outpatient services EI—Hospital inpatient services ER—Emergency department services EO—Observation care services EC—Critical care services EN—Nursing facility services EH—Home services EE—Ophthalmological services EB—Behavioral health services EM—Care management/coordination EX—Miscellaneous	PC—Cardiovascular PV—Vascular PG—Digestive/gastrointestinal PM—Musculoskeletal PS—Skin PE—Eye PO—Other organ systems	RR—Radiation oncology RH—Chemotherapy RD—Dialysis RT—Physical, occupational, and speech therapy RB—Chiropractic RI—Injections and infusions (nononcologic) RX—Miscellaneous	IC—CT IM—MR IU—Ultrasound IS—Standard X-ray IN—Nuclear IX—Miscellaneous	TA—Anatomic pathology TC—Cardiography TP—Pulmonary function TN—Neurologic TX—Miscellaneous	No subcategories

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

FAMILIES (DIGITS 3 AND 4)

The third and fourth digit are numerical and identify closely related codes that describe one type of service. They represent families of similar but not identical services, represented by more than one code. Although the codes that make up the subcategories represented by digits 1 and 2 are in the same clinical area (organ system in the case of procedures, place of service in the case of evaluation and management, and technical modality in the case of imaging), the subcategories represented by digits 3 and 4 represent the same basic service, with variations that often produce contiguous HCPCS codes.

For example, in 2015, 19 different colonoscopy codes produced nearly $710 million in spending; the highest spending code was responsible for only $246 million, but six different codes had individual spending of only $25 million. In BETOS 2.0, all 19 codes would be considered part of a family of similar codes to give a more accurate and useful identification of high-spending services. Many such examples demonstrate the value of analyzing spending at the family rather than the individual code level.

Families must be reviewed annually because of changes to HCPCS codes and current spending, but subcategories are based on clinical factors and substantial spending, are stable, and do not need to be revised every year.

Although families were part of the BETOS 1.0 structure, updates were not systematic and did not reflect how spending changed over time. The families identified in BETOS 2.0 are more formally and consistently developed, leveraging data sources such as placement in the CPT code book and Medicare claims data (i.e., whether codes were indented below a primary code, had similar levels of work RVUs or fixed increments of work RVUs to reflect quantity or duration of the work, and had similar distributions of place of service). In some cases, the RUC descriptions for similar services were reviewed to determine whether they reflected the same basic work with only minor variations. Clinician judgment was solicited in the few cases in which assignment of a code to a family required service expert knowledge.

Families of like codes were created primarily to provide an alternative to code-based analysis of services that represent substantial PFS spending. We relied on precedents that MedPAC had established to serve as a spending threshold for identification of named families. The March 2017 MedPAC Report to Congress, which used BETOS 1.0 to analyze PFS spending, presented BETOS subcategories of HCPCS codes that together produced at least 0.2 percent of PFS spending in some broad categories (MedPAC 2017). (In our analysis, 0.2 percent is approximately $180 million.) Using

this 0.2 percent threshold to identify eligible families for explicit designation, we reviewed the top 512 codes in 2015 that represented 90 percent of PFS spending. The 512th code was responsible for about $17 million in spending, or less than 10 percent of the amount needed to constitute a reported family subcategory. We then created families for these 512 codes, including as named families in BETOS 2.0 only those that exceeded the $180 million spending threshold. We did not attempt to create families of similar codes for all HCPCS codes; we only did so for families that could potentially exceed the 0.2 percent spending threshold to be identified in BETOS 2.0.[3] HCPCS codes within low-spending families continued to be assigned at the individual code level. Maintainers of BETOS 2.0 can modify the spending threshold to suit their needs and vary it across the broad categories, as MedPAC does.

Maintainers of BETOS 2.0 can modify the spending threshold to suit their needs and vary it across the broad categories, as MedPAC does.

PROCEDURAL CLASSIFICATION: MAJOR OR OTHER (DIGIT 5)

An early focus of the BETOS revision work was reliably distinguishing between Major and Other (non-Major) Procedures. This meaningful distinction is documented in the MedPAC 2017 Report to Congress, which shows significantly different rates of growth for Major and Other Procedures since 2000 (MedPAC 2017). Users of BETOS 1.0 were able to convert the more numerous subcategories (e.g., major, ambulatory, minor, endoscopic) into Major and Other; they found that distinction useful and clinically meaningful even if, at a code level, the assignment of procedures into one or another category can be controversial. In BETOS 2.0, the Major and Other distinction is reserved for Procedures and not extended to Treatments. Consistent with our treatment of families of like codes, all codes within a family are assigned together into the appropriate Major or Other Procedure designation, even if an individual code would have been assigned differently based on its own characteristics.

The challenge was to develop clear-cut, objective criteria upon which to base a simple algorithm for assigning 5,766 applicable procedures to Major/Other classifications. The technical expert panel discussed whether there were classification systems in use that differentiated between procedures along Major/Other lines. No such systems were identified.

We considered the following criteria: (1) global periods, (2) time, (3) work descriptions, (4) place of service, and (5) work RVUs. In appendix A, we describe why we adopted the threshold of work RVUs as the primary criterion and the threshold of inpatient place of service as a secondary criterion as the basis for a formal algorithm that determines whether a procedure is Major or Other. In brief, work RVUs capture a composite measure of time and intensity of physician effort, are relatively stable, and were the only data element readily available for virtually all HCPCS codes in the PFS. A single work RVU threshold independent of place of service became the primary criterion used to differentiate Major and Other procedures. Based on clinical judgment supported by the technical expert panel, we concluded that as a secondary criterion, a lower threshold of work RVUs could support a Major Procedure designation if a significant percentage of the procedures was inpatient place of service, as summarized in the Medicare physician claims summary file.

The algorithm was defined as follows. To classify a procedure as Major, the code met one of the following criteria:

- Work RVU > 9.0
- Work RVU > 5.5 and performed in the inpatient hospital setting at or above 15 percent of the time

Families, by definition, contain multiple HCPCS codes considered variations of a unique service. As such, all codes in a single family were assigned to the same Major or Other category. We assigned all codes within a family to Major or Other based on the assignment of the highest-spending code within the family using the standard algorithm.

ADD-ON CODES

The CPT coding system contains almost 500 “add-on” codes, which are not billed as stand-alone services but are submitted with the primary codes to which they apply. Add-on codes may (1) indicate additional intraservice work of the same type as a primary procedure (e.g., an additional lesion removed, an additional vertebral segment repaired); or (2) describe activities made possible by the primary procedure but of a different type (e.g., imaging or a test made possible because an invasive procedure has permitted access for the additional service).

Each add-on code was reviewed to judge the type of service it represents. Because add-on codes do not account for substantial spending, their misassignment would not have much effect on broad category and subcategory spending calculations.

Using work RVUs as the primary criterion for differentiating Major from Other procedures presents an operational problem for correctly cataloging procedure-based add-on codes. Add on codes associated with a Major primary procedure typically have work RVUs below the threshold that would normally place them into the Major category. However, as an add-on code representing work similar to the primary procedure, they should be considered Major. To accomplish this, we linked add-on codes to their primary procedure when relevant and assigned them to the same Major and Other category as the primary procedure.

Decision Rules

Decision rules were developed to address areas of ambiguity in determining the correct category placement of a code or a family of codes (table 5).

TABLE 5

Decision Rules

	Rule	Example	Additional instructions
1.	If the primary purpose is to accomplish a procedure, which imaging facilitates, assign the code(s) to Procedure. If the primary purpose is to produce an image for interpretation, which the procedure facilitates, assign the code(s) to Imaging.	Cardiac catheterizations to produce an angiogram would be Imaging Fluoroscopy and sonographic guidance would be considered a Procedure	▪ Classify all related codes (e.g., a separate Imaging code assigned to a Procedure code) as a Major (M) or Other (O) procedure. ▪ If a code for a procedure with Imaging as the primary purpose would be considered a major (M) procedure, assign the code to Procedures, not to Imaging. This is an exception from the general rule because we considered that a Major procedure even for the purpose of generating an Image should receive a Procedure designation.
2.	Assign physical examinations performed for the purpose of obtaining specimens or otherwise related to obtaining test material for analysis to the Evaluation and Management (EM) category.	Performing an examination to obtain a Pap smear	▪ There will usually be a separate code for test interpretation, which naturally is assigned to Tests.
3.	Assign procedures performed for the purpose of obtaining measurements, biopsies, or other test material for analysis to the Procedures category and appropriate subcategories.	Cystometrogram, prostate biopsy	

	Rule	Example	Additional instructions
4.	Assign EM activities that are intrinsically linked to a treatment category, without which the treatment requiring application of specific technologies or extra modalities could not proceed, to the applicable treatment.	Dialysis, radiation therapy, physical therapy	
5.	Assign CPT "unlisted codes," (often designated with the final two digits of 99 or 59) to the subcategory of the organ system the unlisted codes are part of.	"Unlisted procedure, pelvis or hip joint"	▪ Unlisted codes would have no established work RVUs. For unlisted procedure codes, determine whether the code would be considered as Major (M) or Other (O) solely on the percent inpatient place of service, using the same 15 percent threshold for assigning other named procedures. Classify unlisted codes with 15 or more percent inpatient place of service as Major (M) procedures.
6.	Trace add-on codes (listed in CPT appendix B) to the primary code to which they are added, as described in the main body of the CPT at the add-on code number.		▪ When the add-on code is for the same basic service as the primary service, assign it to the same broad category and subcategory as the primary code and, if a procedure, to the same M or O category. ▪ When the add-on code represents a different type of service, such as Imaging or Tests, that was facilitated by the performance of the primary code (e.g., Intraoperative Neurophysiology—95920), assign it to a broad category and subcategory based on the nature of its own work, not to the code which facilitated the add-on. ▪ Procedural add-on codes that are associated with a procedure code within a family would be considered M or O based on the assignment of the family of the codes.

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

One other area of ambiguity remains challenging. In some cases, classic tests now rely on digital imaging technology for their implementation. Film photography is digitized, and the digitized image is then interpreted. Even an electrocardiogram, a prototypical test, now often relies on digital imaging. We have not developed a decision rule to separate Imaging from Tests that in some way use imaging technology. Rather, we have relied on CMS guidance in BETOS 2.0, taking advantage of Section 5102(b) of the Deficit Reduction Act of 2005, which required a payment cap on the technical component of imaging services and based payments for the same services under the Outpatient Prospective Payment System. CMS publishes what it considers to be Imaging services to which the cap applies. We have used that list as guidance in assigning codes to achieve consistency.[4]

BETOS 2.0 Taxonomy

This section is a high-level guide to the BETOS 2.0, and summarizes the taxonomy presented above. It contains (1) an overview of how BETOS 2.0 is organized, (2) the datasets programmers will use to employ BETOS 2.0 in their projects, and (3) SAS programming code examples for use as a guide. Table 6 contains a summary of the complete BETOS 2.0 taxonomy.

The BETOS 2.0 code has five digits that represent four categories/levels. This structure enables programmers to easily summarize data at each level, from the broadest to the narrowest.

1 **Digit 1** indicates the code's broad category: Evaluation and management (E), Imaging (I), Procedure (P), Treatment (R), Test (T), Anesthesia (A), and Unclassified (N).

2 **Digit 2** represents a subcategory within each broad category (e.g., CT scans as a subcategory of Imaging [IC]). Digits 1 and 2 together form a unique code. A few codes are unclassified and have "NA" as the first two digits.

3–4 **Digits 3 and 4** form a unique two-digit "family" code that describes a cluster of related HCPCS codes.

- E—Evaluation and Management 10–19
- P—Procedures 20–49
- R—Treatments 50–59
- I—Imaging 60–79
- T—Tests 80–89

To be broken out as a family, the cluster of related codes needs to meet a threshold of 0.2 percent of total PFS spending or be of policy significance. If a code does not fall into a family, digits 3 and 4 are coded as 99. BETOS 2.0 currently has 51 families, which fall within all broad categories except Anesthesia and Unclassified. The numbering system allows for additional families to be added to broad categories in the future.

5 Digit 5 classifies procedures as Major (M) or Other (O), and nonprocedures (i.e., any of the other broad categories) as not applicable (N). To classify a procedure as "Major," the code must meet one of the following criteria:

- Work RVU > 9.0, or

- Work RVU > 5.5 and performed in the inpatient hospital setting at or above 15 percent of the time.

For analysis of the initial version of BETOS 2.0, the RVU values were obtained from the 2017 Medicare fee schedule final rule addendum B. Inpatient percentage was calculated as percent inpatient from the 2015 Physician Supplier Procedure Summary (PSPS) File.

Procedure codes that are in the same family (digits 3 and 4) all receive the same Major or Other designation as the procedure code with the highest spending in that family. Add-on codes received the same Major or Other designation as the primary procedure code with which they are associated, with exceptions when the add-on code is unrelated to the primary code as discussed above.

Using the revised BETOS 2.0 taxonomy, appendix B provides a spending breakdown for 2015 Medicare Physician Fee Schedule services for 2015. Appendix B also provides a spending breakdown of procedures classified as Major and Other.

TABLE 6

BETOS 2.0 Taxonomy (Effective 2019)

Digit 1 category	E Evaluation and management	P Procedure	R Treatment	I Imaging	T Test	A Anesthesia
Digit 2 subcategory	EV—Office/outpatient services EI—Hospital inpatient services ER—Emergency dept. services EO—Observation care services EC—Critical care services EN—Nursing facility services EH—Home services EE—Ophthalmological services EB—Behavioral health services EM—Care management/coordination EX—Miscellaneous	PC—Cardiovascular PV—Vascular PG—Digestive/gastrointestinal PM—Musculoskeletal PS—Skin PE—Eye PO—Other organ systems	RR—Radiation oncology RH—Chemotherapy RD—Dialysis RT—Physical, occupational, and speech therapy RB—Chiropractic RI—Injections and infusions (nononcologic) RX—Miscellaneous	IC—CT IM—MR IU—Ultrasound IS—Standard X-ray IN—Nuclear IX—Miscellaneous	TA—Anatomic pathology TC—Cardiography TP—Pulmonary function TN—Neurologic TX—Miscellaneous	None
Digits 3 and 4 family range	10–19 EV—Office/outpatient services 10 New 11 Established 12 Annual wellness visits 99 Other EE— Ophthalmological services 13 Ophthalmology visits 99 Other EB— Behavioral health services 14 Psychotherapy 99 Other EM— Behavioral health services 15 Transition care management 99 Other	20–45 PC—Cardiovascular 20 Percutaneous coronary artery angioplasty and stenting 21 Coronary artery bypass graft 99 Other PV—Vascular 22 Revascularization lower extremity 24 Varicose vein ablation 99 Other PG—Digestive/gastrointestinal 25 Colonoscopy 26 Esophagogastroduodenoscopy 99 Other PM—Musculoskeletal 27 Knee arthroplasty 28 Arthrocentesis	50–53 RR—Radiation oncology 50 Intensity modulated radiation therapy (IMRT) 99 Other RT—Physical, occupational, and speech therapy 51 Physical therapy treatment 52 Physical therapy evaluation 99 Other RI—Injections and infusions (nononcologic) 53 Injection (including vaccinations) 99 Other	60–79 IC—CT 61 CT/CTA abdomen and pelvis 62 CT/CTA head/brain & neck 63 CT/CTA chest 99 Other IM—MR 64 MRI/MRA spine 65 MRI/MRA brain/head 99 Other IU—Ultrasound 66 Echocardiography (transthoracic) 67 Ultrasound—abdomen/retroperitoneal 99 Other	80–89 TA—Anatomic pathology 80 Surgical pathology examination 99 Other TC—Cardiography 81 Electrocardiogram 82 External electrocardiographic monitoring 99 Other TN—Neurologic 83 Sleep study 99 Other	No families

Digit 1 category	E Evaluation and management	P Procedure	R Treatment	I Imaging	T Test	A Anesthesia
		29 Arthrodesis spine 30 Nerve block injection 31 Hip arthroplasty 32 Femoral fracture repair 33 Spinal instrumentation 99 Other PS—Skin 34 Destruction benign skin lesion 35 Mohs surgery 36 Nail procedure 37 Skin biopsy 38 Debridement 39 Skin grafting 40 Paring/cutting hyperkeratotic lesion 41 Wound repair—complex 42 Skin lesion excision 99 Other PE—Eye 43 Cataract surgery 44 Discission secondary membranous cataract 99 Other PO—Other organ systems 45 Cystourethroscopy 99 Other		IS—Standard X-ray 68 Mammography 69 Chest X-ray 70 Cardiac catheterization 71 Fundus photography 99 Other IN—Nuclear 72 Myocardial perfusion scan 73 Positron emission tomography (PET) 99 Other IX—Miscellaneous 74 Computerized ophthalmic imaging 99 Other		
Digit 5 procedure classification	N—Not applicable	M—Major O—Other	N—Not applicable	N—Not applicable	N—Not applicable	N—Not applicable

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Using the BETOS 2.0 File

The file accompanying this report contains the tabs listed in table 7 below and provides the BETOS 2.0 code and label for each HCPCS code.

TABLE 7

Accompanying File

Tab name	Description	Variables
BETOS20_HCPCS	HCPCS to BETOS code crosswalk	HCPCS BETOS_20 BETOS_20_label
Level1_labels	Labels for the broad category	Level1 Level1_label
Level2_labels	Label for each unique two-digit subcategory code and suggested presentation order	Level2 Order Level2_label
Family_labels	Label for each two-digit numeric family code	Family Family_label

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

To calculate the total allowed charges at the broad category level, an analyst would isolate digit 1 of BETOS 2.0 and sum by that character. Below is sample SAS programming code to use BETOS 2.0 with data and to summarize by broad category:

```
proc sort data=BETOS20_HCPCS;
 by HCPCS;
run;
proc sort data=my_service_data;
 by HCPCS;
run;
data BETOS_data;
 merge my_service_data(in=a) BETOS20_HCPCS(in=b);
 by HCPCS;
 if a; if b;
run;

data Broad_category;
 set BETOS_data;
 Broad_cat=substr(BETOS_20,1,1);
run;

proc means data= broad_category sum;
 Class Broad_cat;
 Var allowed_charges;
run;
```

Similarly, an analysis could sum to the digit 2 subcategory level by isolating the first two categories of the BETOS 2.0 code with a substring. At the family level, digits 3 and 4 are isolated with a substring and summed in conjunction with the digit 2 subcategory.

Appendix A. Designating "Major" and "Other" Procedures

An early focus of the current BETOS revision work was to address the challenge of reliably distinguishing between Major and Other (non-Major) Procedures. The primary challenge was to develop clear-cut criteria on which to base the distinction for the 5,766 procedures for which the M or O distinction needed to be made. With so many codes involved, the advantage of relying on objective data, ideally in the form of a formula that could be routinely applied, was evident. The prior work performed for MedPAC had produced some observations about the potential of particular data elements that could be used as part of such a formula. The BETOS 2.0 work confirmed and expanded on this assessment. The study team, advised by the expert panel, came to the following judgments about potential criteria:

- **Global periods.** Procedures with 90-day global periods would be considered Major and codes without global periods Other. The advantage is that the data needed to sort procedures are readily available. The problem is that 90-day global periods have been applied only to surgical procedures. Many nonsurgical procedures, mostly listed in the 90000 section of the CPT coding, have never received global periods. In addition, most of the global periods in the PFS were assigned a long time ago, and have not kept up with changes in practice. Many procedures with global periods do not warrant them. Finally, it is not clear that global periods will be a stable data source; CMS recently attempted to eliminate global periods from payment altogether because of concerns about the unreliability of the current global periods and associated assumptions of postprocedure services provided within global periods. Congress overruled CMS's intent to remove global periods.
- **Place of service.** A procedure that reaches a prespecified percent services performed in the inpatient setting of care would be designated a Major procedure. Many high-intensity and lengthy procedures considered Major take place in an inpatient setting because of the need for general anesthesia, recovery rooms, a hospital stay to monitor potential complications, and so on. A virtue of this potential criterion is that place of service is reliably collected by CMS as part of routine claims submission. However, many procedures would reasonably be considered Major based on requisite skill, intensity, time, and risk, regardless of whether other aspects of the procedure can now safely be performed in an ambulatory surgical facility or specialized procedure suite; thus, inpatient place of service by itself would not be a valid

differentiator of Major and Other. Another disadvantage to relying on place of service is potential instability in the percentage distribution of place of service because of changes in practice and patient and physician preferences, which also can be reflected in geographic variations. If the designation relied just on a threshold percentage for inpatient place of service, a procedure might be Major one year and Other the next.

- **Time.** The potential criterion would be a threshold in minutes of current estimated time for either intraservice time or total time to perform a procedure. The RUC database provides estimates of time associated with the various distinct time periods that services can be divided into for analytic purposes, designated as pre-, intra-, and postservice periods. Time might be considered a key differentiator of Major and Other procedures, with longer procedures exceeding a threshold considered Major. However, time alone does not capture important aspects of service intensity, such as skill and risk, which many consider important in determining the difficulty and seriousness of procedural work. Moreover, evidence suggests that the time estimates contained in the RUC database, generated through specialty society–administered surveys of physicians, are often flawed when compared to empirical times obtained from electronic health records and direct observation. Many of the current RUC-produced time estimates are quite dated. Some high-spending codes have never been surveyed, so the needed time data would be missing.

- **Work RVUs.** The potential criterion would be a threshold of work RVUs to separate Major and Other procedures. Work RVUs did not exist when the original BETOS was developed, but in recent years they have become a widely used measure of physician activity and relative productivity. A virtue of work RVUs is that they represent the composite of the various elements associated with time and intensity and exist for virtually all procedures in Medicare. Work RVUs also are supposed to be reviewed and revised periodically, such that a change in work RVUs—likely downward as a procedure becomes more routinely performed—could and arguably should alter its designation as Major or Other.

Work RVUs, in contrast to total RVUs, better capture the nature of physician work, which more than practice expenses reflect the aspect of the procedure that differentiates Major and Other procedures. Although work RVUs should be routinely reassessed to correct misvaluations, currently the lack of frequent work RVU refinement produces stability in the designation of procedures as Major or Other. Unlike all the other criterion candidates, which are used to establish fees for payment purposes, work RVUs are assigned to nearly all codes.

Adoption of an Algorithm to Assign Procedures into Major and Other

The technical expert panel accepted the study team's view that reliance on objective data that could be used in a simple algorithm to assign procedures into Major or Other procedure categories had the virtues of both greater reliability and administrative feasibility, even if the formula-based assignment sometimes would result in perceived misplacement for some codes. They may have reached a different conclusion if BETOS 2.0 were used for payment rather than analysis.

For the above reasons, we rejected global periods, time, and inpatient place of service as primary criteria. We concluded that work RVUs should become the core metric in the formula development because they attempt to capture the complexity and intensity of physician work. But we continued to review time, place of service, and work RVUs to establish an algorithm for reliably separating Major from Other procedures.

The project team reviewed the data patterns for services that clearly fell into either the Major or Other category. Typically, prototypical Major procedures take place in a dedicated operating room, take hours of intraservice work, have high work RVUs of 15 or more and are predominantly inpatient-based. Prototypical Other (non-Major) procedures, such as skin biopsies and injections, take only a few minutes to perform, have low work RVUs of 1.5 or less, and are rarely performed in the inpatient setting. The challenge comes with the relatively few codes in the middle.

We identified codes that had relatively high work RVUs and long intraservice time estimates but were rarely performed in an inpatient setting. Similarly, we noted that some clear-cut non-Major procedures with low work RVUs routinely take place only in the inpatient setting because that is where the need for the procedure arises; these relatively minor procedures are typically performed on admitted patients. Insertion of a central venous catheter for physiologic monitoring is a prototypical example, confirming that place of service by itself would not differentiate Major and Other procedures.

At first, we simply attempted to model the impact of using a single work RVU cutoff to differentiate Major and Other procedures. For many codes, work RVUs were extremely high or extremely low—for example, more than 15 or less than 1.5. The challenge was establishing a work RVU threshold as part of a formula. We relied mostly on clinical judgment supported by a spending analysis such that the formula would maintain the spending distribution of Major and Other procedures in BETOS 1.0, as reflected in in table 4-4 of the MedPAC 2017 analysis.

In modeling the impact of various formulas to separate Major and Other procedures, we found that percentage place of service was useful as a secondary criterion. It permitted inclusion of some codes as Major with modestly lower work RVUs as long as they exceeded a threshold for percent inpatient place of service. The study team used clinical judgment to conclude that some codes that have modestly lower work RVUs but are often performed in an inpatient setting seemed to be Major, compared with codes that had the same work RVUs but are not performed in an inpatient setting.

We modeled various work RVU and percent inpatient place of service to determine the precise thresholds for work RVUs and percent inpatient place of service. Recognizing that the precise thresholds would inevitably be somewhat arbitrary, we analyzed the spending impact of different cutoffs to minimize the change in Major and Other spending from BETOS 1.0 to BETOS 2.0, to support the kind of trend analysis that MedPAC and other users perform.

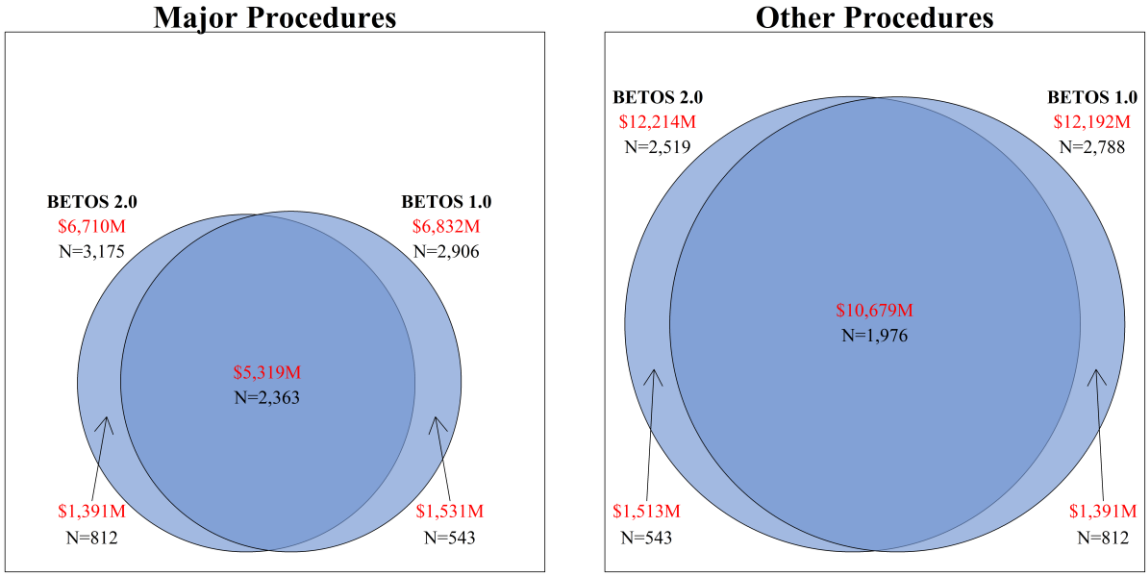
Based on clinical judgment and the modeling of the impact of various thresholds on the percentage of spending in the Major and Other categories, we developed the following algorithm for assigning the nearly 6000 codes for procedures into the Major or Other categories:

To classify a procedure as a major procedure, the code needed to meet one of the following criteria:

- work RVU equal to or greater than 9.0
- work RVU equal to or greater than 5.5 and performed in the inpatient hospital setting at or above 15 percent of the time

FIGURE A.1

Major and Other Procedures



Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Notes: Some codes previously listed in the current BETOS as Major or Other are now considered treatments, not procedures, in the revised BETOS, in which case they are not assigned to the M or O procedure categories. This analysis does not include codes for which allowed charges were not present in 2015 (e.g., codes that were deleted before 2015 or added afterward).

Appendix B. 2017 Fee Schedule Spending by Type of Service

Table B.1 shows Medicare spending using BETOS 2.0, calculated using the 2017 PSPS file after excluding ambulatory surgical center claims and limiting to services payable under the PFS. Table B.2 shows a breakout of BETOS 2.0 Procedures classified by Major and Other.

TABLE B.1

Summary Table of Allowed Charges, BETOS 2.0 (2017)

Dollars

		Level 1	Level 2	Nuclear family	Major/Other
Evaluation and management		**46,889,039,102**			
EV	Office/ outpatient services		23,940,038,816		
	10 New office visits			3,542,213,990	
	11 Established office visits			19,159,515,078	
	12 Annual wellness visits			947,367,893	
	99 Office visits – other			290,941,855	
EI	Hospital inpatient services		10,180,415,997		
ER	Emergency department services		2,908,864,311		
EO	Observation care services		592,292,224		
EC	Critical care services		1,337,816,752		
EN	Nursing facility services		2,658,592,183		
EH	Home services		300,448,352		
EE	Ophthalmological services		2,535,115,349		
	13 Ophthalmology visits			2,410,632,833	
	99 Other			124,482,516	
EB	Behavioral health services		1,686,494,523		
	14 Psychotherapy			1,321,643,648	
	99 Behavioral health services - other			364,850,875	
EM	Care management/coordination		712,453,770		
	15 Transition care management			211,461,215	
	99 Other			500,992,556	
EX	Miscellaneous		36,506,825		
Imaging		**10,179,980,013**			
IC	CT		1,841,979,900		
	61 CT/CTA – abdomen and pelvis			780,654,787	
	62 CT/CTA – head/brain & neck			422,049,438	
	63 CT/CTA – chest			449,532,104	
	99 CT/CTA – other			189,743,572	
IM	MR		1,187,382,760		
	64 MRI/MRA – spine			388,390,726	
	65 MRI/MRA – brain/head			338,338,976	
	99 MR – Other			460,653,058	

		Level 1	Level 2	Nuclear family	Major/Other
IU	Ultrasound		2,706,193,005		
	66 Echocardiography (transthoracic)			990,069,524	
	67 Ultrasound – abdomen/retroperitoneal			241,063,485	
	99 Ultrasound – other			1,475,059,996	
IS	Standard X-ray		2,890,590,179		
	68 Mammography			665,821,447	
	69 Chest x-ray			347,816,247	
	70 Cardiac catheterization			264,048,631	
	71 Fundus photography			208,296,602	
	99 Standard X-ray – other			1,404,607,251	
IN	Nuclear		1,184,500,291		
	72 Myocardial perfusion scan			529,301,928	
	73 Positron emission tomography (PET)			425,337,824	
	99 Nuclear – other			229,860,539	
IX	Miscellaneous		369,333,878		
	74 Computerized ophthalmic imaging			369,306,764	
	99 Miscellaneous – other			27,113	
Procedures		**19,338,912,790**			
PC	Cardiovascular		1,050,741,674		
	20 Percutaneous coronary artery angioplasty & stenting			212,739,244	
	21 Coronary artery bypass graft			179,066,620	
	99 Cardiovascular – other			658,935,810	
PV	Vascular		2,217,409,909		
	22 Revascularization lower extremity			770,134,040	
	23 *Family deleted*				
	24 Varicose vein ablation			269,563,958	
	99 Vascular – other			1,177,711,911	
PG	Digestive/gastrointestinal		1,915,918,022		
	25 Colonoscopy			615,701,666	
	26 Esophagogastroduo-denoscopy			311,758,201	
	99 Gastrointestinal – other			988,458,155	
PM	Musculoskeletal		4,881,609,066		
	27 Knee arthroplasty			515,742,224	
	28 Arthrocentesis			476,905,847	
	29 Arthrodesis spine			378,256,392	
	30 Nerve block injection			645,351,793	
	31 Hip arthroplasty			290,862,701	
	32 Femoral fracture repair			190,463,702	
	33 Spinal instrumentation			131,759,689	
	99 Musculoskeletal – other			2,252,266,718	

		Level 1	Level 2	Nuclear family	Major/Other
PS	Skin		4,471,818,518		
	34 Destruction benign skin lesion			780,310,589	
	35 Mohs surgery			692,995,032	
	36 Nail procedure			493,613,364	
	37 Skin biopsy			370,634,794	
	38 Debridement			263,735,129	
	39 Skin grafting			254,494,942	
	40 Paring/cutting hyperkeratotic lesion			181,287,390	
	41 Wound repair - complex			215,066,911	
	42 Skin lesion excision			197,820,063	
	99 Skin – other			1,021,860,304	
PE	Eye		2,402,950,926		
	43 Cataract surgery			1,205,899,288	
	44 Discission secondary membranous cataract			204,150,282	
	99 Eye – other			992,901,356	
PO	Other organ systems		2,398,464,675		
	45 Cystourethroscopy			249,006,209	
	99 Other organ systems – other			2,149,458,466	
M	Major Procedures				6,961,398,512
O	Other Procedures				12,377,514,278
	Total Procedures				19,338,912,790
Treatments		**8,339,059,154**			
RR	Radiation oncology		1,822,142,064		
	50 Intensity-modulated radiation therapy (IMRT)			435,516,170	
	99 Radiation Oncology – other			1,386,625,895	
RH	Chemotherapy administration		429,337,166		
RD	Dialysis		1,044,276,651		
RT	Physical, occupational, and speech therapy		3,489,830,969		
	51 Physical therapy treatment			3,056,408,021	
	52 Physical therapy evaluation			233,527,894	
	99 Physical, occupational, and speech therapy – other			199,895,053	
RB	Chiropractic		719,262,616		
RI	Injections and Infusions-not oncologic		458,087,951		
	53 Injection (including vaccinations)			288,783,816	
	99 Injections and Infusions-not oncologic – other			169,304,136	
RX	Miscellaneous		376,121,735		
Tests		**4,055,116,740**			
TA	Anatomic pathology		1,366,378,892		
	80 Surgical pathology examination			814,703,525	
	99 Anatomic pathology – other			551,675,367	

		Level 1	Level 2	Nuclear family	Major/Other
TC	Cardiography		1,116,212,555		
	81 Electrocardiogram			376,957,205	
	82 External electrocardiographic monitoring			309,844,919	
	99 Cardiography – other			429,410,431	
TP	Pulmonary function		203,511,150		
TN	Neurologic		795,988,580		
	83 Sleep study			250,801,249	
	99 Neurologic – other			545,187,331	
TX	Miscellaneous		573,025,563		
NA	Exceptions Unclassified	176,842,654	176,842,654		
AA	**Anesthesia**	**2,723,063,802**	**2,723,063,802**		
	Total	91,702,014,254	91,702,014,254		

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

TABLE B.2

BETOS 2.0 Procedures: Major and Other

Dollars

		Major	Other	Total
PC	Cardiovascular	885,289,679	144,370,987	1,029,660,666
PV	Vascular	995,961,089	1,113,389,960	2,109,351,048
PG	Digestive/gastrointestinal	762,351,661	1,290,338,823	2,052,690,484
PM	Musculoskeletal	2,500,267,911	2,170,476,715	4,670,744,626
PS	Skin	426,766,317	3,880,785,103	4,307,551,420
PE	Eye	218,300,068	2,147,005,197	2,365,305,265
PO	Other organ systems	920,987,904	1,445,715,410	2,366,703,314
Total		**6,709,952,018**	**6,709,924,628**	**12,192,082,194**

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Appendix C. Using BETOS 2.0 to Analyze Spending in the Medicare Physician Fee Schedule

We compared spending in 1988 (that used BETOS 1.0) with 2017 (using BETOS 2.0) where there were comparable categories. Although there were significant changes from BETOS 1.0 to BETOS 2.0, both used the same broad categories as the first level of classifying services.

E/M, Imaging, and Tests included comparable codes in BETOS 1.0 and 2.0. Procedure and Treatments, which had been one category in BETOS 1.0, were separated into distinct categories in BETOS 2.0, but for this comparison, they were combined as a single category. Anesthesia moved, intact, from a subcategory to a broad category.

To provide apples-to-apples comparisons between per capita spending in the thirty years between 1988 and 2017, we also needed to account for both the growth in the beneficiary population and the increasing beneficiary opt-out from traditional Medicare into Medicare managed care plans, now called Medicare Advantage. For the 1988 spending breakdown, we used the data presented in the 1992 JAMA article (Berenson and Holahan 1992). We moved allowed charges for surgical pathology codes that had been included as a specialty specific E/M service to Tests because these codes were responsible for substantial spending in 1988—about 3.5 percent of spending for the E/M broad category. We removed the subcategory of laboratory tests from both Tests and from total 1988 MPFS spending because they are no longer paid under the MPFS and then recalculated spending percentages from those presented in the JAMA article.

We used the CMS Research Statistics Data and Systems Trends and Reports to determine that in 1988 there were 30.6 million beneficiaries receiving MPFS services and in 2017, 38.7 million.[5] Using these numbers we were able to convert raw spending numbers into per capita spending.

We also compared subcategories (office- and hospital-based visits) of the highest spending broad category (E/M services). However, as BETOS 2.0 has evolved we needed to aggregate various subcategories that both versions of BETOS include. For an accurate comparison to 1988 spending, we combined, as 2017 inpatient hospital visits, hospital, critical care and observation care visits. For 2017 office-based visits, we combined standard office visits and services that were referred to as “specialty

specific E/M services" that included ophthalmology and behavioral health visits, and also added care management/coordination services (recognized in 2017).

CMS eliminated consultation codes in 2011, which were included in the 1988 analysis. This comprised nearly $1 billion in spending in 1988—about 10 percent of all E/M spending. In 1988, CPT coding—Level I HCPCS—did not distinguish where consultations took place, whether in the hospital or office; however, hospital- and office-based consultations were separately identified in coding that was initiated in 1992 with the new MPFS. We were able to find data from 1992 through 1996, showing that for those years, consultations consistently were about 40 percent office-based and 60 percent hospital-based. Accordingly, we distributed the 1988 spending for consultations using a 40:60 allocation between office and hospital in calculating the 1988 spending for E/M services.

We removed surgical pathology from the 1988 spend, as noted above. Other E/M services in both years include emergency room, nursing home and home visits. We continue to consider emergency room visits separate from inpatient hospital visits.

CMS maintains a list of specialties of physicians, other health professionals, and suppliers, such as durable medical equipment providers, with no apparent logic to the order.[6] Some of the 118 named specialties and supplier types are no longer recognized for payment but remain in the list and many others have trivial levels of spending. By combining related specialty categories with substantial 2017 spending, we wanted to sort specialty spending by BETOS 2.0 type of service. We grouped the physician and other health professional specialties that are paid by the MPFS into a manageable number of specialties. Our process for reducing 118 different, named physician, other health professionals, and supplier categories listed in the CMS link into 29 main specialties paid under the MPFS is described in MedPAC (2019).

We grouped the resulting 29 specialties into six categories, listing individual specialties with common attributes under their appropriate category. We used the percentage of spending received from E/M services as the primary basis for sorting between procedural and nonprocedural specialties. The six resulting categories are: primary care; nonprocedural medical; procedural, nonsurgical; surgical; other physician; and non-MD or non-DO health professionals. We performed analyses at both the group level and the individual specialty level.

Results

Table C.1 presents all MPFS spending in broad categories, subcategories and families, as well as Major and Other Procedures using BETOS 2.0 files for 2017.

Table C.2 presents a 1988 and 2017 spending distribution comparison on various data elements, including per capita spending by broad categories in 1988. It shows that per capita, MPFS spending grew from $838 to $2,370, an increase of 182.8 percent. During that same 30-year period, U.S. real per capita GDP increased 52.1 percent. Table C.2 also demonstrates that the distribution of spending among the broad categories has changed significantly between 1988 and 2017. In 1988, E/M services accounted for 34.4 percent of all allowed charges, compared to 51.1 percent in 2017. Conversely, Procedures and Treatments in 1988 represented 39.0 percent of MPFS spending, compared to 30.2 percent in 2017. Imaging, Tests and Anesthesia percentages also declined modestly as a percentage of total, commensurate with the substantial increase in E/M percentage spending. Overall actual E/M spending increased by more than 400 percent per capita, whereas the other four categories increased between about 140 percent to 190 percent.

TABLE C.1

Fee Schedule Spending, by Broad Category, 1988–2017

	1988			2017				
Categories	**Allowed charges (millions of $)**	**All allowed charges (%)**	**Allowed charges per capita ($)**	**Allowed charges (millions of $)**	**All allowed charges (%)**	**Allowed charges per capita ($)**	**Average annual growth rate per capita, 1988–2017 (%)**	**Average annual growth rate, 2015–17 (%)**
Evaluation /management services	8,813.0	34.4	288.0	46,889.0	51.1	1,211.60	4.9	1.4
Procedures and treatments/ services	10,006.0	39.0	327.0	27,678.0	30.2	715.2	2.6	1.4
Imaging	3,499.8	13.6	114.4	10,180.0	11.1	263.0	2.8	1.1
Tests	1,508.3	5.9	49.3	4,055.1	4.4	104.8	2.6	2.8
Anesthesia	1,126.7	4.4	36.8	2,723.1	3.0	70.4	2.2	1.4
Other	695.2	2.7	22.7	176.8	0.2	4.6	-5.2	1.7
Total	**25,649.0**	**100.0**	**838.2**	**91,702.0**	**100.0**	**2,369.6**	**3.5**	**1.4**

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Further, the share of E/M spending in office versus hospital-based visits has changed substantially. Whereas in 1988 office-based E/M exceeded hospital-based E/M spending by only three percentage points—17.3 percent and 14.4 percent of all allowed charges, respectively—the difference has widened significantly, with 2017 office-based E/M spending (31.5 percent) about 2.5 times hospital-based services (13.2 percent), calculated using data from table C.1. Office-based visits, including those provided by specialties using specialty-specific visit codes and new care coordination services, now make up almost one third of all MPFS spending—or two thirds of E/M spending. Also of note is that the "other" E/M spending, representing mostly emergency room, nursing home and home visits, has more than doubled as a percentage of total spending—to more than 6 percent.

Table C.2 also shows the recent 2015–17 rate of change in spending for the broad categories. The overall average annual growth rate for all services from 2015 to 2017 was 1.4 percent, with a range of growth rates from 1.1 percent for imaging to 2.8 percent for tests. E/M services, which now make up half of all spending, not surprisingly grew at the same average annual rate as overall spending. By comparison the average growth rate from 1985 to 1988 for all services reported in the JAMA paper (which included lab tests) was 12.3 percent (Berenson and Holahan 1992; the underlying inflation rate as measured by CPI-U in 1988 was 4.1 percent and in 2017, 2.1 percent), indicating that growth of MPFS spending in the late 1980s exceeded inflation by about 8 percentage points, whereas growth in the middle of the past decade grew less than inflation.[7]

Table C.3 presents findings for various subcategories of Procedure spending, also showing the percentage of procedures that are Major (vs. Other). The distribution of procedures shows that in 2017, musculoskeletal and skin were by far the highest spending clinical areas for Procedure spending, together making up nearly half of all Procedure spending—25.2 percent and 23.1 percent, respectively. Skin procedures, most of which are office-based, generated nearly $5 billion in allowed charges, over $1 billion more than the combination of all cardiovascular and vascular procedures. Spending for destruction of benign skin lesions, usually through application of liquid nitrogen to the lesions, by itself was responsible for $780 thousand in spending (table 1). This amount is equivalent to about 75 percent of the MFPS spending for all cardiovascular procedures, a Procedure subcategory that includes coronary stent placement, angioplasty, coronary artery bypass surgery, and pacemaker insertions—altogether $1.05 billion. However, as discussed in Limitations below, this comparison, while accurately reflecting actual MPFS spending, does not adjust for the reduced practice expense contribution to fees associated with facility-based services, such as Major cardiovascular and vascular procedures.

TABLE C.2

Traditional Medicare Spending, by Procedures, 2017

	Allowed charges ($)	Percent of all allowed charges (%)	Percent of procedure allowed charges (%)	Average annual growth rate, 2015–17 (%)	Percent Major procedure
PC Cardiovascular	1,050,741,674	1.1	5.4	1.0	84
PV Vascular	2,217,409,909	2.4	11.5	2.8	57
PG Digestive/gastrointestinal	1,915,918,022	2.1	9.9	-3.4	38
PM Musculoskeletal	4,881,609,066	5.3	25.2	2.3	53
PS Skin	4,471,818,518	4.9	23.1	1.9	10
PE Eye	2,402,950,926	2.6	12.4	0.8	8
PO Other organ systems	2,398,464,675	2.6	12.4	0.7	36
Total	**19,338,912,790**			**1.2**	**36**

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Table C.3 demonstrates the variations in individual specialty service percentages in allowed charges by the broad BETOS service categories. It demonstrates a clear demarcation between specialties that receive a substantial majority of their allowed charges from E/M services and those that derive less than 50 percent from E/M. Other analyses (not shown) also show the distribution of all BETOS 2.0 categories identified in table C.1 by specialty. To illustrate the usefulness of the BETOS 2.0 service-specialty distributions, the data show the following:

- The primary care specialties, predominantly family practice and internal medicine, are responsible for nearly 19 percent of all MPFS spending, derived mostly from E/M services; Family practice receives 90 percent of allowed charges from E/M services and internal medicine 91 percent. The data do not support the belief by some that family practitioners do a substantial volume of procedures and treatments, at least for the Medicare population.
- Family physicians receive only 13 percent of their E/M allowed charges from hospital visits, compared to 41 percent for internists (not shown).
- Sixteen percent of MPFS charges is received by health professionals other than MDs and DOs, with both physical and other therapists and nurse practitioners receiving nearly $3.5 million—or nearly four percent of total allowed charges each.
- Only about half of the 19.3 billion in allowed charges for Procedures represents services provided by surgeons—71 percent of Major Procedures and 42 percent of Other Procedures. For surgeons, 51 percent of allowed charges are for Major Procedures, while 49 percent comes from Other Procedures (not shown).
- Of about $378 million spent for spinal fusions, neurosurgeons received 48 percent of the total, orthopedists received 43 percent, and physician assistants 5 percent (not shown).

TABLE C.3

Distribution of Individual Specialty Spending by Broad Service Categories

	$	Evaluation and management (%)	Imaging (%)	Major procedures (%)	Other procedures (%)	Treatments (%)	Tests (%)	Unclassified (%)	Anesthesia (%)
Total 2017 Spending by Broad Service Categories	***91,410,976,661***	**51.3**	**10.9**	**7.6**	**13.5**	**9.1**	**4.4**	**0.2**	**3.0**
Primary Care	***17,034,243,020***	**91.0**	**2.5**	**0.3**	**2.7**	**2.2**	**1.3**	**0.0**	**0.0**
Family Practice	*6,375,680,839*	90.2	2.5	0.3	3.9	2.1	1.0	0.0	0.0
Internal Medicine	*10,462,252,879*	91.3	2.6	0.3	1.9	2.2	1.6	0.0	0.0
Geriatric Medicine	*196,309,302*	97.5	0.5	0.1	0.9	0.6	0.4	0.0	0.0
Nonprocedural medical specialties	***13,193,486,039***	**81.8**	**1.9**	**0.3**	**4.3**	**5.6**	**6.1**	**0.0**	**0.1**
Neurology	*1,617,863,495*	64.3	2.9	0.7	4.5	1.6	26.0	0.0	0.0
Physical Medicine and Rehabilitation	*1,105,270,729*	67.8	1.8	0.4	19.7	3.9	6.2	0.0	0.1
Psychiatry	*1,164,940,694*	96.4	0.0	0.0	0.1	3.2	0.3	0.0	0.0
Pulmonary Disease	*1,731,860,428*	82.7	0.6	0.1	3.1	0.6	12.8	0.0	0.0
Medical Oncology	*2,003,262,716*	69.0	5.3	0.0	0.6	24.1	1.0	0.0	0.0
Emergency Medicine	*3,176,673,258*	93.2	0.6	0.2	4.1	0.5	1.3	0.0	0.0
Other	*2,393,614,720*	87.8	2.1	0.3	3.1	5.3	1.2	0.0	0.2
Procedural internal medicine specialties	***15,376,077,808***	**40.6**	**14.0**	**7.1**	**24.8**	**6.9**	**6.4**	**0.0**	**0.2**
Cardiology	*6,876,276,187*	45.2	30.2	11.1	3.0	0.1	10.2	0.0	0.1
Dermatology	*3,504,884,465*	24.6	0.0	5.6	63.8	1.0	4.9	0.0	0.0
Gastroenterology	*1,699,218,443*	45.2	2.2	2.9	47.0	0.6	2.0	0.0	0.1
Nephrology	*2,201,097,554*	48.2	1.0	2.6	6.3	41.7	0.1	0.0	0.1
Other	*1,094,601,160*	40.2	1.3	1.9	39.9	8.2	7.0	0.0	1.4
Surgical specialties	***18,382,902,561***	**33.8**	**8.0**	**28.4**	**27.0**	**1.0**	**1.7**	**0.0**	**0.0**
General Surgery	*2,237,674,510*	30.3	2.9	42.1	23.9	0.7	0.2	0.0	0.0
Otolaryngology	*1,246,049,268*	40.1	0.9	10.7	40.6	3.8	3.9	0.0	0.0
Ophthalmology	*5,556,551,284*	42.3	11.8	3.9	38.8	0.0	3.2	0.0	0.0
Orthopedic Surgery	*3,993,803,599*	27.4	7.8	45.0	18.3	1.4	0.1	0.0	0.0
Urology	*1,770,618,469*	46.1	4.7	14.5	28.4	2.6	3.7	0.0	0.0
Vascular Surgery	*1,160,057,260*	13.1	21.0	48.3	17.0	0.3	0.1	0.0	0.2
Other	*2,418,148,171*	25.7	4.2	54.8	14.0	0.7	0.6	0.0	0.0

	$	Evaluation and management (%)	Imaging (%)	Major procedures (%)	Other procedures (%)	Treatments (%)	Tests (%)	Unclassified (%)	Anesthesia (%)
Other MD specialties	***10,675,108,977***	**3.5**	**45.2**	**2.5**	**8.0**	**16.2**	**10.7**	**0.0**	**13.7**
Anesthesiology	*2,059,134,491*	11.1	0.7	0.5	15.8	0.9	0.1	0.0	70.8
Pathology	*1,186,647,599*	0.4	0.1	0.0	3.2	0.2	96.1	0.0	0.0
Diagnostic Radiology	*5,619,160,601*	0.9	85.1	4.6	8.7	0.5	0.1	0.0	0.1
Radiation Oncology	*1,810,166,285*	5.2	1.7	0.1	0.4	92.6	0.0	0.0	0.0
Other health professionals	***14,531,569,228***	**52.0**	**1.8**	**1.7**	**11.7**	**24.0**	**0.8**	**0.0**	**8.1**
Optometry	*1,238,445,129*	76.7	11.5	0.0	6.6	0.0	5.2	0.0	0.0
CRNA, Anesthesia Assistant	*1,192,670,281*	0.1	0.0	0.0	1.1	0.1	0.0	0.0	98.7
Podiatry	*1,950,583,277*	40.4	3.1	2.9	53.0	0.5	0.1	0.0	0.0
Nurse Practitioner	*3,375,053,483*	90.8	0.7	0.7	5.0	1.8	1.0	0.0	0.0
Physical Therapist	*3,466,670,632*	0.0	0.0	0.0	2.2	97.6	0.1	0.0	0.0
Physician Assistant	*2,010,568,767*	72.2	1.9	8.0	16.0	1.1	0.8	0.0	0.0
Other	*1,297,577,659*	99.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Uncategorized	***2,217,589,028***	**8.9**	**24.1**	**2.0**	**1.1**	**34.8**	**19.5**	**7.9**	**1.7**

Source: Robert A. Berenson and Mary Jo Braid-Forbes.

Discussion

Our results demonstrate the recent slowdown in spending across all sectors of MPFS spending, with overall average annual fee schedule spending from 2015 to 2017 increasing annually 1.4 percent. This rate of increase is dramatically lower than the growth rates occurring in the earlier period, even after accounting for high inflation of goods and services in the broader economy. From 1985 to 1988, the average annual growth rate of fee schedule spending was 12.3 percent, more than 8 percentage points greater than the general inflation rate. This rapid growth in spending can be appreciated as a likely catalyst for the creation of, first, the volume performance standard in The Omnibus Budget Reconciliation Act of 1989 and then its replacement with the Sustainable Growth Rate in Balanced Budget Act 1997, both approaches attempting to address rapid MFPS spending growth by adjusting fees downward when spending exceeds formula-driven thresholds.

One of the notable findings in our analysis was the major increase in the percentage of total fee schedule allowed charges from E/M services—from 34 percent of total allowed charges in 1988 to 51 percent in 2017. This increase has occurred despite MedPAC's finding that since 2000 the volume of E/M services that accounts for increases in service intensity has been increasing at lower rates than it has for Imaging, Other Procedures, Treatments, and Tests (MedPAC 2019a). Given the relatively slower increase in volume, at least since 2000, the substantial increase in spending for E/M as a percentage of total MPFS spending, likely reflects major changes in relative fees across services, with the initiation of the resource-based fee schedule in 1992. Growing hospital employment of physicians may also be involved, given the different calculation of practice expenses, as discussed under Limitations below.

One purpose of identifying both high and fast-growing spending families is to screen services that might be over-valued in the fee schedule.[8] For example, commentators and researchers have suggested that the nearly $5 billion spent for office-based dermatological procedures at least partly results from substantial over-valuation of some of the office procedures, such as destruction of benign skin lesions and Mohs surgery, and the incorrect assumption that follow-up office visits for many skin procedures routinely occur within the 10-day global period assigned to common skin procedures (Mulcahy and Mehrotra 2020). Similarly, electrocardiogram interpretations, which appear as a family in table C.1, constitute 0.4 percent of all allowed charges in 2017—almost $400 million—and has been identified in research likely substantially over-valued (Zuckerman et al. 2016). In short, because BETOS 2.0 aggregates similar service codes into high-spending subcategories and families, it can

facilitate oversight of the accuracy of fee schedule payment rates to follow Sutton's Law to "go where the money is."

This study has one significant limitation. When a service moves from one setting to another, it can affect clinician fee schedule volume of services and spending, as well as total Medicare spending. As explained by MedPAC, when, for example, a 99213 office visit is provided in the physician office, in 2019, the total RVUs were 2.09. When the visit is provided in a hospital outpatient department, the total is 1.44 (MedPAC 2019a). The "disappearing" RVUs are included and indeed higher in the separate facility fee that is paid directly to the hospital. The result is that while MPFS spending is reduced from $75.32 to $51.90, Medicare's total payment for both the professional service and hospital payment increases to $167.75. In short, BETOS 2.0 accurately captures the actual MPFS spending associated with all fee schedule allowed charges but not the total spending for the service. CMS is currently working to add OPPS and other Part B service codes to its future presentation of BETOS spending. There is no simple way to adjust BETOS 2.0 spending for reduced practice expenses for hospital- or other facility-based services compared to office-based services.

Notes

[1] "Medicare Part B Physician/Supplier Data by BETOS CY2015," Centers for Medicare & Medicaid Services, accessed May 12, 2020, https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/MedicareFeeforSvcPartsAB/Downloads/BETOS15.pdf.

[2] "Overview of Clinical Classifications Software for Services and Procedures (CCS-Services and Procedures)," Agency for Healthcare Research and Quality, March 30, 2017, https://www.hcup-us.ahrq.gov/toolssoftware/ccs_svcsproc/ccssvcproc.jsp#overview.

[3] We initially identified 71 families representing 733 individual HCPCS codes. In our work, we both added and removed families for various reasons, including to (1) remove redundancy from in the EM broad category, because logical, clinically based subcategories were very similar to families of visits; (2) eliminate initially designated families that on full consideration, sometimes informed by experts' opinions, represented diverse services not belonging to a family of like services; and (3) create a few families of policy interest regardless of whether they meet the 0.2 percent spending threshold for designating families.

[4] "CY 2017 PFS Final Rule Outpatient Cap List," Centers for Medicare & Medicaid Services, November 15, 2016, https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/PFS-Federal-Regulation-Notices-Items/CMS-1654-F.html.

[5] National Medicare enrollment trends, 1966–2013; Medicare managed care contract report data as of December 01, 1988; and "Medicare Enrollment Dashboard," Centers for Medicare & Medicaid Services, accessed May 12, 2020, https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Dashboard/Medicare-Enrollment/Enrollment Dashboard.html.

[6] "Medicare Utilization for Part B," Center for Medicare & Medicaid Services, last updated August 27, 2019, https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/medicarefeeforsvcpartsab/medicareutilizationforpartb.

[7] Historical inflation rates, 1914–2019, available from the US Inflation Calculator at https://www.usinflationcalculator.com/inflation/historical-inflation-rates/.

[8] 42 U.S.C. § 1395w-4(c)(2)(K)(ii).

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