Research Report

Survey-Based Reporting of Post-Operative Visits for Select Procedures with 10- or 90-Day Global Periods

Final Report

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Preface

For many surgeries and other types of procedures, payment from Medicare and most other insurers covers the procedure itself and related services delivered within either ten or 90 days after a surgical procedure during what is called the global period. Due to concerns that the number of bundled post-operative visits considered when setting payment rates may not reflect the number of visits provided in clinical practice, the Centers for Medicare & Medicaid Services (CMS) announced plans to unbundle post-operative visits from payment for procedures. However, Congress, as part of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), prohibited CMS from proceeding with this plan. Congress mandated that CMS collect the data needed to revalue procedures with 10- and 90-day global periods, including the *number* and *level* of post-operative visits provided in global periods, and to use these data along with other available data to improve the accuracy of valuation of surgical services under the Medicare Physician Fee Schedule. This report describes the development of a practitioner survey designed to capture the level of post-operative visits that take place during the global period.

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Summary

Background

For many surgeries and other types of procedures, payment from Medicare and most other insurers covers the procedure itself and related post-operative visits delivered within either ten or 90 days after a surgical procedure. This is called the "global period."

For visits that are not part of a global period, practitioners bill using Healthcare Common Procedure Coding System (HCPCS) codes for evaluation and management (E&M) visits. These different visit codes vary in terms of the physician work involved, with the lowest-level code having the least work and the highest-level code having the most work. For example, there are five levels of physician office visits for established patients with the most physician work for level 5 visits. Physician work not only reflects the time involved in the service but also includes factors such as technical skill, physical effort, and mental effort associated with the visit. The nontime aspects of work are typically referred to as "intensity," and physician work is viewed by Centers for Medicare & Medicaid Services (CMS) as the product of time and intensity per unit time. Work relative value units (RVUs) capture relative differences in physician work (i.e., the time, effort, skill, and stress associated with providing the service). Each E&M visit is assigned a certain number of RVUs to reflect the work involved.

CMS's valuation of procedures with global periods includes the work not just for the procedure itself but also for the post-operative visits that are assumed to typically occur during the global period. For procedures that have a global period, in the Physician Time File, CMS publishes the number and level of post-operative visits that were used in valuation organized by E&M visit codes. For example, for HCPCS code 66984, cataract surgery, there are two 99212 office/outpatient visits, two 99213 office/outpatient visits, and half of a 99238 hospital discharge day management visit.[1] Each of these visit codes is associated with a specified amount of time and work. Of note, the E&M visits are not specific to post-operative care, and post-operative visits have never been valued separately (only assigned as comparable E&M codes).

Due to concerns that the number of post-operative visits used to set payment rates does not reflect the number of visits actually provided in clinical practice, CMS adopted a rule to unbundle post-operative visits from payment for procedures. However, as part of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), Congress prohibited CMS from

[1] HCPCS code 99212 is for an office/outpatient visit for established patient, problem focused history and examination, straightforward medical decision making, about ten minutes). HCPCS code 99213 is for an office/outpatient visit for established patient, problem focused history and examination, straightforward medical decision making, about 15 minutes). HCPCS code 99238 is for hospital discharge day management, 30 minutes or less.

proceeding with this plan. Congress mandated that CMS collect the data needed to value surgical procedures, including the *number* and *level* of post-operative visits delivered to Medicare beneficiaries, and use these data along with other available data to improve the accuracy of valuation of surgical services under the Medicare Physician Fee Schedule.

To gather data on the *number* of post-operative visits, CMS required select practitioners to report post-operative visits using the no-pay HCPCS code 99024. To gather data on the *level* of post-operative visits, CMS implemented two additional channels of data collection: (1) a survey of a representative sample of practitioners about the level of post-operative visits furnished during the global periods and (2) direct observation of post-operative care in a small number of sites. This report summarizes the findings of the survey of practitioners, which we implemented as a proof of concept for three procedures: cataract surgery, hip arthroplasty, and complex wound repair.

Survey Approach and Development

The survey was designed to capture the types of care provided in post-operative visits. The survey was developed building on RAND's prior work on (1) the *development of nonpayment claims codes* (known as G-codes) that were intended to collect information on the number and level of post-operative visits (Mehrotra et al., 2016; Gidengil et al., 2017) and (2) *direct observation* of post-operative visits. For the work on new nonpayment claims codes, RAND interviewed individual practitioners who perform post-operative visits and brought together an expert panel on post-operative care that is provided during the global period. For the direct observation work, MedStar, in collaboration with RAND, conducted direct observations of 120 post-operative visits conducted by ten practitioners and nonpractitioner clinical staff at eight sites across six different surgical specialties to document workflow processes and tasks completed during post-operative visits. Survey domains and their specific questions were chosen to inform our understanding of the level of visits and ultimately revaluation of post-operative visits during the global period.

Based on this prior work, we used the following survey domains to capture relevant information about post-operative work:

1. *Practice characteristics*, such as practice size, academic affiliation, accountable care organization (ACO), or other shared savings model participation
2. *Visit characteristics*, such as date and location of the visit and complexity of the visit and whether the visit was expected or not as part of the usual clinical course
3. *Procedure characteristics*, meaning information about the original procedure associated with the global period that prompted the visit such as date, procedure location, and payment source
4. *Patient characteristics*, such as age and gender
5. *Staff* involved in the visit (nurse practitioners, physician assistants, residents, nurses, and others, including by category)
6. *Activities* performed during the visit, both by the respondent and staff

7. *Time spent* on the visit, both by the respondent and staff
8. *Comparisons of work* during the post-operative visit to E&M codes (this allowed us to compare reported work in terms of RVUs).

Due to initially low response rates to the piloted survey and feedback from specialty societies, we made significant changes to the sampling frame and length of survey. The pilot survey asked respondents to describe post-operative visits after all surgical procedures with a 10- or 90-day global period. Based on feedback, we focused on post-operative visits after three procedures—cataract surgery, hip arthroplasty, and complex wound repair. Limiting the survey to post-operative visits after three procedures allowed us to tailor the survey (e.g., including questions specific to cataract surgery), and we hoped this would enhance both response rates and the accuracy of the data collected. To improve the response rate, we also obtained practitioner emails from a different source. For the pilot, we used email addresses provided by CMS, but in the final survey, we used physician email addresses purchased from an external vendor due to concern about email address accuracy. We also had the survey invitation come directly from a CMS email address. Finally, we simplified and shortened the instrument wherever possible, asking respondents to report on only five visits instead of ten visits.

The final survey was fielded electronically from September to December 2018. We did not offer any financial or other incentives for completing this survey.

Key Findings

Response rates. Our response rate was 15.5 percent overall (12.1 percent for cataract surgery, 16.0 percent for hip arthroplasty, and 18.5 percent for complex wound repair).

Procedure characteristics. The majority of cataract surgeries occurred in ambulatory surgical centers, with some performed in hospital outpatient departments. Most hip arthroplasties took place in the inpatient hospital setting, and most complex wound repair procedures took place in physician offices. Respondents were asked to report on visits *regardless* of payer, though most *procedures* for all three provider groups were paid for by Medicare. Commercial coverage was more common for hip arthroplasties and complex wound repair than for cataract surgery.

Visit characteristics. The majority of reported post-operative visits occurred in physician offices and ranged from 85 percent for hip arthroplasty visits to 96 percent for cataract surgery visits. Hospital outpatient department visits accounted for fewer than 5 percent of visits in all three procedure categories. Some hip arthroplasty visits (12 percent) were in the inpatient hospital setting.

The median time in days from the procedure to the reported visit for cataract surgery was one day and visits were clustered on the earlier side of the post-operative course, indicating that many patients are returning to be seen the day after their procedure. For hip arthroplasty, the median number of days between the procedure and reported office-based visit was 22 days, and

visits were spread relatively broadly over the 90-day period. Reported complex wound repair visits tended to be later in the 10-day post-operative period at a median of seven days.

Respondents reported on more visits that were expected rather than unexpected (we considered visits being unexpected as another proxy for intensity) and more so for cataract surgery and hip arthroplasty than for complex wound repair. Except for complex wound repair procedures, it was relatively rare for post-operative visits to be related to multiple procedures.

The staff involved in the post-operative visit varied by procedure. During cataract surgery post-operative visits, specialized ophthalmologic staff were involved in about three-quarters of visits. Respondents who performed hip arthroplasty visits were most likely to report using a physician assistant in the visit, and few respondents reported working with a nurse practitioner. About 10 percent of respondents who reported on complex wound repair visits and about 25 percent of those who reported on cataract surgery and hip arthroplasty visits indicated that they used staff other than the categories we provided as options.

Overall, respondents reported that they performed routine post-operative activities almost all (> 90%) of the time. The exception to this was care coordination, which occurred about two-thirds of the time for hip arthroplasty and about a third of the time for cataract surgery and complex wound repair. Nonroutine post-operative activities were, as expected, less commonly reported compared with routine activities but were more often reported in follow-up for complex wound repair (25.6%) than for hip arthroplasty (9.6%) or cataract surgery (14.1%).

Time and work. For each of the three procedures, we compared reported physician time and work (relative to reference E&M codes) to the physician time and work implied by the E&M visits considered by CMS when valuing the procedures as listed in the Physician Time File. Reported physician time and work were generally similar—but slightly less—than Physician Time File levels for the two procedures with 90-day global periods (cataract surgery and hip replacement).

In contrast, for complex wound repair, reported physician time and work were higher than would be expected from the Physician Time File.

A summary of findings by procedure follows in Table S.1.

Lessons Learned

During the initial development, refinement, and fielding of this practitioner survey, we identified a number of lessons that may be useful if CMS decides to expand the use of this methodology to study post-operative visits. As noted above, we made significant changes to the sampling frame and length of survey after pilot testing. We summarize a few of the major lessons.

Table S.1. Summary of Key Findings Organized by Procedure

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Average time in days from procedure to visit	10.1 (8.4–11.8)	28.4 (26.6–30.2)*	5.9 (5.7–6.2)*,†
Practitioner time in average post-operative visit (minutes)			
From survey	16.5 (15.4–17.5)	22.9 (21.6–24.2)*	21.8 (19.2–24.5)*
Expected	19.4	29.6	16.0
Practitioner time between visits as reported in survey	6.6 (5.1–8.1)	15.5 (12.3–18.7)*	9.6 (8.5–10.7)*,†
Work per visit in average post-operative visit (measured in RVUs)			
From survey	0.87 (0.84–0.91)	1.01 (0.98–1.04)*	0.78 (0.74–0.82)*,†
Expected	0.89	1.10	0.48

NOTES: The term "expected" refers to the time or RVUs based on the post-operative visits reported in the Physician Time File. The Physician Time File includes the number and level of visits that were used when the procedure was initially valued. For cataract surgery, expected RVUs were 0.71 if not counting the half discharge visit as a full visit but 0.89 if counting the half discharge visit as a full visit. Average time to reported inpatient visits for hip arthroplasty was 1.6 (0.73–2.45) To indicate p-values for hip arthroplasty and complex wound repair, the asterisk symbol (*) indicates a *p*-value of < 0.05 for each compared with cataract surgery. For complex wound repair, the dagger symbol (†) indicates a *p*-value of 0.05 for comparison to hip arthroplasty. All *p*-values are available on request.

Sampling respondents. To produce precise estimates of time and work on post-operative visits after a given procedure, there must be an adequate number of post-operative visits within our reporting period. For most global surgery procedures, there are simply not enough practitioners who perform a given procedure frequently enough so that they will have a post-operative visit over the six-week window we used. Even with a high volume procedure such as hip arthroplasty, we had to sample practitioners below our planned threshold. Thus, in selecting procedures for future data collection efforts, we recommend grouping procedures by body part/system and surveying post-operative visits across the grouping.

Contacting respondents. We focused on an electronic approach to fielding this survey. We encountered numerous issues in accurately identifying practitioner email addresses. Future efforts should consider a mailed survey.

Feasibility and usability. As noted above, the phenomenon of survey fatigue is exacerbated by increasing demands on practitioners' time. For this reason, we strongly encouraged the use of medical staff to complete the survey and even framing this data collection as a practice-based effort may lead to higher response rates and more accurate information. We did not attempt to offer a paper-based survey in addition to the online version, but for future work we recommend fielding via both modalities in the hopes of increasing response rates. At the very least, a paper

worksheet or reporting tool could help staff collect necessary data prior to entering the online survey.

Respondent assistance. We received an extremely high volume of questions during the final survey fielding. Given the significant volume of questions related to the survey, for future efforts CMS could consider a dedicated support line for the survey with significant investment in personnel to staff the line. We also recommend education sessions and material to help respondents prepare for reporting. Finally, one helpful tool was the creation of several completed versions of the survey for respondents to review, particularly given the complexity of the task asked of respondents.

Survey question changes. During survey development, we made a number of decisions that impacted specific survey questions as well as the survey structure. In developing this survey, there was a tension between collecting very detailed information that could potentially be used to inform revaluation of global period payments and the survey burden on respondents. Based on the poor response rates during the pilot as well as feedback from both individual physicians and from specialty societies, we shortened and simplified the survey dramatically.

Conclusions

As part of 2015 MACRA legislation, Congress mandated that CMS collect data on the number and level of post-operative visits delivered to Medicare beneficiaries in the global period and use these data to assess accuracy of payment. Congress did not specify how the number and level of visits should be collected. CMS chose to pursue multiple avenues to collect this information including claims-based data collection via practitioner reporting to assess the number of visits (summarized in a separate report), a practitioner survey (summarized in this report), and direct observation to assess the level of visits. Using data reported via our practitioner survey, we found that reported physician time and work for cataract surgery and hip replacement post-operative visits were generally similar—but slightly less—than the levels expected based on the E&M visits assumed to typically occur by CMS when valuing these procedures. Reported physician time and work for complex wound repair post-operative visits were higher than Physician Time File levels.

Based on our experiences with various approaches to collecting data on the level of post-operative visits as well as the status quo (estimate of practitioner work based on the Relative Value Update Committee [RUC]/specialty society surveys, which rely on E&M codes), we suggest thinking of these data collection methods as a spectrum with both benefits and trade-offs to each approach. Given the strengths and weaknesses of these approaches, we would recommend consideration of a claims-based approach coupled with information about the level of service or the use of G-codes. A survey instrument could serve as a complement to a claims-based approach for procedures or groups of procedures for which valuation is thought to be particularly problematic.

Acknowledgments

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Abbreviations

ACO	accountable care organization
AMA	American Medical Association
CMS	Centers for Medicare & Medicaid Services
CPT	Current Procedural Terminology
E&M	evaluation and management
FAQ	frequently asked questions
FFS	fee-for-service
HCPCS	Healthcare Common Procedure Coding System
HHS	U.S. Department of Health and Human Services
ICU	intensive care unit
MACRA	Medicare Access and CHIP Reauthorization Act of 2015
MIPS	Merit-Based Incentive Payment System
NP	nurse practitioner
NPI	National Provider Identifier
PA	physician assistant
PE	practice expense
PECOS	Provider Enrollment, Chain, and Ownership System
RBRVS	resource-based relative value scale
RUC	RVS Update Committee
RVS	relative value scale
RVU	relative value unit
TIN	tax identification number

1. Background

The Centers for Medicare & Medicaid Services (CMS) use the resource-based relative value system (RBRVS) to determine payment for practitioners for their professional services. For many surgeries and other types of procedures, CMS and most private insurers cover a bundle of services, including post-operative visits, delivered during a global period.[1] This bundled payment includes some pre-operative care, the procedure itself, and post-operative visits within either ten or 90 days after a surgical procedure. CMS spending on surgical procedures is sizable, as procedures with 10- and 90-day global periods reflect nearly 10 percent of all Medicare fee-for-service (FFS) spending in 2017.[2]

The number of post-operative visits typically furnished during the global period for a procedure is set by CMS when valuing the procedure. The level of a visit refers to the physician work associated with a visit and is typically differentiated by using existing evaluation and management (E&M) visit levels (e.g., 99212, 99213, etc.). Physician work reflects not just the time involved in the service but also the technical skill, physical effort, mental effort, and stress due to the potential risk to the patient associated with the visit. The nontime aspects of work are typically referred to as "intensity," and physician work is viewed by CMS as the product of time and intensity per unit time. Two visits could involve the same physician time but differ in work due to difference in intensity (e.g., a 15-minute visit taking place in the intensive care unit versus a 15-minute visit that takes place in a physician's office). For visits *outside* of the global period, providers bill using different Healthcare Common Procedure Coding System (HCPCS) codes corresponding to E&M visit levels that vary in terms of the physician work involved, with the lowest-level code having the least work and the highest-level code having the most work. For example, there are five levels of physician office visits for established patients and the physician work associated with each level increases from level 1 to level 5.

CMS currently publishes information on the level of visits that are assumed to typically occur during the global period in the Physician Time File. For each HCPCS procedure code with a 10- or 90-day global period, the Physician Time File lists counts of post-operative visits organized by select E&M visit codes. For example, for HCPCS code 66984, cataract surgery, the Physician

[1] Surgical procedures are invasive procedures involving incisions or destruction of tissues and can be performed in a variety of settings, including offices, clinics, surgical centers, or hospitals. Procedures include invasive cardiology procedures (e.g., catheterizations) and radiology procedures.

[2] Procedures with 10- and 90-day global periods reflected 2.2 percent and 7.8 percent of all Medicare fee-for-service (FFS) spending in 2017, respectively. Percentages were generated using information from the 2018 Physician Fee Schedule (Centers for Medicare & Medicaid Services, "Global Surgery Data Collection," CMS.gov, December 4, 2018b).

Time File lists two 99212 office/outpatient visits, two 99213 office/outpatient visits, and half of a 99238 hospital discharge day management visit.[3] Each of these visit codes is associated with a specified amount of time and work. Importantly, the E&M visits are never valued as post-operative visits specifically. The E&M visit codes are billed separately only when the visits are not included in a global period. Some of the E&M codes (e.g., HCPCS codes 99212 and 99213) are among the highest-volume services under Medicare Part B. The post-operative visit level is assumed to require a similar amount of time and work as do these E&M visit analogues. (For more detail on the valuation of global periods, please see Chapter 2).

The American Medical Association/Specialty Society Relative Value Update Committee's (RUC) surveys conducted by specialty societies submit recommendations to CMS on the number of post-operative visits that typically occur in the global periods as well as the work and time involved (i.e., level based on E&M codes). The RUC survey results are then used as an input into CMS's subsequent valuation of the total work for the procedure. Both the RUC survey and CMS's Physician Time File are posted with the Physician Fee Schedule online and list the number of post-operative visits for each procedure with a global period, by level of visit, based on corresponding E&M codes.

Historically, CMS has not collected data on how many post-operative visits are actually performed. Because post-operative visits make up about 22 percent of the total work of surgical global bundles (Mulcahy et al., 2015), inaccurate counts of post-operative visits may result in over- or underpayment on average to practitioners for specific procedures with global periods. Prior medical chart reviews by the Department of Health and Human Services (HHS) Office of Inspector General indicated that the number of post-operative visits used for valuation overestimates the number of post-operative visits actually provided in clinical practice for select surgical procedures with global periods (HHS, 2007, 2012a, 2012b).

In response to concerns about inaccurate payment, in 2014 CMS announced plans to transition all 10-day and 90-day global periods to zero-day global periods (CMS, 2014) in the Physician Fee Schedule Final Rule. Under this new system, practitioners would bill for post-operative visits separately. After objections from the surgical community on reporting burden and potential negative financial impact on patients (Ollapally, 2015; DiVenere, 2015; American Society of Plastic Surgeons, 2015), Congress, as part of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), prohibited CMS from proceeding with this plan. Congress mandated that CMS collect the data needed to value surgical procedures, including the number and level of post-operative visits delivered to Medicare beneficiaries, and use these data

[3] HCPCS code 99212 is for an office/outpatient visit for established patient, problem focused history and examination, straightforward medical decisionmaking, about ten minutes. HCPCS code 99213 is for an office/outpatient visit for established patient, problem focused history and examination, straightforward medical decisionmaking, about 15 minutes. HCPCS code 99238 is for hospital discharge day management, 30 minutes or less.

along with other available data to improve the accuracy of valuation of surgical services under the Medicare Physician Fee Schedule. While Congress required that CMS collect data on the number and level of visits, it did not mandate a particular data collection approach.

To gather data on the number of post-operative visits, CMS required select practitioners to report post-operative visits using the no-pay Healthcare Common Procedure Coding System (HCPCS) code 99024 (CMS, 2017). Results from RAND's analysis of claims-based data collection are presented in a separate report (Kranz et al., 2019).

In addition to the claims-based reporting on the number of post-operative visits, CMS implemented two additional channels of data collection to gather information on the *level* of post-operative visits: (1) a survey of a representative sample of practitioners about the level of post-operative visits furnished during the global periods and (2) direct observation of post-operative care in a small number of sites.

This report is focused on the survey of practitioners.[4] The survey was fielded by RAND for CMS during 2018 to collect information on the activities, time, staff, and work involved in delivering post-operative care during the global period. In this report, we provide an overview of Medicare payment policy for procedures associated with a global period as well as how those payments are currently determined (Chapter 2); describe the survey development (Chapter 3); present the results of the survey (Chapter 4); detail the lessons learned through multiple iterations of survey development and fielding (Chapter 5); and offer our conclusions on the policy implications and potential next steps for CMS (Chapter 6).

[4] We use the term "practitioners" throughout the report for consistency with other work and with CMS's preferred terminology. We realize that practitioners encompass both physician and nonphysician practitioners (nurse practitioners, physician assistants, etc.). This survey only included physicians because we could only access physician email addresses through our vendor (see Chapter 3). Thus, in this report practitioner refers to physicians only, and we use the terms "nurse practitioners" and "physician assistants" specifically where appropriate to refer to nonphysician practitioners.

2. Overview of the Current Valuation Approach for Post-Operative Services in the Global Period

As we note in Chapter 1, CMS uses the RBRVS as the basis for paying practitioners for their professional services. Under the RBRVS, each specific service is valued in three components: physician work, practice expense (PE), and malpractice expense. Work relative value units (RVUs) capture relative differences in physician time and intensity (i.e., the effort, skill, and stress associated with providing the service). The PE RVUs measure the relative costs of resource inputs used in providing a service, including office rent, nonphysician personnel labor, equipment, and supplies. Total RVUs are adjusted for geographic price differences and multiplied by a dollar conversion factor to determine the Medicare Physician Fee Schedule payment amount. In the case of surgeries and other procedures, the physician work component includes the procedure itself, preparations prior to the procedure, and immediate post-operative recovery.

Unlike other services, physician work for surgical procedures may include post-operative visits within a global period (10 or 90 days following the surgical procedure) and, in the case of surgeries with 90-day global periods, a pre-operative visit the day before the procedure. Post-operative E&M visits related to surgical procedures are bundled into total work for Current Procedural Terminology (CPT) procedure codes with a 10- or 90-day global period. These E&M visits are not paid separately under the RBRVS when they are performed by the same practitioner who performed the surgical procedure within the global period. The next section describes in further detail the process for determining the value of global periods for procedures.

Process for Determining Valuation of Global Periods

After the RBRVS was implemented, a process to review and revise the RVUs was needed to ensure refinement and updating as CPT codes are modified or added, new technology is introduced, and practice patterns change. The American Medical Association (AMA)/Specialty Society Relative Value Scale Update Committee (RUC) meets three times a year to consider new and revised CPT codes and potentially misvalued services that are identified either through its Relativity Assessment Workgroup or by CMS. The RUC is supported by an Advisory Committee of 123 specialty societies that collect data related to the work, time, number of post-operative visits, and other factors via physician surveys. The RUC reviews these survey data and makes recommendations to CMS (AMA, n.d.). CMS then determines the final physician work RVUs, physician time, and number of post-operative visits for the procedure.

Estimating Practitioner Work

As with the data collection effort to establish level of work that we describe later in this report, the predominant mechanism of collecting data to establish new or revised RVUs is via physician surveys conducted by the specialty societies. However, unlike our survey, the specialty societies' physician survey uses a vignette that describes the typical patient receiving the procedure.

The specialty societies' survey elicits information on where the practitioner typically provides the procedure (and in the case of a hospital procedure, whether the patient is discharged the same day or typically has an overnight stay), postrecovery room visits provided on the same day as the procedure, and the estimated number of post-operative visits performed in both the hospital and office settings following the day of surgery.

For valuing the *procedure*, the respondent is asked to compare the survey procedure and reference procedure on different domains of intensity (mental effort and judgment, technical skill/physical effort, and psychological stress) using a scale of 1 to 5 for preservice, intraservice, and immediate post-operative services; a similar ranking is not requested for the post-operative visits. The survey also asks the respondent to estimate total work RVUs for the survey procedure relative to the value assigned to the reference procedure.[1] Separate estimates of work for the individual components are not obtained.

To collect the information on post-operative *visits*, the survey uses CPT codes for E&M visits. Typical times associated with each code for hospital visits (noncritical care inpatient visits, subsequent observation care visits, discharge day management) and office/clinic visits are provided in the survey. Again, no direct estimate of the work that occurs during the post-operative visits is obtained.

The RUC uses a variety of methodologies to review the specialty society proposals and formulate its recommendations for work values, including a comparison of the proposed values with values for key reference codes furnished by the specialty and other physician specialties. The RUC submits its recommendation to CMS.

After reviewing the RUC's recommendations, CMS determines a final single work value for the surgical procedure that accounts for all components of the service, including the post-operative visits. Of note, work for the post-operative visits is not separately estimated in the valuation process nor is there any assessment of how the post-operative visit work compares with the E&M visits defined by the CPT codes used to estimate visits. As a supplement to the Physician Fee Schedule, CMS posts the number of post-operative visits organized by E&M level as well as information on physician time in the Physician Time File.

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[1] This comparison is called "magnitude estimation."

Our practitioner survey differs from the RUC's survey both in scope and approach. While the RUC survey uses a hypothetical vignette to describe the typical patient, we ask the practitioners to report on actual patient visits as they occur (or as close in time as possible) and ask directly about the work associated with each visit (in terms of both time and intensity). We also ask about individual visits, as opposed to an episode of care, to obtain detailed information about the level (i.e., work) associated with each visit. Chapter 3 contains more information about the domains of information captured about each visit.

Estimating Practice Expense

For new, revised, or misvalued codes, the RUC PE subcommittee reviews estimates put forth by the specialty societies of the direct PE inputs for clinical staff, medical equipment, and supplies associated with each post-operative office visit for a given procedure. For example, the equipment estimate might include a cast cutter, and the supplies estimate might include bandages and dressings. CMS reviews the RUC recommendations, develops refined direct cost inputs, and attaches prices to each input. For a surgical procedure performed in an office setting, a similar step is taken about the direct PE inputs for the intraservice time. No direct costs are associated with intraservice time for procedures performed in a facility setting or hospital inpatient post-operative visits because the facility assumes those costs. Indirect costs are allocated to a surgical procedure on the basis of the direct costs specifically associated with a code and the work RVUs.

In theory, the PE direct cost estimates for a surgical procedure performed in an inpatient setting should therefore only reflect the number of post-operative office visits and any specialized staff, equipment, or supplies used during these visits (note that the 90-day global includes the day before the procedure, so it might include direct costs for this day of pre-operative services). However, many of the estimates were made some years ago and thus may not reflect current practices. The shift of surgical procedures from inpatient to the outpatient setting, along with shorter lengths of inpatient stay, may affect the number of post-operative office visits and type of care provided during such visits. In addition, the growth of team-based care has implications for the respective roles of physicians, nonphysician practitioners, and clinical staff in providing post-operative care.

Our survey focuses on physician work and staff time. However, we provide an explanation of PE estimation in this chapter as staff time is part of PE. We had originally hoped to also collect information on medical equipment and supplies, but this was not feasible. (For more details, please see Chapter 3.)

Billing for Post-Operative Services Provided During the Global Period

Medicare bundles post-operative care related to surgical procedures into the total payment for procedure codes with a 10- or 90-day global period. Post-operative visits are not paid separately under RBRVS when they are performed by the same practitioner who performed the surgical

procedure.[2] The bundling policy applies to all medical and surgical services related to the procedure during the global period provided by the practitioner who performed the surgical procedure, including follow-up visits, postsurgical pain management, miscellaneous services and supplies, and any additional medical and surgical services needed due to complications that do not require an additional trip to the operating room.[3]

The practitioner performing the surgery may be paid separately for noninpatient, medically necessary E&M visits during the global period if the service is documented as not related to the post-operative care of the surgery (modifier = 24) or is documented as being more extensive than the usual pre-operative and post-operative care furnished on the same day as the procedure (modifier = 25).

As of now, practitioners do not need to bill for post-operative E&M visits to receive payment for these services because they are included in the bundled payment for the surgical procedure. With the claims-based reporting system implemented for the time being by CMS, Medicare claims data for select practitioners in nine states now include when and how many post-operative visits are provided to patients for select procedures.[4]

[2] Practitioners use modifier –54 to indicate that they performed the surgical procedure and inpatient E&M visits, but not other E&M visits. Practitioners use modifier –55 to indicate that they performed only post-operative outpatient E&M services.

[3] For procedure codes with zero-day global periods, any post-operative visits on the day of the surgery are bundled.

[4] Announced in November 2016, CMS required that all practitioners who practice in groups with ten or more practitioners in nine states (Florida, Kentucky, Louisiana, Nevada, New Jersey, North Dakota, Ohio, Oregon, and Rhode Island) report post-operative visits associated with approximately 293 common procedure codes using HCPCS code 99024.

3. Survey Development and Methods

This chapter describes the development of a survey intended to capture the work that occurs during and between post-operative visits during the global period. The survey was administered to practitioners performing selected procedures with a 10- or 90-day period.

Survey Development

The survey was developed building on RAND's prior work on (1) the *development of new nonpayment claims codes* (known as G-codes) intended to collect information on the number and level of post-operative visits (Mehrotra et al., 2016; Gidengil et al., 2017) and (2) *direct observation work* performed by RAND at a small number of clinics. For the prior work on the new nonpayment claims codes, RAND gathered input from individual practitioners who perform procedures and later an expert panel on the range of post-operative care provided during the global period. For the direct observation work, MedStar, in collaboration with RAND, conducted direct observations of 120 post-operative visits conducted by ten practitioners and nonpractitioner clinical staff at eight sites across six different surgical specialties to document workflow processes and tasks completed during post-operative visits. The approach used for the direct observation as well as a high-level summary of the results is in Appendix A. Based on our findings from this prior work, we proposed the following survey domains to capture relevant information about post-operative work.

1. *Practice characteristics*, such as practice size, academic affiliation, accountable care organization (ACO), or other shared savings model participation
2. *Visit characteristics*, such as date and location of the visit and complexity of the visit and whether the visit was expected or not as part of the usual clinical course
3. *Procedure characteristics*, meaning information about the original procedure associated with the global period that prompted the visit, such as date, procedure location, and payment source
4. *Patient characteristics*, such as age and gender
5. *Staff* involved in the visit (nurse practitioners [NP], physician assistants [PA], residents, nurses, and others, including by category)
6. *Activities* performed during the visit, both by the respondent and staff
7. *Time spent* on the visit, both by the respondent and staff
8. *Comparisons of work* during the post-operative visit with E&M codes (this allowed us to compare reported work using RVUs).

Domains and their specific questions were chosen to inform our understanding of the level of visits and ultimately revaluation of post-operative visits during the global period. Key practice, visit, and procedure characteristics were chosen as potential determinants of practitioner work so

that we could later perform stratified analyses to understand which types of visits and/or settings might be associated with increased work (e.g., first visit, unexpected visit, nonambulatory setting, etc.). For example, we asked about expected versus unexpected visits to better understand whether a visit being unexpected might serve as a proxy for complexity and thus increased work. We asked about which staff and how much of their time were involved in the visit not only to understand how staff intersect with the practitioner in the visit but also to see if staff time varied predictably with practitioner time across different procedures (as staff time would be considered part of PE).

To measure the level of the visit itself, we measured practitioner (in this case, physician) face-to-face and non–face-to-face time. We chose to measure time given that E&M codes are associated with a particular amount of time so that we could compare these visits against the visits currently bundled in the global period. In addition, time and work tend to be closely related. We also asked respondents to specifically compare the visit with comparable E&M codes in terms of work.

Cognitive Testing

Drafting the survey and eliciting feedback. After developing survey domains and draft questions in fall 2016, we performed a first round of cognitive testing with a small set of practitioners ($N = 3$) who perform procedures with global periods. The goal of this round of cognitive testing was to ensure that questions were being understood as intended and to obtain high-level feedback on a draft survey. Based on feedback from this smaller set of interviews, we refined the survey further.

Cognitive interviews with practitioners. Next, we embarked on more formal cognitive testing. We approached 20 specialty societies to request nominations for members who would be willing to test the survey and provide feedback. Of those, 14 specialty societies provided nominations and we were able to conduct interviews with 11 nominees. We interviewed one individual from each of the following specialties: general surgery, colorectal surgery, vascular surgery, thoracic surgery, neurosurgery, plastic and reconstructive surgery, surgical oncology, ophthalmology, otolaryngology, dermatology, and podiatry. Each interview lasted between 30 and 60 minutes and took place in spring 2017. We used a semistructured interview guide to ensure that themes and feedback were elicited consistently across the interviews.

Specialty society feedback. After having refined the survey based on feedback from the cognitive interviews, we also offered 19 specialty societies the opportunity to provide feedback, which included societies representing the eight of the 11 specialties included in the cognitive interviews. We received specific feedback from several of the societies as well as feedback gathered by the American College of Surgeons on behalf of 18 other specialty societies.

Pilot Testing

After reviewing all feedback, we pilot tested an updated survey. The instrument was intended to describe ten post-operative visits associated with any procedure with a global period (i.e., we did not specify particular procedures). Based on our cognitive interviews to develop and test the survey, we estimated that it would take approximately two hours to complete (ten to 15 minutes to report on each of ten visits and eight minutes for a final set of questions about practice characteristics).

Given the complexity of the information we were attempting to capture, we planned to field the survey electronically. We did not think that a paper-based version would be feasible given the complex skip patterns needed to gather the information relevant to the level of a post-operative visit. Specifically, the survey had branching logic for office-based versus inpatient visits and later had questions with complex skip patterns that would work best with an online survey.

Pilot testing was performed on a sample of 557 practitioners who performed a minimum number of procedures covered by Medicare with a global period in 2016 (see sampling approach section below). The survey was piloted during September 2017. Invitations to participate in the survey were sent by email and came from NORC, the survey firm that hosted the survey on behalf of CMS. Practitioner email addresses were provided by CMS.

Despite the use of supplemental telephone calls and messages, the response rate remained extremely low at 0.2 percent (one complete response and three partial responses) with only 1.8 percent of sampled practitioners even opening the survey link. When making supplemental phone calls, research team members inquired as to why the practitioner had not completed the survey (sometimes directly to the practitioner and sometimes to the practice manager). Common reasons included: (1) lack of time; (2) lack of penalty for not completing the survey (i.e., competing priorities with other initiatives that would result in loss of revenue); (3) survey length and complexity; and (4) lack of awareness that practice staff could assist with the survey. On review of CMS-provided email addresses, we also were concerned that a large share of emails did not reach the intended recipient (e.g., going to coding/billing companies). These issues are discussed in more depth in Chapter 4 (Lessons Learned).

Survey Refinement and Final Structure

Survey changes. Given the poor response rate in the pilot, we made a number of substantive changes to the survey. First, given the difficulty in fielding the survey to a wide range of specialties and procedures, we focused on three high volume procedures with global periods that were common enough to likely result in a robust sample size: (1) cataract surgery; (2) hip arthroplasty; and (3) complex wound repair (Table 3.1). This approach allowed us to tailor the survey (e.g., include questions specific to cataract surgery) that we hoped would enhance both response rates and the accuracy of the data collected. While generalizability of the survey was of

course decreased, this approach of targeting three procedures allowed us to use this survey as a proof of concept for future surveys that could encompass more procedures.

Table 3.1. Description of Selected Procedures for Final Survey

Full Description	Short Description	HCPCS Codes	Global Period
Extracapsular cataract removal with insertion of intraocular lens prosthesis (one stage procedure), manual or mechanical technique (e.g., irrigation and aspiration or phacoemulsification)	"Cataract surgery"	66984	90 days
Arthroplasty, acetabular, and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft	"Hip arthroplasty"	27130	90 days
Reconstructive procedures and complicated wound closure, 1 cm or larger, all body parts (including trunk, scalp, arms, legs, forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands, feet, eyelids, nose, ears, and lips)	"Complex wound repair"	13100, 13101, 13120, 13121, 13131, 13132, 13151, and 13152	10 days

We also obtained practitioner emails from a different source. For the pilot, we had used email addresses provided by CMS, but in the final survey we used physician email addresses purchased from SK&A.[1] We used SK&A email addresses because the email addresses used by CMS were often for billing or credentialing organizations rather than for practitioners or practices directly. Based on our pilot work, we believe a significant share of the emails were being sent to these billing or credentialing organizations and not forwarded to practitioners. SK&A provides personal practitioner email addresses, providing a direct way to transmit the survey invitation to practitioners. We discuss the merits of contacting practitioners rather than practices in Chapter 4 (Lessons Learned).

In addition to the new source of email addresses, we made the change to have the survey invitation come directly from a CMS email address. The invitation email for the pilot survey had come from NORC (the firm fielding the survey on behalf of RAND).

Finally, we simplified and shortened the survey wherever possible, resulting in a final survey structure as described in the section below. Specifically

[1] See SK&A ("Physician Email List," SK&A database, 2019) for more information about the SK&A file of physician email addresses.

1. CMS made the decision to ask respondents to report on five visits instead of ten visits to decrease survey burden. Each respondent was asked to report on post-operative visits over the course of their day(s) until they had reached five visits. This meant that respondents were typically reporting on five different patients. By asking respondents to report on fewer visits, we significantly cut down the estimated time to complete the survey. We were also able to enlarge our survey sample for procedures for which there would be fewer post-operative visits during the survey window (e.g., hip arthroplasty; for more detail please see the sampling section below).
2. We moved a section of text containing frequently asked questions (FAQ) to a website so that respondents could click on a link to access them.
3. We removed a set of questions that asked for detailed information on other procedures related to the visit (meaning procedures that were performed the same day as the procedure of interest or in a staged fashion) as well as a question related to complications.
4. We omitted a set of questions about what supplies were used during the visit. While we had originally intended to ask about supplies in an effort to collect information to inform an estimate of PE, it quickly became clear that an overly detailed survey would result in a response rate too low to be of use.

We estimated that reporting on each visit could be completed in approximately five minutes and that answering a set of questions about practice characteristics would take approximately eight minutes (no changes were made to the practice characteristics questions). Assuming a respondent reported on five visits and answered the practice characteristics questions, this would result in a total time burden of approximately 33 minutes, compared with the two hours we estimated for the previous version.

Final survey structure. First, potential respondents received an email directly from CMS with the survey link. Respondents used the survey link and their National Provider Identifier (NPI) number to access the informed consent portion of the survey. Staff members were encouraged to assist in the survey and could use the practitioner's NPI to access the instrument. Each time that a new respondent accessed a practitioner's survey, they were asked to review the informed consent documentation.

Each practitioner was asked to provide information on five post-operative visits during the survey window starting on a particular day, regardless of payer, on which they personally saw the patient during the global period for *one* of the following procedures (depending on the specialty of the practitioners who was surveyed): cataract surgery, hip arthroplasty, or complex wound repair (for more information on how many sampled practitioners had five visits, please see below). Respondents could choose to submit information on consecutive post-operative visits (e.g., during a clinic session or inpatient rounds) or on every second or third post-operative visit, depending on what was most convenient for them and their staff. Regardless of whether the respondent chose to report on consecutive visits or every second or third post-operative visit, we asked that they report on visits as they happened over the course of their day(s), not the visits over a particular patient's post-operative course. This means that, typically, respondents would be reporting on five different patients. We asked respondents to report in this way to ensure that

they could report on visits in a timely way within the survey time window (versus following a patient for weeks to ensure enough visits). We also wanted respondents to report on as random a sample as possible (both in terms of patients and time of day) while balancing the complexity of the survey effort. We note that in spite of our efforts to explain this clearly in the survey instructions, we received a number of calls and emails asking for clarification on how to report visits.

The survey asked practitioners to describe post-operative visits during the global period, starting the day of the procedure and after the patient had left the recovery room. We did not ask respondents to report on pre-operative visits that would occur prior to the procedure, even though these are considered part of a global period in the case of those with a 90-day global period. An extensive list of answers to FAQs was available on a website, accessible via a link included in both the invitation email and the survey itself (see Appendix B for the FAQ text).

After logging in, reading the survey instructions, and providing consent (see Appendix C), respondents were next taken through a brief set of screening questions (see Appendix D), primarily to ascertain their typical case mix between office-based and inpatient visits for a given procedure. We collected this information to ensure reporting on a case mix similar to their actual case mix (balanced between office-based and inpatient visits, as applicable). Based on their response to the screening questions, each respondent was assigned to a mix of a total of five office-based and/or inpatient visits. For example, if the respondent indicated that they typically saw approximately 60 percent of post-operative visits in an office or other outpatient setting as part of the global period for total hip arthroplasty, then they would be assigned three office-based visits (60 percent) and two inpatient visits (40 percent) for the survey to reflect their actual case mix. This was done to ensure that respondents reported on at least some visits in each setting, especially if they typically would see visits in both settings for a given procedure. These visits were laid out on a landing page on which the respondent could access each visit as well as a final set of questions about practice characteristics.

For each visit, respondents were asked questions about the date of the visit, the location of the visit, the original procedure with the global period related to the visit, patient characteristics, staff involved in the visit, activities performed during the visit, time spent on the visit, and estimates of work relative to comparator E&M visits (see Appendix E for a sample visit module for an office-based visit).

The survey ended with a set of questions on the respondent's practice, including practice size, academic affiliation, and care coordination resources (see Appendix F).

Sampling Approach

We used a power calculation to determine the number of respondents necessary to obtain a 95 percent confidence interval of ± 1 minute around an estimate of the practitioner time involved in the visit.[2] To determine power, we focused on the precision of our estimate of time for two reasons. First, reported practitioner time for post-operative visits can be compared with practitioner time for E&M visits to help estimate the level of post-operative visits. Second, practitioner time is highly correlated with practitioner work. The power calculation resulted in a target of 311 responses per procedure. We aimed for 311 *respondents* rather than *visits* as the up-to-five-visit–level responses from a single respondent may be highly correlated.[3] We assumed a 20-percent response rate based on RAND's prior experience fielding practitioner surveys. This yielded a target of 1,555 ($311 \times [1/0.2]$) respondents per group.

We constructed our sampling frame of eligible practitioners using Medicare FFS claims data accessed via CMS's integrated data repository. We identified NPIs that in 2016

1. Were located in one of the 41 states or the District of Columbia where claims-based reporting of post-operative visits using HCPCS code 99024 was not required. For the claims-based reporting, nine randomly selected states were selected. This criterion was intended to prevent a single practitioner from being asked to both report post-operative visits via claims and respond to the survey.
2. Had a minimum volume of paid claim lines for the three survey procedures (cataract surgery, hip arthroplasty, and complex wound repair). The specific volume thresholds are described below.
3. Had an email address available from the vendor (SK&A) that we used to obtain contact information. This latter criterion meant that only physicians were surveyed, as SK&A did not have access to nonphysician practitioner email addresses.

The rationale for the volume thresholds was to increase the likelihood that sampled practitioners would have five post-operative visits after one of the three selected procedures during the six-week[4] survey reporting period. Without a volume threshold, sampled practitioners might not have had enough post-operative visits to report during the planned survey window. Based on a set of assumptions,[5] we initially used a 40-procedure-per-year threshold for cataract

[2] We assumed a nine-minute standard deviation of the time distribution—a conservative assumption based on our observed 6.5-minute standard deviation from a sample of more than 100 post-operative visits in our direct observation effort.

[3] In fact, the intraclass correlation coefficient for practitioner time was 0.8075, indicating a high level of correlation within respondent.

[4] The survey had initially been planned to stay open for four weeks, but we later extended it to six weeks.

[5] Specifically, that (1) Medicare volume is two-thirds of practitioners' total volume for study procedures; (2) procedures are uniformly distributed over weeks; (3) each 10-day procedure results in a half of a post-operative visit in expectation; and (4) each 90-day procedure results in one visit in expectation.

surgery, a 26-procedure-per-year threshold for hip arthroplasty, and an 80-procedure-per-year threshold for the 10-day global period procedure (complex wound repair). SK&A email addresses were not available for all of the practitioners above the volume threshold (Table 3.2). For both complex wound repair and hip arthroplasty, we ultimately sampled all of the providers above the original threshold as well as a random sample drawn from physicians above a lower threshold (16 procedures per year for hip arthroplasty and 40 procedures per year for complex wound repair) to reach 1,555 sampled physicians in each category. Table 3.2 provides the fraction of practitioners above these volume thresholds, the final number of practitioners in each sampling frame after restricting to those with available SK&A email addresses, and the final number sampled in each category.

Table 3.2. Practitioners Above the Volume Threshold

Study Procedure(s)	Total Practitioners Performing These Procedures	Practitioners above Volume Threshold	Practitioners above Volume Threshold with Contact Information	Sampled
Complex wound repair	11,785	1,625 with 80 or more procedures; an additional 746 with 40 or more procedures (2,371 total)	1,112 with 80 or more procedures; an additional 509 with 40 or more procedures	1,112 with 80 or more procedures; 443 randomly selected with between 40 and 79 procedures (1,555 total)
Cataract surgery	8,428	6,232	4,731	1,556
Hip arthroplasty	6,615	1,564 with 26 or more procedures; an additional 971 with 16 or more procedures (2,535 total)	1,271 with 26 or more procedures; an additional 784 with 16 or more procedures	1,271 with 26 or more procedures; 284 randomly selected with between 16 and 25 procedures (1,555 total)

Survey Fielding

The final survey was fielded beginning in late September 2018 and ending in late December 2018. Practitioners were sent an invitation to the survey by email directly from CMS (see Appendix G), along with a PDF attachment containing a letter from CMS leadership (see Appendix H). We did not offer any financial or other incentives for completing this survey. Although we considered this approach, the feedback we received from cognitive interviews and telephone follow-up calls to practices was that financial incentives paid directly to the practitioner (e.g., $500–$1,000) were unlikely to significantly increase the likelihood of participation.

We staggered the start dates for the survey by procedure (cataract surgery first, followed by hip arthroplasty and then complex wound repairs). This allowed us to ensure that the survey

functioned well for the first procedure prior to fielding it for subsequent procedures and also gave us more time to answer questions and help respondents troubleshoot the survey. Email reminders were sent to respondents by CMS at approximately two weeks and four weeks following the initial invitation. Surveys were open for six weeks.

Survey Weights

We developed survey weights to address two concerns. First, the lack of active email addresses for all physicians in our sampling frame raises concerns that the physicians with active email addresses could be systematically different than those without. Second, the significant rates of nonresponse to the survey (as described below) raises concerns that respondents could be systematically different than nonrespondents. Both concerns could lead to biased estimates and threats to the generalizability of our results.

To address these concerns, we calculated two weights, one for eligibility into the sample and the other for survey nonresponse. The scaled product of these two weights was then used in the final analysis to produce results that are generalizable to Medicare practitioners billing above the volume thresholds. The specific approach to calculating both weights was similar in both cases. For the eligible sample weights, we used logistic regression to estimate the probability of inclusion of a practitioner with a valid email address in the potential sample. RAND modeled this probability as a function of four practice characteristics: (1) practice size, measured as the number of NPIs billing in 2016 under the same tax identification number (TIN); (2) census division; (3) whether the practice was in an urban or rural area; and (4) the count of cataract surgery, hip arthroplasty, and complex wound repair procedures. The reciprocal of these probabilities are the eligible sample weights. RAND used a similar methodology (including the same variables) to estimate nonresponse probabilities within the eligible samples for each specialty, using the reciprocal of the probability of response as the nonresponse weight. For our purposes, a respondent is a practitioner who has completed the practice characteristics questions as well as at least one visit. The product of these weights is then scaled to sum to the original population sizes for each specialty (6,232 practitioners for cataract surgery, 2,535 practitioners for hip arthroplasty, and 2,371 practitioners for complex wound repair). Weighted summary statistics calculated according to this methodology provide statistically unbiased estimates of population parameters.

The cataract surgery practitioners had the largest population size and were therefore generally scaled larger than the weights applied to hip arthroplasty or complex wound repair practitioners. The weights applied to cataract practitioners had a mean of 33.1 and ranged from 12.02 to 75.18. For the hip arthroplasty practitioners, the mean of the scaled weights was 10.21 with a range of 6.68 to 24.85. For the complex wound repair practitioners, the mean of the scaled weights was 5.64 with a range of 2.43 to 9.00. The variance inflation of the weighted sampling

strategy compared with a random sampling strategy did not exceed 12 percent for any of the specialties.

Our sampling weights were calculated and applied at the physician level. We weighted each visit-level response by this physician-level weight for the purpose of calculating visit-level descriptive statistics. Not all physicians submitted data for a total of five visits as requested. We could not determine whether physicians submitting data on fewer than five visits did so because they (a) performed fewer than five visits over the reporting period or (b) performed five or more visits over the reporting period but did not submit data on five visits. Due to the ambiguity, we did not use weights to account for nonresponse within individual physicians. We did use clustered standard errors to account for repeated visit measures within physicians.

4. Estimating the Level of Post-Operative Visits Through Survey Data

This chapter reports on the results from the survey, such as response rates, practice characteristics, and visit characteristics (which includes time spent by the practitioner and staff and estimates of work based on other analogous visits).

Please note that given the complexity of the tables (as each table summarizes statistics for three procedures), we use the following shorthand notation

- Unless otherwise indicated, all numbers in parentheses represent 95-percent confidence intervals.
- To indicate *p*-values for hip arthroplasty and complex wound repair, the asterisk symbol (*) indicates a *p*-value of < 0.05 for each compared with cataract surgery. For complex wound repair, the dagger symbol (†) indicates a *p*-value of 0.05 for comparison to hip arthroplasty. All *p*-values are available on request.

Response Rates

Respondents were defined as those who completed the practice characteristics questions and at least one completed visit. Our response rate was 15.5 percent overall (12.1 percent for cataract surgery, 16.0 percent for hip arthroplasty, and 18.5 percent for complex wound repair [see Table 4.1]). Respondents submitted complete visits for 3,561 visits in total; these are the basis of the analyses that follow.

Table 4.1. Response Rates by Specialty

	Cataract Surgery *N* (%)	Hip Arthroplasty *N* (%)	Complex Wound Repair *N* (%)	Pooled *N* (%)
Sampled	1,556	1,556	1,555	4,666
Opened practice characteristics questions section	192 (12.3%)	257 (16.5%)*	297 (19.1%)*	746 (16.0%)
Practice characteristics questions completed	191 (12.3%)	255 (16.4%)*	296 (19.0%)*	742 (15.9%)
Completed practice characteristics questions and:				

	Cataract Surgery *N* (%)	Hip Arthroplasty *N* (%)	Complex Wound Repair *N* (%)	Pooled *N* (%)
1 or more visits	188 (12.1%)	249 (15.9%)*	288 (18.5%)*	725 (15.5%)
2 or more visits	183 (11.8%)	244 (15.6%)*	276 (17.7%)*	703 (15.1%)
3 or more visits	182 (11.7%)	241 (15.4%)*	266 (17.1%)*	689 (14.8%)
4 or more visits	180 (11.6%)	239 (15.3%)*	264 (17.0%)*	683 (14.6%)
5 visits	178 (11.4%)	237 (15.2%)*	259 (16.7%)*	674 (14.4%)
Total completed visits	933	1,244*	1,384*,†	3,561
Visits used in analysis	911	1,205*	1,353*,†	3,469

SOURCE: RAND analysis of survey data.
NOTE: Fewer than the total reported visits are used for analysis because some respondents submitted completed visits but not a completed set of practice characteristics questions.

Comparing Respondents to the Population Sample

The characteristics of our weighted respondents were generally similar to all practitioners in the sampling frame who had a volume of procedures above the specified threshold (Appendix I, Table I.1). We used difference in proportions to compare the weighted sample and all practitioners in the sampling frame in terms of rural/urban and census division, and we used standardized mean differences for practice size (based on the practice's TIN) and number-of-procedures-performed-per-year practice size and number of procedures performed per year. The standardized mean differences on these characteristics were extremely small, with no largest standardized mean difference being greater than 0.0. The difference in proportions was also small, ranging from 0.1 to 4.7 percent. Therefore, we did not see any evidence that our weights are substantially out of balance with the populations means.

Practice/Respondent Characteristics

In this section we describe respondent characteristics. The vast majority of cataract surgery and complex wound repair providers reported furnishing between 81–100 percent of post-operative visits in the office or other ambulatory setting when asked about their typical case mix of post-operative visits for the procedure (Table 4.2). Hip arthroplasty providers were more likely to perform post-operative visits in inpatient settings, which is in keeping with the fact that hip arthroplasties were more likely to take place in an inpatient setting (see Appendix I, Table I.5).

Table 4.2. Provider Post-Operative Visit Settings

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Majority (81%–100%) of post-operative visits provided in the office and other ambulatory settings	96.4% (92.6%–98.3%)	65.2% (58.6%–71.2%)*	92.3% (88.4%–94.9%)†

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. For hip arthroplasty, the breakdown of visits between 0%–80% was as follows: 0%–20% was 3.1% (1.4%–6.6%); 21%–40% was 4.4% (2.4%–7.9%); 41%–60% was 13.7% (9.6%–19.0%); 61%–80% was 13.7% (9.9%–18.8%).

About one-fifth of hip arthroplasty providers were in very large practices with 100 or more practitioners (including physicians, nurse practitioners, and physician assistants), but this was less common for cataract surgery and complex wound repair providers (Appendix I, Table I.2). More than 40 percent of hip arthroplasty providers were in a multispecialty practice while about 30 percent had a primary practice associated with an academic medical center (Appendix I, Table I.2). Cataract surgery and complex wound repair providers were broadly similar regarding practice characteristics, with about 22 percent in multispecialty practices and 20 percent affiliated with an academic medical center.

About a third of respondents did not know whether their practice participated in an ACO or other shared-risk arrangements. Among respondents who were able to respond to this question, hip arthroplasty providers were the most likely to participate in an ACO or other shared-risk arrangement, and complex wound repair providers were least likely (Table 4.3). Interestingly, 40 percent of hip arthroplasty providers reported participating in a bundled payment initiative. This may be due to participation in (or even perceived participation in) CMS's Comprehensive Care for Joint Replacement Model (CMS, 2019). This model tests bundled payment and quality measurement for an episode of care associated with hip and knee replacements.

Table 4.3. Provider Accountable Care Organization Participation

Provider Participation in the Following	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Any	28.5% (21.9%–35.0%)	50.6% (44.0%–57.1%)*	14.9% (10.7%–19.1%)*,†
Medicare ACO	18.7% (13.1%–24.3%)	20.9% (15.6%–26.1%)	12.7% (8.8%–16.7%)†
Medicaid ACO	4.3% (1.5%–7.2%)	9.2% (5.5%–12.9%)*	3.8% (1.7%–6.0%)†
Commercial ACO	10.6% (6.3%–14.9%)	15.6% (10.8%–20.4%)	9.3% (6%–12.6%)†
Bundled payment initiatives	2.3% (0.2%–4.4%)	40.7% (34.3%–47.0%)*	2.7% (0.9%–4.5%)†
Fully capitated contracts	5.1% (1.8%–8.4%)	5.5% (2.4%–8.5%)	3.7% (1.5%–6.0%)

Provider Participation in the Following	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Other shared-risk contracts	3.3% (0.8%–5.8%)	6.9% (3.5%–10.2%)	0.7% (–0.3%–1.7%)†
None	39.5% (32.2%–46.9%)	17.7% (12.4%–23.0%)*	42.5% (36.5%–48.4%)†
Don't know	31.4% (24.7%–38.1%)	31.3% (25.1%–37.4%)	42.6% (36.7%–48.5%)*,†

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Of note, respondents who indicated that they participated in an ACO received a further set of ACO-specific questions (see Appendix J for ACO-specific results).

Regarding care coordination provided by the practice, complex wound repair practitioners were least likely and hip arthroplasty practitioners were most likely to be in a practice where a care coordinator was used and where patients received care coordination half of the time or more (Appendix I, Table I.3). Hip arthroplasty practitioners were much more likely to be in practices routinely using specialized pre-operative assessment and scheduling follow-up visits within two weeks.

Providers varied in whether they typically provided a pre-operative visit on the day of or the day prior to the procedures in our study, with higher rates for hip arthroplasty and complex wound repair providers and lower rates for cataract surgery providers (Appendix I, Table I.4).[1]

Procedure and Patient Characteristics

Next, we focus on procedure characteristics. The majority of cataract surgeries occurred in ambulatory surgical centers, with some performed in hospital outpatient departments. Most hip arthroplasties took place in the inpatient hospital setting, and most complex wound repair procedures in physician offices (Appendix I, Table I.5).

Respondents were asked to report on visits *regardless* of payer, though most *procedures* for all three provider groups were paid for by Medicare (Appendix I, Table I.6). Commercial coverage was more common for hip arthroplasties and complex wound repair than for cataract surgery.

Patient age at the time of the procedure was roughly comparable across procedures, with patients undergoing cataract surgery being slightly older compared with hip arthroplasty and

[1] Respondents were asked on each visit module whether they typically provided a pre-operative visit prior to the procedure that resulted in the post-operative visit. While most providers responded to this question consistently, some responded "yes" and "no." We categorized providers reporting a pre-operative visit more than half of the time as typically providing pre-operative visits. We also note that both the 10-day and 90-day global period include a pre-operative visit on the day of the procedure (i.e., applies to all three procedures of interest), but only 90-day procedures include a pre-operative visit the day prior to the procedure (i.e., applies to only cataract surgery and hip arthroplasty).

complex wound repair patients (Appendix I, Table I.7). A smaller share of complex wound repair patients was female.

Visit Characteristics

This final set of results describes characteristics of the post-operative visits themselves including the location, staff, activities, and time involved in the visit. The majority of post-operative visits occurred in physician offices, ranging from 85 percent for hip arthroplasty visits to 96 percent for cataract surgery visits (Table 4.4). Hospital outpatient department visits accounted for fewer than 5 percent of visits in all three procedure categories. Some hip arthroplasty visits (12 percent) were in the inpatient hospital setting. The small share of facility-based visits following hip arthroplasty is surprising given that more than half of the post-operative visits included in the Physician Time File are assumed to be inpatient hospital visits. Respondents, not having understood that we wanted them to report on both inpatient and office-based visits as applicable, may have been more likely to report on visits after discharge from the inpatient setting. However, this is also likely a function of our having assigned respondents a set number of inpatient versus office-based visits. As described in Chapter 3, we asked respondents what their typical mix of inpatient and office-based visits would be for the given procedure (Appendix D) and then assigned them to report on visits accordingly. If, for example, a respondent indicated that they saw 81 percent to 100 percent of post-operative visits for cataract

Table 4.4. Post-Operative Visit Place of Service

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Ambulatory place of service	**100%**	**87% (84.2%–89.9%)***	**99.8% (99.5%–100%)†**
Office	95.9% (93%–97.7%)	84.6% (81.1%–87.5%)*	93.4% (90.2%–95.6%)†
Hospital outpatient department	3.5% (1.8%–6.5%)	1.9% (0.9%–3.9%)	4.4% (2.6%–7.2%)
Emergency department	NR	NR	NR
Ambulatory surgery center	NR	NR	1.7% (0.7%–3.9%)
Other ambulatory setting	NR	NR	NR
Inpatient place of service	**0%**	**13% (10.1%–15.8%)***	**NR**
Inpatient hospital, non-ICU	0	12.3% (9.8%–15.4%)*	NR
Inpatient hospital, ICU	0	NR	0
Post-acute care facility	0	0	0
Other inpatient facility	0	NR	NR

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. NR: Not reported due to fewer than ten responses.

surgery in the office, then they were assigned five office-based visits. If they indicated that they saw 61 percent to 80 percent of post-operative visits in the office, then they were assigned four office-based visits and one inpatient visit.

Table 4.5 describes the timing of reported post-operative visits relative to the procedure. The median time in days from the procedure to the reported visit for cataract surgery was one day, and visits were clustered on the earlier side of the post-operative course (Figure 4.1), indicating that many patients are returning to be seen the day after their procedure. For hip arthroplasty, the median number of days between the procedure and reported office-based visit was 22 days, and visits were spread relatively broadly over the 90-day period (Figure 4.2). The median time from hip arthroplasty to the reported inpatient visit was one day. Reported complex wound repair visits tended to be later in the 10-day post-operative period (Figure 4.3) at a median of seven days.[2] The above findings assume that we obtained a relatively random sampling of each respondent's post-operative visits for a given procedure. However, it is possible that respondents may have more often reported on certain types of visits (e.g., earlier visits in the post-operative course) for some reason.

Table 4.5. Average Time from Procedure to Visit

	Cataract Surgery	Hip Arthroplasty (Office-Based Visit)	Hip Arthroplasty (Facility-Based Visit)	Complex Wound Repair
Average time in days	10.1 (8.4–11.8)	28.4 (26.6–30.2)*	1.6 (0.73–2.45)*	5.9 (5.7–6.2)*,†
5th percentile	1	1	0	0
10th percentile	1	1	0	0
25th percentile	1	13	1	5
Median	1	22	1	7
75th percentile	14	43	1	7
90th percentile	32	57	2	9
95th percentile	43	73	3	10

SOURCE: RAND analysis of survey data.
NOTES: Four complex wound repair visits with reported dates greater than ten days from the procedure were excluded. Two complex wound repair and one cataract surgery visits with a visit date prior to the procedure date were excluded.

[2] We note that in some interviews with or calls from practitioners performing complex wound repairs, it was noted that follow-up visits for suture removal often take place outside of the 10-day global period (i.e., at closer to 14 days due to the suture material).

Figure 4.1. Cataract Surgery Visit Timing Relative to Procedure Date of Service

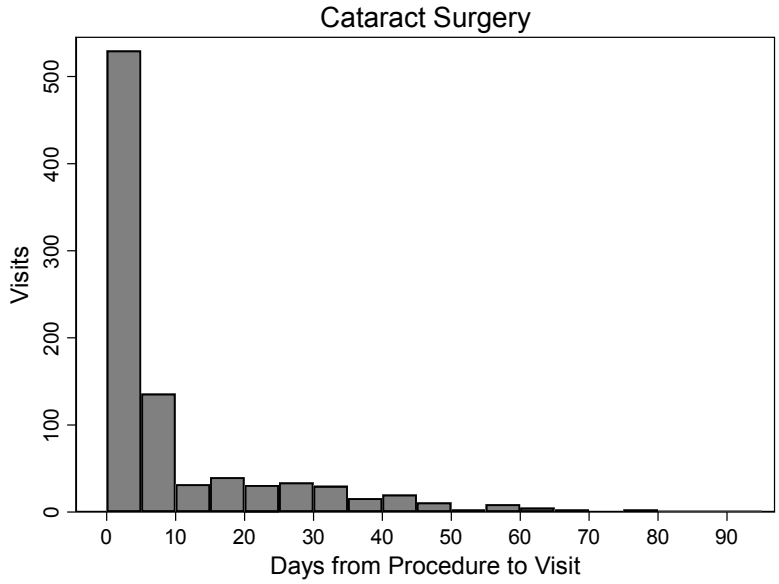


Figure 4.2. Hip Arthroplasty Visit Timing Relative to Procedure Date of Service

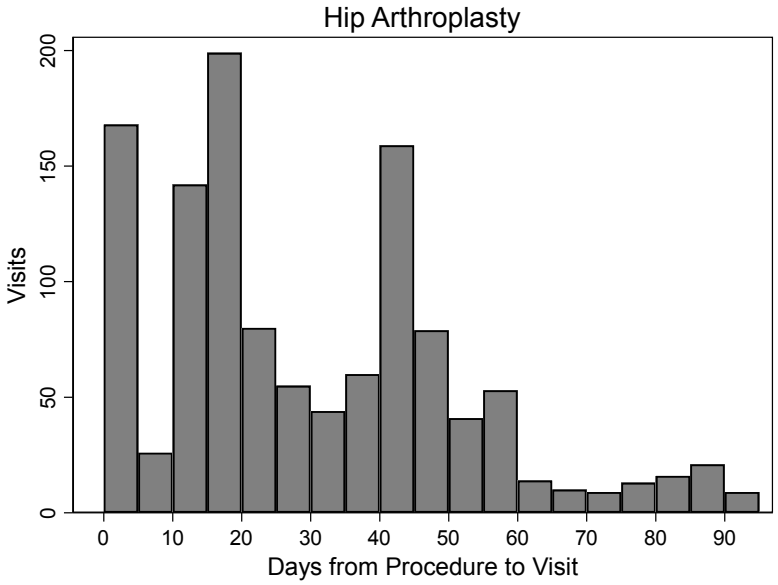
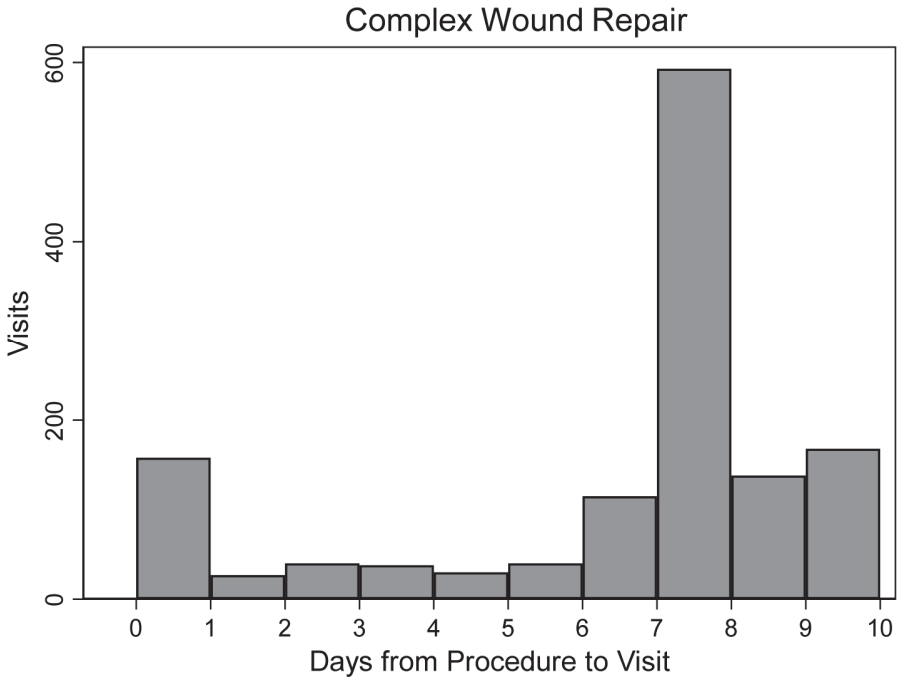


Figure 4.3. Complex Wound Repair Visit Timing Relative to Procedure Date of Service



One of the questions asked in the survey was whether the reported office-based visit was the first office-based post-operative visit after the procedure. We compared this reported rate to what we would expect based on the Physician Time File. As noted in Chapter 2, the Physician Time File reports the total number of post-operative visits expected for each procedure. For example, if a procedure has three expected office-based post-operative visits, then we would expect that one-third of the reported visits would be the first post-operative visit if physicians are reporting on random post-operative visits. We also compared the share that we expected to be first visits based on our analysis of post-operative visits reported using HCPCS code 99024 (Kranz et al., 2019). In our survey results for cataract surgery and hip arthroplasty, respondents reported more visits as being first visits than we expected based on the Physician Time File and claims-based reporting. For complex wound repair, the rates were similar to the Physician Time File (100 percent) but quite different than that reported in claims (46.5 percent) (Table 4.6). The higher rate of first visits reported via the survey for cataract surgery and hip arthroplasty compared with claims-based report could be due to a misunderstanding of the question. Another possibility is that, as noted above, survey respondents disproportionally reported on first visits despite our instructions to report on five consecutive visits or five visits following a skip pattern.

Table 4.6. Comparison of Observed with Expected Share of First Post-Operative Visits

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Share of visits that were first as reported in survey	56.8% (51.0%–62.7%	53.4% (48.2–58.6%)	92% (89.5%–94.4%)*,†
Claims-based reporting share of ambulatory visits that were first	27.9%	43.4%	46.5%
p-value (compared with reported)	< 0.001	< 0.001	< 0.001
Physician Time File share of ambulatory visits expected to be first visits	20.0%	33.3%	100%
p-value (compared with reported)	< 0.001	< 0.001	< 0.001

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. Physician Time File share expected to be first visits was obtained by summing the total number of visits allocated in the global period in the Physician Time File and dividing one by this number. *p*-values not reported for claims-based reporting share of ambulatory visits that were first (across procedures), nor for Physician Time File share of ambulatory visits expected to be first (across procedures).

Overall, respondents reported on more visits that were expected rather than unexpected (we considered visits being unexpected as another proxy for intensity) and more so for cataract surgery and hip arthroplasty than for complex wound repair (Table 4.7). The low rate of unexpected visits for complex wound repair was somewhat surprising, as in cognitive interviews we had heard that most post-operative visits for complex wound repairs were for complications or unexpected post-operative issues. Respondents did not commonly report on performing other procedures during the visit unrelated to follow-up care but were most likely to do so for complex wound repairs.

Table 4.7. Visit Characteristics

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Post-operative visit was expected	98.6% (97.7%–99.4%)	96.0% (94.6%–97.3%)*	89.0% (86.3%–91.7%)*,†
Performed other procedures during visits[a]	4.3% (2.3%–6.3%)	6.3% (3.4%–9.3%)	10.3% (7.8%–12.8%)*,†

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. Share expected to be first visits from the Physician Time File, and claims-based reporting are provided for comparison.
[a]The question asked whether the respondent performed any other procedures during the visit (not related to follow-up care), for which the respondent billed separately.

Except for complex wound repair procedures, it was relatively rare for post-operative visits to be related to multiple procedures (Table 4.8). Nearly half of complex wound repair visits

were related to multiple procedures performed on the same date of service, which was somewhat higher than we had anticipated though not completely unexpected given that multiple complex wound repairs in different but related areas could occur. The low rate of multiple procedures performed the same day is not unexpected for cataract surgery and hip arthroplasty as it would be less common to operate on both eyes on the same day (for cataract surgery) or multiple joints (for hip arthroplasty). However, staged procedures for cataract surgery (presumably where one eye undergoes the procedure first, followed some time later by the other eye) were reported about 10 percent of the time.

Table 4.8. Other Procedures Related to the Post-Operative Visit

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Multiple procedures on the same day (e.g., bilateral procedures)	6.5% (4.3%–8.8%)	3.9% (2.2%–5.5%)	46.5% (41.3%–51.7%)*,†
Multiple procedures not on the same day	9.9% (6.8%–13.1%)	2.9% (1.8%–3.9%)*	7.1% (4.7%–9.5%)†
Either case	15.6% (11.8%–19.3%)	6.5% (4.5%–8.5%)*	49.8% (44.6%–55.1%)*,†

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Staffing

The staff involved in the post-operative visit varied by procedure (Table 4.9). During cataract surgery post-operative visits, specialized ophthalmologic staff were involved about three-quarters of visits (i.e., a Certified Ophthalmic Assistant, Certified Ophthalmic Technologist, or Certified Ophthalmic Medical Technologist). Respondents who performed hip arthroplasty visits were most likely to report using a physician assistant in the visit, and few respondents reported working with a nurse practitioner. About 10 percent of respondents reporting on complex wound repair visits and about a quarter of those reporting on cataract surgery and hip arthroplasty visits indicated that they used staff other than the categories we provided as options.

Table 4.9. Staff Involved in Post-Operative Visit

Staff	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Nurse Practitioner	NR	5.5% (3.3%–7.6%)	1.3% (0.4%–2.2%)†
Physician Assistant	NR	34.2% (28.7%–39.6%)	6.5% (3.9%–9.2%)*,†
Resident	1.7% (0.2%–3.1%)	7.7% (4.5%–10.9%)*	2.4% (1.2%–3.6%)†
Registered Nurse	NR	14% (9.8%–18.2%)	16.7% (12.8%–20.7%)

Staff	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Licensed Practical Nurse	2.1% (0%–4.1%)	7.4% (4.2%–10.5%)*	10.6% (7.7%–13.6%)*
Medical/Technical Asst	10.4% (6.2%–14.7%)	55.8% (50.3%–61.3%)*	62.2% (56.9%–67.5%)*
Certified Surgical Tech	NR	1.6% (0.3%–2.9%)	2.3% (0.9%–3.8%)
Certified Ophthalmic Asst (COA), Tech (COT), or Med Tech (COMT)	72.1% (65.8%–78.3%)	NA	NA
Optometrist	8.5% (4.3%–12.6%)	NA	NA
Other Staff	28.4% (21.9%–34.9%)	26.3% (21.3%–31.4%)	10.5% (7.1%–13.9%)*,†
No Staff	4.7% (1.8–7.6%)	12.9% (9.5%–16.4%)*	5.5% (2.9%–8%)†

SOURCE: RAND analysis of survey data.
NOTES: NR: Not reported due to fewer than ten responses. NA: Not asked for visit category. Note that the term "resident" includes interns, residents, and fellows per CMS (CMS, 2018a).

Activities

Overall, respondents reported that they performed routine post-operative activities almost all (> 90 percent) of the time (Table 4.10). The exception to this was care coordination, which occurred about two-thirds of the time for hip arthroplasty and about a third of the time for cataract surgery and complex wound repair. Nonroutine post-operative activities were, as expected, less commonly reported compared with routine activities but were more often reported in follow-up for complex wound repair (25.6 percent) than for hip arthroplasty (9.6 percent) or cataract surgery (14.1 percent).

Table 4.10. Activities Performed During Post-Operative Visit

Activity	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Review information (e.g., lab results, pathology, imaging, operative notes)?	79.3% (74.0%–84.6%)	98.5% (97.5%–99.4%)*	91.5% (88.8%–94.3%)*,†
Review interim patient history and discuss interim progress (e.g., pain, fever, new complaints)?	99.5% (99.0%–99.9%)	99.6% (99.1%–100%)	97.9% (96.4%–99.5%)†
Conduct a patient exam and/or perform routine post-operative activities?	99.8% (99.5%–100.1%)	99% (98.3%–99.6%)*	99.8% (99.5%–100.0%)†

Activity	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Provide counseling to the patient and/or family?	96.8% (94.8%–98.9%)	97.8% (96.6%–98.9%)	96.6% (94.7%–98.4%)
Write progress notes, orders, prescriptions, forms, or other paperwork/charting?	100% (100%–100%)	99.1% (98.4%–99.8%)*	99.6% (99.2%–100%)*
Provide care coordination, not including routine follow-up scheduling (e.g., discussed with another provider, arranged home health, etc.)?	30% (24.1%–35.9%)	66.1% (61.3%–70.8%)*	37.5% (32.7%–42.4%)†
Perform nonroutine post-operative activities?	14.1% (10.1%–18.2%)	9.6% (6.9%–12.3%)	25.6% (21.6%–29.6%)*,†

SOURCE: RAND analysis of survey data.

Of all activities reported across all three procedures (Appendix I, Tables I.8–I.10), respondents reported they themselves were the ones most commonly performing the activities compared with other staff. This may have been a function of the fact the respondents knew which activities they personally performed but may have been less aware of activities performed by others. Activities were also reported to be performed far more frequently face-to-face compared with non–face-to-face, whether performed by the practitioner or other staff.

Time

Practitioners spent an average of 16.5 minutes in total time for cataract surgery visits, being as expected significantly less than for hip arthroplasty (22.9 minutes, $p < 0.001$) or complex wound repair (21.8 minutes, $p < 0.001$). Practitioners spent about 60 percent (for hip arthroplasty visits) and 75 percent (for cataract surgery visits) of the visit time on face-to-face activities compared with non–face-to-face activities (Table 4.11).

Staff time was not split into face-to-face time and non–face-to-face time, as we thought this level of detail would be difficult for practitioners to report. Staff time spent on cataract surgery visits was significantly longer compared with hip arthroplasty (14.9 versus 9.9 minutes, $p = 0.02$) but shorter compared with complex wound repair (14.9 versus 17.0 minutes, $p = 0.04$) (Table 4.11). Staff time in relation to practitioner time varied by procedure but generally paralleled practitioner time. For cataract surgery and complex wound repair, staff spent about as much as time on the visit as the practitioner (1.10 times, 95% CI 0.99–1.22, $p = 0.08$ for cataract surgery and 1.03, 9% CI 0.93–1.13, $p = 0.55$ for complex wound repair). For hip arthroplasty, staff spent significantly less time than the practitioner (0.88 times as much, 95% CI 0.78–0.97, $p = 0.014$). While we collected data on staff time in this survey, we note that such staff time would be considered as part of PE in the RUC process and not contribute to the physician time component

nor to the level of the visit. However, we collected staff time to understand whether it varies consistently with physician time (i.e., can staff time be consistently inferred from physician time?). We note that, based on our results above, staff time does not vary consistently with physician time when looking across procedures, ranging from 1.8 to 2.2 times as much as physician time depending on the procedure.

Table 4.11. Time (in Minutes) Spent by Practitioner and Nonphysician Staff During Post-Operative Visit

	Number of Visits with Staff	Mean	25th Pctl.	Median	75th Pctl.
Cataract surgery					
Practitioner time	911	16.5 (15.4–17.5)	10	15	20
Face-to-face	911	12.1 (11.3–12.8)	8	10	15
Non–face-to-face	911	4.4 (3.8–5.0)	0	4	5
PA/NP time	NR	NR	NR	NR	NR
Resident time	20	14.1 (8.1–20.1)	10	10	20
Other staff	911	14.9 (13.6–16.2)	10	15	20
Hip arthroplasty					
Practitioner time	1,205	22.9 (21.6–24.2)*	15	20	27
Face-to-face	1,205	14.3 (13.5–15.1)*	10	15	15
Non–face-to-face	1,205	8.6 (7.8–9.4)*	5	5	10
PA/NP time	451	16.9 (15.2–18.7)	10	15	20
Resident time	78	17.6 (12–23.1)	10	15	20
Other staff	1,003	9.9 (8.8–11)*	0	10	15
Complex wound repair					
Practitioner time	1,353	21.8 (19.2–24.5)*	10	15	25
Face-to-face	1,353	14.4 (12.5–16.3)*	6	10	15
Non–face-to-face	1,353	7.4 (6.4–8.4)*	3	5	10
PA/NP time	95	19.1 (12.1–26.1)	10	15	20
Resident time	42	12 (9.1–15)	7	10	15
Other staff	1,348	17 (14.7–19.4)†	10	12	15

SOURCE: RAND analysis of survey data.
NOTES: PA = physician assistant; NP = nurse practitioner. NR: Not reported due to fewer than ten responses. Staff categories which were marked as involved in the visit but with zero minutes during the visit contribute to the summary statistics. Please note that here practitioner time means physician time as we only sampled physicians for this survey.

Given that practitioner time spent on the visit was thought to be a main driver of the level of the visit, we compared mean observed practitioner time from our survey with mean expected practitioner time from the Physician Time File (Table 4.12). We found that practitioners reported having spent less time on post-operative visits than would be expected based on the E&M visits currently in the bundled payment for cataract surgery and hip arthroplasty, but more time than would be expected for complex wound repair (all *p*-values <0.001).

Table 4.12. Comparison of Observed to Expected Practitioner Time Spent on the Visit

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Practitioner time spent on day of visit in minutes as reported in survey	16.5 (15.4–17.5)	22.9 (21.6–24.2)*	21.8 (19.2–24.5)*
Practitioner time spent on day of visit in minutes as reported in Physician Time File	19.4	29.6	16.0
p-value	< 0.001	< 0.001	< 0.001

SOURCE: RAND analysis of survey data.
NOTES: Physician time in minutes from the Physician Time File was calculated by summing the minutes associated with each of the E&M visits in the bundle and dividing by the total number of visits. *p*-values are not reported for practitioner time spent on day of visit as reported in the Physician Time File across procedures.

We examined how total practitioner time varied by selected key visit characteristics, including visit location, other procedures performed, the visit being expected or not, and whether it was the first visit (Table 4.13). Time did not vary significantly by visit location for hip arthroplasty or complex wound repair or by whether other procedures were performed during the follow-up visit. If the visit was unexpected, the practitioner time spent was significantly longer than if the visit was expected for hip arthroplasty (31.9 versus 22.4 minutes, $p = 0.0049$) but not for cataract surgery or complex wound repair. If the visit was *not* the first post-operative visit, it was associated with significantly more practitioner time for complex wound repair (35.6 versus 20.6 minutes, $p = 0.0089$) but not for cataract surgery nor hip arthroplasty. Given that the global period is only ten days for complex wound repair, anything more than one visit is likely to be different than the typical visit in comparison to visits in a 90-day global period. Finally, practitioner time did not vary by whether the practice was an ACO member for any of the three procedures.

Table 4.13. Practitioner Time (in Minutes) Spent on Visit by Key Variables

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Visit location			
Office	16.3 (15.17–17.36)	22.5 (21.2–23.8)*	21.5 (18.9–24.2)*
Other ambulatory location	20.9 (15.8–26.0)	31.4 (12.1–50.8)	25.1 (12.4–37.8)
Inpatient	N/A	23.6 (20.7–26.4)	N/A
p-value	0.08	0.53	0.58
Other procedure performed			
No	16.5 (15.3–17.6)	21.1 (17.9–24.4)*	22.8 (21.6–24.0)*
Yes	16.3 (14.1–18.5)	22.5 (19.0–26.0)*	23.74 (17.9–29.6)*
p-value	0.88	0.75	0.50
Visit expected or not			
Expected	16.4 (15.3–17.5)	**22.4 (21.0–23.7)***	21.9 (19.0–24.9)*
Unexpected	20.1 (14.4–25.8)	**31.9 (25.1–38.7)**	20.4 (17.5–23.3)†
p-value	0.20	**0.0049**	0.45
First visit			
Yes	16.7 (15.2–18.2)	22.5 (20.6–24.4)*	**20.6 (18.0–23.2)***
No	16.1 (14.8–17.4)	23.1 (21.4–24.8)*	**35.6 (24.6–46.6)***,†
p-value	0.48	0.61	**0.0089**
Accountable care organization			
Yes	15.9 (14.2–17.6)	23.1 (20.7–25.4)*	21.9 (15.4–28.4)
No	16.6 (15.3–17.9)	22.8 (21.2–24.3)*	21.8 (18.9–24.7)*
p-value	0.52	0.85	0.98

SOURCE: RAND analysis of survey data.
NOTES: The asterisk and dagger superscripts indicate significance across procedures (i.e., across columns, as for all other tables). In addition, bolded cells highlight significance within the row (i.e., within the procedure, but across the predictor of interest). Reported *p*-values within the rows are from two-way means comparisons except for hip arthroplasty across visit location categories—a three-way means comparison. Please note that here practitioner time means physician time, as we only sampled physicians for this survey.

We performed similar analyses looking at staff time by key visit characteristics (Table 4.14). Cataract surgery follow-up visits had the most variability by key characteristics. Staff time was significantly longer in office versus nonoffice ambulatory locations (15.3 versus 12.6 minutes, $p = 0.0291$), when procedures were performed during the visit (18.5 versus 14.6 minutes, $p = 0.008$), when the visit was unexpected (23.6 versus 15.1 minutes, $p = 0.0373$), and when it was not the first visit (16.6 versus 14.1 minutes, $p = 0.0335$). Staff time also varied by whether the visit was expected or not for hip arthroplasty (24.8 minutes for unexpected versus 17.5 minutes,

$p = 0.0269$). As with practitioners, staff time did not vary by whether the practice was an ACO member for any of the three procedures.

Table 4.14. Nonphysician Time (in Minutes) Spent on Visit by Key Variables

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Visit location			
Office	**15.3 (13.9–16.6)**	17.7 (15.8–19.6)*	18.7 (15.9–21.5)*
Other ambulatory location	**12.6 (10.6–14.7)**	21.8 (13.1–30.6)	18.6 (13.7–23.5)*
Inpatient	**N/A**	15.7 (11.6–19.9)	N/A
p-value	**0.0291**	0.43	0.96
Other procedure performed			
No	**14.6 (13.3–15.8)**	17.3 (15.5–19.2)*	18.3 (14.6–22.0)
Yes	**18.5 (15.5–21.5)**	20.1 (15.6–24.6)	19.0 (15.8–22.4)
p-value	**0.008**	0.24	0.76
Visit expected or not			
Expected	**15.1 (13.8–16.35)**	**17.5 (15.6–19.4)***	18.8 (15.9–21.8)*
Unexpected	**23.6 (15.5–31.8)**	**24.8 (18.2–31.4)**	17.6 (14.4–20.8)
p-value	**0.0373**	**0.0269**	0.57
First visit			
Yes	**14.1 (12.8–15.3)**	18.3 (15.9–20.7)*	17.4 (15.1–19.6)*
No	**16.6 (14.4–18.9)**	17.2 (14.9–19.6)	34.7 (17.4–52.0)*
p-value	**0.0335**	0.48	0.0502
Accountable care organization			
Yes	16.0 (13.2–18.8)	8.9 (7.2–10.7)	16.8 (10.2–23.4)
No	14.6 (13.1–16.0)	10.2 (8.9–11.6)*	17.1 (14.5–19.6)*
p-value	0.38	0.25	0.94

SOURCE: RAND analysis of survey data.
NOTES: The asterisk and dagger superscripts indicate significance across procedures (i.e., across columns, as for all other tables). In addition, bolded cells highlight significance within the row (i.e., within the procedure, but across the predictor of interest). Reported *p*-values within the rows are from two-way means comparisons except for hip arthroplasty across visit location categories—a three-way means comparison. Nonphysician time here refers to NP, PA, resident, and other staff time summed together.

Time and Activities Between Visits

We also asked about practitioner time spent between visits. We only asked about time spent between two ambulatory visits—the current visit on which the respondent was reporting and the last visit—as long as there was at least one day between the two visits. The mean time spent

caring for the patient between visits ranged from about seven minutes (cataract surgery) to 16 minutes (hip arthroplasty). Time spent between visits accounted for a larger proportion of total practitioner time spent on the visit (both in between visits and during the visit) for hip arthroplasty and complex wound repair (both about 30 percent) compared with cataract surgery (about 20 percent) (Table 4.15).

Table 4.15. Practitioner Time Spent Between Visits

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Average time in minutes	6.6 (5.1–8.1)	15.5 (12.3–18.7)*	9.6 (8.5–10.7)*,†
5th percentile	0	0	0
10th percentile	0	0	0
25th percentile	0	5	5
Median	5	10	8
75th percentile	10	15	15
90th percentile	20	30	20
95th percentile	25	45	25
Mean time spent between visits as a % of total time spent during visit and between visit	20.3% (16.9%–23.7%)	32.6% (30.1%–35.0%)*	31.1% (28.9%–33.3%)*

SOURCE: RAND analysis of survey data.
NOTE: Question only asked for an ambulatory post-operative visit when the patient was not seen by the respondent's practice the day prior to the visit.

The types of activities performed between visits varied by the procedure for which the post-operative visit was being performed. Respondents for hip arthroplasty and complex wound repair visits were more likely to review information, provide counseling, and write progress notes and other paperwork between visits than respondents for cataract surgery. Respondents reporting on visits for hip arthroplasty were more likely than others to provide care coordination between visits (Table 4.16). Across all three procedures, the most common activities were to review information and write progress notes.

Table 4.16. Activities Performed by Practitioner Between Visits

Activity	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Review information (vitals, lab, path, image, notes, etc.)?	28.9% (23.4%–34.5%)	55.8% (50.6%–61.1%)*	62.7% (57.8%–67.7%)*
Provide counseling to the patient and/or family?	20.1% (15.3%–24.9%)	45.9% (40.9%–50.9%)*	44.8% (39.7%–49.8%)*

Activity	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Write progress notes, orders, prescriptions, forms, or other paperwork?	30.2% (24.6%–35.9%)	60.5% (55.7%–65.3%)*	64% (59.1%–68.9%)*
Provide care coordination (e.g., discuss with another provider, arrange home health, etc.)?	8.1% (4.9%–11.4%)	41.3% (36.3%–46.3%)*	18.8% (15%–22.5%)*,†

SOURCE: RAND analysis of survey data.
NOTE: Question only asked for an ambulatory post-operative visit where the patient was not seen by the respondent's practice the day prior to the visit.

Reported Work

We asked respondents how much work the visit entailed compared with E&M code 99213 (office/outpatient established patient, low complexity, low/moderate severity) for ambulatory post-operative visits or 99232 (subsequent hospital care, moderate complexity, minor complication, or inadequate response) for inpatient post-operative visits. Overall, the reported work was about the same as the comparator code, ranging between 80 and 100 percent (Table 4.17). The median reported work relative to the reference code was 100 percent for cataract surgery and hip arthroplasty and 80 percent for complex wound repair. The mean work was also similar, ranging from about 80 percent (complex wound repair) to nearly 100 percent (hip arthroplasty).

Table 4.17. Reported Work for Post-Operative Visits Relative to E&M Code 99213/99232

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Average work as a % of reference	90.0% (86.4%–93.6%)	104.3% (101.2%–107.4%)*	80.1% (76.1%–84.22%)*,†
5th percentile	50	50	20
10th percentile	50	72	33
25th percentile	75	90	50
Median	100	100	80
75th percentile	100	100	100
90th percentile	110	143	110
95th percentile	150	150	150

SOURCE: RAND analysis of survey data.
NOTE: Respondents reported work relative to either code 99213 (for ambulatory post-operative visits) or code 99232 (for inpatient post-operative visits). *p*-value reported for average work across procedures only.

We looked at reported work, expressed in RVUs, compared with expected RVUs per visit (from the Physician Time File) averaged across all visits in each procedure's bundle (Table 4.18). Average RVUs per visits as reported in the survey were the product of reported work relative to a reference code and the work RVU valuation for the reference code. We adjusted work RVUs for facility-based visits by a factor of 1.39/0.97 to adjust for the relative difference in work RVUs for the reference ambulatory visit code (99213 at 0.97 RVUs) to the reference inpatient visit code (99232, 1.39 RVUs). Expected RVUs were the number of RVUs assigned to each visit in the Physician Time File that were then summed and divided by the total number of visits in the Physician Time File. We report results in two ways for cataract surgery due to a half discharge visit on the time file. In the first, the half discharge visit contributes work RVUs to the denominator and a full visit to the numerator. In the second, the half discharge visit contributes work RVUs to the denominator but does not contribute at all to the numerator.

Table 4.18. Comparison of Observed with Expected Work RVUs

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Average reported work RVUs per visit as reported in survey	0.87 (0.84–0.91)	1.01 (0.98–1.04)*	0.78 (0.74–0.82)*,†
Expected work RVUs per visit as based on Physician Time File	0.71 counting the half discharge visit as a full visit, 0.89 when the half discount visit contributes to total work but not the visit count	1.10	0.48
p-value	0.00 counting the half discharge visit as a full visit, 0.33 when the half discount visit contributes to total work but not the visit count	0.00	0.00

SOURCE: RAND analysis of survey data.
NOTE: *p*-values for expected work RVUs across procedures are not reported.

Reported work was higher than expected work for cataract surgery when the half discharge visit bundled with the payment for HCPCS code 66984 is counted as a full visit but is slightly less than expected when the work associated with post-operative visits is distributed across four

office visits only.[3] Reported work was slightly lower than expected for hip arthroplasty visits and was higher than expected for complex wound repair visits. The complex wound repair result could reflect a higher share of visits that involved complications or additional procedures on wound.

We also looked at reported work as predicted by key variables, as we did for time spent on visits. Complex wound repair visits that took place in a non–office-based versus office-based setting were associated with significantly higher reported work. For all three procedures, post-operative visits that were unexpected were associated with significantly higher reported work. Finally, a complex wound repair post-operative visit being the first visit was associated with significantly less work than subsequent visits (Table 4.19).

Table 4.19. Reported Work (as a Percentage of E&M Visits[a]) Associated with Visit by Key Variables

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Visit location			
Office	89.99% (86.26%–93.73%)	99.24% (96.27%–102.2%)*	**78.63% (74.63%–82.62%)**[*,†]
Other ambulatory location	89.59% (80.2%–98.97%)	85.81% (71.37%–100.25%)	**101.24% (82.64%–119.84%)**
Inpatient	N/A	99.22% (94.24%–104.19%)	**N/A**
p-value	0.94	0.19	**0.0184**
Other procedure performed			
No	89.47% (85.67%–93.27%)	98.73% (95.96%–101.5%)*	80.08% (74.14%–86.01%)[*,†]
Yes	92.74% (85.07%–100.4%)	101.31% (90.04%–112.57%)	80.12% (75.32%–84.92%)[*,†]
p-value	0.41	0.66	0.91
Visit expected or not			
Expected	**89.56% (85.92%–93.19%)**	**97.14% (94.29%–99.99%)***	**77.59% (73.35%–81.82%)**[*,†]
Unexpected	**118.83% (95.78%–141.89%)**	**139.6% (124.94%–154.26%)**	**100.14% (91.39%–108.89%)**[†]
p-value	**0.013**	**<0.001**	**<0.001**

[3] A half discharge visit is common on the Physician Time File for procedures most often performed in the hospital outpatient department or other ambulatory settings even though there is no "discharge" because the patient is not admitted. The half visit presumably represents work not captured by a typical evaluation and management office visit.

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
First visit			
Yes	88.58% (84.53%–92.64%)	98.58% (94.24%–102.92%)*	**78.98% (74.78%–83.18%)**[*,†]
No	91.81% (86.41%–97.21%)	99.17% (95.91%–102.42%)*	**92.81% (81.76%–103.85%)**
p-value	0.29	0.82	**0.0192**
Accountable care organization			
Yes	91.6% (87.4%–95.6%)	99.2% (93.9%–104.5%)*	78.6% (66.7%–90.5%)[†]
No	84.9% (77.9%–91.9%)	98.8% (95.6%–102.0%)*	80.4% (76.1%–84.6%)[*,†]
p-value	0.11	0.88	0.78

SOURCE: RAND analysis of survey data.

NOTES: The asterisk and dagger superscripts indicate significance across procedures (i.e., across columns, as for all other tables). In addition, bolded cells highlight significance within the row (i.e., within the procedure, but across the predictor of interest). Reported *p*-values within the rows are from two-way means comparisons except for hip arthroplasty across visit location categories—a three-way means comparison.

[a]For office-based visits, respondents were asked to estimate the work associated with the visit as a percentage of the E&M code 99213 (office/outpatient established patient, low complexity, low/moderate severity). For inpatient visits, respondents were asked to estimate the work as a percentage of E&M code 99232 (subsequent hospital care, moderate complexity, minor complication or inadequate response). Reported *p*-values are from two-way means comparisons except for hip arthroplasty across visit location categories, which is a three-way means comparison.

Summary of Results by Specialty

Below we summarize results from this chapter by procedure as an alternative means of highlighting key results, particularly those that relate to work.

Cataract surgery. Most cataract surgery procedures took place in ambulatory surgical centers, with some taking place in hospital outpatient departments. However, most reported that post-operative visits took place in an office-based setting. The average time from the procedure to the reported visit in this survey was 10.1 days (median of one day). Average practitioner time spent on the day of the visit was 16.5 minutes, with 6.6 minutes being spent on activities between visits. Practitioner time on the day of the visit was less than the 19.4 minutes that would be expected from the Physician Time File. The average post-operative visit was estimated to be about 90 percent of the work of a 99213 E&M visit. Expressed as RVUs, reported work was 0.87 RVUs for the average post-operative visit, which was similar compared with the 0.71 or 0.89 RVUs that would be expected based on the current valuation for the average post-operative visits (depending on whether the 0.5 discharge visit is counted as no visit or one visit).

Hip arthroplasty. Nearly all hip arthroplasty procedures took place in an inpatient setting, and most reported that post-operative visits took place in an office-based setting. The average time from the procedure to the reported visit in this survey was 1.6 days (median of one day) for reported inpatient visits and 28.4 days (median 22 days) for office-based visits. Average

practitioner time spent on the day of the visit was 22.9 minutes, with 15.5 minutes spent between visits. Practitioner time on the day of the visit was less than the 29.6 minutes that would be expected from the Physician Time File. The average post-operative visit was estimated to be about 104 percent of the work of a 99213/99232 E&M visit. Expressed as RVUs, reported work was 1.01 RVUs for the average post-operative visit compared with the 1.10 RVUs that would be expected based on the current valuation for the average post-operative visit.

Complex wound repair. Most complex wound repair procedures and visits took place in an office-based setting. The average time from the procedure to the reported visit in this survey was 5.9 days (median of seven days). Average practitioner time spent on the day of the visit was 21.8 minutes, with 9.6 minutes spent on activities between visits. Practitioner time spent on the day of the visit was more than the 16.0 minutes that would be expected from the Physician Time File. The average post-operative visit was estimated to be about 80 percent of the work of a 99213 E&M visit. Expressed as RVUs, reported work for an average visit was 0.78 RVUs compared with the 0.48 RVUs that would be expected based on the current valuation for the average post-operative visit.

For a summary of the above findings, please see Table 4.20 below.

Table 4.20. Summary of Key Findings Organized by Procedure

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Average time in days from procedure to visit	10.1 (8.4–11.8)	28.4 (26.6–30.2)*	5.9 (5.7–6.2)*,†
Practitioner time in average post-operative visit (minutes)			
From survey	16.5 (15.4–17.5)	22.9 (21.6–24.2)*	21.8 (19.2–24.5)*
Expected	19.4	29.6	16.0
Practitioner time between visits as reported in survey	6.6 (5.1–8.1)	15.5 (12.3–18.7)*	9.6 (8.5–10.7)*,†
Work per visit in average post-operative visit (measured in RVUs)			
From survey	0.87 (0.84–0.91)	1.01 (0.98–1.04)*	0.78 (0.74–0.82)*,†
Expected	0.89	1.10	0.48

NOTES: The term “expected” refers to the time or RVUs based on the post-operative visits reported in the Physician Time File. For cataract surgery, expected RVUs were 0.71 if one did not count the half discharge visit as a full visit but 0.89 if one counted the half discharge visit as a full visit. Average time to reported inpatient visits for hip arthroplasty was 1.6 (0.73–2.45).

5. Lessons Learned and Limitations from Survey Development and Fielding

During the initial development, refinement, and fielding of this practitioner survey, we identified a number of lessons that may be useful if CMS decides to expand the use of this methodology to study post-operative visits. As discussed in Chapter 3, we made significant changes to the sampling frame and length of survey after pilot testing. In this chapter we describe lessons learned related to sampling respondents, contacting respondents, incentives for participation, feasibility and usability, respondent assistance, and engagement.

Sampling Respondents

Small practitioner sample sizes. For a large fraction of global surgery procedures, there are simply not enough practitioners who perform a given procedure and therefore have an adequate number of post-operative visits within our reporting period to report on sufficient visits over a several-week window to produce precise estimates of time and work for individual procedure codes. Even with a high volume procedure such as hip arthroplasty, we had to sample practitioners below our planned threshold. If we lengthened the survey window, we could potentially collect more data, particularly for specific procedures for which it was a challenge to accumulate enough post-operative visits during the survey period. However, practitioners may perceive a longer survey window as a higher burden.

Thus, in selecting procedures for future data collection efforts, we recommend broader groups of procedures defined by body part and/or system. The latter option has the advantage of covering a wider range of procedure codes but at the cost that the data collected is not specific to individual procedure codes. The latter approach requires an assumption that there are commonalities in post-operative visits following groups of related codes.

- Consider surveying on broader groups of procedures—for example, those focusing on the same body part/system.
- Consider lengthening the window of time that the survey is offered to allow for more opportunity to participate for interested practitioners.

Contacting Respondents

Availability of accurate email addresses. We focused on an electronic approach to fielding this survey. We encountered numerous issues in accurately identifying practitioner email addresses. Our initial approach had been to use the email addresses that CMS has on file for

practitioners. However, when we manually examined a subsample of these email addresses, we realized that a significant share went to coding and billing companies rather than to practitioners themselves. In many cases, these were generic coding and billing email addresses (i.e., to an organization rather than to an individual), rendering them unhelpful for this survey. To obtain more accurate email addresses, we used a commercial vendor (SK&A). While better, in many cases the SK&A email addresses were personal email addresses. Ideally, we would prefer professional email addresses or practice email address for communication.

Absent a database of either professional or practice email addresses, future efforts could consider sending a paper copy of the invitation to the mailing address on record in CMS's enrollment database[1] ahead of email contact. If CMS wishes to consider further online survey work to collect information about post-operative or other care, investing in an up-to-date and complete database of email addresses for practitioners who participate in CMS would be very helpful. Alternatively, a mailed paper-based survey may be worth consideration given the response rate seen in this study. (Please see "Feasibility and Usability" section below for further discussion of a paper-based survey.)

Source of the email invitation. We noted an extremely low response rate during the pilot phase of the survey, with only a small number of sampled practitioners even accessing the survey link. The invitation email for the pilot came directly from NORC (the firm fielding the survey on behalf of RAND), and while it mentioned this was a CMS initiative, this may not have been immediately clear to the practitioner given the originating email address. Practitioners receive a high number of emails on a daily basis, including from a number of external sources that may not be trustworthy. We believe that external emails from an unknown source might be deleted without being read. To increase the likelihood that a practitioner would read the email and access the survey link, CMS sent the final survey. In addition, a letter from CMS's Director of the Hospital and Ambulatory Payment Group was attached to the email. While we cannot assess whether the changes from the pilot to the final survey resulted in an increased response rate, based on the higher response rate, we believe that this switch was important.

Survey terminology and "survey fatigue." In addition, the phenomenon of "survey fatigue" is well known (O'Reilly-Shah, 2017), particularly among physicians. This refers to the ever-increasing number of surveys received from many sources, thus decreasing the likelihood that practitioners will respond. During the pilot, we referred to the effort as a "survey." However, for the final fielding of the survey we changed the wording to "data collection effort" or "providing information." Our hope was that this would decrease the number of practitioners who might dismiss a survey. In addition, this terminology seemed more transparent and appropriate to a data

[1] See U.S. Department of Health and Human Services ("Welcome to the Medicare Provider Enrollment, Chain, and Ownership System (PECOS)," Centers for Medicare & Medicaid Services, n.d.) for the Medicare Provider Enrollment, Chain, and Ownership System (PECOS) portal.

collection instrument with multiple sets of questions (which can be thought of as modules) in contrast to more traditional brief surveys.

- Investing in an up-to-date database of accurate email addresses, either to the practitioner's professional email address or practice email address, is recommended prior to implementation of any online survey effort.
- Survey invitation emails should come from the sponsor directly (in this case, CMS) rather than a survey firm to ensure recognition by the participants.
- Given the degree of survey fatigue among practitioners, consider using alternative language such as "data collection effort."

Incentives for Participation

Financial incentives and payment penalties. We did not offer any financial or other incentives for completing this survey for a number of reasons. While we were aware of the literature indicating that financial incentives may increase response rates to physician surveys (Field, 2002; Noel, 2018), this was more a data collection effort than a traditional physician survey. Given the length of the survey, and based partly on feedback from cognitive interviews, we estimated that we would have to pay a large amount to truly increase likelihood of participation (i.e., in the order of hundreds of dollars). Even then, some interviewees and survey nonrespondents with whom we followed up stated that a financial incentive would not change their likelihood of participating. In addition, the cost of spending $500–$1,000 per practitioner for such a large-scale effort would significantly affect feasibility. Some practitioners noted competing priorities with other ongoing payment incentive programs such as the Merit-Based Incentive Payment System (MIPS) (CMS, n.d.), making participation in a survey effort that is not associated with a potential payment penalty unlikely.

Because we offered neither incentives nor payment penalties related to participation in this effort, we cannot comment on whether such an approach would have improved our response rate. For future surveys, it may be helpful to explore the effect of a payment penalty on survey participation. A payment penalty was authorized by Congress but was not enforced by CMS for this effort.

- While financial incentives could in theory increase response rates, based primarily on the high cost but also feedback from respondents, we do not recommend planning for their use in a large-scale national survey without careful consideration of the cost trade-offs.
- Payment penalties were not used in this effort but could be further explored as a means of increasing response rates.

Feasibility and Usability

Encouraging the use of support staff. As noted above, the phenomenon of survey fatigue is exacerbated by increasing demands on practitioners' time. For this reason, we strongly encouraged the use of medical staff to complete the survey. Roughly 60 percent of respondents took advantage of this opportunity. Not only does using medical staff to assist with data collection decrease the respondent burden for practitioners, but also medical staff may be better positioned to answer some of the survey questions, such as the payer for the procedure, patient characteristics, and procedure characteristics (or they can look up this information, assuming they can access the medical record). We did emphasize that practitioners should personally answer the questions about how much time they personally spent caring for the patient, either face-to-face or non–face-to-face during the visit or in between visits. Continuing to emphasize the participation of medical staff and potentially even framing this data collection as a practice-based effort may lead to higher response rates and more accurate information collected.

Paper-based versus electronic data collection. We did not attempt to offer a paper-based survey in addition to the online version. We had planned to field the survey electronically given the complexity of the original survey instrument, making a paper version infeasible. However, with the final shortened and simplified instrument, a paper-based version could be feasible with some modifications. Based both on the physician survey literature (Martins et al., 2012) as well as on anecdotal feedback we received from practitioners and practices, a paper-based survey may in fact be preferred by some respondents. Given that email addresses may not be correct and/or are difficult to obtain, a paper-based approach may better reach practitioners—but this assumption needs testing. We also do not know for certain whether paper-based surveys would result in increased response rates (e.g., there is no guarantee that practitioners will open mail, much as they might not read an email invitation). If feasible, in future work we recommend fielding the survey via both modalities in the hopes of increasing response rates. At the very least, a paper worksheet or reporting tool could help staff collect necessary data prior to entering the online survey.

- Emphasize the use of medical staff in assisting with data completion and consider framing the data collection effort as a practice-based effort.
- For future survey fielding, consider the use of a paper-based survey or tool in addition to online survey tools.

Respondent Assistance

High volume of questions about the survey. In designing the survey, we balanced providing adequate instruction to potential respondents with avoiding too heavy a text burden that might result in nonresponse. To accomplish this, we set up a website with FAQs that was linked to the

survey invitation email, the informed consent page, and the landing page of the survey. Despite these efforts, we received an extremely high volume of questions during the final survey fielding. There were roughly 300 emails and 250 phone calls from the roughly 750 practitioners who responded to the survey. We believe this was due to two primary factors: (1) the survey itself was complex, with a set of screening questions, five visit modules, and a set of practice characteristics, and (2) we had practitioners from a variety of specialties using one survey instrument that was partially but not entirely tailored to their specialty.

Most questions related to a small number of issues, including

1. Having enough visits to contribute during the survey period. This was a particular concern for practitioners who performed complex wound repairs and who often did not routinely see patients in follow-up during the 10-day global period unless there was a complication; this concern also came up for practitioners who performed hip arthroplasty. To address this question, we added text to the FAQ page to clarify that the respondent should report on as many visits as possible during the survey period. Should this survey instrument be refined, we suggest building in a mechanism for respondents to indicate that they had fewer than five visits (to indicate that they tried to complete the survey effort).
2. Reporting on visits that preceded the survey time window to satisfy the reporting request. In fact, some respondents reported on visits that were remote in time from the survey window, though our intent was for reporting to occur in "real time" to the extent possible.
3. Requesting to reset part or all of a submitted survey.
4. Confirming whether respondents were *required* to participate.
5. Confirming of the authenticity of the invitation email.

One helpful tool was the creation of several completed versions of the survey for respondents to review, particularly given the complexity of the task asked of respondents. While we recognized that providing sample surveys could potentially affect survey responses, we believed that it was important to help respondents understand the survey burden up front as well as the survey structure. We created both office-based and inpatient sample visit modules as well as a completed set of practice characteristics questions, which were included on the FAQ website.

- Given the significant volume of questions related to the survey, for future efforts consider a dedicated support line for the survey with significant investment in personnel to staff the line.
- Consider educational sessions and material to help respondents prepare for reporting.
- Continue to include completed versions of the survey questions, as this helped respondents understand the survey burden up front and made the survey structure clearer.

Engagement

While creating the survey, we tested the survey multiple times with practitioners who performed the procedures of interest and received valuable input and feedback. If the survey is deployed on a larger scale, we recommend continuing to engage specialists for their feedback and planning for multiple iterations of item refinement and review. It may also be helpful to directly engage medical staff who support practitioners, particularly if their role in completing the survey is emphasized. In addition, to the extent possible, tailoring the survey to a particular procedure or specialty may make the survey more usable and understandable and yield better data. For example, we tailored the staff mix for cataract surgery by adding staff specific to ophthalmology practices. In future work, the survey could also be tailored to 10- and 90-day procedures, given the likely differences in the post-operative visits following such procedures based on our analyses of complex wound repair versus hip arthroplasty and cataract surgery. Our analyses confirmed that this was an important step, given that such staff were involved in the visits a large percentage of the time. If in the future this survey were to be scaled up (i.e., to all or many more procedures with a global period), we note that a more feasible approach may be to tailor the survey by specialty.

- Continue to engage practitioners who perform procedures (and their medical staff) in refining and tailoring survey items.

Survey Questions

During survey development, we made a number of decisions that impacted specific survey questions as well as the survey structure. In developing this survey, there was a tension between collecting very detailed information that could potentially be used to inform revaluation of global period payments and the survey burden on respondents. Based on the poor response rates during the pilot as well as feedback from both individual physicians and from specialty societies, we shortened and simplified the survey dramatically. Specifically, we removed some detailed questions about procedures related to the visit and the respondent's practice. Below are some lessons learned that are relevant to survey structure and/or specific questions.

Procedure-relevant questions. As we explored the sequence of visits with specialists during cognitive interviews, it became clear that visits related to more than one procedure (e.g., a staged procedure or a bilateral procedure) were variably common depending on the specialty. For example, for ophthalmology, visits related to staged cataract surgery (where one eye is operated on first, followed by the second eye some days or weeks later) were reported to be common (though this translated into 10 percent in our survey). Initially, we had programmed the survey such that respondents could specify other procedures related to the visit in detail rather than asking them to report on the primary procedure in detail. After having piloted this approach, we

switched to a simpler approach. We changed these questions to ask respondents to simply indicate whether a visit was related to a staged or bilateral procedure to decrease respondent burden. Interestingly, except for complex wound repair procedures, it was relatively rare for post-operative visits to be related to multiple procedures based on the results from our survey data. Thus, we recommend continuing to keep this question as simple as possible.

Activities questions. Overall, we found that most respondents endorsed having performed most routine post-operative activities during visits. Given that these were so often performed, for future surveys we recommend considering asking fewer questions about specific routine activities.

Identifying unexpected visits and/or complications. During cognitive interviews, practitioners expressed the concern that some visits are "expected" and have a predictable—and often smaller—amount of work associated with them. However, other visits are not expected as part of the typical clinical course, and capturing the work that happens during such visits is important. We developed a question to capture this idea by asking if the visit was expected or unexpected. Another way we sought to capture this was by asking whether the visit was for a complication. However, we received strong feedback that practitioners would not feel comfortable reporting that a complication occurred to CMS. We recommend continuing to avoid this language. However, we do recommend continuing to ask about whether a visit is unexpected as a way of identifying visits that may be associated with more work. Our results indicated that at least for cataract surgery and hip arthroplasty, unexpected visits were associated with more practitioner time (hip arthroplasty) and more staff time (both cataract surgery and hip arthroplasty). Unexpected visits were also associated with significantly higher reported work for all three procedures.

Practice questions. To personalize the survey, we asked respondents to name their primary practice. This was then auto-programmed into other questions in the survey. In developing the survey and conducting cognitive interviews, we were concerned that a reasonable proportion of respondents might work at more than one practice. We programmed the survey accordingly, asking respondents for each visit where the visit took place (i.e., at their primary practice "XYZ" or elsewhere). However, in our analysis we found that it was very uncommon for these reported visits to take place outside of the primary practice. Thus we recommend asking only for the name of the primary practice with the goal of personalizing the survey.

- Wherever possible, we recommend using a shorter, simpler survey, though this must be balanced against the need for granular information.
- Rather than asking for details about all procedures related to a visit, consider asking about the main procedure and allow the respondent to simply indicate whether there were other procedures related to the visit.
- Ensure that there is a mechanism to ask about whether a visit was expected or unexpected as a proxy for asking about complications, given that practitioners are unlikely to feel comfortable reporting on complications.
- Consider simplifying by asking only once about respondents' primary practice and rely on the assumption that almost all visits will take place at the primary practice.

6. Conclusions

Summary

We developed a survey to collect information on the level of post-operative visits that occur as part of the global period for surgical procedures. Initially we had planned to sample and survey respondents about all surgical procedures with a 10- or 90-day global period. However, given issues with response rates, we ultimately focused on three procedures—cataract surgery, hip arthroplasty, and complex wound repair. For these three procedures we collected information on visit characteristics, practitioner time (including between visits), staff time, types of post-operative activities performed, and the physician's views on reported work in the visit. We also examined time and work and found that they varied depending on several characteristics, including visit location, whether the visit was unexpected, and whether it was the first visit.

Time and Work Reported Versus Expected

Our survey identified findings that were broadly similar to what we expected based on the Physician Time File for cataract surgery and hip replacement and somewhat different for complex wound repair. Overall, we found that the reported time and work associated with each post-operative visit for cataract surgery and hip arthroplasty was about the same or slightly less than the corresponding E&M visits considered during the valuation of these procedures. Complex wound repair was associated with both more reported time and work than would be expected based on reference E&M visit time and work. The concept of revaluation and the potential application of data collected via the survey to revaluation is explored further in a separate report (Mulcahy et al., 2019).

Regarding physician time, we found that reported physician time on the day of the visit was somewhat less for cataract surgery and hip arthroplasty than what would have been expected based on a weighted average of time associated with E&M codes. While we cannot rule out the possibility that practitioners cannot accurately report time, we have no reason to believe this is the case. We further tried to mitigate this risk by asking the respondents to report in "real time" during a specified survey window. As noted earlier in the report, each procedure has a bundle that includes a certain number of visits, each of which are assigned a typical amount of time and work RVUs based on related E&M visits. Reported work was, like time, also about the same or slightly less than would be expected for cataract surgery and hip arthroplasty. This suggests that post-operative visits may involve less work than comparator E&M visits used in the valuation process for these two procedures, and more work for complex wound repair.

We do note that we also collected information on the reported time spent by the physician between visits. If this time were to be added to the time spent on the day of the visit, it would

increase time spent related to the visit by 30 percent to 40 percent depending on the procedure. Medicare's policy outside of global periods is to bundle this non–face-to-face work into payment for E&M visits. As a result, time spent in between visits does not directly contribute to valuation, even for bundled payments for the global period.

We did not rely on this survey to identify the number of expected visits during the post-operative global period, given our parallel effort to collect this information via claims-based reporting (Kranz et al., 2019). However, we did note a discrepancy in the number of visits that were reported that were the first office-based visit after the procedure for cataract surgery. While this number aligned with what was expected for hip arthroplasty, many more visits were reported as the first visit for cataract surgery and complex wound repair than would be expected. There are several possible reasons for this finding. The first is that respondents may have been more likely to choose to report on the first visit for some reason. Alternatively, respondents may have been more likely to report on visits at a time of day when first visits tend to occur based on similar practice patterns (e.g., if most respondents reported visits starting at the beginning of the day, and first post-operative visits tend to be scheduled in the morning). We tried to avoid the latter by asking respondents to report on every second or third visit of the day in an effort to spread out visits over the day, but respondents were also given the option to report on consecutive visits. Finally, if fewer visits are performed than are accounted for in the bundled payment, this could also lead to overrepresentation of first visits observed in the survey.

Future Work in This Area

As part of 2015 MACRA legislation, Congress mandated that CMS collect data on the number and level of post-operative visits delivered to Medicare beneficiaries and use these data to assess accuracy of payment (for use of these and other data in revaluation, please see Mulcahy et al., 2019). Congress did not specify how the number and level of visits should be collected. CMS chose to pursue multiple avenues to collect information on the number and level of post-operative visits included in the global period. These included claims-based data collection via practitioner reporting (to assess the number of visits; for more detail please see Kranz et al., 2019), and a practitioner survey and direct observation (to assess the level of visits). Based on our experiences with these approaches as well as the status quo (estimate of practitioner work based on the RUC survey, which relies on E&M codes), we suggest thinking of these as a spectrum with both benefits and trade-offs to each approach. We discuss these approaches and compare and contrast the benefits below to help inform future choices about implementing a survey versus other means of data collection.

Claims-based reporting to collect information on level. Beginning on July 1, 2017, CMS required select practitioners in nine states to use the no-pay HCPCS code 99024 to report post-operative visits associated with select high volume procedures with 10- or 90-day global periods furnished to FFS Medicare beneficiaries. Claims-based data collection allows constant data

collection at a relatively low cost to CMS coupled with the ability to obtain a larger, nationally representative sample of practitioners. Moreover, information can be collected for all procedures given that the claims codes do not have to be tailored by procedure. There are some drawbacks to the current claims-based reporting approach, as the use of a single HCPCS code (HCPCS code 99024) precludes the collection of information on the level of post-operative visits.

This lack of granularity with the use of 99024 alone could be improved in two different ways. First, 99024 could be combined with place of service to allow differentiation between inpatient, intensive care unit (ICU), and office-based visits. Alternatively, CMS could use a previously proposed set of G-codes (i.e., nonpayment billing codes could capture some information about level) (Mehrotra et al., 2016; Gidengil et al., 2017). RAND had developed a new set of codes that combined scope of services with time for both inpatient and office-based services. In the inpatient setting, visits would be divided into typical, complex, and critical care encounters. In the office-based setting, visits would be divided into typical and complex encounters as well as visits during which patients are seen only by clinical staff. In both settings, typical visits would be used most frequently, and we provided a list of services that would be encompassed by a typical visit. We also allowed for the ability to code internet- and phone-based care delivery with additional codes. These proposed G-codes attempted to balance the need for a simple and straightforward system with the demand for a set of codes to capture the granularity and heterogeneity associated with post-operative care delivery. Such codes could simultaneously collect data on both the number and level of post-operative visits at a cost to CMS that would be similar to that of claims-based reporting using only 99204.

One drawback to the use of any claims-based reporting approach is that practitioners who must use such codes may see such reporting as an undue burden. This perceived burden would be increased as the complexity of claims-based reporting increases (i.e., more so with G-codes than with 99024). While training is required upfront of both practitioners and billing staff, with time this burden would likely decrease.

Direct observation. Certainly, collecting information on visits via direct observation provides detailed, objective data but is severely limited as an approach given both feasibility (including practitioners' willingness to allow observers into clinical encounters) and cost concerns. In particular, scaling this approach in a cost-effective manner would be difficult. Our direct observation effort involved sending trained human factors observers to each of eight practices. Conducting similar observations across hundreds of practices would likely be cost prohibitive. Another significant barrier is recruitment of practices. Recruitment of even a small number of practices proved to be a challenge. Moreover, scaling up a direct observation study means that practices sampled should ideally be representative of the larger pool of practices. Incentives to participate could encourage recruitment but would again diminish feasibility by adding to the cost of such a data collection. One final barrier to data collection is the potentially low number of post-operative visits per day, unless large, high volume practices are selected.

Practitioner survey using E&M codes (status quo). The current valuation of the global period relies on the RUC survey performed by specialty societies. The survey asks practitioners only indirectly about the level of post-operative visits by assigning E&M codes to post-operative visits. The strengths and weaknesses of using E&M codes to capture post-operative care are discussed in an earlier report (Mehrotra et al., 2016) and are summarized again here. The main advantage to this approach is that most practitioners are very familiar with using E&M visit codes which makes their use in a survey appealing.

However, the E&M system is felt to be a generally flawed way to capture visit complexity (Berenson, Basch, and Sussex, 2011; Berenson and Goodson, 2016; Brett 1998). As noted above, E&M codes are built on complexity in such elements as the medical history, review of systems, family history, social history, and family history as well as how many organ systems are examined. In the context of a post-operative visit, many of these elements may be irrelevant. For example, a practitioner may only need to examine the wound site when addressing a potential post-operative infection. When an orthopedic surgeon does a routine post-operative wound check after hip arthroplasty, using an E&M framework's need for "highly complex" history of present illness, the surgeon would need to consider the location, quality, severity, duration, timing, context, modifying factors, and associated signs or symptoms. These questions may not be necessary in the post-operative management of the rotator cuff, while other complexities (care coordination, such as referral to physical therapy) may not be well captured. Given these concerns, E&M codes could either overestimate or underestimate the level of post-operative visits. No direct comparison of time and work exists currently for validation.

Practitioner survey collecting data on work de novo. The practitioner survey that is the topic of this report falls in the middle of the spectrum bounded by claims-based reporting and direct observation in terms of both feasibility and granularity of information obtained.

One major component of the cost to CMS in collecting data is in developing the survey, but with the information learned from this effort, this up-front effort should be lower in the future. Should a paper-based version be implemented, this would also result in (modest) costs to CMS, including both mailing and data entry costs. Such costs would vary by survey sample size and (for data entry costs) survey length and complexity. The information that can be learned from the survey is far more granular in level than can be captured by claims codes (even G-codes) and can feasibly capture both practitioner and staff time. Although we had hoped to capture some level of information about PE other than staff time in our initial survey, we found that it resulted in too high a survey burden for respondents. Future surveys could include a streamlined set of items focused on PE. We also note that while we consider costs to CMS in this report, there is also reporting burden to consider for physicians and other staff. While claims-based data collection requires some time up front to train physicians and billing and coding staff, the overall burden is likely lower compared with this survey instrument. However, CMS's current claims-based reporting effort involves many more practitioners than those we sampled and those who ultimately reported data for our survey.

One challenge to feasibility of a survey is the need for a potentially large sample size. The most comprehensive approach would be to sample a sufficient number of practitioners to observe an adequate number of post-operative visits for each individual surgical procedure. However, this approach would be cost and time prohibitive and in some cases total annual Medicare utilization for a given procedure does not cross the needed volume threshold. We recognize that post-operative care following very similar surgical procedures—for example, procedures sharing a Current Procedural Terminology (CPT) level 2 heading—may involve similar activities and practitioner time even if there are differences in the number of visits. As a result, future survey efforts could sample differentially by specialty to maximize the ability to estimate attributes of post-operative care for the largest possible range of surgical procedures. With such an approach, the survey instrument could be feasibly tailored to specialty (as tailoring to procedure would be infeasible regardless).

Table 6.1 summarizes the strengths and weaknesses of each data collection approach for valuation of the bundled post-operative payment.

Table 6.1. Strengths and Weaknesses of Data Collection Approaches for Global Period

	Strengths	Weaknesses
Claims-based reporting	• Constant data collection • Data collection feasible nationally and across all procedures of interest • Low cost to CMS (even with use of G-codes)	• Burden of reporting may be perceived as high by practitioners asked to report • Without combining with place of service or using more detailed G-codes, CMS cannot obtain information on level of visits
Direct observation	• High level of granularity	• High cost to CMS • Some burden to practitioners • Feasibility challenges (recruiting practices, sending trained observers, adequate number of post-operative visits while observers are present)
Practitioner survey (RUC)	• Existing mechanism that could be leveraged efficiently to collect data • Relies on E&M codes, which are well understood by practitioners	• E&M codes may not lend themselves well to capturing complexity of post-operative care, and work is not otherwise collected by the RUC survey
Practitioner survey (*de novo)*	• Can achieve fairly high level of granularity • Potentially lower cost to CMS, depending on sample size and survey granularity	• Reporting burden is the highest of these approaches • Obtaining adequate response rates can be difficult and also pose a challenge to representativeness • Difficult to capture adequate detail about PE in same survey

Given the strengths and weaknesses of the above approaches, *we would recommend consideration of a claims-based approach coupled with either information about level of service or the use of G-codes. This survey instrument could serve as a complement to a claims-based approach for procedures or groups of procedures for which valuation is thought to be particularly problematic.*

Conclusions and Next Steps

In response to concerns that the number and level of post-operative visits provided to beneficiaries is lower than the number used in the process to value procedures, Congress required that CMS collect data on post-operative visits beginning in July 2017. Through a survey that collected detailed information on practitioner time and activities, we found that time spent on the visit was less than would be expected based on the current Physician Time File for two of the procedures studied. We also measured practitioner time spent on patient care between visits, which increased total time spent on the visit by about 30 percent to 40 percent, recognizing that time between visits is not currently included in valuation. Our results support the use of this survey approach for revaluation of surgical procedures with bundled post-operative visits, whether through claims-based reporting, survey-based reporting, or a complementary combination of both.

Appendix A. Summary of Direct Observation Task

Congress mandated that CMS collect data on the number and level of post-operative visits from a representative sample of physicians. CMS initiated three ways of collecting data. The first is claims-based reporting. The second is the survey summarized in this report. The third and final was direct observations of post-operative visits to document surgeon tasks and workflow processes. As a subcontractor to RAND, MedStar Health conducted the direct observation data collection. In this appendix, we summarize a longer report by MedStar Health entitled *Direct Observation of Post-Operative Visits*.[1]

The primary goal of the direct observation effort was to inform RAND's development of the survey and to ensure that that survey instrument captured the range of care directly observed in post-operative visits. Another goal of the pilot was to understand the feasibility of a large-scale national data collection on post-operative visits using direct observation.

Methods

MedStar conducted direct observation in six surgical specialties: ophthalmology, podiatry, otolaryngology, orthopedics, dermatology, and urology. Of the six specialties, direct observations were conducted at a single practice for five specialties. For the remaining specialty, podiatry, MedStar conducted direct observation at three practices. This allowed them to see how workflows vary within a single specialty.

Practices were selected to maximize diversity in regions of the United States—rural, suburban, and urban locations—as well as varying practice types (e.g., academic health systems, single specialty outpatient, single specialty hospital based). Practices were recruited using convenience sampling.

Recruitment proved to be quite challenging for several reasons and required contact with over 80 practices. Given the demands of a busy clinical practice, many practices assumed that an observation would result in unnecessary burden. Another barrier was fewer post-operative visits scheduled across all specialties than anticipated; even with two days, not enough post-operative visits were observed.

Researchers introduced themselves to patients, explained the purpose of the study, and obtained verbal consent. One researcher shadowed the surgeon and another researcher shadowed the patient. This allowed MedStar to capture tasks conducted by the surgeon outside the exam

[1] This report is based on work performed by MedStar Health in collaboration with RAND. We gratefully acknowledge Jessica Howe, Katie Adams, Josh Puthumana, Akhila Iyer, Allan Fong, and Raj Ratwani for their coauthorship of this section of the report.

room and also tasks conducted by nonsurgeon clinical staff. Nonsurgeon clinical staff included residents, nurse surgeons, physician assistants, registered nurses, medical assistants, and technicians. The patient visit was defined as the time the patient was in the exam room from start to finish and included face-to-face tasks completed by the surgeon and nonsurgeon clinical staff.

MedStar researchers used Task Tracker to capture the content of the visit. Task Tracker is an electronic data collection application that allows researchers to categorize general work processes and record multitasking by providing a time stamp of when tasks begin and end on a second-by-second basis.

They captured the following tasks

- Review of information (vitals, lab, path, image, notes)
- Review of patient history and interim progress (e.g., discuss bowel function, fever, new complaints)
- Perform patient exam (e.g., abdominal exam)
- Stitch, suture, and staple removal
- Change dressings, application or removal of cast
- Any other procedure (e.g., wound treatment)
- Counseling and care coordination (e.g., answering patient questions, future visit scheduling)
- Writing of progress notes, orders, prescriptions
- Medication management
- Completion of forms or other paperwork
- Other.

Results

In total, MedStar conducted direct observation of 120 post-operative visits conducted by ten surgeons at eight practices. The number of team members involved in a post-operative visit varied dramatically across practices (Table A.1).

Table A.1. Care Team Variability Across Practices

Specialty	# of Observations	# of Immediate Clinical Team Members	Clinical Team Composition
Dermatology	7	1	Surgeon
Otolaryngology	24	4	Surgeon, nurse surgeon, nurse, and medical student
Ophthalmology	14	5	Surgeon, ophthalmologist resident, and 3 technicians
Orthopedics	19	3	Surgeon, medical assistant, and x-ray technician

Specialty	# of Observations	# of Immediate Clinical Team Members	Clinical Team Composition
Podiatry site #1	10	7	2 DPM surgeons, DPM nonsurgeon, podiatrist student, and 3 medical assistants
Podiatry site #2	7	4	2 DPM surgeons and 2 medical assistants
Podiatry site #3	19	2–5 depending on facility	1 DPM surgeon, 2 nurses, and 2 medical assistants
Urology	20	5	Surgeon, nurse surgeon, and medical assistants

NOTE: DPM = doctor of podiatric medicine.

There was wide variability across the practices on all time measurements, including time spent with surgeon and time spent with nonsurgeon clinical staff (Table A.2). Total patient visit time is time spent with the surgeon and nonsurgeon clinical staff and time waiting in the exam room between clinical and patient interactions.

Table A.2. Number of Visits, Average Total Patient Visit, Time with Surgeon, and Time with Nonsurgeon Clinical Staff

Specialty	Mean Total Patient Visit (Min.)	Mean Time with Surgeon (Min.)	Mean Time with Staff (Min.)
Dermatology	20.26	19.18	0
ENT	28.41	9.45	0.74
Ophthalmology	36.09	3.14	20.51
Orthopedics	38.88	10.31	12.86
Podiatry	36.25	9.79	18.94
Urology	14.16	5.32	3.59
All specialties	**26.89**	**8.83**	**8.13**

Average total patient visit times at Podiatry Site #3 were at least twice as high as patient visit times in the other two podiatry sites, though sites #1 and #2 also were notably different in mean total visit times (17.7 versus 25.5 minutes).

Patient history and progress made up the largest fraction of visit time for surgeons, ranging from 12 percent to 41 percent of the visit time across specialties, while counseling and care coordination provision made up the largest other component, ranging from 17 percent to 44 percent. In most practices, stitches, dressing changes, and casts made up only a small fraction of surgeon time. The exception was the orthopedic practice, where this task accounted for 18 percent of the surgeon's time.

While nonsurgeon staff conducted a wide range of activities, it was not clear they were completely complementary. In other words, less surgeon time was not clearly associated with more staff time or vice versa.

Summary

While scheduling direct observations was challenging, MedStar was able to collect rich data on the tasks and time spent on tasks by surgeons and nonsurgeon clinical staff. There were dramatic differences across specialties and different practices within a specialty regarding workflow and tasks completed by the surgeon versus nonsurgeon clinical staff, time spent on post-operative visits, and care team composition. The variation in time was seen both in total visit time and visit time spent interacting with a surgeon or team member.

While some of this variation in post-operative visits appears to be driven by the types of procedures performed, needs at the post-operative visit, and the structure of the practice, most of the variation appears to be driven by idiosyncratic variation across surgeons and practices. Anecdotally, MedStar researchers witnessed different team dynamics, leadership styles, and organization structures at each surgeon site. This is possibly best illustrated in the differences observed across the three podiatric practices where even within a specialty there was notable variation.

Though it is possible for this approach to be used in a national data collection, MedStar raised concerns about scalability. They emphasized the wide variation in time and tasks observed across specialties and roughly estimated that there would need to be direct observation of about 15 practices *per specialty.* This could be cost prohibitive given that observers would need to be there for many days, given the small number of post-operative visits per day. Observing even ten post-operative visits required several days of observation in most practices. Another barrier was the recruitment of an adequate number of practices. We recommend consideration of incentives to practices for participation.

Appendix B. Answers to Frequently Asked Questions (FAQ) About the Survey

Data Collection Overview

The Centers for Medicare and Medicaid Services ("Medicare") is required by statute to collect information on the level of post-operative visits, including the time, staff, and resources involved in furnishing post-operative visits. Medicare is required to use this information to improve the accuracy of payment rates for surgical services. The RAND Corporation and NORC at the University of Chicago are nonprofit research organizations that are collecting this information on Medicare's behalf.

Who is sponsoring this data collection?

Medicare is sponsoring this data collection effort. The Medicare statute requires the program to collect data on post-operative visits from a representative sample of physicians and to use this information to improve the accuracy of payment rates for surgical services. Click here to view a letter from Medicare outlining expectations for participation. The RAND Corporation and NORC at the University of Chicago are nonprofit research organizations that are collecting this information on Medicare's behalf.

What do I need to do?

As a physician who participates in Medicare, you are required to provide information about post-operative care surrounding five post-operative visits that are included in the global period.

You will be asked about post-operative care related to one of three specific CPT codes or sets of codes, depending on your specialty

- CPT codes 13100, 13101, 13120, 13121, 13131, 13132, 13151, and 13152 (complex repair procedures)
- CPT code 27130 (total hip arthroplasty)
- CPT code 66984 (cataract surgery).

What kinds of questions are you going to ask?

You will be asked about post-operative care centered on five post-operative visits included in the global period, including:

- Date and location of the post-operative visit
- Staff and resources used for the visit
- Which activities were performed during the visit as well as in between visits.

You will be asked a short set of questions about your case mix and then assigned a total of five office and/or inpatient visits based on your responses. You can see an example of a completed office visit here and a completed inpatient visit here.

You will also be asked a short set of questions about your practice. An example of the completed practice visit questions can be found here.

How do I report this information?

Reporting this information about post-operative care is done entirely over the internet, and we recommend that office or clinical staff assist you.

- You will need to reference your (or the physician's) email received from CMS MACRA_Global_Surgery@cms.hhs.gov for your personalized link.
- You will also need your (or the physician's) National Provider Identifier (NPI), a 10-digit identification number CMS issues to healthcare providers.
- To find your NPI, please visit https://npiregistry.cms.hhs.gov
- If you experience technical issues, please call 1-888-246-9504 or email MedicarePostopData@norc.org**.**

How many visits should I complete?

We ask you to report on **five post-operative visits** that you furnished during the global period. These visits may be a mix of office-based and inpatient-based visits depending on the case mix you describe in answer to an earlier question.

Office-based visits: These visits can be office-based or other outpatient visits and include visits in the physician office, hospital outpatient department, ED, or other ambulatory setting. Hospital outpatient department and ED visits are included in this category, even though they take place at a hospital.

Inpatient visits: Include visits in the inpatient floor, ICU, and long-term care facility settings. Please do not include hospital outpatient department visits or ED visits.

A navigation screen will clearly label office and inpatient visits. After you report on your first visit, please continue to report on either (1) consecutive visits (during your clinic session or inpatient rounds, for example), or (2) every second or third visit, until you have completed five visits. Regardless of your choice, we are asking you to report on visits as they happen over the course of your days(s), *not* visits over a particular patient's post-operative course.

For which visits should I report information?

- Please report *only* on visits that fall within the global period for the procedure. These are visits that you should *not* otherwise bill separately because they are part of a global period.
- You may report on visits during the global period that take place starting the day of the procedure after the patient has left the recovery room.
- Report on visits *regardless* of payer for the procedure (i.e., do not restrict only to visits following procedures paid for by Medicare).
- Only report on visits where you *personally* saw the patient.
- Do not include pre-operative visits.

How should I complete the survey if I don't provide any post-operative visits for a given procedure or if I provide fewer than five visits in the reporting period (between Thursday, 11/8/2018, and Monday, 12/31/2018)? For example, I am a dermatologist, and I do not routinely provide post-operative visits after a complex wound repair.

Please report on visits *regardless* of payer for the procedure (i.e., do not restrict only to visits following procedures paid for by Medicare). If you do not anticipate having a total of five post-operative visits to report on between Thursday, 11/8/2018, and Monday, 12/31/2018, *only then* report on any visits prior to November 8. If you still will not have a total of five post-operative visits, please report on all possible visits and contact NORC at MedicarePostOpData@norc.org. Please include that you do not anticipate having a total of five post-operative visits (regardless of payer or reporting period) and they can record your response as complete.

When should I complete reporting this information?

Please start at your earliest convenience and complete by Monday, December 31.

What if I see a patient multiple times in one day?

If you see a patient multiple times in the same day, please report all of the activities and resources you used on that calendar day as a single "visit." Do not report two or more separate visits for the same patient on the same day.

Can my staff assist me in reporting this information?

Yes. While you may choose to report this information on your own, we recommend that clinical or support staff in your practice (e.g., billing/coding staff, practice manager, medical assistant, nurse, etc.) assist you. However, we ask that you personally report on information related to the time you spent with the patient.

How was I selected for this data collection effort?

You were selected based on the number of relevant Medicare procedures with global periods that you performed last year and to serve as a representative for your specialty. Your participation is critical to the success of this data collection effort.

How much time will this take?

We estimate that it will take **about five minutes to report on each of the five post-operative visits.**

You may also be asked a short set of questions regarding your practice; it is estimated to take no more than 5–8 minutes to complete.

Why should I participate in this data collection effort?

Post-operative visits are included as part of the payment for procedures that have a global period. Inaccurate information about post-operative visits may result in misvalued payments that could lead to over- or underpayment to physicians like you. Medicare is required by law to collect data on the time, staff, and resources involved in furnishing post-operative visits.

Whom do I contact if I have any questions?

- If you experience technical issues, please call 1-888-246-9504 or email MedicarePostopData@norc.org.
- If you have any questions about this study you can contact the RAND Project Director, Andrew Mulcahy, at 703-413-1100, x 5496 or CMS Technical Advisor, Kathy Bryant, at 1-571-589-8413.

- If you have questions about your rights as a participant, you may call the NORC Institutional Review Board Administrator (toll-free) at 1-866-309-0542.

Can I return to this page if I have any questions?

Yes. These FAQs are available at https://a4survey.norc.org/Global_FAQ or by clicking on the FAQ hyperlink at the bottom of each screen. This will open as a separate webpage for your reference.

Appendix C. Survey Log-In and Informed Consent Text

Survey log in

Medicare's Post-Operative Visit Data Collection

Data Collection Overview

You have been selected by the Centers for Medicare and Medicaid Services ("Medicare") to report information on post-operative visits. Medicare is required by statute to collect information on the level of post-operative visits, including the time, staff, and resources involved in furnishing post-operative visits. Medicare is required to use this information to improve the accuracy of payment rates for surgical services. The RAND Corporation and NORC at the University of Chicago are nonprofit research organizations that are collecting this information on Medicare's behalf.

Log In

To confirm your identity, please enter your National Provider Identifier (NPI)* (or if you are assisting a physician, please enter the physician's NPI) below.

NPI:

* NPI is a 10-digit identification number CMS issues to healthcare providers. If you enter an incorrect NPI you will remain on this screen.

To find your NPI, please visit https://npiregistry.cms.hhs.gov.

If you experience technical issues, please call 1-888-246-9504 or email MedicarePostopData@norc.org. For a list of frequently asked questions (FAQs), please click here: https://a4survey.norc.org/Global_FAQ.

Informed Consent

Medicare's Post-Operative Visit Data Collection

As a physician who participates in Medicare, you are being asked to provide information on five post-operative visits that are included in global periods. This involves the following

- Please submit information by January 7, 2019, on **five post-operative visits** that you furnished to patients during the 90-day global period for 27130, arthroplasty, acetabular, and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft, hereafter referred to as "total hip arthroplasty."
- You can choose to submit information on **consecutive post-operative visits** (during your clinic session or inpatient rounds, for example) or on **every second or third post-operative visit** depending on what is most convenient for you and your staff.
- Regardless of your choice, we ask you to report on visits **as they happen over the course of your day(s)**, not visits over a particular patient's post-operative course.
- Do not limit your responses to post-operative visits for Medicare beneficiaries. Report information on post-operative visits regardless of the payer for the procedure.
- We estimate that it will take **about five minutes to report on each of the five post-operative visits**.

After you have completed reporting on the five visits, we will ask you a short set of questions regarding your practice. You may choose to report information on your own, but we recommend that clinical or support staff in your practice (e.g., billing/coding staff, practice manager, medical assistant) assist you. However, we ask that you personally fill out the information related to the time spent with patients.

Your responses will be kept private to the extent permitted by law. All findings will be reported in aggregate; disclosing information that identifies an eligible health care professional or a group practice is strictly prohibited. If you have questions about this study you can contact the RAND Project Director, Andrew Mulcahy, at 1-703-413-1100, x5496, or CMS Technical Advisor, Kathy Bryant, at 1-571-589-8413.

Appendix D. Survey Screening Questions

The next few questions will collect information about your case mix and will only be asked once.

Please use the "Back" and "Next" buttons to navigate between the questions. Do not use your browser buttons.

If at any time during reporting you would like to exit, please use the "Save and Exit" button. Using this button will ensure you are able to return to the same location when you resume reporting information.

Screener Questions

Do you perform post-operative visits in an office or other outpatient setting (e.g., a physician's office, hospital outpatient department, or other ambulatory setting)?

1. Yes
2. No, I do not typically perform any office or other outpatient visits for total hip arthroplasty.

What is the approximate percentage of post-operative visits that you see typically in the office or other outpatient setting (e.g., a physician's office, hospital outpatient department, emergency department, ambulatory surgical center) versus inpatient setting (e.g., hospital inpatient, ICU, long-term care facility) as part of the global period for total hip arthroplasty?

1. 0%–20% in the office or other outpatient setting
2. 21%–40% in the office or other outpatient setting
3. 41%–60% in the office or other outpatient setting
4. 61%–80% in the office or other outpatient setting
5. 81%–100% in the office or other outpatient setting

What is the name of your primary practice where you see patients most frequently?

Main Street Clinic

Thank you for completing the questions about your practice mix. Next, we'd like to give you more information about the rest of the data collection effort.

For which visits should I report information?

- Please report only on visits that fall within the 90-day global period or total hip arthroplasty. These are visits that you should not otherwise bill separately because they are part of a global period.
- You may report on visits during the global period that take place starting the day of the procedure after the patient has left the recovery room as well as those that take place during the 90 days after the day of the procedure.
- Report on visits regardless of payer for the procedure (i.e., do not restrict only to visits following procedures paid for by Medicare).
- Only report on visits where you personally saw the patient.
- Do not include pre-operative visits.

For answers to FAQs please click here. You can also find answers to FAQs by clicking on the FAQ hyperlink at the bottom of each screen during the survey.

By clicking "Next" you will return to the home navigation page where you can select a visit to report.

Appendix E. Sample Office-Based Visit Module

Medicare's Post-Operative Visit Data Collection

SAVE AND EXIT

You have selected an **OFFICE VISIT**. Please select "Next" to continue or "Save and Exit" to return back to the home navigation page to select a different visit.

What was the date of this visit? _____

You may include some additional information below to identify this visit in case you or your clinical or support staff need to return to complete this visit later. Please note that providing this information is ***optional*** and will be kept **confidential**.

OPTIONAL VISIT INFORMATION
(e.g., initials, time of visit, etc.)

[VISLOC1]
Where did this visit take place?

1. Office
2. Hospital outpatient department
3. Emergency department
4. Ambulatory surgical center
5. Other ambulatory setting

[SHOW IF VISLOC1=1]
Did this visit take place at your primary practice site Main Street Clinic?

1. Yes
2. No; Please indicate the name of the practice site: _____

Procedure Information

Now we will ask you some questions about the procedure that prompted this visit. As a reminder, you may have clinical or support staff assist you with any of these questions.

What was the date of the total hip arthroplasty?

Did you perform any other procedures for the same patient on the same day as the total hip arthroplasty (including bilateral procedures) that are related to this visit?

1. Yes
2. No

Are there any other procedures not performed on the same day as the total hip arthroplasty that are related to this visit (e.g., a staged or other related procedure)?

1. Yes
2. No

Where did the *primary* procedure take place?

1. Inpatient hospital (includes acute care hospital, emergency department, and long-term care facility)
2. Ambulatory surgical center
3. Office
4. Hospital outpatient department
5. Other (please specify) _____

What was the primary payment source for the procedure(s)?

1. Medicare or Medicare Advantage
2. Medicaid, CHIP, or other state-based program
3. Commercial
4. Other (including self-pay, TRICARE, VA, etc.)
77. Don't know

Would you typically perform a pre-operative visit on the day of or the day before this procedure?

1. Yes
2. No

Patient Information

What is the age of the patient?

_____ years

What is the self-identified gender of the patient?

1. Male
2. Female
3. Transgender
4. Does not identify as female, male, or transgender (nonbinary/third gender)

Visit Information

Where did this patient come from prior to the visit?

1. Home
2. Transported from another health care facility
3. Not known
4. Other _____

Was the scheduling of this visit expected as part of the typical post-operative course for the procedure(s) performed?

1. Expected
2. Unexpected

Was today's visit the *first* post-operative outpatient visit since the procedure?

1. Yes
2. No

Staff/Activities Involved in Visit

Which, if any, of the following staff assisted you ***on the day of this visit***? Please do not include nurse practitioners (NPs), physician assistants (PAs), and other staff who are billing for this visit separately from you. If no staff assisted you, please select "None" below.

	Assisted in Visit?
Nurse Practitioner (NP)	☐
Physician Assistant (PA)	☑
Resident	☑
Registered Nurse (RN)	☐
Licensed Practical Nurse (LPN)	☐
Medical/Technical Assistant (MTA)	☐
Certified Surgical Technology (CST)	☐
Other staff	☐
None	☐

Next, we would like to learn more about the activities that were performed ***on the day of*** the visit. Please think through all of the activities and resources used on the day of the visit as you answer the questions below.

Please indicate who performed each activity ***on the day of*** this visit and indicate whether the activity was performed face-to-face and/or non–face-to-face. If an activity was not performed, please select "Not performed" for that activity.

Did you and/or the following staff:

Review information (e.g., lab results, pathology, imaging, operative notes)?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Review interim patient history and discuss interim progress (e.g., pain, fever, new complaints)?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Conduct a patient exam and/or perform *routine* post-operative activities (e.g., examine operative site, remove sutures, change dressing)?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Perform *nonroutine* post-operative activities (e.g., evacuate hematoma)?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Provide counseling to the patient and/or family?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Write progress notes, orders, prescriptions, forms, or other paperwork/charting?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you and/or the following staff:

Provide care coordination, not including routine follow-up scheduling (e.g., discussed with another provider, arranged home health, etc.)?

	You personally	Your NP/PA	Your resident	Not performed
Face-to-face	☐	☐	☐	☐
Non–face-to-face	☐	☐	☐	☐

Did you perform any other procedures during this visit (not related to follow-up care) for which you billed separately?

1. Yes

   Please specify up to four procedures.

2. No

☐

Time Spent on Day of Visit

What was the approximate total time in minutes that you personally spent on all ***face-to-face*** activities on the day of the visit?

☐ minutes

What was the approximate total time in minutes that you personally spent on all ***non–face-to-face*** activities on the day of the visit?

☐ minutes

What was the approximate total time in minutes that your NP/PA(s) spent on assisting you on the day of the visit?

[ ] minutes

What was the approximate total time in minutes that your resident(s) spent on assisting you on the day of the visit?

[ ] minutes

List of Activities Prior to the Visit

Did you or another practitioner in your practice last see the patient yesterday (i.e., the day prior to this visit)?

1. Yes [go to A19]
2. No [go to A16a]

[A16a]

Now we'd like to learn more about the work that sometimes takes place in between visits. Please select the activities below that you personally performed ***between the last time you or another practitioner in your practice saw this patient*** *and this visit*. Please do *not* include any activities performed on the day of this visit.

Did you….	Yes	No
Review information (vitals, lab, path, image, notes, etc.)?	☐	☐
Provide counseling to the patient and/or family?	☐	☐
Write progress notes, orders, prescriptions, forms, or other paperwork?	☐	☐
Provide care coordination (e.g., discuss with another provider, arrange home health, etc.)?	☐	☐

What was the approximate total time in minutes that you personally spent on all non–face-to-face activities since the last visit? (Again, please do not include time you spent on the day of this visit).

[ ] minutes

Visit Complexity

[A19]

How much work was this visit compared to the typical post-operative visit that would occur at this point after this procedure?

1. Much more work
2. Somewhat more work
3. About as much work
4. Somewhat less work
5. Much less work

How would you bill this visit if you were using E&M codes (i.e., if this visit were not part of the global period)?

Please note that we have shortened the descriptor of each E&M code due to space constraints. CPT® codes, descriptors, and other data only are copyright © 2017 American Medical Association. All rights reserved. CPT is a registered trademark of the American Medical Association (AMA).

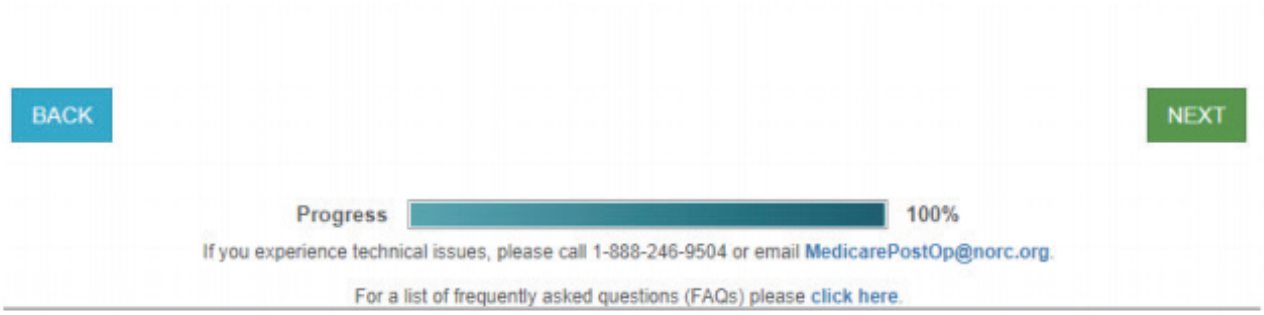
- 99211 Office/outpatient visit for established patient, physician or other qualified health care professional presence not required, ~5 min
- 99212 Office/outpatient visit for established patient, problem focused history & examination, straightforward medical decision making, ~10 min
- 99213 Office/outpatient visit for established patient, problem focused history & examination, straightforward medical decision making, ~ 15 min
- 99214 Office/outpatient visit for established patient, detailed history & examination, medical decision making of moderate complexity, ~25 min
- 99215 Office/outpatient visit for established patient, comprehensive & examination, medical decision making of high complexity, ~40 min

How much work was this visit for you personally, relative to a typical 99213 visit (office/outpatient established patient, low complexity, low/moderate severity)?

(Assume the work for a typical 99213 visit is 100%. A response of 50% indicates that this visit was half as much work as a typical 99213. A response of 200% indicates that this visit was twice as much work as a typical 99213.)

[ ] %

Thank you for your responses. You have completed all of the questions for this particular visit. By clicking “Next” you will return to the home navigation page.



Appendix F. Sample Practice Characteristics Module

Practice Characteristics

Please answer the following questions for your *primary* practice Main Street Clinic.

Is Main Street Clinic affiliated with an academic medical center?

1. Yes
2. No

Is this a single- or multi-specialty practice?

1. Single-specialty
2. Multi-specialty

Does Main Street Clinic participate in any of the following shared-risk arrangements? *Check all that apply.*

1. Medicare ACO
2. Medicaid ACO
3. Commercial ACO
4. Bundled Payment Initiatives
5. Fully Capitated Contracts
6. Other shared-risk contracts. Please describe: _____
7. None
8. Don't know

What is the zip code of Main Street Clinic? _____

About how many practitioners (including physicians, nurse practitioners, and physician assistants) are associated with Main Street Clinic (please include yourself)?

1. 1
2. 2–3
3. 4–10
4. 11–50
5. 51–100
6. > 100

Care Coordination

How often do your patients receive the following types of care when undergoing total hip arthroplasty?

Coordination with their primary care physician to manage chronic conditions before elective surgeries ("pre-hab")	Always ∨ Sometimes Never Not applicable
Assessment at a specialized pre-operative clinic or service	
Use of a care transition worker (e.g., nurse, social worker, coach) during the peri-discharge period (if admitted)	
Operative report or discharge summary sent to the patient's primary care physician within 3 days of procedure or discharge	Select an answer… ∨
Follow-up telephone calls within 2 days after a procedure or discharge	Select an answer… ∨
Follow-up scheduled with patient's primary care physician within 2 weeks of procedure or discharge	Select an answer… ∨
Collection of patient or case outcome data, including registries	Select an answer… ∨

Other approaches to management of care around a procedure (please specify)

Does Main Street Clinic have a care coordinator, case manager, patient navigator, or similar position?

1. Yes [go to (CARE_E)]
2. No [go to (CARE_F)]
77. Don't know [go to (CARE_F)]

[CARE_E]

What percentage of patients undergoing procedures in your practice Main Street Clinic received care coordination from a designated individual such as a care coordinator, case manager, patient navigator, or other?

1. 0%–24%
2. 25%–49%
3. 50%–74%
4. 75%–100%
77. Don't know

[CARE_F]

Does Main Street Clinic use an electronic health record (EHR) system? Do not include electronic billing record systems.

1. Yes, all electronic
2. Yes, part paper and part electronic
3. No

ACO-Specific Questions

When did Main Street Clinic join your ACO?

1. Within the last 6 months [go to ACO17]
2. Between 7 and 12 months ago [go to ACO16a]
3. More than 12 months ago [go to ACO16a]
77. Don't know [go to ACO18]

[ACO16a]

Since joining your ACO, how have the following aspects of your procedures and post-operative care changed?

Volume of procedures performed	Decreased greatly ∨ Decreased slightly Stayed about the same Increased slightly Increased greatly Not applicable
Percentage of referrals coming from other providers within the ACO	
Share of pre-operative care provided for your patients by you	
Share of post-operative care provided for your patients by you	

[ACO17]

What percentage of the patients for whom you have performed a procedure with a 10- or 90-day global period in the last 6 months was attributed to your ACO?

1. 0%–24%
2. 25%–49%
3. 50%–74%
4. 75%–100%
77. Don't know

[ACO18]

If your ACO earns shared savings payments, does that result in a shared savings payment for you personally?

1. Yes [go to ACO18a]
2. No [go to ACO19]

[ACO18a]

By what mechanism would you personally become eligible for that shared savings payment? *Check all that apply*.

1. Providers receive payments based only on the shared savings the ACO received (e.g., fixed profit sharing)
2. Providers receive payments based on their number of ACO-attributed patients they see (e.g., ACO panel size)

3. Providers receive payments based on the volume of services they delivered to ACO patients (e.g., ACO RVUs)
4. Providers receive payments based on their performance on measures of clinical quality
5. Providers receive payments based on their performance on measures of patient satisfaction
6. Providers receive payments based on their performance on measures of efficient use of resources or cost savings
7. Other (please specify) _____
77. Don't know

[ACO19]

Are physicians who perform procedures with global periods of 10 or 90 days active participants in the leadership (either clinical or administrative) of your ACO?

1. Yes, executive-level administrative and clinical leadership
2. Yes, executive-level administrative leadership only
3. Yes, executive-level clinical leadership only
4. No
5. Other (please specify) _____
77. Don't know

What is your or, if employed, your employer's relationship with your ACO?

1. Employed by the ACO
2. Included within, but not directly employed by, the ACO
3. Contracted exclusively with the ACO
4. Contract with the ACO, in addition to other organizations or health systems
5. Formally affiliated but not contracted with the ACO
6. No formal relationship with the ACO
77. Don't know

Thank you for your responses. You have completed all of the questions about your practice.

Appendix G. Email Invitation from CMS

[DATE]

Dear Dr. [DRNAME],

You have been selected by Medicare to report information on post-operative visits related to [ProcedureDescription] (CPT code [CPTCode]) to Medicare. **Your participation is required.**

Starting within the next four weeks, please provide information about the post-operative care that you and your staff furnished during and around five post-operative visits. These may be office and/or inpatient (and any other facility-based) visits. You can start reporting information on post-operative visits at your convenience, but we ask that you complete reporting by [ENDDATE].

The Medicare Access and CHIP Reauthorization Act of 2015 (also known as MACRA) requires Medicare to collect data on post-operative visits following procedures with 10- and 90-day global periods. Medicare is requiring a sample of providers to report information related to the level of post-operative visits associated with select procedures. Medicare has contracted with RAND and NORC, both non-profit research organizations, to collect this information.

You may choose to complete the survey on your own, but clinical or support staff in your practice (e.g., billing/coding staff, practice manager, medical assistant) may assist you in filling out the survey. Sample completed visit responses and answers to frequently asked questions (FAQs) can be found here: https://a4survey.norc.org/Global_FAQ.

The information you provide will help Medicare understand the full range of physician work that is involved in furnishing post-operative care. A letter from Medicare outlining expectations for participation in the survey can be found here: https://a4survey.norc.org/Media/1/Medicare_survey_participation_letter.pdf

Your NPI number to access the survey can be found at https://npiregistry.cms.hhs.gov.

To access your survey, please follow this link:

[SURVEYLINK]

If you have any question, please contact [CMS CONTACT INFO].

Appendix H. Letter from CMS Leadership Accompanying Email

DEPARTMENT OF HEALTH & HUMAN SERVICES
Centers for Medicare & Medicaid Services
7500 Security Boulevard, Mail Stop C5-15-12
Baltimore, Maryland 21244-1850

Center for Medicare

February 21, 2018

Dear Medicare Physician,

As you may know, the Medicare Access and CHIP Reauthorization Act of 2015 (also known as MACRA) requires Medicare to collect data on post-operative visits following procedures with 10- and 90-day global periods. As part of Medicare's data collection effort, physicians in nine select states have been asked to start reporting post-operative visits using claims codes. In all other states, physicians will participate in a survey to collect information on 5 select post-operative visits. Physician participation in Medicare's data collection efforts is extremely important in order to collect data that is representative across specialties, procedures, geography, and practice settings.

CMS has contracted with RAND, a non-profit research organization, to develop and conduct the survey to collect information about the activities, staff, resources, and time involved in post-operative visits, as well as the non-face-to-face services that happen around visits. The data collected through the survey will help CMS understand the full range of physician work and resources that are involved in furnishing post-operative care.

You have been randomly selected to participate in this survey because you perform a certain volume of procedures with 10- and 90-day global periods. The information that you and other physicians provide through the survey will be used to update the payment rates that you receive from Medicare for procedures with global periods.

We recognize that participating in the survey will entail an investment of time and effort on your part and on the part of your staff. Thank you in advance for your participation in this important data collection activity.

Sincerely,

Carol L Blackford

Carol L. Blackford
Director
Hospital Ambulatory and Policy Group
Center for Medicare

Appendix I. Additional Analyses of Survey Data

Please note that given the complexity of the tables (as each table summarizes statistics for three procedures), we use the following shorthand notation

- Unless otherwise indicated, all numbers in parentheses represent 95-percent confidence intervals.
- To indicate *p*-values for hip arthroplasty and complex wound repair, the asterisk symbol (*) indicates a *p*-value of < 0.05 for each compared with cataract surgery. For complex wound repair, the dagger symbol (†) indicates a *p*-value of 0.05 for comparison to hip arthroplasty. All *p*-values are available on request.

Table I.1. Comparison of Respondents to Population Sample

	Population Percent	Weighted Response Percent	Difference in Proportions/ Standardized Mean Difference/Difference in Medians
Cataract surgery			
Rural	13.1%	13.2%	–0.1%
Census division			
New England	7.2%	9.5%	–2.3%
Middle Atlantic	13.2%	15.5%	–2.3%
East North Central	14.6%	16.7%	–2.1%
West North Central	8.0%	8.0%	0%
South Atlantic	17.7%	12.9%	4.7%
East South Central	5.4%	3.1%	2.3%
West South Central	11.0%	8.6%	2.3%
Mountain	7.3%	8.2%	–1.0%
Pacific	15.8%	17.4%	–1.6%
Practice size (mean ± SD)	154 ± 502.4	152 ± 495.5	0.0
Practice size (median)	6	6	0
Procedure count (mean ± SD)	218 ± 216.4	224 ± 228.8	0.0
Procedure count (median)	152	166	–14
Hip arthroplasty			
Rural	13.9%	12.2%	1.6%
Census division			
New England	7.4%	7.7%	–0.3%
Middle Atlantic	11.2%	11.0%	0.2%
East North Central	17.4%	17.1%	0.4%
West North Central	10.6%	11.0%	–0.4%
South Atlantic	17.1%	17.9%	–0.8%
East South Central	5.3%	5.2%	0.1%
West South Central	9.2%	8.2%	1.0%
Mountain	9.4%	9.4%	0.9%

	Population Percent	Weighted Response Percent	Difference in Proportions/ Standardized Mean Difference/Difference in Medians
Pacific	12.2%	12.5%	–0.3%
Practice size (mean ± SD)	362 ± 654	358 ± 648.2	0.0
Practice size (median)	70	71	–1
Procedure count (mean ± SD)	38 ± 26.4	44 ± 28.2	0.0
Procedure count (median)	30	38	–8
Complex wound repair			
Rural	11.4%	10.7%	0.7%
Census division			
New England	6.1%	6.6%	–0.4%
Middle Atlantic	12.3%	12.5%	–0.2%
East North Central	10.1%	11.0%	–0.8%
West North Central	7.2%	7.2%	–0.1%
South Atlantic	17.8%	18.1%	–0.2%
East South Central	5.1%	4.6%	0.5%
West South Central	11.0%	10.4%	0.6%
Mountain	9.3%	9.8%	–0.4%
Pacific	21.1%	19.9%	1.2%
Practice size (mean ± SD)	217 ± 599.2	196 ± 534	0.0
Practice size (median)	7	6	1
Procedure count (mean ± SD)	188 ± 168.4	200 ± 158.8	0.0
Procedure count (median)	126	150	–24

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. Please note that practice size is calculated based on Tax Identification Numbers (TIN), which results in a small number of practices having a very large number of practitioners, thus skewing the distribution. For this reason, we also report the median, which is more likely to be reflective of practice size in this case.

Table I.2. Provider Practice Characteristics

Primary Practice Characteristics	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Practice size			
1	15.6% (11.0%–21.7%)	2.4% (0.8%–6.6%)*	17.2% (13.1%–22.4%)†
2–3	20.2% (14.6%–27.2%)	3.9% (1.9%–7.7%)*	23.2% (18.5%–28.7%)†
4–10	31.8% (25.2%–39.1%)	22.6% (17.5%–28.6%)*	34.3% (28.8%–40.3%)†
11–50	21.1% (15.9%–27.6%)	41.3% (35.0%–47.9%)*	14.1% (10.6%–18.6%)†
51–100	5.7% (3.1%–10.1%)	11.1% (7.7%–15.7%)*	0.9% (0.2%–3.4%)*,†
> 100	5.7% (3.3%–9.6%)	18.8% (14.1%–24.6%)*	10.3% (7.3%–14.3%)*,†

Primary Practice Characteristics	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Multi-specialty practice	22.8% (17.4%–29.4%)	45.6% (39.1%–52.2%)*	22.1% (17.6%–27.4%)†
Academic medical center	20.5% (15.3%–26.9%)	29.5% (24.0–%35.7%)*	20.9% (16.6%–26.0%)†

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Table I.3. Practice Care Coordination Characteristics

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Practice has care coordinator	55.3% (47.9%–62.5%)	67.2% (60.5%–73.2%)*	38.9% (33.3%–44.9%)*,†
Share with ≥50% of patients receiving care coordination	46.3% (39.1%–53.7%)	55.2% (48.6%–61.7%)	23.7% (19%–29.2%)*,†
Practice sometimes or always:			
Coordinate with PCP for "pre-hab"	93.5% (89.8%–97.3%)	99.2% (98.1%–100.3%)*	83.4% (79%–87.9%)*,†
Specialized pre-op assessment	60.6% (53.3%–68%)	90.1% (85.9%–94.3%)*	44.9% (38.9%–50.8%)*,†
Care transition peri-discharge	24.2% (17.9%–30.5%)	97% (94.9%–99.1%)*	26.8% (21.5%–32.1%)†
Operative report w/in 3 days	61.1% (54%–68.3%)	88.3% (83.9%–92.8%)*	91.7% (88.2%–95.1%)*
Phone call w/in 2 days	86.6% (81.6%–91.7%)	88.5% (84.1%–92.8%)	94.3% (91.4%–97.2%)*,†
Follow-up w/in 2 weeks	39.7% (32.4%–46.9%)	71.6% (65.7%–77.5%)*	51.9% (45.9%–57.9%)*,†
Collect patient outcome data	79.1% (73.2%–85%)	74.3% (68.3%–80.3%)	75.7% (70.6%–80.9%)

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Table I.4. Provision of Pre-Operative Visits

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Typically provides pre-operative visit	15.4% (9.9%–21.0%)	31.7% (25.5%–37.9%)*	31.4% (25.8%–37.0%)*

SOURCE: RAND analysis of survey data.

Table I.5. Procedure Place of Service

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Inpatient hospital	4.7% (2.5%–8.8%)	94.2% (91.5%–96%)*	1.0% (0.4%–2.8%)*,†
Ambulatory surgical center	65.2% (58.1%–71.6%)	3.2% (1.9%–5.4%)*	8.0% (5.4%–11.7%)*,†
Office	1.8% (0.6%–5%)	NR	84.8% (80.1%–88.5%)*
Hospital outpatient department	26.7% (20.9%–33.5%)	1.6% (0.7%–3.5%)*	6.2% (4%–9.4%)*,†
Other	NR	0%	0%

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Not reported	NR	NR	0%

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. NR: Not reported due to fewer than ten responses.

Table I.6. Primary Payment Source for Procedure

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Medicare or Medicare Advantage	70.7% (74.4%–74.4%)	57.5% (53.5%–60.9%)*	60.4% (64.1%–64.1%)*
Medicaid, CHIP, or other state-based program	3.9% (6.1%–6.1%)	2.5% (1.7%–3.6%)	1.4% (2.3%–2.3%)*,†
Commercial	19.7% (22.9%–22.9%)	31.8% (28.2%–35.2%)*	31.4% (34.9%–34.9%)*
Other (e.g., self-pay, TRICARE, VA)	1.3% (2.3%–2.3%)	4.2% (2.8%–6.2%)*	3.3% (4.5%–4.5%)*
Don't know	4.3% (7.7%–7.7%)	3.9% (2.3%–6.5%)	3.5% (5.8%–5.8%)
Missing	NR	NR	NR

SOURCE: RAND analysis of survey data.
NOTES: Percentages may not add up to 100% due to rounding. NR: Not reported due to fewer than ten responses.

Table I.7. Patient Characteristics

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Mean age	71.6 (70.9–72.3)	66.9 (66.1–67.3)*	68.9 (67.8–70.0)*,†
% female	58.9% (55.4–62.2%)	57.6% (54.7–60.5%)	40.5% (37.7–43.4%)*,†

SOURCE: RAND analysis of survey data.

Table I.8. Activities Performed During Cataract Surgery Post-Operative Visit, by Staff Type and Face-to-Face Status

Activity	Practitioner Face-to-Face	Practitioner Non–Face-to-Face	Other Staff Face-to-Face	Other Staff Non–Face-to-Face
Review information (e.g., lab results, pathology, imaging, operative notes)?	66.0% (59.6%–72.4%)	27.7% (21.9%–33.5%)	40.8% (34.3%–47.3%)	17.6% (12.9%–22.3%)
Review interim patient history and discuss interim progress (e.g., pain, fever, new complaints)?	93.2% (90.3%–96.1%)	19.6% (14.8%–24.5%)	73.9% (68.5%–79.3%)	10.9% (7.1%–14.8%)

Activity	Practitioner Face-to-Face	Practitioner Non–Face-to-Face	Other Staff Face-to-Face	Other Staff Non–Face-to-Face
Conduct a patient exam and/or perform routine post-operative activities?	92.8% (89.2%–96.4%)	NA	77.1% (71.4%–82.7%)	NA
Provide counseling to the patient and/or family?	92.6% (89.4%–95.9%)	7.0% (4.1%–9.9%)	55.1% (48.6%–61.6%)	8.6% (5.3%–11.9%)
Write progress notes, orders, prescriptions, forms, or other paperwork/charting?	86.0% (81.3%–90.7%)	30.5% (24.5%–36.6%)	73.3% (67.6%–79.0%)	22.5% (17.0%–27.9%)
Provide care coordination, not including routine follow-up scheduling (e.g., discussed with another provider, arranged home health, etc.)?	15.5% (11.2%–19.7%)	6.0% (3.5%–8.5%)	19.6% (14.3%–24.9%)	9.5% (6.1%–12.9%)
Perform nonroutine post-operative activities?	11.4% (7.7%–15.2%)	NA	4.0% (2.1%–6.0%)	NA

SOURCE: RAND analysis of survey data.
NOTE: For *p*-values compared with other procedures, please see notation in Tables I.9 and I.10.

Table I.9. Activities Performed During Hip Arthroplasty Surgery Post-Operative Visit, by Staff Type and Face-to-Face Status

Activity	Practitioner Face-to-Face	Practitioner Non–Face-to-Face	Other Staff Face-to-Face	Other Staff Non–Face-to-Face
Review information (e.g., lab results, pathology, imaging, operative notes)?	86.4% (82.9%–89.8%)*	42.0% (36.7%–47.3%)*	49.3% (44.1%–54.6%)*	30.7% (25.6%–35.7%)*
Review interim patient history and discuss interim progress (e.g., pain, fever, new complaints)?	87.6% (84.2%–90.9%)*	35.3% (30.2%–40.4%)*	64.4% (59.3%–69.5%)*	26.3% (21.6%–30.9%)*
Conduct a patient exam and/or perform routine post-operative activities?	87.7% (84.3%–91.0%)*	NA	52.6% (47.4%–57.9%)*	NA
Provide counseling to the patient and/or family?	87.2% (84.3%–91.0%)*	17.0% (13.2%–20.8%)*	50.2% (45.0%–55.5%)	17.2% (13.3%–21.1%)*
Write progress notes, orders, prescriptions, forms, or other paperwork/charting?	67.0% (62.3%–71.6%)*	43.9% (38.8%–48.9%)*	53.5% (48.4%–58.6%)*	40.5% (35.3%–45.8%)*
Provide care coordination, not including routine follow-up scheduling (e.g., discussed with another provider, arranged home health, etc.)?	35.2% (30.2%–40.1%)*	20.4% (16.4%–24.4%)*	38.8% (33.9%–43.7%)*	28.0% (23.3%–32.7%)*

Activity	Practitioner Face-to-Face	Practitioner Non–Face-to-Face	Other Staff Face-to-Face	Other Staff Non–Face-to-Face
Perform nonroutine post-operative activities?	7.4% (5.0%–9.7%)	NA	4.0% (2.1%–5.7%)	NA

SOURCE: RAND analysis of survey data.
NOTE: For *p*-values compared with other procedures, please note that the asterisk (*) indicates significant difference at $p < 0.05$ from the corresponding value in Table I.8 (cataract surgery). For *p*-values compared with complex wound repair, please see Table I.10.

Table I.10. Activities Performed During Complex Wound Repair Surgery Post-Operative Visit, by Staff Type and Face-to-Face Status

Activity	Practitioner Face-to-Face	Practitioner Non–Face-to-Face	Other Staff Face-to-Face	Other Staff Non–Face-to-Face
Review information (e.g., lab results, pathology, imaging, operative notes)?	76.1% (71.8%–80.4%)*,†	35.8% (30.8%–40.7%)*	53.5% (48.4%–58.5%)*	30.7% (25.6%–35.7%)*
Review interim patient history and discuss interim progress (e.g., pain, fever, new complaints)?	81.1% (77.3%–85.0%)*,†	24.4% (20.1%–28.6%)†	70.5% (65.8%–75.2%)	21.8% (17.8%–25.9%)*
Conduct a patient exam and/or perform routine post-operative activities?	85.7% (82.3%–89.0%)*	NA	68.4% (63.6%–73.2%)*,†	NA
Provide counseling to the patient and/or family?	82.6% (79.0%–86.3%)*	9.8% (6.9%–12.7%)†	63.3% (58.6%–68.1%)*,†	15.6% (12.0%–19.2%)*
Write progress notes, orders, prescriptions, forms, or other paperwork/charting?	62.3% (57.3%–67.2%)*	48.9% (43.8%–54.0%)*	63.5% (58.5%–68.5%)*,†	39.0% (34.3%–43.7%)*
Provide care coordination, not including routine follow-up scheduling (e.g., discussed with another provider, arranged home health, etc.)?	18.2% (14.5%–21.9%)†	12.9% (9.8%–16.1%)*,†	19.7% (15.9%–23.5%)†	12.7% (9.7%–15.8%)†
Perform nonroutine post-operative activities?	23.9% (20.0%–27.9%)*,†	NA	8.6% (6.3%–10.8%)*,†	NA

SOURCE: RAND analysis of survey data.
NOTE: For *p*-values compared with other procedures, please note that the asterisk (*) indicates significant difference at $p < 0.05$ from the corresponding value in Table I.8 (cataract surgery), and the dagger (†) indicates significant difference at $p < 0.05$ from the corresponding value in Table I.9 (hip arthroplasty).

Appendix J. ACO-Specific Analyses

The practice module given to respondents included a set of questions specific to practices that participate in ACOs or other shared savings models (see Appendix E). CMS had originally directed us to develop such questions as there was interest in knowing whether practitioners and practices affiliated with ACOs in particular expend greater time and effort in providing post-operative global services in keeping with their goal of improving care coordination for their assigned beneficiaries. ACOs are organizations in which practitioners and hospitals voluntarily come together to provide high quality and coordinated care for their patients. Because such organizations share in the savings realized by Medicare, the incentive is to minimize post-operative visits while maintaining high quality post-operative care for patients. Our original plan had been to survey a small number (two to three) of Pioneer ACOs and second-generation ACOs. However, in engaging with ACOs we found little interest in completing such a survey throughout the organization. This is not entirely surprising given the evidence that surgical care has not been a high priority for ACOs, at least in early Medicare ACOs (Dupree et al., 2014). Given this, we decided to ask all respondents whether their practice participated in an ACO or other shared savings model and asked the ACO-specific questions to all those who indicated such participation. Below are the analyses of the ACO-specific questions asked of respondents.

Please note that given the complexity of the tables (as each table summarizes statistics for three procedures), we use the following shorthand notation

- Unless otherwise indicated, all numbers in parentheses represent 95-percent confidence intervals.
- To indicate *p*-values for hip arthroplasty and complex wound repair, the asterisk symbol (*) indicates a *p*-value of < 0.05 for each compared with cataract surgery. For complex wound repair, the dagger symbol (†) indicates a *p*-value of 0.05 for comparison to hip arthroplasty. All *p*-values are available on request.

Table J.1. Timing of Joining ACO

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
How long ago did the practice join ACO?			
Within last 6 months	2.0% (0.3%–12.6%)	3.3% (1.0%–9.7%)	1.7% (0.2%–11.5%)
Between 7 and 12 months ago	4.3% (1.1%–15.8%)	8.5% (3.6%–18.8%)	1.5% (0.2%–9.7%)
More than 12 months ago	67.0% (52.3%–79.0%)	48.8% (36.6%–61.1%)	47.3% (33.7%–61.4%)
Don't know	26.7% (15.9%–41.2%)	39.4% (28.1%–52.1%)	49.4% (35.6%–63.4%)*

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Table J.2. Changes Since Joining ACO

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Volume of procedures performed			
Decreased greatly	0%	0%	0%
Decreased slightly	3.2% (0.4%–19.4%)	5.1% (0.7%–28.4%)	0%
Stayed about the same	72.9% (53.0%–86.5%)	65.4% (47.7%–79.6%)	58.9% (38.1%–76.9%)
Increased slightly	4.0% (0.6%–23.4%)	14.5% (5.9%–31.6%)	11.7% (3.7%–31.1%)
Increased greatly	0%	4.3% (1.1%–15.9%)	4.4% (0.6%–25.4%)
Don't know	20.0% (8.5%–40.1%)	10.7% (4.0%–25.5%)	25.0% (11.4%–46.3%)
Percentage of referrals coming from other providers within the ACO			
Decreased greatly	0%	0%	0%
Decreased slightly	0%	5.1% (0.7%–28.4%)	0%
Stayed about the same	74.2% (54.8%–87.2%)	49.1% (32.9%–65.5%)*	67.4% (46.0%–83.4%)
Increased slightly	6.9% (1.7%–24.0%)	29.9% (17.1%–46.7%)*	12.1% (3.9%–32.0%)
Increased greatly	0%	2.2% (0.3%–14.3%)	0%
Don't know	18.9% (8.0%–38.3%)	13.7% (5.7%–29.3%)	20.5% (8.6%–41.7%)
Share of pre-operative care provided for ACO patients by the ACO			
Decreased greatly	0%	0%	0%
Decreased slightly	0%	0%	0%
Stayed about the same	86.2% (64.9%–95.5%)	72.6% (55.1%–85.1%)	76.0% (55.1%–89.1%)
Increased slightly	4.5% (0.6%–25.7%)	14.3% (5.7%–31.7%)	0%
Increased greatly	0%	2.3% (0.3%–14.6%)	0%
Don't know	9.3% (2.3%–30.8%)	10.8% (4.1%–25.8%)	24.0% (10.9%–44.9%)
Share of post-operative care provided for ACO patients by the ACO			
Decreased greatly	0%	0%	0%
Decreased slightly	0%	2.2% (0.3%–14.4%)	0%
Stayed about the same	82.9% (62.3%–93.4%)	72.6% (55.1%–85.1%)	71.7% (50.6%–86.2%)
Increased slightly	8.1% (2.0%–27.2%)	6.8% (2.2%–19.3%)	4.4% (0.6%–25.4%)
Increased greatly	0%	7.6% (1.7%–27.5%)	0%
Don't know	9.0% (2.3%–30.0%)	10.8% (4.1%–25.8%)	24.0% (10.9%–44.9%)

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

Table J.3. Eligibility for Shared Savings Payment as Part of ACO

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
If your ACO earns shared savings payments, does that result in a shared savings payment for you personally?			
Yes	24.7% (13.8%–40.1%)	30.3% (20.3%–42.7%)	20.5% (10.9%–35.2%)
No	75.3% (59.9%–86.2%)	66.9% (54.3%–77.5%)	79.5% (64.8%–89.1%)
Don't know	0%	2.7% (0.4%–16.9%)	0%
[If answered yes to above] By what mechanism would you personally become eligible for that shared savings payment?[a]			
Providers receive payments based only on the shared savings in the ACO received (e.g., fixed profit sharing)	22.9% (5.4%–60.8%)	25.5% (10.1%–51.1%)	29.3% (8.8%–64.1%)
Providers receive payments based on their number of ACO-attributed patients they see (e.g., ACO panel size)	19.2% (4.4%–55.0%)	29.4% (12.3%–55.3)	26.0% (6.1%–65.5%)
Providers receive payments based on the volume of services they delivered to ACO patients (e.g., ACO RVUs)	9.0% (1.1%–46.1%)	18.0% (6.5%–41.1%)	0%
Providers receive payments based on their performance on measures of clinical quality	30.6% (9.4%–65.1%)	44.0% (23.6%–66.7%)	34.9% (10.8%–70.5%)
Providers receive payments based on their performance on measures of patient satisfaction	17.2% (3.9%–51.4%)	18.7% (6.7%–42.3%)	9.5% (1.2%–48.0%)
Providers receive payments based on their performance on measures of efficient use of resources or cost savings	30.6% (9.4%–65.1%)	18.1% (6.5%–41.3%)	44.9% (16.7%–76.8%)

SOURCE: RAND analysis of survey data.

[a] Percentages may not add up to 100% because questions required checking all that applied.

Table J.4. Leadership of and Relationship with ACO

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Are physicians who perform procedures with global periods of 10 or 90 days active participants in the leadership (either clinical or administrative) of your ACO?			
Yes, executive-level administrative and clinical leadership	19.8% (9.3%–37.4%)	30.2% (17.3%–47.1%)	24.3% (12.3%–42.2%)

	Cataract Surgery	Hip Arthroplasty	Complex Wound Repair
Yes, executive-level administrative leadership only	2.60% (0.3%–17.8%)	2.0% (0.3%–14.0%)	0%
Yes, executive-level clinical leadership only	3.1% (0.4%–20.6%)	2.1% (0.3%–14.1%)	0%
No	37.7% (22.2%–56.2%)	30.0% (18.2%–45.0%)	30.2% (16.6%–48.4%)
Other	0%	0%	0%
Don't know	36.8% (21.7%–55.0%)	35.8% (22.2%–52.2%)	45.5% (28.8%–63.3%)
What is your or, if employed, your employer's relationship with your ACO?			
Employed by the ACO	1.7% (0.2%–11.4%)	1.2% (0.2%–7.9%)	5.3% (1.3%–19.3%)
Included within, but not directly employed by, the ACO	12.8% (5.8%–26.0%)	7.0% (2.9%–15.9%)	12.6% (5.2%–27.6%)
Contracted exclusively with the ACO	5.1% (1.3%–18.2%)	2.7% (0.7%–10.4%)	4.2% (1.0%–15.5%)
Contract with the ACO in addition to other organizations or health systems	27.5% (16.1%–42.8%)	32.1% (21.5%–44.9%)	11.8% (5.3%–24.4%)[†]
Formally affiliated but not contracted with the ACO	14.9% (6.7%–29.8%)	7.9% (3.1%–18.8%)	13.7% (6.1%–27.9%)
No formal relationship with the ACO	8.2% (2.6%–22.8%)	2.3% (0.6%–8.8%)	4.3% (1.0%–16.0%)
Don't know or missing	29.8% (17.9%–45.2%)	46.9% (32.5%–74.2%)	48.0% (33.4%–63.0%)

SOURCE: RAND analysis of survey data.
NOTE: Percentages may not add up to 100% due to rounding.

References

AMA—*See* American Medical Association.

American Medical Association, "RVS Update Process Committee (RUC)," n.d. As of March 29, 2019:
https://www.ama-assn.org/about/rvs-update-committee-ruc/rvs-update-committee-ruc

American Society of Plastic Surgeons, "CMS Moves to Eliminate 10- and 90-day Surgical Global Periods in Medicare," *Advocacy News*, February 1, 2015. As of October 11, 2018:
https://www.plasticsurgery.org/for-medical-professionals/advocacy/advocacy-news/cms-moves-to-eliminate-10-and-90-day-surgical-global-periods-in-medicare

Berenson R. A., P. Basch, and A. Sussex, "Revisiting E&M Visit Guidelines—A Missing Piece of Payment Reform," *New England Journal of Medicine*, Vol. 364, No. 20, 2011, pp. 1892–1895.

Berenson, R. A., and J. D. Goodson, "Finding Value in Unexpected Places—Fixing the Medicare Physician Fee Schedule," *New England Journal of Medicine,* Vol. 374, No. 14, 2016, pp. 1306–1309.

Brett, A. S., "New Guidelines for Coding Physicians' Services—A Step Backward," *The New England Journal of Medicine*, Vol. 339, No. 23, December 3, 1998, pp. 1705–1708.

Centers for Medicare & Medicaid Services, "Medicare Program; Revisions to Payment Policies Under the Physician Fee Schedule, Clinical Laboratory Fee Schedule, Access to Identifiable Data for the Center for Medicare and Medicaid Innovation Models & Other Revisions to Part B for CY 2015 [CMS-1612-P]," *Federal Register*, Vol. 79, No. 133, July 11, 2014.

———, "Medicare Program; Revisions to Payment Policies Under the Physician Fee Schedule and Other Revisions to Part B for CY 2018; Medicare Shared Savings Program Requirements; and Medicare Diabetes Prevention Program [CMS-1676-F]," *Federal Register*, Vol. 82, No. 219, November 15, 2017.

———, "Guidelines for Teaching Physicians, Interns, and Residents," *MLN Booklet*, March 2018a. As of April 15, 2019:
https://www.cms.gov/outreach-and-education/medicare-learning-network-mln/mlnproducts/downloads/teaching-physicians-fact-sheet-icn006437.pdf

———, "Global Surgery Data Collection," CMS.gov, December 4, 2018b. As of March 15, 2019:
https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/Global-Surgery-Data-Collection-.html

———, "Comprehensive Care for Joint Replacement Model," CMS.gov, March 18, 2019. As of April 15, 2019: https://innovation.cms.gov/initiatives/CJR

———, "MIPS Overview," CMS.gov, n.d. As of March 15, 2019: https://qpp.cms.gov/mips/overview

CMS—*See* Centers for Medicare & Medicaid Services.

DiVenere, L., "Why CMS' Plan to Unbundle Global Surgery Periods Should Be Scrapped," *OBG Management*, Vol. 27, No. 5, May 2015. As of October 11, 2018: https://www.mdedge.com/sites/default/files/issues/articles/OBGM_0515_DiVenere.pdf

Dupree, J. M., K. Patel, S. J. Singer, M. West, R. Wang, M. J. Zinner, and J. S. Weissman, "Attention to Surgeons and Surgical Care Is Largely Missing from Early Medicare Accountable Care Organizations," *Health Affairs*, Vol. 33, No. 6, June 2014, pp. 972–979.

Field, T. S., C. A. Cadoret, M. L. Brown, M. Ford, S. M. Greene, D. Hill, M. C. Hornbrook, R. T. Meenan, M. J. White, and J. M. Zapka, "Surveying Physicians: Do Components of the 'Total Design Approach' to Optimizing Survey Response Rates Apply to Physicians?" *Medical Care*, Vol. 40, No. 7, July 2002, pp. 596–605.

Gidengil, C. A., A. Mehrotra, A. M. Kranz, E. Butcher, L. H. Hilborne, and B. O. Wynn, "Testing New Codes to Capture Post-Operative Care," *RAND Health Quarterly*, Vol. 7, No. 1, 2017. As of May 14, 2019: https://www.rand.org/pubs/periodicals/health-quarterly/issues/v7/n1/03.html

HHS—*See* U.S. Department of Health and Human Services.

Kranz, Ashley, Teague Ruder, Ateev Mehrotra, and Andrew W. Mulcahy, *Claims-Based Reporting of Post-Operative Visits for Procedures with 10- or 90-Day Global Periods*, Santa Monica, Calif.: RAND Corporation, forthcoming 2019.

Martins, Y., R. I. Lederman, C. L. Lowenstein, S. Joffe, B. A. Neville, B. T. Hastings, and G. A. Abel, "Increasing Response Rates from Physicians in Oncology Research: A Structured Literature Review and Data from a Recent Physician Survey," *British Journal of Cancer*, Vol. 106, No. 6, February 2012, pp. 1021–1026.

Mehrotra, A., C. A. Gidengil, L. H. Hilborne, A. M. Kranz, S. Dellva, J. N. Mafi, and B. O. Wynn, *Developing Codes to Capture Post-Operative Care*, Santa Monica, Calif.: RAND Corporation, RR-1526-CMS, 2016. As of May 14, 2019: https://www.rand.org/pubs/research_reports/RR1526.html

Mulcahy, Andrew W., Barbara Wynn, L. Burgette, and A. Mehrotra, "Medicare's Step Back from Global Payments," *New England Journal of Medicine*, Vol. 372, No. 15, April 9, 2015, pp. 1385–1387.

Mulcahy, Andrew W., Harry H. Liu, T. Ruder, S. Lovejoy, K. Merrell, and A. Mehrotra, *Using Claims-Based Estimates of Post-Operative Visits to Revalue Procedures with 10- and 90-Day Global Periods*, Santa Monica, Calif.: RAND Corporation, forthcoming 2019.

Noel, H., and A. R. Huang, "The Effect of Varying Incentive Amounts on Physician Survey Response," *Evaluation & the Health Professions*, November 1, 2018. As of May 14, 2019: https://doi.org/10.1177/0163278718809844

Ollapally, V., "Changes on the Horizon for Global Services Payment," *Bulletin of the American College of Surgeons*, September 1, 2015. As of October 11, 2018: http://bulletin.facs.org/2015/09/changes-on-the-horizon-for-global-services-payment/

O'Reilly-Shah, V. N., "Factors Influencing Healthcare Provider Respondent Fatigue Answering a Globally Administered In-App Survey," *PeerJ*, Vol. 5, 2017, p. e3785.

Public Law 114-10, Medicare Access and CHIP Reauthorization Act of 2015, April 16, 2015. As of March 12, 2019: https://www.govinfo.gov/content/pkg/PLAW-114publ10/html/PLAW-114publ10.htm

SK&A, "Physician Email List," SK&A database, 2019. As of May 14, 2019: https://www.skainfo.com/databases/physician-email-list

U.S. Department of Health and Human Services, Office of Inspector General, *Review of Cataract Global Surgeries and Related Evaluation and Management Services, Wisconsin Physicians Service Insurance Corporation, Calendar Year 2003*, Chicago, Ill.: HHS, March 2007. As of May 14, 2019: https://oig.hhs.gov/oas/reports/region5/50600040.pdf

———, *Cardiovascular Global Surgery Fees Often Did Not Reflect the Number of Evaluation and Management Services Provided*, Washington, D.C.: HHS, May 2012a. As of May 14, 2019: https://oig.hhs.gov/oas/reports/region5/50900054.pdf

———, *Musculoskeletal Global Surgery Fees Often Did Not Reflect the Number of Evaluation and Management Services Provided*, Washington, D.C.: HHS, May 2012b. As of May 14, 2019: https://oig.hhs.gov/oas/reports/region5/50900053.pdf

———, "Welcome to the Medicare Provider Enrollment, Chain, and Ownership System (PECOS)," Centers for Medicare & Medicaid Services, n.d. As of May 14, 2019: https://pecos.cms.hhs.gov/pecos/login.do#headingLv1