maryland
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cost review commission

Post-Acute and Long-Term Care
Model Progression Stakeholder Engagement Workgroup

Agenda

January 26, 2023
11 am – 1 pm
4160 Patterson Avenue
Baltimore, MD 21215

1. **Introductions**

2. **Review of Workgroup purpose and first meeting discussion (see summary for October 26, 2022 discussion)**

   Generation of ideas and policy recommendations to improve quality of care, increase care coordination, and reduce costs in long-term and post-acute care settings. Initial focus is moderating the trend in Medicare expenditures for inpatient episodes of care that include a general hospital stay followed by a stay in a SNF for Medicare post-acute care rehabilitation. (Oct. 2022)

   Additional comment on Rifkin plan model (see revised description)

3. **Additional models or model variations to consider and discuss (see unified model description, July 2022)**

4. **Data sets available or in need of development related to models and policy options**

5. **Next meeting/adjournment**

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Post-Acute and Long-Term Care
Model Progression Stakeholder Engagement Workgroup

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TCOC Model Progression

Progression Plan Development Timeline

Oct 2022-April 2023
- Small Workgroups begin
- Progress Updates to Secretary's Vision Group (SVG)

April 2023
- Small Workgroups Conclude
- Written workgroup recommendations finalized by HSCRC and State staff

May-June 2023
- Draft Progression Plan finalized (May)
- Draft plan circulated to HSCRC Commission and SVG for initial comment (June)

June - Sept 2023
- Draft Progression Plan circulated for public comment
- Socialize with other important stakeholders (elected officials, others as needed)

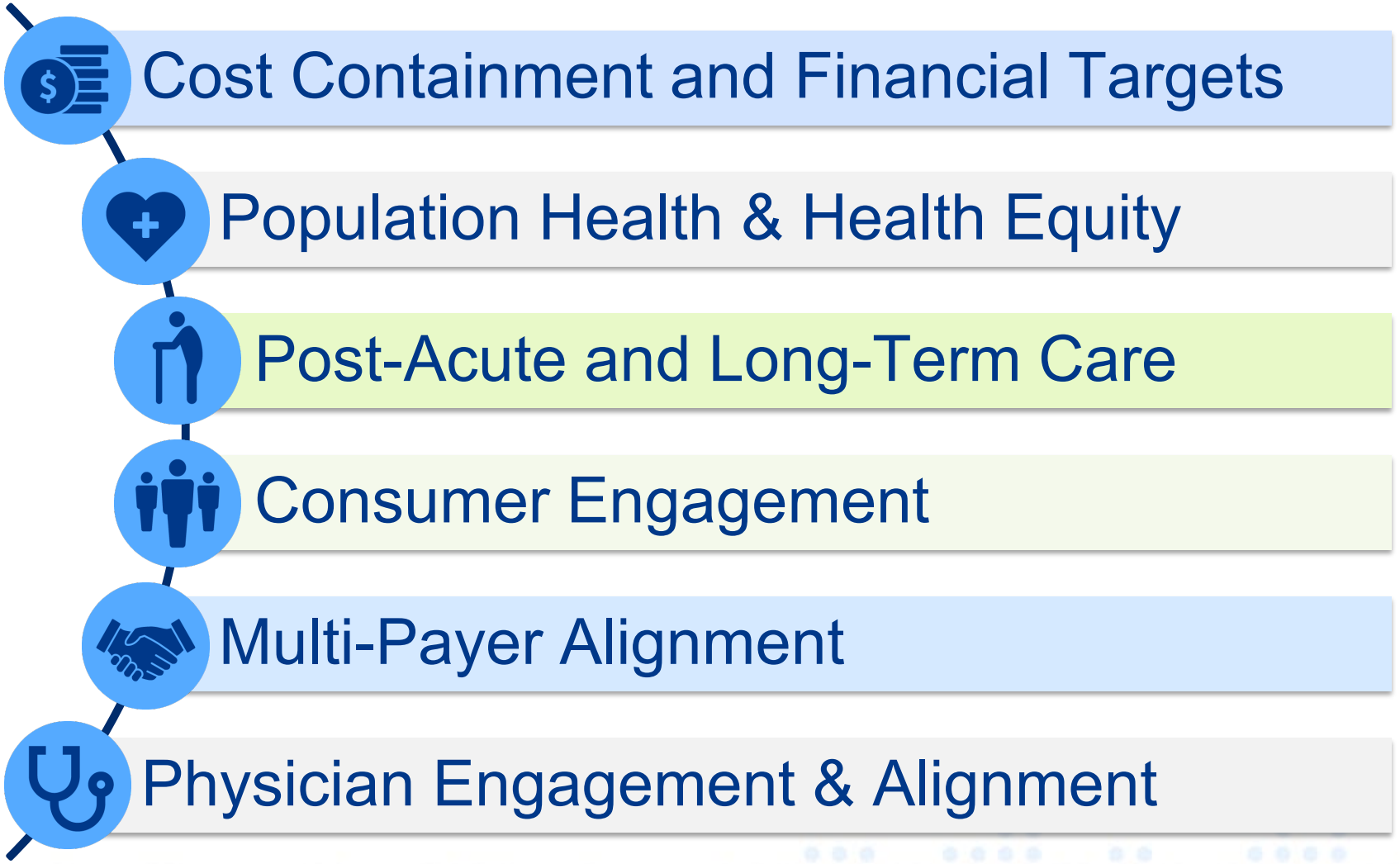
Oct - Dec 2023
- Public comments reviewed and integrated into final Progression Plan

Dec 2023
- Final Progression Plan submitted to CMMI

Stakeholder Engagement Approach

- HSCRC and other State staff are planning stakeholder engagement meetings to develop content for a written Progression Plan for the expansion of the Model (or a new Model) beyond 2026.
- Small groups will meet on priority topics, October - April 2023.
  - To the extent possible, staff will utilize existing workgroup structures; new groups will be created for select topics
  - Staff leading the small groups will reach out to Commissioners for input
- Progression Plan drafted for review, May-June 2023
  - Commission will receive updates on progress and also view a draft of the Progression Plan before the public comment period.
  - Members of the Secretary's Vision Group (MHA, MedChi, Payers, HFAM/LifeSpan, MHCC, Medicaid, MDH) will also be asked to review and comment.
- Public Comment and Final Submission to CMMI, June-December 2023
  - Public comment period will allow for additional comments from all stakeholders before presented to CMMI
  - Begin negotiation process with CMMI on future of Model based on vision in Progression Plan

Stakeholder Small Group Focus Areas



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Report to Congress: Unified Payment for Medicare-Covered Post-Acute Care

Analysis and Development of the Prototype Unified PAC Prospective Payment System Called for in the IMPACT Act

Prepared for:

Centers for Medicare & Medicaid Services
Office of the Assistant Secretary for Planning and Evaluation

Prepared by:

Benjamin Silver, PhD • Anne Deutsch, RN, PhD, CRRN • Nicole Coomer, PhD • Kelsey Warren, BA • Amy Kandilov, PhD • Melvin Ingber, PhD • Allison Dorneo, BA • John Potelle

RTI International

3040 East Cornwallis Rd.
Research Triangle Park, NC 27709

July 2022

Report to Congress: Unified Payment for Medicare-Covered Post-Acute Care (PAC)

Analysis and Development of the Prototype Unified PAC Prospective Payment System Required by the IMPACT Act

Benjamin Silver, Anne Deutsch, Nicole Coomer,
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Table of Contents

List of Appendices

List of Figures

List of Tables

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Executive Summary

Post-acute care (PAC) represents an important component of the health care delivery system in the United States, with the Medicare fee-for-service program spending more than $57 billion on these services in 2019 (The Medicare Payment Advisory Commission (MedPAC), 2021a). PAC providers include skilled nursing facilities (SNFs), inpatient rehabilitation facilities (IRFs), long-term care hospitals (LTCHs), and home health agencies (HHA) [§ 1899B(a)(2)(A) of the Social Security Act]. It can be provided after an acute care hospitalization as well as for "community entrants" (i.e., patients who do not have a prior acute stay).

Although each type of PAC provider has distinct features and roles within the health care delivery system, the type of services offered in each of these settings can overlap. For example, IRFs and SNFs both treat patients with rehabilitation needs, and SNFs and LTCHs both typically care for patients whose needs are more medical in nature. Although there can be important differences in type and intensity of services patients need, past work has shown that there is also some amount of overlap in patient need in terms of medical condition and level of functional limitations between these settings (Balentine et al., 2018; Barnett et al., 2019; Buntin et al., 2010; Chovanec et al., 2021; Gage et al., 2012; Mallinson et al., 2014; Sharareh et al., 2014).

In 2014, the Improving Medicare Post-Acute Care Transformation (IMPACT) Act was signed into law. A key provision of the IMPACT Act was the development of a technical prototype Unified PAC prospective payment system (PPS) that would set payment for PAC services on the basis of beneficiary clinical characteristics rather than type of provider. The IMPACT Act also required the use of standardized data elements collected across the different PAC settings to be incorporated into and determine payments under the prototype.

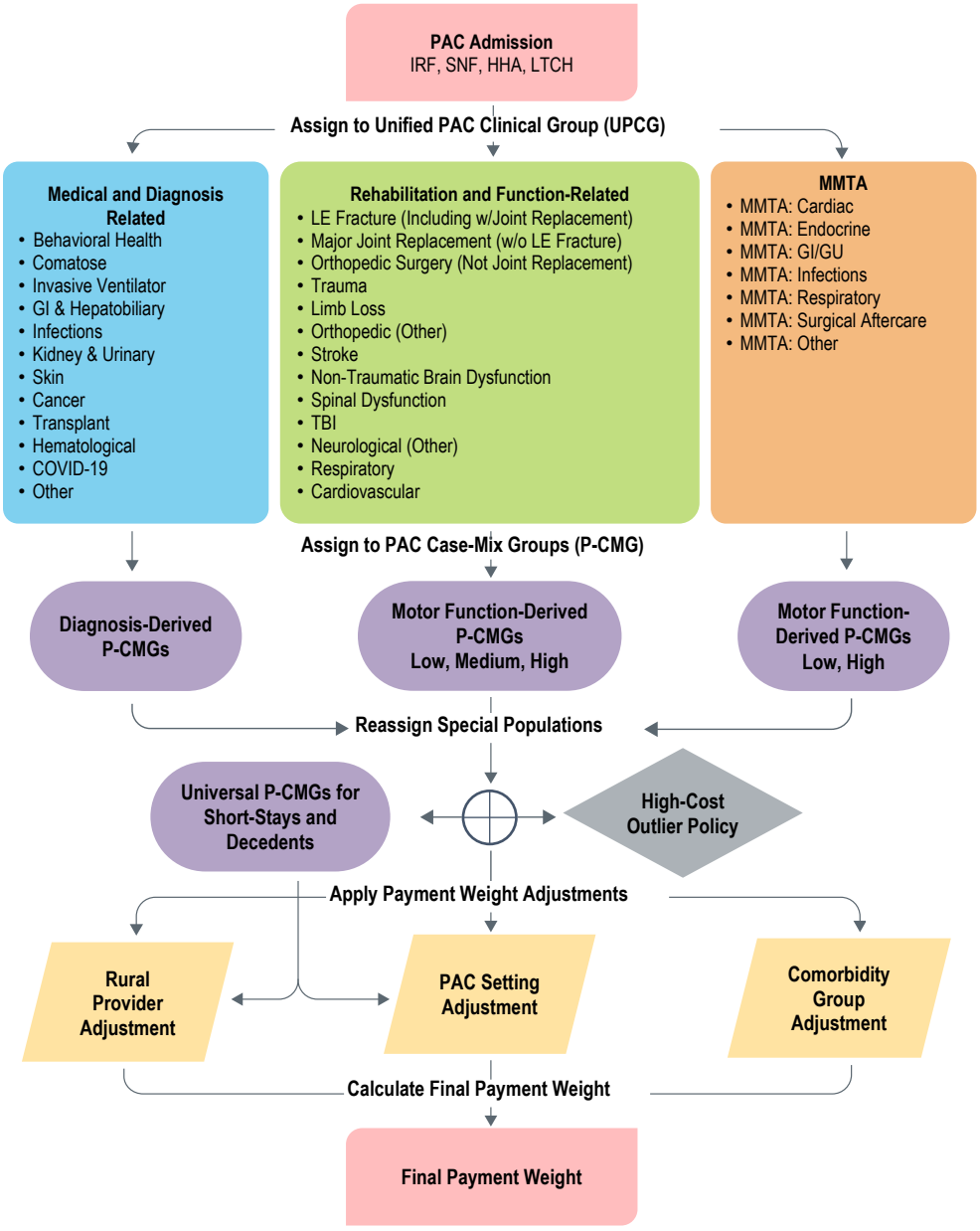
In this report, we present the prototype for the Unified PAC PPS and the analyses used to design and calibrate it. We begin by describing the data used in this analysis, including Medicare claims and enrollment data, PAC assessment data, and Medicare cost report data. Because the unit of payment currently varies across the four PAC settings, for the purposes of this work, we defined a PAC "stay" as an individual stay for IRF and LTCH, the total days for which per diem was billed for a SNF stay, and a continuous sequence of HHA episodes. We then present the structure of the prototype—including how it approaches case-mix adjustment and payment weight assignment—and the analyses and results used in developing this framework. Finally, we explore key considerations for unifying PAC payment, such as cost-sharing and value-based payment (VBP).

The prototype Unified PAC PPS framework is presented in ***Figure ES-1*** and described throughout this paper. It bases payment on several key factors relevant to beneficiary needs and costs of care. These include:

- **Unified PAC Clinical Groups (UPCG)**: 32 distinct clinical condition groups representing the patient's primary reason for PAC. These UPCGs are associated with different types of beneficiary needs, both clinically and in terms of costs of care. They can be conceptualized in three general categories:
  - Rehabilitation and Therapy-Focused (*Rehabilitation*)
  - Medical and Diagnosis-Focused (*Medical*)
  - Medication Management, Teaching, and Assessment (*MMTA*)
- **PAC Case-Mix Groups (P-CMG)**: Subgroups within each UPCG differentiating patients' needs on the basis of clinical characteristics and relative costliness. Characteristics used include the following:
  - Self-care and mobility (motor) function (as reported using standardized data elements on the PAC assessment instrument); higher scores indicate higher functional abilities
  - Primary PAC diagnosis
  - Diagnoses and procedures reported during a prior acute stay
- **Comorbidity Groups**: A measure of clinical complexity and relative costliness based on the combination of secondary diagnoses reported on the PAC claim and information reported on the PAC assessment instrument. A higher index score indicates higher costliness.
- **PAC Setting Types**: An indicator reflecting the type of PAC setting in which the beneficiary was treated.
- **Rural Settings**: An indicator that the provider is operating in a rural area.

The prototype begins by assigning beneficiaries to one of 32 UPCGs and to a P-CMG specific to the UPCG. Rehabilitation UPCGs each have three P-CMGs, which are differentiated by the beneficiary's admission self-care and mobility function as recorded on standardized data elements on the PAC assessment. MMTA UPCGs have two such P-CMGs. For Medical UPCGs, P-CMG assignments are generally based on a more-specific primary diagnosis for payment purposes. For example, the cancer UPCG differentiates by type of cancer. Additional P-CMGs are included in each UPCG to identify special populations such as short stays, beneficiaries who do not survive the PAC stay, and high-cost outliers. Each combination of UPCG and P-CMG is assigned a base payment weight reflecting its relative costliness. The base payment weight is then adjusted to account for costs associated with the beneficiary's comorbidities, rural-based providers, and the type of PAC setting. For illustrative purposes, the rural location of the provider was used in the analysis. Wage adjustment is based on the location of the beneficiary, not the provider under home health PPS. The final payment to a PAC provider would be calculated by multiplying this adjusted "final" payment weight by a base amount (i.e., conversion factor), as is typically done for Medicare-covered PAC. Additional adjustments may also be applied for factors such as the cost of labor in each geographic area.

Figure ES-1. The Prototype Unified PAC PPS Framework



Notes:
GI = Gastrointestinal; GU = Genitourinary; LE = Lower Extremity; TBI = Traumatic Brain Injury.
"Decedents" refers to PAC stays where the beneficiary is recorded as having been discharged dead on the claim.
"Short stays" refers to IRF, SNF, and LTCH stays lasting no longer than 3 calendar days or HHA episodes lasting up to four visits and qualifying for Low-Utilization Payment Adjustment.
High-cost outliers were defined as having a claim cost more than three standard deviations from the mean within UPCG, P-CMG, and PAC provider type.

Consider a patient receiving PAC in a SNF with a UPCG of "Lower Extremity Fracture (Including with Joint Replacement)." The patient has a motor function score of 15 (out of 27), which places them in the first P-CMG. This results in a base payment weight of 1.41 (indicating that patients in this group are, on average, 41% more costly than the average PAC stay). This patient is being treated in a SNF, which in this UPCG results in a PAC setting adjustment factor of 0.87. The patient is also assigned into Comorbidity Group 2, which in this UPCG has an adjustment factor of 1.09. The SNF is in an urban area and does not receive a rural adjustment. The final payment weight is calculated as follows:

$$\textit{Payment Weight} = 1.41 * 0.87 * 1.09 * 1.0 = 1.34$$

The PAC setting adjustment is an important aspect of the prototype Unified PAC PPS because there are significant statutory and regulatory differences governing the different PAC settings (e.g., intensity of services). Differences such as these can have implications for costs of care above and beyond individual patient needs, and it was important to consider these differences to ensure equitable payment to providers, access to care for beneficiaries, and fair and reasonable payment for PAC across settings. These PAC setting adjustments can also be modified in the future should the regulations be changed as part of a broader effort to unify PAC policy.

Our analyses found that the prototype predicted costs of care well across the different UPCGs and PAC providers. From 2017 to 2020, the model consistently resulted in a payment weight that, on average, did not underpay or overpay relative to total costs of the PAC stay by more than 4%. In addition, payment weights calibrated using data from 2017 to 2019 still predicted costs in 2020 reasonably well despite the COVID-19 public health emergency (PHE). This indicates that the structure of the prototype may be robust to significant economic shocks such as this.

These results indicate that the prototype Unified PAC PPS presented in this report has the potential to achieve the goal of a unified approach to payment for PAC in the future. However, several key steps will need to be taken before any future testing or implementation can begin. In particular, the prototype was calibrated using data from 2017 to 2019—before the COVID-19 pandemic PHE and before the introduction of revised payment systems for SNF (2019) and HHA (2020). Although we believe that the clinical concepts and analytic approach upon which the prototype is based are sound, it will be important to understand the implications for costs of care of COVID-19 and the revised payment systems, and to recalibrate the payment weights accordingly. Additionally, concepts such as the UPCGs may benefit from the introduction and collection of a new set of standardized data elements across PAC settings, and factors such as unified cost-sharing rules and a unified approach to quality measurement, such as a VBP program, will need to be considered.

This report does not include legislative recommendations, as additional analyses would need to be done prior to testing or implementation of a unified PAC payment system. We note that universal implementation of a unified PAC payment system could not be done under CMS's existing statutory authority. The additional analyses that could be done include:

- Recalibration of the prototype using newer data, including data collected after the COVID-19 public health emergency

- Further development of a Quality Metrics and Value-Based Purchasing (VBP) Program to accompany the prototype provided in this report
- Further analysis of the existing PAC regulatory requirements that could be unified under a unified PAC payment system
- Further exploration of how copayments and co-insurance would operate under a unified PAC payment system
- Development of a uniform way of reporting the primary reason for treatment in each Medicare PAC setting (i.e., on the patient assessment instrument versus the Medicare claim form)
- Further analysis of the need for hospital collection of standardized patient assessment items at discharge
- Consideration of a patient navigator who could educate and support Medicare beneficiaries and their families by helping them to understand the handoffs and choices at admission and discharge across Medicare provider settings and whether that could be operationalized in fee-for-service Medicare

Part 1–Introduction and Background

Post-acute care (PAC) represents an important component of the health care delivery system in the United States; the Medicare fee-for-service (FFS) program spent more than $57 billion on these services in 2019 (MedPAC, 2021a). PAC providers include inpatient rehabilitation facilities (IRFs), skilled nursing facilities (SNFs), home health agencies (HHA), and long-term care hospitals (LTCHs) [§ 1899B(a)(2)(A) of the Social Security Act (the Act)]. It can be provided after an acute care hospitalization as well as for "community entrants" (i.e., patients who do not have a prior acute stay).

Currently, each of the four PAC settings has its own distinct system for paying providers for the care they deliver to Medicare FFS patients. Over time, an uneven distribution of each type of PAC provider across the United States has meant that some patients with similar characteristics may have been treated in different types of PAC settings with different costs and payments. For example, IRFs and SNFs both treat patients with rehabilitation needs, and SNFs and LTCHs typically care for patients whose needs are more medical in nature. Although there can be important differences in type and intensity of services needed by patients, past work has shown that there is also some amount of overlap in patient characteristics in terms of medical condition and level of functional limitations between these settings (Balentine et al., 2018; Barnett et al., 2019; Buntin et al., 2010; Chovanec et al., 2021; Gage et al., 2012; Mallinson et al., 2014; Sharareh et al., 2014). The existing PAC prospective payment systems (PPSs) and quality reporting programs contribute to these differences; siloed payment systems pose challenges to accessing efficient, coordinated, high-quality care.

The IMPACT Act

The Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 was signed into law on October 6, 2014 (Pub. L. 113-185). Section 2(b)(2)(A) of the IMPACT Act directed the Secretary of Health and Human Services to submit a report to Congress with recommendations and a technical prototype for a Unified PAC PPS that (1) sets payment according to individual beneficiary characteristics (such as cognitive function, motor function, and impairments), rather than PAC type; (2) accounts for the clinical appropriateness of services furnished and beneficiary outcomes; (3) is designed to incorporate standardized patient assessment data as described under Section 1899B of the Social Security Act; and (4) furthers clinical integration, such as by motivating greater coordination around a single condition or procedure to integrate hospital systems with PAC providers. The IMPACT Act also specifies that the report should (1) discuss which PAC regulations specified under the Social Security Act under title XVIII of the Social Security Act should be altered under a Unified PAC PPS; (2) include an analysis of the impact of the recommended payment system on beneficiary cost-sharing, access to care, and choice of setting; (3) a projection of any potential reduction in expenditures that may be attributable to the application of the recommended payment system; and (4) the value of acute care and critical access hospitals collecting and reporting standardized patient assessment data. In addition, the report is to be developed in consultation with the Medicare Payment Advisory Commission (MedPAC) and other appropriate stakeholders.

Overview of This Report

The purpose of this report is to present the prototype for a Unified PAC PPS, as called for in the IMPACT Act, and the analyses used in developing it. We begin in *Part 1, Introduction and Background,* with an overview of the payment systems and regulatory framework governing each of the four PAC setting types. In *Part 2, Building a Prototype Unified PAC PPS,* we describe the prototype and the analyses and methodology used in developing and calibrating it. In *Part 3, PAC Landscape and Prototype Impacts*, we describe the landscape of PAC providers and utilization. We then examine the prototype's ability to predict PAC costs of care and measure its potential impact by comparing the hypothetical payment weights to Medicare payments under the separate payment systems. We also present an analysis of data from calendar year (CY) 2020 to examine changes in utilization of PAC services as well as the prototype's ability to predict spending in that context. In *Part 4, Considerations for Implementation*, we review the performance of the prototype and the assumptions and limitations of this work. We then discuss additional considerations for testing or implementation, including (1) potential changes to the existing regulatory framework governing PAC settings, (2) alignment with existing and future value-based payment (VBP) initiatives, (3) unifying cost-sharing rules for PAC, (4) health IT integration and the potential value of collecting data upon discharge from a prior acute stay, and (5) the role patient navigators could play under a Unified PAC PPS. Finally, we present *Conclusions* in Part 5 and *Recommendations for Legislative Action* in Part 6.

PAC Under the Medicare FFS Benefit

Each of the four PAC settings (IRF, SNF, HHA, and LTCH) has its own statutory payment system for paying providers for the care they deliver to Medicare FFS patients. As a result, Medicare payments for patients with similar characteristics treated in different PAC settings can vary for reasons independent of patient need. Some of the differences in payment across PAC settings are attributable to true differences in the underlying costs incurred by these providers caused by factors such as structural, regulatory, and service delivery requirements; however, others are associated with the disparate approaches to payment. In constructing a prototype Unified PAC PPS, it is important to consider these differences and their implications for payment. Doing so can help ensure equitable payment to providers, access to needed care for beneficiaries, and fair and reasonable payment for PAC across settings.

PAC Regulatory Environment

In constructing a prototype Unified PAC PPS, it is important to consider statutory and regulatory differences and their implications for payment. Doing so can help ensure equitable payment to providers, access to needed care for beneficiaries, and fair and reasonable payment for PAC across settings.

In this section, we present a high-level overview of the PAC settings discussed in this report, including key payment policies, statues, and regulations governing their operations as providers eligible to bill Medicare FFS. Our aim with this summary is not to present a comprehensive review of the existing regulatory framework. Rather, we identify key factors distinguishing PAC settings that can affect costs of care and may be important to consider in relation to the testing and implementing of a Unified PAC PPS. Additionally, many of the

regulations presented in this section were waived as part of the COVID-19 PHE. We discuss this in greater detail in *Part 4, Considerations for Implementation*.

IRFs

Payment System: IRFs are one of two PAC settings classified as hospitals by the Medicare statute (§ 1886(d)(1)(B) of the Act). IRFs include freestanding rehabilitation hospitals and rehabilitation units of acute care hospitals, long-term care hospitals, critical access hospitals, and inpatient psychiatric facilities. Payments for Medicare FFS beneficiaries are made to IRFs under the IRF PPS (Centers for Medicare & Medicaid Services (CMS), 2021f), which uses information from the IRF Patient Assessment Instrument (IRF-PAI) to classify patients based on clinical characteristics and expected resource needs [§ 1886(j)(2) of the Act]. Complete regulatory history of the IRF PPS is published annually (CMS, 2021c).

Beneficiary Eligibility: For an IRF to receive Medicare payments under the IRF PPS, at least 60% of their patient population must have one of the 13 listed diagnoses that typically require intensive rehabilitation therapy, also referred to as the 60% compliance threshold or the "60 percent rule" [42 CFR § 412.29 (b)(1)]. An assessment is done to verify that the patient's clinical status requires and can reasonably be expected to actively participate in, and benefit from, an intensive rehabilitation therapy program. Specifically, this means that the beneficiary must be able to actively participate in therapy for at least 3 hours a day, 5 days per week, or 15 hours over a 7-day consecutive period [42 CFR § 412.622(a)(3)(iii)].

Patient Assessment: The IRF-PAI is used to collect patient assessment data for quality measure calculation and payment determination [42 CFR § § 412.606(b)(1) and 412.634(b)(1) and §§ 1886(j)(2)(D) and (j)(7)(F) of the Act] (CMS, 2021n). This assessment process includes direct patient observation and communication with the patient as well as patient data from various sources, such as the patient's physicians, family, and clinical records [42 CFR § 412.606 (b)(3)(i) and (ii)]. The assessment contains standardized patient data elements [§ 1886(j)(7)(F)(ii) and § 1899B(b)(1) of the Act].

Admission Criteria: An IRF stay is considered reasonable and necessary if there is a reasonable expectation that the patients' needs meet the IRF coverage criteria, documentation, and interdisciplinary team approach to care requirements [42 CFR § 412.622(a)(3), (4), and (5) and § 1862(a)(1) of the Act].

Staffing and Training Requirements: A condition of participation for all hospitals is that a physician must be present or on call for 24 hours a day [42 CFR 482.12(c)(3)]. A rehabilitation physician must also perform a minimum of three face-to-face visits per week. A non-physician provider may provide one of the three face-to-face visits after the first week [42 CFR § 412.29(e)]. IRF care must be overseen by an interdisciplinary team that includes a registered nurse (RN) with specialized training or experience in rehabilitation, a social worker or case manager (or both), and a licensed or certified therapist from each therapy discipline involved in treating the patient [42 CFR § 412.662(a)(5)].

SNFs

Payment System: SNFs are primarily engaged in providing skilled nursing care or rehabilitation services to residents [§ 1819(a)(1) of the Act]. Medicare FFS payment to SNFs is made under the SNF PPS (CMS, 2021k). On October 1, 2019, the SNF PPS was updated to the Patient-

Driven Payment Model (PDPM) (CMS, 2021i). This new payment system consists of five case-mix–adjusted components based on patient characteristics (physical therapy, occupational therapy, speech language pathology, nursing, and nontherapy ancillaries) as well as a variable per diem adjustment that adjusts the per diem rate over the course of a patient's stay. In this model, individual patient needs are addressed independently, which in turn improves payment accuracy (Acumen, 2018; CMS, n.d.). The SNF PPS is authorized under Section 4432(a) of the Balanced Budget Act of 1997. Complete legislative history is published annually (CMS, 2021o).

Beneficiary Eligibility: Beneficiaries must have a prior inpatient hospital stay of at least 3 consecutive days to be eligible for Medicare coverage of inpatient SNF care. This requirement was modified in response to the COVID-19 public health emergency (see discussion of public health emergency in part 4 of this report). In addition, the beneficiary must be admitted to the SNF within 30 days after discharge from the inpatient hospital or within such time as it would be medically appropriate to begin an active course of treatment [§ 1861(i) of the Act].

Patient Assessment: SNFs are mandated to complete the Minimum Data Set (MDS) for all residents [42 CFR § 483.20(b)(1)(xvii) and § 1819(b)(3)(A) and (f)(6)(A) of the Act] (CMS, 2021h). This instrument captures a comprehensive assessment of residents' functional status and health needs. The MDS includes standardized data elements as required by § 1899B(b)(1) of the Act. After the initial assessment is completed within the first 8 days of the patient's stay, periodic assessments are scheduled according to the resident's condition [42 CFR § 483.20(b)(2) and § 1819(b)(3)(A) of the Act].

Admission Criteria: In addition to the 3-day prior acute hospitalization requirement, a physician must have ordered the inpatient services for which the patient needs SNF care (e.g., nursing care, physical therapy, occupational therapy, speech language pathology). Beneficiaries must receive the required skilled care daily, and these services can only be provided in a SNF on an inpatient basis [42 CFR § 424.20(a)(1)(i)].

Staffing and Training Requirements: All medical care provided by a SNF must be under the supervision of a physician [§ 1819(b)(6) of the Act], and residents must be seen by a physician at least once every 30 days for the first 90 days after admission (and at least every 60 days thereafter) [42 CFR § 483.30(c)]. Nursing personnel must be present 24 hours a day, and an RN must be present for 8 consecutive hours per day [42 CFR § 483.35(a)(1) and (b)(1) and § 1819(b)(4)(C) of the Act].

HHAs

Payment System: HHAs provide care in the home to beneficiaries who require skilled nursing or other therapeutic services. The Home Health PPS was authorized by the Balanced Budget Act of 1997 and subsequently implemented in October 2000. More-specific detail on the conditions of participation for HHAs and what constitutes home health services can be found in § 1891 and § 1861(m) of the Act, respectively. Complete legislative history for HHAs is available on the CMS website (CMS, 2021e).

On January 1, 2020, the Home Health PPS was updated to the Patient-Driven Groupings Model (PDGM). This new case-mix classification model sets payment for 30-day episodes of care based on clinical characteristics and other patient information. These groups are differentiated by the following characteristics:

- Admission source (2 subgroups)
- Timing of the 30-day episode (2 subgroups)
- Clinical grouping (12 subgroups)
- Functional impairment level (3 subgroups)
- Comorbidity adjustment (3 subgroups)

Beneficiary Eligibility: The regulations at 42 CFR § 409.42 outline the requirements that a beneficiary must meet to qualify for home health services. The regulations at 42 CFR § 409.42 follow the statutory eligibility requirements at § 1814(a) and § 1835(a) of the Act. HHAs must verify the patient's eligibility for the Medicare home health benefit, including skilled need and homebound status, at the time of the initial assessment and at the time of the comprehensive assessment [42 CFR § 484.55(a), (b)].

Patient Assessment: HHAs are required to collect the Outcome and Assessment Information Set (OASIS)—the data collection method and performance reporting tool required for all Medicare-certified HHAs to accept Medicare payments [42 CFR § 484.55 (c)(8) and § 1895(b)(3)(B) of the Act]. OASIS contains standardized patient data as required by § 1899B(b)(1) of the Act. The assessment must be completed within 5 days of the start of care and updated every 60 days [42 CFR § 484.55(b) and (d)].

Admission Criteria: Physician/practitioner certification requirements for payment are outlined in 42 CFR § 424.22 and these regulations are based on the statutory requirements in § 1814 and § 1835 of the Act.

An initial assessment must be done by an RN or an appropriate rehabilitative skilled professional (e.g., speech language pathologist, physical therapist, occupational therapist) to determine a patient's eligibility for the Medicare home health benefit and homebound status within 48 hours of initial referral or return from the hospital [42 CFR § 484.55(a)(1) and (2)]. A comprehensive assessment must then be completed within 5 days of the start of care [42 CFR § 484.55(b)(1)].

Staffing and Training Requirements: An HHA must have policies, established by a group of professional personnel that includes one or more physicians and one or more RNs, to govern the services it provides. The provision of these services must also be supervised by a physician or registered professional nurse [§ 1861(o)(1) of the Act]. Additional personnel qualifications are described in 42 CFR § 484.115.

LTCHs

Payment System: LTCHs are classified as hospitals by the Medicare benefit [§ 1886(d)(1)(b)(iv) of the Act] (CMS, 2021g). Medicare FFS payments for LTCHs are made through the LTCH PPS, where patients are categorized into long-term care diagnosis-related groups (LTC-DRGs) and payment is based on average resource use [§ 1886(m)]. Patient stays that are less than five-sixths of the average length of stay for each LTC-DRG receive lower payments [42 CFR § 412.529], and patient stays receive high-cost outlier payments if the costs for the stay exceed typical costs by a specified amount [42 CFR § 412.525(a)]. LTCH stays that do not meet the criteria for the LTCH standard Federal rate payment (see below) receive site-neutral rate payments, the lesser of the Inpatient Prospective Payment System (IPPS)

comparable per diem amount or estimated costs [42 CFR § 412.522 and § 1886(m)(6)(A) of the Act]. Complete legislative history is available on the CMS website (CMS, 2021g). The LTCH PPS is a dual rate payment system under which cases that meet the statutory patient criteria are paid the LTCH standard Federal payment rate and cases that do not meet the statutory patient criteria are paid the site-neutral payment rate

Beneficiary Eligibility: To receive LTCH PPS payments, an LTCH patient must have a preceding acute care hospital stay with at least 3 days in an intensive care unit (ICU) or at least 96 hours of ventilator care [§ 1886(m)(6)(A) of the Act]. Additionally, to receive LTCH PPS payments, LTCH patients may not have a psychiatric or rehabilitation principal diagnosis. For a hospital to be classified as an LTCH, the average Medicare inpatient length of stay must be greater than 25 days (excluding site-neutral stays) [§ 1886(d)(1)(B) of the Act]. LTCHs with more than 50% of discharges in a reporting year classified as site-neutral will be paid under the Inpatient Prospective Payment System [42 CFR § 412.522 and § 1886(m)(6)(C) of the Act].

Patient Assessment: LTCHs are mandated to complete the LTCH Continuity Assessment Record and Evaluation (CARE) Data Set (LCDS) for all patients to fulfill the quality reporting requirement in § 1899B(b)(1) of the Act. The LCDS collects data on patient demographics, cognitive patterns, motor function, and diagnoses and must be submitted in a timely manner both after admission and after discharge. Unlike in other settings, assessment data from the LCDS are not currently used in setting payment.

Admission Criteria: To be admitted to an LTCH, the patient should require inpatient hospitalization for the treatment of their condition [§ 1861(ccc)(1) of the Act]. LTCH physicians should conduct preadmission screening and physical examinations to determine admission eligibility [§ 1861(ccc)(4) of the Act].

Staffing and Training Requirements: A condition of participation for all hospitals is that a physician must be present or on call 24 hours a day [42 CFR 482.12(c)(3)]. Organized nursing service must be present 24 hours per day. All nursing services must be furnished or supervised by an RN, and an RN must be present 24 hours per day [§ 1861(e)(5) of the Act]. The LTCH must also have an interdisciplinary team of health care professionals involved in treatment, including physicians, to prepare and carry out an individualized treatment plan for each patient [§ 1861(ccc)(4) of the Act].

Part 2–Building a Prototype Unified PAC PPS

In this section, we summarize the methodology used to develop and calibrate the prototype Unified PAC PPS. Our aim with the prototype was to develop a framework for paying PAC covered by Medicare FFS that could be applied across each of the major PAC provider types: IRF, SNF, LTCH, and HHA. Currently, each of these settings has its own unique payment system for paying providers for the care they deliver to Medicare FFS patients. In recent years, two of these payment systems have been updated to incorporate selected standardized self-care and mobility data elements into their respective case-mix adjustment methodologies; however, the overall payment systems remain disparate, and payments made by Medicare for patients with similar characteristics treated in different PAC settings can vary. This disparity is driven in part by the different structures of the payment systems and in part by important differences in the underlying costs incurred by these settings, which are in turn caused by factors such as licensure requirements and regulatory staffing and infrastructure requirements necessary to treat certain patients. A prototype Unified PAC PPS must therefore balance the aim of developing a unified approach to case-mix adjustment while continuing to account for these setting-specific costs. It should also be able to adapt if these regulations are modified over time to reduce the differences across settings.

We begin by describing the data used in this analysis, including Medicare claims and administrative data, PAC assessment data, and Medicare cost report data. Because the unit of payment varies across the four PAC settings, for this work, we defined a PAC "stay" as an individual stay for IRF and LTCH, the total days for which per diem was billed for a SNF stay, and a continuous sequence of HHA episodes. We then describe the structure of the prototype—including how it approaches case-mix adjustment and payment weight assignment—and the analyses and results used in developing this framework. Finally, we present hypothetical payment weights estimated using data from 2017 through 2019, designed to represent the types of weights that could be estimated for testing or implementation in the future. We examine the predictive ability of these weights and their impact on Medicare payments across key groups of Medicare beneficiaries and providers in *Part 3, PAC Landscape and Prototype Impacts*. We also examine the model's performance in 2020, following both the introduction of the SNF PDPM and HHA PDGM payment models and the COVID-19 PHE.

The resulting prototype Unified PAC PPS framework is presented in ***Figure 2-1*** and described throughout this section. It begins by assigning beneficiaries to one of 31 **Unified PAC Clinical Groups (UPCG)**. These UPCGs can be conceptualized in three general categories: Medical and Diagnosis-Focused (Medical); Rehabilitation and Therapy-Focused (Rehabilitation); and Medication Management, Teaching, and Assessment (MMTA). Next, the beneficiary is assigned to a **PAC Case-Mix Group (P-CMG)** specific to each UPCG. Rehabilitation UPCGs each have three P-CMGs that are differentiated by the beneficiary's motor function score (see *Key Variables–Case-Mix Adjustment*), whereas MMTA UPCGs have two motor function–based P-CMGs. For Medical UPCGs, P-CMGs are generally based on further differentiating primary diagnosis for payment purposes. Additional P-CMGs are included in each UPCG to identify special populations such as short stays, beneficiaries who do not survive the PAC stay, and high-cost outliers (see *Data Sources and Sample Selections*). Finally, the payment weight is adjusted to account for **comorbidity groups** (excluding short stays and decedents), **rural** providers, and costs that are specific to the **PAC setting.**

Data Sources, Sample Selection, and Key Variables

Data Sources and Sample Selection

The data used in these analyses were drawn from CY 2017 to CY 2020 Medicare Provider Analysis and Review (MedPAR) claims, HHA Claims, the IRF-PAI, the MDS, the LCDS, and OASIS assessment databases.

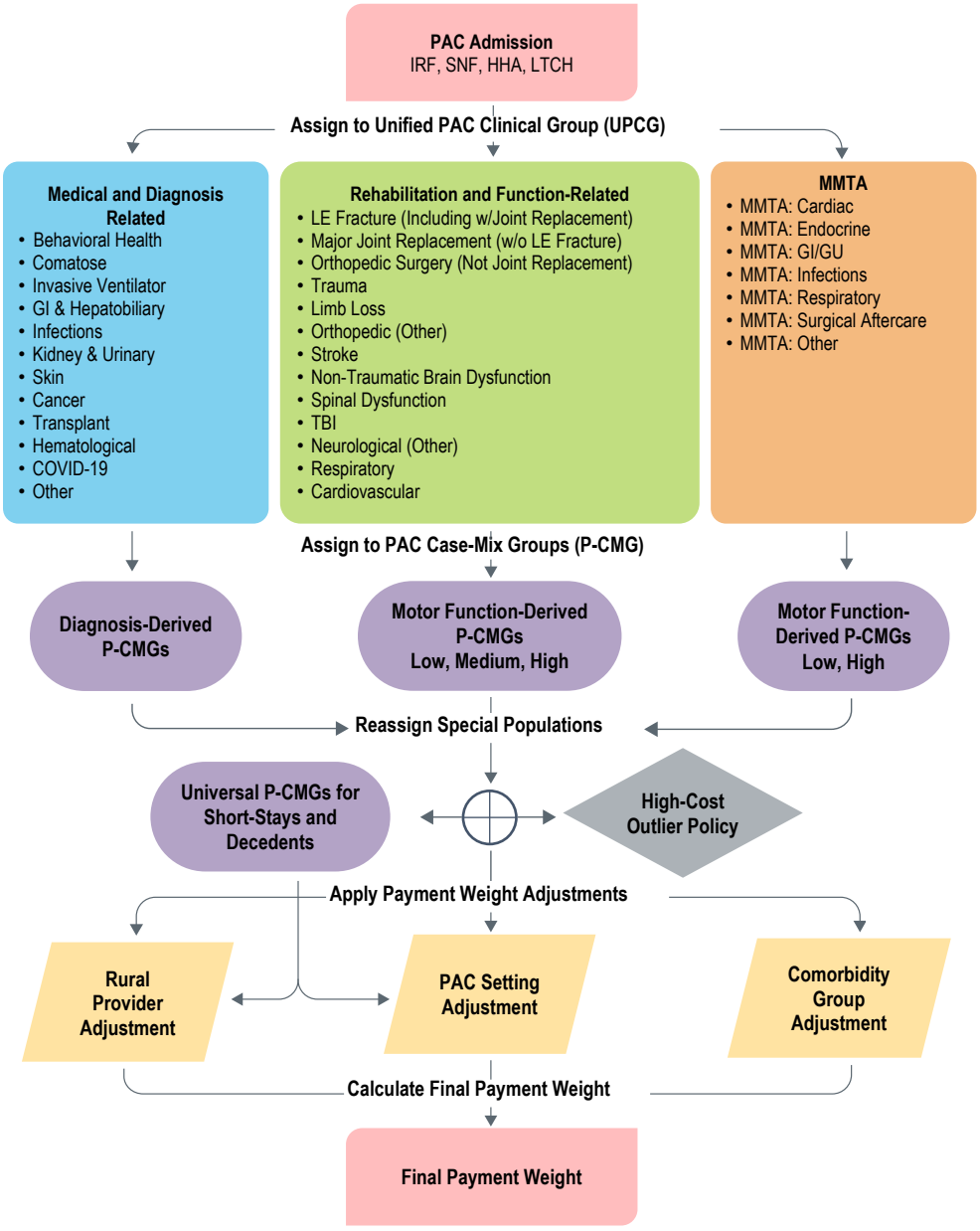
For each of the data years, we began by identifying all SNF, IRF, LTCH, and HHA claims submitted by providers within the 50 United States and the District of Columbia where Medicare FFS (i.e., not Medicare Advantage) was the primary payer. From these claims, we identified a random sample of 50% of Medicare FFS beneficiaries with at least one PAC stay in the calendar year. Distinct random samples of beneficiaries were identified for each year. For beneficiaries in our sample, all PAC claims were included in these analyses.

Because the unit of payment varies across the four PAC settings, for this work, we defined a PAC "stay" as an individual stay for IRF and LTCH, the total days for which per diem was billed for a SNF stay, and a continuous sequence of HHA episodes. With respect to payment, for IRF and LTCH, this definition largely resembles the current unit of payment. For SNF, the total per diem for a given stay is aggregated and total payments are summed to the stay. HHAs, in contrast, are paid per episode (60 days through 2019, 30 days beginning in 2020), and a beneficiary's course of treatment can span multiple consecutive episodes. We therefore conceptualized a "stay" as a continuous sequence of HHA episodes for a beneficiary with a specific HHA.[1,2] Assessment data were drawn from the initial "Start of Care" assessment from the first HHA episode in the sequence, and costs were summed across all included episodes.

[1] An episode was considered part of the sequence if it began within 60 days of the end of the most recent HHA episode with the same provider (which aligns with current recertification rules for HHAs [42 CFR 484.55(d)(1)]).

[2] Because distinct samples were identified in each year, HHA episodes from the prior year and the subsequent year could not be consistently identified. We therefore excluded HHA sequences beginning in the first 2 months of the year or ending in the final 2 months of the year (approximately half of sequences identified in each year), as they may be incomplete.

Figure 2-1. Prototype Unified PAC PPS Framework



Notes:
LE = Lower Extremity; GI = Gastrointestinal; GU = Genitourinary; TBI = Traumatic Brain Injury.
"Decedents" refers to PAC stays where the beneficiary is recorded as having been discharged dead on the claim.
"Short stays" refers to IRF, SNF, and LTCH stays lasting no longer than three calendar days or HHA episodes lasting no longer than four visits.
High-cost outliers were defined as having a claim cost more than three standard deviations from the mean within UPCG, P-CMG, and PAC provider type.

We identified special populations of PAC stays for exclusion from certain stages of the analysis. These special populations will be treated differently for payment purposes in the prototype Unified PAC PPS. The first is short stays, which were defined as having a length of stay of 3 calendar days or fewer in institutional PAC settings (IRF, SNF, and LTCH) and HHA episodes with four visits or fewer, which would qualify for Low-Utilization Payment Adjustment through CY 2019 (Low-Utilization Payment Adjustment, [42 CFR 484.230(a)]). The selection of 3 days for IRF, SNF, and LTCH aligns with the current structure of the IRF PPS [42 CFR 412.620(b)(2)], whereas the short-stay policy for LTCHs is Medicare Severity (MS)-DRG–specific [42 CFR 421.529(a)] and SNFs are paid per diem [42 CFR 413.335(a)]. We therefore selected the IRF approach to defining short stays as most closely resembling the structure of the PAC stay as defined in the prototype Unified PAC PPS. We also identified decedents, defined as PAC stays where the beneficiary is reported on the claim as having been discharged deceased. Both short stays and decedents will be assigned to special P-CMGs within each of the UPCGs. Finally, we identified "short transfers" as beneficiaries who were discharged from the PAC stay directly to another institutional PAC setting with a length of stay that was below the average within the UPCG and PAC setting type. These cases are likely to be of lower cost and could indicate that the beneficiary required additional care at a different level than the PAC setting could provide. Following the example of the IRF PPS, we gave these cases reduced weight in the design and calibration of the prototype Unified PAC PPS (Wissoker & Garrett, 2018).

Matching PAC Claims to Assessments

For each calendar year, we identified all claims submitted by PAC providers for beneficiaries in our sample with an end date during the calendar year. MedPAR was used to identify institutional PAC stays (IRF, SNF, and LTCH) because a PAC stay may have multiple claims. Because HHA episodes cannot be found in MedPAR, individual HHA claims were identified and matched to assessments. Claims data were used with Medicare cost reports to calculate the total cost for the inpatient PAC stay or HHA sequence (see *Key Variables–Claim Cost*).

PAC provider types are identified through a combination of CMS Certification Number (including Special Unit Codes) and the Provider of Services file (CMS, 2007, 2021j). LTCH stays were further differentiated by whether the claim was paid under the standard LTCH payment system or under site-neutral payment rules (MedPac, 2021b). The organization of PAC provider and claim types is presented in ***Table 2-1.***

PAC stays were matched to admission assessment data (MDS for SNF, IRF-PAI for IRF, LCDS for LTCH, and OASIS for HHA) by beneficiary identifier (Health Insurance Claim Number or Medicare Beneficiary Identifier), PAC provider ID/type, and dates of service. PAC stays that could not be matched to an assessment using these criteria (approximately 10% of claims from 2017 to 2019) were excluded from analyses. In addition, we excluded HHA sequences where the initial episode's OASIS assessment was missing key self-care and mobility data used to calculate the motor function score (less than 2% per year, see *Key Variables–Case-Mix Adjustment*), because this may indicate that the assessment was a recertification and not the start of care (CMS, 2019).

Table 2-1. Included PAC Provider Types

PAC Type	Facility Type	PAC Payment Program	Assessment Type
IRF	Rehabilitation Hospital	IRF PPS	IRF-PAI
	Hospital-Based IRF Unit of IPPS, LTCH, and IPF		
	IRF Unit in Critical Access Hospital		
SNF	Freestanding SNF	SNF PPS	MDS
	Hospital-Based SNF Unit		
	Swing Bed		
LTCH	LTCH	LTCH PPS[3]	LCDS
HHA	Freestanding HHA	Home Health PPS	OASIS
	Hospital-Based HHA		
	SNF-Based HHA		

Key Variables–Claim Cost

PAC payment systems have historically been based on analyses of total costs of care rather than total Medicare payments (or allowed charges). The rationale for using total costs rather than total payments is that total costs more accurately reflect the true cost to the providers of caring for patients, whereas total payments also include policy-based adjustments that are not directly related to the costs of providing care.

Decomposing Claim Cost

Because PAC can often involve several distinct types of care, and because fixed costs that are independent of patient need can vary by PAC setting type, we began by considering the potential to decompose total costs to differentiate between costs associated with various patient characteristics, which reflect patients' needs, versus other costs that do not vary based on patient characteristics. We attempted three approaches for decomposing claim costs, as discussed in detail in ***Appendix B***.

Our exploration of alternative approaches identified challenges in pursuing a decomposition of total costs with the currently available data sources. As a result of these explorations, and given that total costs are the basis of the current Medicare PAC PPSs, our analyses in support of the prototype development were conducted using total costs.

[3] All LTCH claims are paid under the LTCH PPS, which is a dual rate payment system (the LTCH standard Federal rate for cases that meet the statutory patient criteria and the site-neutral payment rate for those cases that do not meet the statutory patient criteria).

Calculating Total Claim Cost

Costs for each PAC stay from 2017–2020 were calculated using 2017 cost reports following the methods in Coomer et al. (2017). In brief, for inpatient PAC settings (IRF, SNF, and LTCH), costs are calculated by first determining the routine cost per day for each facility as well as each facility's ancillary cost-to-charge ratios from each facility's Medicare cost report. Routine cost per day is then multiplied by the number of utilization days listed on the claim, and ancillary costs are determined by multiplying ancillary charges on the claim by the facility's cost-to-charge ratio. These two values are then summed, and outliers are trimmed within each setting as needed to calculate total claim cost.

For HHA claim costs, Medicare cost reports and claims data are used to determine each HHA's average cost per visit and cost per minute for each type of visit, as well as the agency's cost-to-charge ratio for supplies. Total cost for the episode is then calculated using these values and the number of minutes and supply charges reported on the claim and summing to the level of the episode. Total costs for each episode are then summed to calculate the total cost of the stay (sequence). Outliers are trimmed within each setting as needed.

Adjusting Costs for Inflation

Because of the timing of analyses and the availability of complete cost report data, we opted to apply the values derived from 2017 cost reports to 2018, 2019, and 2020 claims and to apply an inflation adjustment factor based on the market basket calculation for each PAC setting to express costs uniformly in 2017 dollars. This method is detailed in ***Appendix B***.

To adjust the claim cost for LTCH, IRF, and SNF, we divided the ancillary cost portion of the total cost calculation by the inflation factor associated with each year. This, in effect, expressed ancillary costs in 2017 dollars. Routine cost per day is calculated using the 2017 facility cost report data and is therefore already expressed in 2017 dollars. We followed a similar approach for HHA: adjusting the supplies costs to 2017 dollars using the corresponding inflation factor. Total costs can therefore be interpreted as being expressed in 2017 dollars across all years of data.

Wage Adjustment of Claim Cost

CMS adjusts Medicare payments to PAC settings using a local area wage index in accordance with Sections 1886(d)(3), 1888(e)(4), and 1895(b)(4) of the Act. The wage index is calculated as the average hourly wage for a labor market area divided by the national average hourly wage. It is applied to the labor portion of the standardized payment amounts to adjust for area differences in wage levels. For our analyses, we used the wage index to standardize costs across geographic areas for these measured differences in labor costs. That is, we divided the labor-share portion of total claim cost by the local area wage index—the inverse of how CMS applies this statistic to claim payments. This ensures that we capture the effect of patient characteristics and other covariates on cost irrespective of provider location. The resulting claim cost amount can therefore be interpreted as wage-adjusted cost of care expressed in 2017 dollars. For the remainder of this report, we refer to this value as "total cost" of the PAC stay.

Key Variables–Case-Mix Adjustment (Independent Variables)

In connection with the IMPACT Act, selected standardized self-care and mobility assessment data were collected and submitted to CMS starting in October 2012 for LTCHs and in October

2016 for IRFs and SNFs. HHAs started collecting data for a single standardized mobility data element in 2017 and then for additional standardized self-care and mobility data elements in January 2019 (See ***Appendix C***). Using these and other assessment data, we created several variables for the analyses: (1) a motor (i.e., physical) function score calculated using data from the standardized self-care and mobility data elements, (2) indicators of bladder and bowel incontinence, (3) a cognitive and communication function score calculated using data from the assessment data elements, (4) an indicator of the presence of an acute inpatient admission before the current PAC stay, and (5) an indicator of other PAC utilization before the current PAC stay. These variables were selected for case-mix adjustment by examining their relationship with costs of care across PAC settings as well as their correlation with each other (i.e., multicollinearity, which could have implications for including them in the case-mix adjustment). Inclusion was also informed by those variables used in the existing PAC payment systems. The final set of variables discussed in this section were determined to be strong predictors of costs with only minimal levels of multicollinearity.

Because some of the data used in this analysis were collected before January 2019, when the standardized self-care and mobility data were collected in all four PAC settings, to the extent possible, we combined standardized assessment-based data with analogous data collected across the assessment instruments in 2017 and 2018. In this section, we describe the construction of each of the assessment-based variables.

Motor Function

We began by creating an admission motor (self-care and mobility) function score that could be used across all four types of PAC. In 2019 and beyond, this measure was composed of standardized self-care and mobility data elements available across all four assessment instruments (the MDS for SNFs, the IRF-PAI for IRFs, the LCDS for LTCHs, and the OASIS for HHAs). In 2017 and 2018, we constructed a cross-walked motor function score based on standardized self-care and mobility data for IRF, SNF, and LTCH and based on a smaller set of home health–specific self-care and mobility data for HHA. To examine the stability of our results across years, this cross-walked motor function measure was also generated using 2019 and 2020 data.

Standardized Self-Care and Mobility Items for SNF, IRF, and LTCH in 2017 and 2018, and All Settings in 2019 and Beyond

The admission motor function score calculated using data from standardized items includes eating, oral hygiene, toileting hygiene, sit to lying, lying to sitting on side of bed, sit to stand, chair/bed-to-chair transfer, toilet transfer, and walk 50 feet (***Table 2-2***). We elected to use a motor score rather than separate self-care and mobility scores because the motor function scores are used to classify patients within clinically defined groups of patients and the self-care and mobility data are correlated.

Table 2-2. Standardized Self-Care and Mobility Data Elements Used to Create the SNF, IRF, and LTCH Motor Function Score Using Standardized Items

Data Element ID	Data Element Label
GG0130A	Eating
GG0130B	Oral hygiene
GG0130C	Toileting hygiene
GG0170B	Sit to lying
GG0170C	Lying to sitting on side of bed
GG0170D	Sit to stand
GG0170E	Chair/bed-to-chair transfer
GG0170F	Toilet transfer
GG0170J	Walk 50 feet

All standardized motor function items, which include self-care and mobility activities, are coded using the same six-level rating scale where a higher score reflects higher ability. The rating scale and descriptor labels are as follows:

- **06. Independent**. Patient completes the activity with no assistance from a helper.
- **05. Setup or clean-up assistance**. Helper sets up or cleans up; patient completes activity. Helper assists only prior to or following the activity.
- **04. Supervision or touching assistance.** Helper provides verbal cues or touching/steadying assistance as patient completes activity. Assistance may be provided throughout the activity or intermittently.
- **03. Partial/moderate assistance**. Helper does less than half the effort. Helper lifts, holds, or supports trunk or limbs, but provides less than half the effort.
- **02. Substantial/maximal assistance**. Helper does more than half the effort. Helper lifts or holds trunk or limbs and provides more than half the effort.
- **01. Dependent**. Helper does *all* of the effort. Patient does none of the effort to complete the task.

For some patients, admission data may include one or more of the "activity not attempted" codes because the patient could not perform an activity and the helper did not perform the activity for the patient. The reason the activity was not attempted may be because of a safety or medical issue, because the activity was not applicable, because there was an environmental limitation, or because the patient refused to perform the activity. The "Activity Not Attempted" codes are as follows:

- **07. Patient refused**
- **09. Not applicable** (The patient did not perform this activity prior to the current illness, exacerbation, or injury)
- **10. Not attempted due to environmental limitations**
- **88. Not attempted due to medical condition or safety concerns**

To create the motor function score, we conducted analyses of the "activity not attempted" codes so we could recode them to the most-appropriate level of function on the six-level rating scale. The analyses included a random sample of records with an equal number of stays for each PAC provider. We examined the admission "activity not attempted code" data using Rasch analysis.

In general, Rasch analysis uses item-level response or observation data to determine how well items in a set work together to help measure a construct. As part of the analysis, Rasch methodology places persons and the items of interest on a *ruler* so individual items at each level can be observed in relation to the other items in the set. Rasch output includes person Rasch measures, representing the person ability on the Rasch ruler and the average Rasch measure for each response option.

Improving our understanding of "Activity Not Attempted" with Rasch Analysis

To create the motor function score, we conducted analyses of the "activity not attempted" codes so we could recode them to the most-appropriate level of function on the six-level rating scale. Rasch methodology places persons and the items of interest on a ruler so individual items at each level can be observed in relation to the other items in the set.

We used Winsteps software (Linacre, 2021) to conduct Rasch analysis of the rating scale (1 to 6) data and determine the mean motor Rasch measure value associated with each code (rating scale scores and the activity not attempted codes) for each item. Using these results, for each data element, we identified the mean Rasch measure value of the six-level score that was the closest match to the mean Rasch measure value for the "activity not attempted" codes. Based on these results, we used that rating level as the recode value.

Although we did observe some variation across PAC settings for some items, most data elements had Rasch measure values that aligned with the same rating scale level across provider types. ***Table 2-3*** shows the score that we used when recoding the "activity not attempted" codes for each data element. Most data elements were recoded to 2 ("Substantial Assistance"), two data elements were recoded to 1 ("Dependent"), and one data element was recoded to 3 ("Partial Assistance").

Table 2-3. Values Used for Recoding Standardized Assessment Items Coded "Activity Not Attempted" to Create the SNF, IRF, and LTCH Motor Function Score, 2019

Data Element ID	Data Element Label	Use of "Activity Not Attempted" Codes					Recoded Value (6-Level Rating Scale)
		SNF	IRF	HHA	LTCH	LTCH-SN	
GG0130A	Eating	2.49%	3.48%	0.72%	27.71%	13.61%	2–Substantial Assistance
GG0130B	Oral hygiene	4.28%	2.15%	0.66%	5.80%	4.03%	3–Partial Assistance
GG0130C	Toileting hygiene	5.72%	2.41%	0.55%	6.27%	5.22%	2–Substantial Assistance
GG0170B	Sit to lying	2.52%	3.56%	4.70%	24.87%	17.56%	2–Substantial Assistance
GG0170C	Lying to sitting on side of bed	2.22%	3.83%	4.88%	31.47%	20.92%	2–Substantial Assistance
GG0170D	Sit to stand	4.83%	9.39%	3.72%	51.74%	38.41%	1–Dependent

Data Element ID	Data Element Label	Use of "Activity Not Attempted" Codes					Recoded Value (6-Level Rating Scale)
		SNF	IRF	HHA	LTCH	LTCH-SN	
GG0170E	Chair/bed-to-chair transfer	2.62%	6.14%	4.42%	41.20%	32.32%	1–Dependent
GG0170F	Toilet transfer	11.06%	17.53%	3.54%	56.39%	45.43%	2–Substantial Assistance
GG0170J	Walk 50 feet	53.37%	55.41%	32.55%	80.76%	73.62%	2–Substantial Assistance

Notes: SN = Site-Neutral. Recoded value presented on scale of 1 to 6.
Source: RTI International Analysis of Medicare Claims and Assessment Data, 2019

OASIS Items Used to Create the Motor Function Score for HHA for 2017 and 2018

Given the availability of only one standardized item in home health in 2017 and 2018, the HHA version of the motor function score needed to be supplemented with HHA-specific items from the OASIS assessment. The question of which OASIS items to include in the motor function score from 2017 and 2018 was discussed with the 2019 Technical Expert Panel. Panelists noted the lack of standardized data across settings as a limitation to the analysis, although they understood the motivation to conduct analyses using available data. The panel did not have any specific comments on the choice of items for the HHA motor function score. Given the limited availability of item data across all OASIS records, we were limited in which items to use.

Ultimately, four OASIS items were used for the HHA motor function score: the single standardized item that was collected in home health and three home health–specific items similar to the items available in the other PAC settings (ability to dress upper body, ability to dress lower body, and transferring) (***Table 2-4)***.

Table 2-4. OASIS Items Used to Create the Motor Function Score for Home Health for 2017 and 2018

Data Element	Description
GG0170C	Lying to sitting on side of bed (standardized item)
M1810	Ability to dress upper body
M1820	Ability to dress lower body
M1850	Transferring

Creating a Cross-Walked Motor Function Score for 2017 and 2018

Although the calculation of the function score is straightforward when standardized items are available across all four PAC settings, score construction is more complicated when the standardized items are not available across all settings. As outlined above, we had data at all timepoints for only four items in the home health setting in 2017 and 2018, whereas we selected nine of the standardized items that were available for the other settings. However, the presence of the single standardized item in home health did help inform a potential scale for the other

items because we could observe the distribution of the scores for the standardized item with the HHA-specific items.

Creating the cross-walked motor score also required consideration of the rating scales used to code the home health items. The standardized items are all coded using a six-level rating scale based on the type and amount of assistance required to complete the activity. In contrast, the HHA-specific items are coded on rating scales that range from four levels to six levels and consider the presence of other aspects of function in addition to assistance needed. Absent the ability to observe the same level of specificity across all settings in 2017 and 2018, we created a motor function score that was generally equivalent across the four types of PAC providers.

For the IRF, SNF, and LTCH data, we selected each of the standardized assessment data elements presented in ***Table 2-2*** and rescaled each data element to create a four-level rating scale (0 to 3), as indicated in ***Table 2-5***. Recoding was based on the available HHA data from the HHA-specific items.

We then created an admission motor function score for each IRF, SNF, and LTCH patient by summing the recoded scores. The minimum value for each item is 0, and the maximum value is 3. Therefore, with nine items, the minimum motor function score is 0, and the maximum score is 27.

In 2019 and beyond, when all nine items were available across all four PAC settings, we also calculated the score using the items on their original six-point scale. The minimum value for each item is 1, and the maximum value is 6. Therefore, with nine items, the minimum summed standardized motor function score is 9, and the maximum summed score is 54. In future years, additional items may be added to the score as they are introduced and/or become available across all the assessments.

Table 2-5. Rescaling Standardized Data Elements Used in the Admission Motor Function Score Calculation

Original Code and Recoded "Activity Not Attempted" Code	Rescaled To
06–Independent	3–Independent
05–Setup or cleanup	2–Setup
04–Supervision or touching assistance	1–Some assistance
03–Partial assistance	1–Some assistance
02–Substantial assistance	1–Some assistance
01–Dependent	0–Dependent

Note: Higher score indicates greater performance/independence.

For the HHA stays in 2017 and 2018, we selected each of the OASIS data elements presented in ***Table 2-4***. The rating scale for the home health data elements varies by item, so we created rescaling rules for each set of items. We rescaled the OASIS-specific data to create a four-level rating scale, as described in ***Tables 2-6 and 2-7***. This four-level rating scale aligns with the four-level rating scale we created for the IRF, SNF, and LTCH function data.

Table 2-6. Rescaling for M1810, Ability to Dress Upper Body, and M1820, Ability to Dress Lower Body

Original Code	Rescaled To
0–Able to obtain clothing and dress without assistance	3–Independent
1–Dresses after clothing setup	2–Setup
2–Helper assistance	1–Some assistance
3–Dependent	0–Dependent
Missing or dash	3–Independent

Note: Higher score indicates greater performance/independence.

Table 2-7. Rescaling for M1850, Transferring

Original Code	Rescaled To
0–Independent	3–Independent
1–Minimal assistance or device	2–Setup
2–Bears weight/pivots helper assistance for transfer	1–Some assistance
3–Helper assistance; unable to bear weight/pivot	0–Dependent
4–Bedfast; able to turn/position in bed	0–Dependent
5–Bedfast; unable to turn/position in bed	0–Dependent
Missing or dash	3–Independent

Note: Higher score indicates greater performance/independence.

Because data for fewer home health items were available, we weighted the data for some of the OASIS-specific items to create a motor function score that is generally equivalent to the score constructed using the standardized items. ***Table 2-8*** presents the list of the home health items and the standardized items that we considered approximately equivalent. These mappings were used to determine the item weights shown in ***Table 2-9***. For each home health patient, we used the recoded score for each item and multiplied it by the weight listed, then summed that product to create a score that ranges from 0 to 27.

Table 2-8. Identification of Generally Equivalent OASIS and Standardized Assessment Data Elements

HHA OASIS Data Element and Description	Standardized Data Element and Description
GG0170C: Lying to sitting on side of bed	GG0170B: Sit to lying
GG0170C: Lying to sitting on side of bed	GG0170C: Lying to sitting on side of bed
M1810: Ability to dress upper body	GG0130A: Eating
M1810: Ability to dress upper body	GG0130B: Oral hygiene
M1820: Ability to dress lower body	GG0130C: Toileting hygiene
M1850: Transferring	GG0170D: Sit to stand
M1850: Transferring	GG0170E: Chair/bed-to-chair transfer
M1850: Transferring	GG0170F: Toilet transfer

HHA OASIS Data Element and Description	Standardized Data Element and Description
M1850: Transferring	GG0170J: Walk 50 feet

Table 2-9. OASIS Item Weights for Calculation of the HHA Admission Motor Function Score

Data Element and Description	Weight	Individual Data Element Value Range	Weighted Minimum Value	Weighted Maximum Value
M1810: Ability to dress upper body	2	0–3	0	(3 * 2) = 6
M1820: Ability to dress lower body	1	0–3	0	(3 * 1) = 3
GG0170C: Lying to sitting on side of bed	2	0–3	0	(3 * 2) = 6
M1850: Transferring	4	0–3	0	(3 * 4) = 12
TOTAL			0	27

Notes: Higher score indicates greater performance/independence. Weighted minimum value = data element min * weight. Weighted maximum value = data element max * weight.

Cognitive and Communication Function

Cognitive and communication function are measured in several different ways across the four PAC assessment types for the years under study. For example, the IRF-PAI and the SNF MDS contain the Brief Interview of Mental Status at admission in all three data years of interest, but these items are not included in the HHA OASIS or LTCH LCDS. However, data for two aspects of communication—Expression and Comprehension—are collected across all four assessment types in 2017 and 2018, and three out of four settings in 2019 and beyond. These items are presented in ***Tables 2-10 to 2-15*** and vary in structure. Using data for these items, we created a composite score by mapping the Expression and Comprehension items to a three-point scale and then summing scores for the two items. The final composite score ranges from 0 to 4 points with higher scores indicating more ability. Ultimately, an indicator for any Cognitive or Communication impairment, defined as a score of less than 4 on this measure, was included in the comorbidity adjustment.

Table 2-10. Rescaling of the Expression Variable from SNF MDS Item B0700, Expression of Ideas and Wants

Original Code	Rescaled To
0–Understood	2–Expresses without difficulty/understood
1–Usually understood	1–Some to frequent difficulty or sometimes/usually understood

Original Code	Rescaled To
2–Sometimes understood	1–Some to frequent difficulty or sometimes/usually understood
3–Rarely/never understood	0–Rarely/never expresses self or understood
Missing or dash	2–Expresses without difficulty/understood

Note: Higher score indicates greater performance/independence.

Table 2-11. Rescaling of the Expression Variable from IRF-PAI and LCDS Item BB0700, Expression of Ideas and Wants

Original Code	Rescaled To
4–Expresses complex messages without difficulty	2–Expresses without difficulty/understood
3–Exhibits some difficulty with expression	1–Some to frequent difficulty or sometimes/usually understood
2–Frequently exhibits difficulty with expression	1–Some to frequent difficulty or sometimes/usually understood
1–Rarely/never expresses self	0–Rarely/never expresses self or understood
Missing or dash	2–Expresses without difficulty/understood

Note: Higher score indicates greater performance/independence.

Table 2-12. Rescaling of the Expression Variable from HHA OASIS Item M1230, Speech and Oral Expression of Language and Wants

Original Code	Rescaled To
0–Expresses complex messages easily in all situations	2–Expresses without difficulty/understood
1–Minimal difficulty with expression	1–Some to frequent difficulty or sometimes/usually understood
2–Expresses simple ideas or needs	1–Some to frequent difficulty or sometimes/usually understood
3–Severe difficulty expressing basic ideas and wants	0–Rarely/never expresses self or understood
4–Unable to express basic needs, but not comatose or unresponsive	0–Rarely/never expresses self or understood
5–Patient is nonresponsive or comatose	0–Rarely/never expresses self or understood
Missing or dash	2–Expresses without difficulty/understood

Note: Higher score indicates greater performance/independence.

Table 2-13. Rescaling of the Comprehension Variable from SNF MDS Item B0800, Ability to Understand Others

Original Code	Rescaled To
0–Understands	2–Understands without difficulty

Original Code	Rescaled To
1–Usually understands	1–Usually or sometimes understands
2–Sometimes understands	1–Usually or sometimes understands
3–Rarely/never understands	0–Rarely/never understands
Missing or dash	2–Understands without difficulty

Note: Higher score indicates greater performance/independence.

Table 2-14. Rescaling of the Comprehension Variable from IRF-PAI and LTCH LCDS Item BB0800, Understanding Verbal and Nonverbal Content

Original Code	Rescaled To
4–Understands	2–Understands without difficulty
3–Usually understands	1–Usually or sometimes understands
2–Sometimes understands	1–Usually or sometimes understands
1–Rarely/never understands	0–Rarely/never understands
Missing or dash	2–Understands without difficulty

Note: Higher score indicates greater performance/independence.

Table 2-15. Rescaling of the Comprehension Variable from HHA OASIS Item M1220, Understanding of Verbal Content

Original Code	Rescaled To
0–Understands	2–Understands without difficulty
1–Usually understands	1–Usually or sometimes understands
2–Sometimes understands	1–Usually or sometimes understands
3–Rarely/never understands	0–Rarely/never understands
UK–Unable to assess understanding	0–Rarely/never understands
Missing or dash	2–Understands without difficulty

Note: Higher score indicates greater performance/independence.

Bowel and Bladder Incontinence

Bladder and bowel incontinence are measured using similar items on the IRF-PAI, MDS, and LCDS. Items are included on each of these assessments indicating the frequency of bladder and bowel incontinence. In contrast, the OASIS simply includes an indicator of any bladder or bowel incontinence. It also includes an item indicating whether the patient requires a urinary catheter. To create a common variable to measure incontinence across all four assessment types, we created variables indicating (1) the presence of either bladder or bowel incontinence, but not both, and (2) the presence of both bladder and bowel incontinence noted on the assessment. These mutually exclusive variables were structured in this manner to facilitate inclusion in the comorbidity group adjustment.

Prior Acute Care and PAC

Although most PAC stays follow discharge from an inpatient hospitalization, some utilization begins without a prior acute stay. These "community entrants" are especially common in HHA but also occur in other PAC settings (Wissoker & Garrett, 2018). In addition, patients requiring PAC often use multiple sites of care during their treatment (Wissoker & Garrett, 2018). To estimate the importance of these factors, we created two additional variables. The first variable indicates the presence of an acute inpatient discharge within 90 days of the beginning of the PAC stay, because a patient discharged from an acute care hospital may have more-significant needs than a community entrant. We chose 90 days for illustrative purposes and because this would enable multiple PAC stays in a trajectory of care to be associated with the prior acute stay, if applicable. For example, if a patient begins in a SNF and, 21 days later, is discharged home to receive care from an HHA, both the SNF stay and the HHA episode would be associated with the prior acute hospitalization. Although a course of PAC may last longer than 90 days, the needs of a patient with a more-extended course of treatment may be less related to the initial hospitalization at that point. The second variable we created indicates whether the PAC stay is occurring within 30 days of the end of another PAC stay, because subsequent PAC stays would indicate a patient is further along a recovery trajectory and may have less-significant or different needs.

Identifying the UPCGs

An important consideration in developing the Unified PAC PPS payment groups is that patients are admitted to PAC with varying medical conditions and goals of care. A patient's needs and course of treatment can vary considerably based on these factors.

UPCG

An important consideration in developing the Unified PAC PPS payment groups is that patients are admitted to PAC with varying medical conditions and goals of care. A patient's needs and course of treatment can vary considerably based on these factors. For example, some patients require medication management education after a new diagnosis of a chronic condition, other patients have goals of restoring function and need varying intensity of rehabilitation services, and other patients require intensive medical care and monitoring for medically complex conditions, such as ventilator weaning. Medically complex PAC tends to be provided in LTCHs, whereas intensive rehabilitation is primarily provided in IRFs (and some SNFs) and medication management education is generally provided by HHAs. However, similar patients can sometimes be treated in different types of PAC settings. A Unified PAC PPS must therefore aim to account for the clinical complexity of patient populations typically treated in each of the PAC settings while also capturing the clinical similarity of patients who could conceivably be cared for by multiple types of settings.

In this section, we describe the process of identifying UPCGs and assigning PAC stays to them. These UPCGs represent the broadest unit of classification in the prototype Unified PAC PPS (see ***Figure 2-1***). They are presented in ***Table 2-16.*** The UPCGs can be conceptualized in three general categories: (1) Rehabilitation and Therapy-Focused (Rehabilitation), (2) Medical and Diagnosis-Focused (Medical), and (3) MMTA. The selection of UPCGs within these groups for inclusion in the prototype was based on several factors, including (1) patients' needs and goals of care, (2) body systems and PAC primary diagnoses of importance, (3) prior acute procedures that are likely drivers of PAC use, (4) alignment with clinical concepts in existing

PAC payment systems, and (5) availability of existing data. We also included additional UPCGs based on feedback from several Technical Expert Panel members (e.g., Cancer, Transplants).

Each PAC stay was assigned to its UPCG in a stepwise process that draws upon multiple sources of existing information. These sources include the following:

- MMTA groups, identified for HHA PAC stays only using the publicly available Home Health PPS Grouper Software.
- Beneficiaries who are dependent on an invasive ventilator or who are comatose at the time of admission to the PAC setting, as reported on the PAC assessment instrument.
- PAC stays following an acute inpatient admission for certain key procedures that are likely to be the reason the beneficiary is receiving PAC, determined using the MS-DRG listed on the claim for the prior acute hospital stay.
- Primary diagnosis, as reported on the claim for the PAC stay.
- The clinical grouping to which the PAC stay was assigned under the existing PAC payment system.

At each step, corresponding PAC stays are assigned to their respective UPCGs, and only remaining unassigned cases are assigned by subsequent steps. The sequence of the steps was selected as shown to prioritize certain key factors (e.g., invasive ventilator dependence) that are most likely to be the primary reason for PAC and the key driver of costs of care. It is important to note, however, that any future testing or implementation of the proposed prototype framework should assign PAC patients to the appropriate UPCG on the basis of one or more new data elements added to the PAC assessment instruments. We discuss this limitation and present an example of a draft set of data elements in *Part 4, Considerations for Implementation.*

Table 2-16. UPCGs for the Prototype

Category	UPCG
MMTA[1]	MMTA: Cardiac
	MMTA: Endocrine
	MMTA: Gastrointestinal/Genitourinary
	MMTA: Infections
	MMTA: Respiratory
	MMTA: Surgical Aftercare
	MMTA: Other
Rehabilitation and Function Related	Lower Extremity Fracture (Including with Joint Replacement)
	Major Joint Replacement Without Lower Extremity Fracture
	Orthopedic Surgery (Not Joint Replacement)
	Trauma
	Limb Loss
	Orthopedic (Other)
	Stroke
	Nontraumatic Brain Dysfunction

Category	UPCG
	Spinal Dysfunction
	Traumatic Brain Injury
	Neurological (Other)
	Respiratory
	Cardiovascular
Medical and Diagnosis-Related	Behavioral Health[1]
	Comatose
	Invasive Ventilator
	Gastrointestinal & Hepatobiliary
	Infections
	Kidney & Urinary
	Skin
	Cancer
	Transplant
	Hematological
	Other
	COVID-19[2]

Notes:
1. Only applies to HHA cases.
2. Only applies to claims from 2020 and beyond.

Step 1–Identify Condition-Specific Medication Management, Teaching, and Assessment and Behavioral Health (HHA Only)

A subset of the clinical groupings included in the Home Health PDGM focuses on a PAC service largely unique to HHAs: MMTA. Patients receiving this level of care primarily require medical instruction in the use of their medications, teaching, and assessment rather than institutional care with 24-hour nursing services. In addition, beneficiaries requiring Behavioral Health care (as defined in the PDGM) are primarily treated by HHAs. Because these services are generally not the primary reason for care in other PAC settings, HHA patients receiving these services were assigned to UPCGs corresponding to those services. Using the publicly available Home Health PPS Grouper Software, PAC stays from HHAs were assigned to home health clinical groups by the primary diagnosis listed on the claim (CMS, 2021a). For the purposes of the prototype, PAC stays from other PAC provider types were not mapped to these UPCGs.

Step 2–Invasive Ventilator Use and/or Comatose

For patients who are admitted to a PAC setting on an invasive ventilator (including those who will undergo ventilator weaning) and patients who are comatose or in a persistent vegetative state, these conditions are typically the primary driver of treatment and of costs of care. Treatment for such patients can be lengthy and costly, and they are usually (but not always) treated in the LTCH setting. As a result, any PAC stays where invasive ventilator use or coma are indicated on the admission assessment are mapped to these UPCGs accordingly.

The MDS and LCDS include a standardized data element indicating the patient is using an invasive ventilator at the time of admission; however, the data element does not indicate the length of time the patient required the ventilator. For the IRF and HHA setting, we used the International Classification of Diseases, 10th revision, Procedure Coding System (ICD-10-PCS) codes reported on the claim to identify patients on a ventilator. As discussed in *Part 4, Considerations for Implementation*, provide more-detailed information about use of an invasive ventilator could be collected on all PAC admission assessments to identify patients who require extended use of an invasive ventilator.

Step 3–Prior Acute Procedures

Certain PAC stays are driven primarily by the nature of the prior acute stay. These PAC stays are therefore identified using the MS-DRG code listed on the prior acute claims (CMS, 2021b). They are (1) lower extremity fracture (including with major joint replacement), (2) major joint replacement (without lower extremity fracture), (3) orthopedic surgery (other than major joint replacement), (4) limb loss, (5) nontraumatic brain dysfunction, and (6) trauma. ***Table 2-17*** presents the MS-DRGs with assignment to these UPCGs. The primary diagnosis on the prior acute claim was also mapped to corresponding Clinical Classification Software Refined (CCSR) to differentiate the presence of lower extremity fractures on claims for major joint replacement.

Table 2-17. UPCG Assignment Rules for Prior Acute Procedures

UPCG	Prior Acute MS-DRG	Prior Acute Diagnosis CCSR
LE Fracture (Including with Joint Replacement)	461, 462, 466, 467, 468, 469, 470, 533, 534, 535, 536	Primary Diagnosis CCSR of LE Fracture
Major Joint Replacement Without LE Fracture	461, 462, 466, 467, 468, 469, 470	No Primary Diagnosis of LE Fracture
Orthopedic Surgery (Not Joint Replacement)	480, 481, 482, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 509, 510, 511, 512, 513, 483, 484, 507, 508	
Limb Loss	239, 240, 241, 616, 617, 618, 474, 475, 476, 255, 256, 257	
Nontraumatic Brain Dysfunction	023, 024, 025, 026, 027, 054, 055, 075, 076, 077, 078, 079	
Trauma	956, 957, 958, 959, 963, 964, 965, 183, 184, 185, 913, 914	

Note: LE = lower extremity.
Sources: CMS (2021b), RTI International

Step 4–PAC Claim Primary Diagnosis Grouping

Patients not yet assigned to a UPCG by this step were sorted into clinically meaningful groups using the Agency for Health Care Research and Quality's (AHRQ) CCSR (Healthcare Cost and Utilization Project, 2021) for the ICD-10 Clinical Modification (ICD-10-CM). CCSR for ICD-10-CM aggregates more than 70,000 ICD-10-CM diagnosis codes into 542 clinically meaningful

categories across 21 body systems, which generally follow the structure of the ICD-10-CM chapters.

The list of CCSRs (CCSR v2021.1) was obtained from the AHRQ Website. Each of the 542 CCSR Categories were mapped to one of the UPCGs listed in ***Table 2-16***. The complete list of CCSR to UPCG mappings is presented in ***Appendix D.*** Because individual ICD-10-CM diagnosis codes sometimes document (1) multiple conditions or (2) a condition and a common symptom or manifestation, the CCSR software sometimes assigns a single diagnosis code to multiple CCSRs. We therefore reviewed each of the CCSRs generated by the primary diagnosis on the PAC claim in sequence until identifying one that maps to one of the UPCGs. Mapping was informed by the following factors: (1) body system, (2) relevance to PAC, and (3) consideration of the code in the context of a primary diagnosis.

Body System

Each of the CCSRs are associated with an ICD-10-CM Diagnosis Chapter. Many of these chapters are associated with body systems that align with the UPCGs and were therefore mapped accordingly. However, within each body system classification, the codes were also reviewed for additional specificity that could indicate a more-appropriate mapping for PAC. For example, although most of the “Diseases of the circulatory system” aligned with the ”Cardiovascular” UPCG, *CIR20–CIR25,* which refers to stroke diagnoses (see ***Appendix D***), was assigned to the “Stroke” UPCG.

Relevance to PAC

The CCSRs cover the entire range of diagnoses captured in ICD-10-CM, many of which have limited relevance to PAC. As a result, several CCSRs were mapped to the category “Other.” The overarching goal of the UPCG assignment was to minimize the number of PAC stays that were ultimately classified as “Other,” and these CCSRs primarily represented conditions that were expected to be of very low frequency in the PAC setting, such as those related to pregnancy, childbirth, and the puerperium. In addition, the “Factors Influencing Health Status and Contact with Health Services” and “External Causes of Morbidity” codes were all also grouped into the “Other” UPCG because of the nonspecific nature of the categories.

PAC Primary Diagnosis

Another consideration when conducting the CCSR to UPCG mapping was the likelihood that a given condition would be a primary diagnosis (as opposed to a comorbidity) that would suggest a reason for needing PAC services. For example, although there may be many beneficiaries with a diabetes-related diagnosis, diabetes is not likely to be the primary reason a patient would require institutional PAC. Although diabetes may be a primary reason a patient receives home health for *MMTA*, this would be captured in Step 1. Therefore, the classification of a common, though not likely, primary diagnosis for institutional PAC into the “*Other*” UPCG was also not considered a concern when mapping diagnoses to UPCGs.

Step 5–Existing PAC Assessment Groupings

In each of the existing PAC payment systems, a primary medical condition is a key factor in the case-mix classification system. Each also has its own approach to defining the condition, but the underlying intent is the same across settings. As a final step to augment our assignment mechanism, we reviewed the rehabilitation impairment category (RIC) assignment for IRF

beneficiaries who remained unassigned and mapped each RIC to its corresponding UPCG category. We also used the grouper software from the newly introduced SNF and HHA payment systems to map PAC stays to the corresponding clinical groupings from each setting. These groupings then informed the assignment of any remaining unmapped PAC stays. The mappings of UPCGs to each of the setting-specific PPS clinical groupings are presented in ***Tables 2-18*** to ***2-20***. After Step 5, any remaining patients were assigned to the "Other" UPCG.

Table 2-18. IRF RIC to UPCG Mappings

RIC	UPCG
Stroke	Stroke
Traumatic Brain Injury	Traumatic Brain Injury
Nontraumatic Brain Injury	Nontraumatic Brain Dysfunction
Traumatic Spinal Cord Injury	Trauma
Nontraumatic Spinal Cord Injury	Neurological (Other)
Neurological	Neurological (Other)
Fracture of Lower Extremity	Lower Extremity Fracture (Including with Joint Replacement)
Replacement of Lower Extremity Joint	Major Joint Replacement Without Lower Extremity Fracture
Other Orthopedic	Orthopedic (Other)
Amputation, Lower Extremity	Limb Loss
Amputation, Other	Limb Loss
Osteoarthritis	Orthopedic (Other)
Rheumatoid, Other Arthritis	Orthopedic (Other)
Cardiac	Cardiovascular
Pulmonary	Respiratory
Pain Syndrome	Other
Major Multiple Trauma, No Brain Injury or Spinal Cord	Trauma
Major Multiple Trauma, with Brain or Spinal Cord Injury	Trauma
Guillain Barre	Neurological (Other)

Table 2-19. SNF PDPM Clinical Group to UPCG Mappings

PDPM Group	UPCG
Acute Infections	Infections
Acute Neurologic	Neurological (Other)
Cancer	Cancer
Cardiovascular and Coagulations	Cardiovascular

PDPM Group	UPCG
Major Joint Replacement or Spinal Surgery	Major Joint Replacement without Lower Extremity Fracture
Medical Management	Other
Non-orthopedic Surgery	Other
Non-surgical Orthopedic/Musculoskeletal	Orthopedic (Other)
Orthopedic Surgery (Except Major Joint Replacement or Spinal Surgery)	Orthopedic Surgery (Not Joint Replacement)
Pulmonary	Respiratory

Table 2-20. Home Health PDGM Clinical Group to UPCG Mappings

PDGM Group	UPCG
Neuro Rehabilitation	Neurological (Other)
Wound	Skin
Complex Nursing Interventions	Other
Musculoskeletal Rehabilitation	Orthopedic (Other)

Step 6 (2020 Data Only)–COVID-19

For CY 2020 only, PAC claims with a primary diagnosis indicating COVID-19 infection (primary diagnosis ICD-10-CM codes U07.1 or B97.29) were assigned to a separate "COVID-19" UPCG. Unlike in other steps, this assignment overrode any prior groupings because a primary diagnosis of COVID-19 was considered the likely reason for PAC for the year 2020. A secondary diagnosis of COVID-19 was incorporated into the comorbidity adjustment.

P-CMG

As with existing PAC payment systems, the UPCGs represent broad clinical classifications. A wide array of patient needs and resulting costs of care exist within each of these groupings. As a result, each of the PAC payment systems incorporates additional case-mix adjustment to further subdivide patients into clinically meaningful groups for payment purposes. In this section, we describe our approach to generating the P-CMGs within each of the UPCGs using motor function data (see *Key Variables–Case-Mix Adjustment)* and diagnosis information.

P-CMGs were modeled using a two-stage approach that adjusts for beneficiary demographic and clinical characteristics that were available across all PAC setting types. In the first stage, we used a regression-based approach to estimate the relative costliness of each PAC provider type within UPCG. These models controlled for beneficiary age, the unified motor function score, bowel and bladder incontinence, and the unified cognitive and expression function score. We also adjusted for the presence of an acute claim in the 90 days before the PAC stay as well as a PAC claim in the 30 days before the PAC stay. Then, in Stage 2, we used Classification and Regression Tree (CART) analysis with a dependent variable of "setting-adjusted" cost to

generate P-CMGs for each UPCG that could be applied across all applicable PAC provider types.

The CART analyses yielded several important findings. First, costs of care were primarily driven by the motor function score in our models. We found that splits made based on the motor function scale were reasonably consistent across years for a given UPCG and were also largely robust to changes in the specification of the motor function score. We found that for Rehabilitation UPCGs, where therapy would be a key driver of the total cost of care, models tended to result in three distinct P-CMGs. In contrast, Medical UPCGs tended to have no more than one split, with motor function explaining little of the variation in costs of care.

These results were synthesized across years to create a single set of P-CMG assignment rules for each UPCG that could be applied across all years. For Rehabilitation UPCGs, PAC stays were split into three P-CMGs that can be conceptualized as high, medium, and low levels of motor function score or costs. MMTA UPCGs were split into two P-CMGs based on motor function. The exact motor function scores associated with each P-CMG varied by UPCG. For most of the Medical UPCGs, sample size and data limitations precluded subdividing the sample into multiple P-CMGs. However, we were able to subdivide the UPCGs for Infections, Cancer, and Transplants using the primary diagnosis on the PAC claims and the MS-DRG from the prior acute claim (where applicable).

Trim Outliers and Special Populations

We began by identifying and removing statistical outliers and special populations likely to have separate payment rules in the prototype from our sample. First, we identified short stays and decedents (see *Data Sources and Sample Selection*) and beneficiaries who were discharged to another institutional PAC setting with a length of stay below the 25th percentile by UPCG and PAC provider type (short transfers). After trimming these cases from the data, we calculated the natural log of the total cost for each remaining stay and the mean and standard deviation of log cost for each combination of UPCG and PAC provider type. Any stays where log cost was more than three standard deviations from the mean within its respective group were excluded from the case-mix analyses described in this section.

Model Setting-Specific Effects

The first stage of modeling the P-CMGs involved estimating the relative costliness of each PAC provider type. We used a generalized linear model with a log link function and gamma distribution to estimate the setting-specific effect on claim cost within each UPCG. Models were estimated separately for each UPCG and controlled for each of the demographic and assessment case-mix adjustment variables described in *Key Variables–Case-Mix Adjustment*. The exponentiated setting coefficient from each model can be interpreted as the multiplicative effect of receiving PAC in one setting type compared with a reference category (in this case, IRF), holding the case-mix adjustment variables constant. We then divided total cost for the PAC stay by the corresponding setting effect estimated for the UPCG to which the PAC stay was assigned to create setting-adjusted claim cost. This cost is intended to represent what costs of care would be for patients had they all been treated in the same PAC setting, or what costs are independent of the setting in which the patient is treated. This served as the dependent variable in Stage 2, described in the next section.

Model P-CMGs Using CART

In the second stage, we used CART analysis to assign PAC stays to P-CMGs within each UPCG. CART is a nonparametric machine learning technique that can be used to generate decision trees and sort observations into discrete groupings called nodes. It has been used on multiple occasions to develop case-mix adjustment frameworks for Medicare-covered PAC payment (Acumen, 2018; Morley et al., 2019; Wissoker & Garrett, 2018). The aim of this approach is to identify groups of patients who have clinically similar characteristics and comparable costs of care across settings. This approach balances the goals of a complex system that recognizes the wide array of patients who receive PAC and a manageable, efficient payment mechanism that is not overly burdensome.

Separate CART models were run by year for each UPCG using a dependent variable of setting-adjusted claim cost. Separate models were also run for each year. The initial models were limited to a minimum node size of 1,000 PAC stays. A complexity parameter of 0.001 was also imposed on the model, meaning that a split would only be made if it improved overall model error of the final tree by at least 0.001. We selected these parameters to construct a P-CMG framework where individual groups were specific enough to effectively differentiate patients while still large enough to generate statistically meaningful estimates of costliness for payment purposes.

We tested alternative approaches to constructing the motor function measure, including (1) recoding all items missing a response or coded “Activity Not Attempted” to a score of 1 (dependent) except for *Toileting Transfer* (recoded to 2), and (2) constructing the motor score using full standardized items across all four PAC settings. The standardized items are only available across all four settings from 2019 and beyond, but constructing the score in this manner better represents how the score could be incorporated into future testing or implementation of a Unified PAC PPS. This version of the motor function score ranges from a minimum of 9 to a maximum of 54. Finally, we tested different combinations of the case-mix adjustment variables as potential splitters to see how their exclusion would affect the model results.

The resulting trees were then “pruned” in three phases. First, each tree was limited to splits where the cross-validated error was within one standard error of the minimum error (known as the 1-SE rule) (Breiman, 1984). This rule is designed to remove splits where the improvement in model fit is small and less useful. Second, each split was evaluated for clinical and fiscal appropriateness. Specifically, we examined whether, for a given split, the average costs for the resulting nodes follow a logical pattern (i.e., do patients with greater functional limitations have higher predicted cost). Finally, we examined whether the strongest predictors in each UPCG were those one would clinically expect, and whether there is a large enough difference in average cost between nodes to justify the split.

The CART analyses yielded several important findings. First, costs of care were primarily driven by the motor function score in our models. We found that splits made based on the motor function scale were reasonably consistent across years for a given UPCG and were also largely robust to changes in the specification of the motor function score. In contrast, the remaining covariates differentiated PAC stays infrequently across UPCGs and were inconsistent across years. This was true even for variables such as bladder and bowel incontinence and the cognitive and expression function score, which we would expect to have more of an impact

across UPCGs. Cognitive function, in particular, was identified by Technical Expert Panel members as being a more-important factor than was reflected in the CART results. We therefore elected to base the P-CMGs solely on the motor function scale and to incorporate bladder and bowel incontinence and the cognitive and expression function score into a subsequent phase of the prototype's case-mix adjustment focused on comorbidities. Results from each of these models and years tested for are presented in ***Appendix E.***

Final P-CMG Assignment

Review of the motor-function-only CART models identified several key patterns in both the number of splits and their cut points across UPCGs. We found that for *Rehabilitation* UPCGs, where therapy would be expected to be a key driver of the total cost of care, models tended to result in three distinct P-CMGs. Deviation from this trend was largely observed in UPCGs with smaller sample sizes. In contrast, *Medical* UPCGs tended to have no more than one split, with motor function explaining little of the variation in costs of care. We therefore divided our UPCGs into three general categories for P-CMG assignment: (1) rehabilitation/therapy-focused (Rehabilitation), (2) medical condition-focused (Medical), and (3) MMTA.

For Rehabilitation UPCGs, PAC stays were split into three P-CMGs that can be conceptualized as high, medium, and low levels of motor function score or costs. The scores on the motor function scale separating the P-CMGs varied by UPCG and were based on the results of the CART analysis. These results were evaluated and synthesized into a single set of grouping rules that could be applied across all data years. MMTA UPCGs were split into two P-CMGs based on motor function, also with cut points varying based on CART analyses.

For most of the Medical UPCGs, sample size and data limitations precluded subdividing the sample into multiple P-CMGs. However, we were able to subdivide the UPCGs for Infections, Cancer, and Transplants using the primary diagnosis on the PAC claims and the MS-DRG from the prior acute claim (where applicable).

We constructed two sets of P-CMGs, one based on the function score ranging from 0 to 27 across all years, and a second based on the function score ranging from 9 to 54. The second set was available only in 2019 and 2020 but reflective of what a future Unified PAC PPS could include.

Upon finalizing the P-CMG assignment rules for each UPCG, PAC stays were assigned to the appropriate group for each year. Special populations—short stays, decedents, and cost outliers (as previously described)—were assigned separate P-CMGs within each UPCG. We then calculated the average cost of PAC stays for each combination of UPCG, P-CMG, and PAC provider type to evaluate the reasonableness of cost estimates relative to clinical and policy expectations. This resulted in 141 distinct P-CMGs (including three in the COVID-19 UPCG), including short stays and decedents but excluding cost outliers. The final list of P-CMG assignment rules using the motor function score ranging from 0 to 27 is shown in ***Table 2-24*** later in this section, and the assignment rules using the motor function score ranging from 9 to 54 can be found in ***Appendix F***.

Comorbidity Groups

Beyond the P-CMGs, important underlying differences in beneficiary health status could affect total costs of care. These comorbidities have traditionally been accounted for in the existing PAC payment systems to ensure providers are paid in a way that accurately reflects the clinical complexity of their patients and that patients are able to access needed care.

The prototype Unified PAC PPS includes an adjustment for **comorbidity groups,** which are based on secondary diagnoses recorded on the PAC claim. A set of 148 distinct comorbidity indicators was adapted from the AHRQ CCSR. Additional comorbidities were included to identify the presence of bladder and bowel incontinence and cognitive impairment recorded on the PAC assessment instrument as well as a secondary diagnosis of Aphasia. The complete list of included comorbidities can be found in ***Appendix A***.

Each comorbidity is assigned a value ranging from 0 to 3 based on its relative costliness within each UPCG. The values associated with each of the secondary diagnoses reported on the PAC claim are then summed to calculate the Unified PAC Comorbidity Index (UPCI). The UPCI can therefore be conceptualized as reflecting both the number of comorbidities and their costliness.

Consider two patients in the "Lower Extremity Fracture (Including with Joint Replacement)" UPCG. We illustrate the calculation of the UPCI for these patients in ***Table 2-21.*** For simplicity, both are assigned to P-CMG number 1 within that UPCG, the group with the lowest abilities in motor function.

The first patient has the comorbidities "Diabetes Mellitus with Complication" (Value = 2) and "Chronic Kidney Disease" (Value = 1). This patient's comorbidities would sum to a UPCI of 3. The second patient has a UPCI of 15 based on the following comorbidities: "Anemia" (Value = 2), "Complications" (Value = 2), "Parkinson's" (Value = 2), "Skin and Subcutaneous Tissue Infection" (Value = 3), "Cognitive Impairment" (Value = 3), and "Both Bladder and Bowel Incontinence" (Value = 3).

Table 2-21. Calculation of the UPCI for Two Hypothetical Patients

Secondary Diagnosis Position on Claim	Patient 1		Patient 2	
	Comorbidity	Value	Comorbidity	Value
Secondary Diagnosis 1	Diabetes Mellitus with Complications	2	Anemia	2
Secondary Diagnosis 2	Chronic Kidney Disease	1	Complications	2
Secondary Diagnosis 3			Parkinson's	2
Secondary Diagnosis 4			Skin and Subcutaneous Tissue Infection	3
Secondary Diagnosis 5			Cognitive Impairment	3
Secondary Diagnosis 6			Both Bowel and Bladder Incontinence	3
Final UPCI	3		15	

The UPCI is then used to sort PAC stays into comorbidity groups, with each group designed to cover approximately 20% of PAC stays in each UPCG. That is, within each UPCG, the values of UPCI assigned to each comorbidity group are selected so that approximately 20% of the PAC stays assigned to that UPCG each year will be assigned to each of the five comorbidity groups. This process is presented in ***Figure 2-2*** below.

Selecting Comorbidities

We aimed to construct comorbidity groups for payment according to relative impact on total cost. We used an ordinary least squares regression with a dependent variable of total cost of the PAC stay and without a constant to estimate the effect of each comorbidity within UPCG. Models were estimated separately for each UPCG and included indicator variables for each of the comorbidities selected for inclusion in the model. We also included intercept terms for each of the P-CMGs within the UPCG. The coefficients for each comorbidity indicator can be interpreted as the additional cost of having that particular comorbidity for patients in a given UPCG independent of the P-CMGs and any other comorbidities the beneficiary may have.

We began with the original set of 542 CCSRs generated by the publicly available software from AHRQ. A comorbidity indicator was set to 1 if a corresponding ICD-10 diagnosis code appears in one of the first 10 secondary diagnosis positions on the PAC claim (excluding the primary diagnosis). Indicators were then recoded to 0 if they also aligned with the UPCG to which the beneficiary was assigned, as this could be interpreted as being directly relevant to the primary diagnosis rather than a separate comorbidity. For example, comorbidity *CIR019* is one of several codes that could be used to assign PAC stays to the “Cardiovascular” UPCG (see ***Appendix D***). This comorbidity would therefore be omitted from the model estimating comorbidity effects for the “Cardiovascular” UPCG (Note: we also recoded this indicator for the “MMTA: Cardiovascular” UPCG).

We then examined the following factors in the results for each UPCG to better understand the importance of each comorbidity indicator in predicting costs:

- Frequency with which a particular comorbidity appears as a secondary diagnosis in each UPCG.
- Magnitude and statistical significance of coefficients.
- Clinical relevance to each UPCG.
- Potential redundancy within a broader condition category.

With these considerations, we implemented several modifications to the CCSR framework for the prototype. Our aim was to only include conditions relevant to PAC and to minimize the degree to which a Unified PAC PPS may inadvertently introduce coding intensity incentives (Kronick & Welch, 2014) or pay twice for the same underlying condition (CMS, 2018). We identified several comorbidities for exclusion from the prototype because they were either vague, infrequently coded on PAC claims, or not directly relevant to costs of care (i.e., had negative or nonsignificant coefficients). We also collapsed several CCSRs into broader clinical constructs. For example, there are 10 distinct CCSRs for various types of head and neck cancers. Most appeared on very few (if any) PAC claims as a secondary diagnosis outside of the “Cancer” UPCG. We therefore combined these CCSRs into a single comorbidity indicator

called “Head and Neck Cancers” and followed a similar process for other types of cancers. The final list of comorbidities can be found in ***Appendix G.***

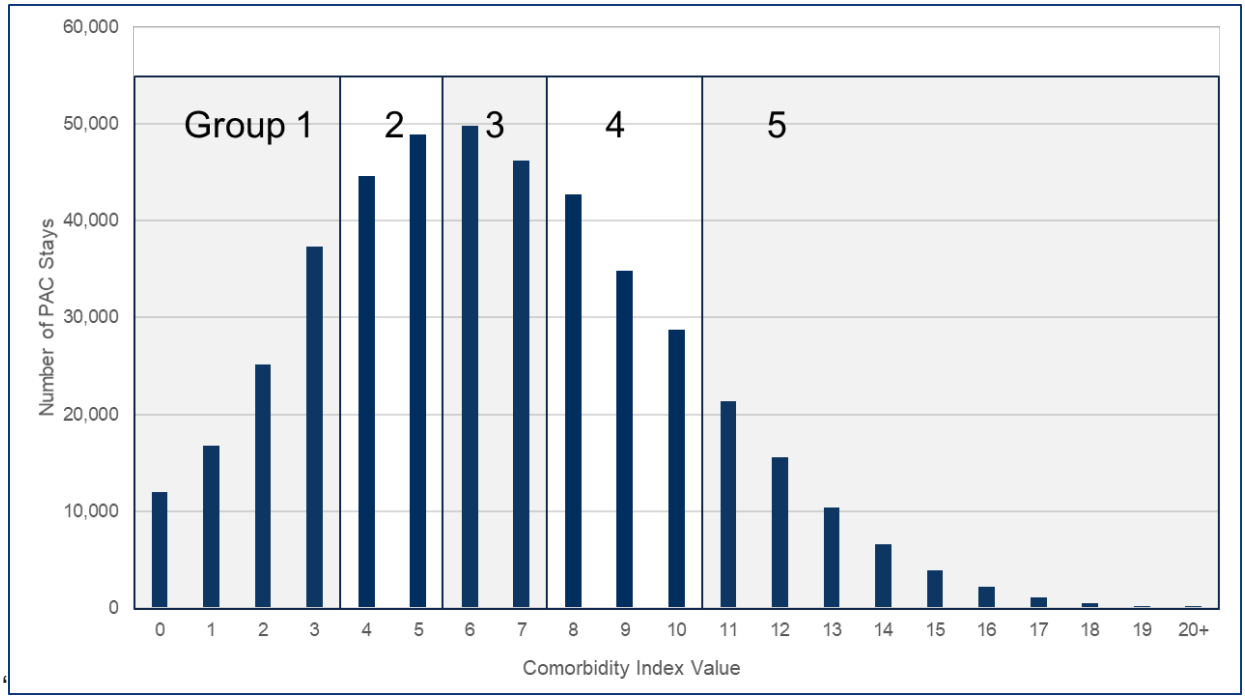
Determining the Tier Value for Each Comorbidity

After identifying the final list of comorbidities, we re-estimated the models described above with the revised groupings. We also included the indicators for bladder and bowel incontinence, a variable indicating the presence of any cognitive and expression impairment (score of less than 4 on the cognitive and expression scale), and a flag for a secondary diagnosis of Aphasia (ICD-10 code R47.01). The coefficients in each UPCG’s updated model were then used to sort each comorbidity into severity tiers intended to represent their relative costliness within that UPCG. Four distinct tiers were identified: (1) no additional cost: zero or negative coefficient, (2) low cost: coefficient less than the median within UPCG, (3) moderate cost: coefficient between the median and 90th percentile within UPCG, and (4) very high cost: coefficient greater than the 90th percentile within UPCG. The relative costliness of these tiers and the comorbidities included in each therefore differed across UPCGs depending on the estimates generated by the corresponding model. We estimated these models separately for CYs 2017 through 2019 and, for each comorbidity, selected the highest-tier assignment across the 3 years to ensure costs of potentially expensive but relatively rare conditions are adequately captured.

The values associated with each secondary diagnosis on the PAC claim were then summed to calculate the UPCI. The UPCI was used to sort PAC stays into comorbidity groups, with each group designed to cover approximately 20% of PAC stays in each UPCG. That is, within each UPCG, the values of UPCI assigned to each comorbidity group are selected so that approximately 20% of the PAC stays assigned to that UPCG each year will be assigned to each of the five comorbidity groups. This process is presented in ***Figure 2-2***.

There are several advantages to structuring comorbidity adjustment in this manner. Most notably, the additive nature of this approach allows for different combinations of comorbidities to be accounted for simultaneously. This contrasts with, for example, the IRF PPS, which assigns the beneficiary to the highest tier associated with any of the comorbidities reported. The approach is similar to how SNF PDPM accounts for comorbidities for nontherapy ancillary costs. However, for the prototype, we have applied this adjustment to total cost of the PAC stay. The structure is also comprehensive, currently covering 148 distinct comorbidities specific to each UPCG, yet is easily updated each year to include new conditions or to capture changes in the relative costliness of caring for different types of patients over time. Furthermore, by including factors such as incontinence and cognitive impairment, we ensure that these important concepts are captured independent of other considerations in case-mix adjustment and estimate their effects separately for each UPCG.

Figure 2-2. UPCI and Comorbidity Group by Number of PAC stays for Stroke–2017 to 2019 Data



Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0030

Estimation of Payment Weights

A Unified PAC payment system should account for the relative costliness of patients based on different clinical and case-mix groupings as well as the differential structural and operating costs of different types of PAC providers. The most straightforward approach to this aim is to base payments on the relative costliness of beneficiaries in each combination of UPCG, P-CMG, comorbidity group, and PAC provider type. However, doing so results in several payment groups having relatively few historical cases on which to base payment weights. This can yield imprecise and unstable estimates year over year. Additionally, distinct payment groups for different PAC settings may not be desirable when attempting to unify PAC payment policy. In other words, it may be beneficial to estimate the relative costliness of PAC settings in a uniform way that is more conducive to policy adjustments (see *Part 4, Considerations for Implementation*).

Determining the Payment Weight

The final payment weight for a PAC stay is calculated by multiplying the base weight by UPCG-specific adjustment factors corresponding to the comorbidity group and PAC setting. An adjustment factor is also applied for providers operating in rural areas, who typically incur higher costs per patient.

In this section, we describe the analyses used to calculate these payment weights and adjustment factors. The prototype Unified PAC PPS begins by estimating a payment weight for each combination of UPCG and P-CMG. These base weights are intended to represent patient clinical characteristics and are calibrated independent of PAC setting type and comorbidity groups. To calculate these

payment weights, we first estimate adjustment factors for comorbidity group, PAC provider type, and providers located in rural areas. We then calculate adjusted cost by dividing the total cost of each PAC stay by its corresponding adjustment factors. This adjusted cost is used to estimate the average relative costliness of each combination of UPCG and P-CMG, which serves as the base payment weight.

The final payment weight for a PAC stay is calculated by multiplying the base weight by UPCG-specific adjustment factors corresponding to the comorbidity group and PAC setting. An adjustment factor is also applied for providers operating in rural areas, who typically incur higher costs per patient. The final payment to a PAC provider would then be calculated by multiplying the final payment weight by a base payment amount, as is typically done for Medicare-covered PAC. Additional adjustments may also be applied for factors such as the cost of labor in each geographic area.

Each of these steps was completed separately for each year and then again using combined data from 2017 to 2019. Results presented in this section were calculated using three combined years of data (2017 to 2019), and year-specific results are presented in ***Appendix H.***

Comorbidity Group, Rural Provider, and PAC Provider Type Adjustment

The first step in calculating payment weights was to estimate the relative costliness of the different comorbidity groups and PAC settings. We also estimated the effect of the provider being in a rural core-based statistical area (as defined in the Medicare provider of services data). We included the rural setting adjustment, in particular, after observing important differences in the costs of care across our payment groups between providers located in urban and rural areas, which aligns with existing research and with existing PAC payment policy.

We used a generalized linear model regression with a log link function and gamma distribution to estimate this for each UPCG. The dependent variable of this model was total cost of the PAC stay, and the model also controlled for P-CMG. We then divided total cost of the PAC stay by the corresponding comorbidity group effect, rural indicator effect, and PAC setting effect to create what we refer to in subsequent sections as “adjusted cost.” The comorbidity group, rural indicator, and PAC setting effects for each UPCG based on data from 2017 through 2019 are presented in ***Tables 2-23*** to ***2-25*** in the next section***,*** and results from individual years are presented in ***Appendix H***. The adjusted cost served as the basis for estimating the payment weights for each P-CMG, which we describe in the next section.

Estimating Payment Weights

A Unified PAC payment system should account for the relative costliness of different clinical and case-mix groupings as well as the differential structural and operating costs of different types of PAC providers without inadvertently incentivizing providers to have higher costs of care.

Payment Weight Calculation

The prototype Unified PAC PPS begins by estimating a payment weight for each combination of UPCG and P-CMG based upon the adjusted cost described in the previous section. These “base weights” are intended to represent patient clinical characteristics and are calibrated independent of PAC setting type, comorbidity groups, and other factors. The average “adjusted cost” was calculated for all P-CMGs (including short stays and decedents) with the exception of the cost outliers group, which would likely be calculated in a different manner, as is done under the existing PAC payment systems (see *Part 1, Introduction and*

Background). Following the example of the IRF PPS, transfers with a below-average length of stay (i.e., short transfers) were given reduced weight in this calculation (Carter et al., 2002) proportional to their length of stay because the transfer may indicate that the patient's needs could not be met in the current setting. Note that this definition of short transfers differs from the definition used when identifying short transfers for exclusion from the CART analysis (see *P-CMG*), which used a threshold of the 25th percentile of length of stay. We selected the average length of stay (the definition used by the IRF PPS) here to be more inclusive because the cases are no longer being excluded, but merely receiving reduced weight in the calculation.

The final payment weight is calculated by multiplying base weight for the UPCG and P-CMG by the multipliers corresponding to the comorbidity groups and PAC provider type to which the beneficiary was assigned. PAC stays with providers operating in rural areas also have the rural adjustment factor associated with their UPCG applied. We illustrate this process below.

Consider a patient receiving PAC in a SNF for Lower Extremity Fracture (Including with Joint Replacement). The patient has a motor function score of 15, which places them in the first P-CMG. This results in a base payment weight of 1.41 (indicating that patients in this group are, on average, 41% more costly than the average PAC stay overall). This patient is being treated in a SNF, which in this UPCG results in a PAC setting multiplier of 0.87. The patient is also sorted into Comorbidity Group 2, which in this UPCG has a multiplier of 1.09. The SNF is in an urban area and does not receive a rural adjustment. The final payment weight is calculated as follows:

$$\textit{Payment Weight} = 1.41 * 0.87 * 1.09 * 1.00 = 1.34$$

Although this approach is arguably less precise than simply estimating payment weights for each combination of UPCG, P-CMG, comorbidity group, PAC setting type, and rural indicator, it has advantages both methodologically and from a policy perspective. As discussed, several of the payment groups have a relatively small number of cases. This can result in unstable estimates that fluctuate over time and increases the likelihood that the final payment weights will need to be constrained to achieve reasonable values. By separately estimating the P-CMG payment weights and adjustment factors within UPCG, the sample sizes used in each estimate are larger and more stable. They are also driven by whichever subgroup is largest (i.e., most likely to be paid for under a future Unified PAC PPS). A second, related advantage is that some payment groups may have no cases in a given year, making direct estimation of payment weights impossible for those groups. Finally, estimating a PAC provider type effect presents opportunities to make incremental adjustments to these effects over time to correspond with broader regulatory changes. We discuss this in greater detail in *Part 4, Considerations for Implementation.*

Baseline P-CMG payment weights based on data from 2017 through 2019 are presented in ***Table 2-22***, and UPCG-level comorbidity group, rural indicator, and PAC setting adjustment factors are presented in ***Tables 2-23*** to ***2-25,*** respectively. Results based on individual years (including 2020) and for special populations (i.e., short stays and decedents) are presented in ***Appendix H***.

As shown in ***Table 2-22,*** the minimum payment weight across UPCGs was 0.2 and was assigned to patients in the "MMTA: Surgical Aftercare" group with a motor function score of at least 11 (out of 27). The highest payment weight (3.0) was assigned to patients in the UPCG

"Spinal Dysfunction" who have a motor function score of less than 8 (out of 27). Base payment weights followed an overall monotonic pattern—that is, higher payment weights were associated with diagnoses and motor function scores that we would expect to be costlier, on average.

Table 2-22. Payment Weights by UPCG and P-CMG, 2017 to 2019

UPCG	P-CMG	Assignment Rule 1	Assignment Rule 2	Payment Weight
MMTA: Cardiac	1	Motor Function ≥ 11		0.26
	2	Motor Function < 11		0.31
MMTA: Endocrine	1	Motor Function ≥ 10		0.26
	2	Motor Function < 10		0.30
MMTA: Gastrointestinal/ Genitourinary	1	Motor Function ≥ 11		0.23
	2	Motor Function < 11		0.28
MMTA: Infections	1			0.26
MMTA: Respiratory	1	Motor Function ≥ 14		0.24
	2	Motor Function < 14		0.29
MMTA: Surgical Aftercare	1	Motor Function ≥ 11		0.20
	2	Motor Function < 11		0.23
MMTA: Other	1			0.25
Lower Extremity Fracture (Including with Joint Replacement)	1	Motor Function ≥ 11		1.41
	2	Motor Function < 11	Motor Function ≥ 8	1.69
	3	Motor Function < 8		1.88
Major Joint Replacement Without Lower Extremity Fracture	1	Motor Function ≥ 12		0.99
	2	Motor Function < 12	Motor Function ≥ 9	1.09
	3	Motor Function < 9		1.34
Orthopedic Surgery (Not Joint Replacement)	1	Motor Function ≥ 13		1.26
	2	Motor Function < 13	Motor Function ≥ 10	1.52
	3	Motor Function < 10		1.77
Trauma	1	Motor Function ≥ 11		1.47
	2	Motor Function < 11	Motor Function ≥ 8	1.78
	3	Motor Function < 8		2.03
Limb Loss	1	Lower		1.96
	2	Upper		1.73
Orthopedic (Other)	1	Motor Function ≥ 11		1.24
	2	Motor Function < 11	Motor Function ≥ 8	1.46
	3	Motor Function < 8		1.69
Stroke	1	Motor Function ≥ 11		1.57
	2	Motor Function < 11	Motor Function ≥ 8	2.09
	3	Motor Function < 8		2.54

UPCG	P-CMG	Assignment Rule 1	Assignment Rule 2	Payment Weight
Nontraumatic Brain Dysfunction	1	Motor Function ≥ 11		1.37
	2	Motor Function < 11	Motor Function ≥ 8	1.76
	3	Motor Function < 8		2.32
Spinal Dysfunction	1	Motor Function ≥ 11		1.57
	2	Motor Function < 11	Motor Function ≥ 8	2.13
	3	Motor Function < 8		3.19
Traumatic Brain Injury	1	Motor Function ≥ 11		1.42
	2	Motor Function < 11	Motor Function ≥ 8	1.73
	3	Motor Function < 8		2.21
Neurological (Other)	1	Motor Function ≥ 11		1.47
	2	Motor Function < 11	Motor Function ≥ 8	1.80
	3	Motor Function < 8		1.99
Respiratory	1	Motor Function ≥ 15		1.26
	2	Motor Function < 15	Motor Function ≥ 11	1.58
	3	Motor Function < 11		1.92
Cardiovascular	1	Motor Function ≥ 14		1.18
	2	Motor Function < 14	Motor Function ≥ 11	1.44
	3	Motor Function < 11		1.75
Behavioral Health	1			0.25
Coma	1			2.06
Invasive Ventilator	1			2.35
Gastrointestinal & Hepatobiliary	1			1.50
Infections	1	HIV/AIDS		2.45
	2	Hepatitis		1.64
	3	Septicemia		1.73
	4	Other		1.85
Kidney & Urinary	1			1.65
Skin	1			1.40
Cancer	1	Breast		1.68
	2	Gastrointestinal		1.64
	3	Respiratory		1.52
	4	Skin		1.76
	5	Endocrine		1.47
	6	Blood		1.68
	7	Bone/Soft Tissue		1.81
	8	Other		1.67

UPCG	P-CMG	Assignment Rule 1	Assignment Rule 2	Payment Weight
Transplant	1	Heart		1.92
	2	Liver		1.89
	3	Lung		2.18
	4	Kidney/Pancreas		1.59
	5	Bone Marrow		1.61
	6	Other		1.92
Hematological	1			1.76
Other	1			1.42

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

In ***Table 2-23***, we present the PAC setting adjustment factors applied to the prototype Unified PAC PPS. For ease of interpretation, adjustment factors are presented relative to IRF, with the exception of MMTA UPCGs and Behavioral Health, which are specific to HHA and do not require setting adjustment. In general, costs were lower in SNF (range 0.65 to 0.93) and HHA (0.16 to 0.26) and higher for LTCH (1.47 to 3.07) and LTCH–Site-Neutral (LTCH-SN) (1.25 to 4.37).

Table 2-23. PAC Setting Adjustment Factors, 2017 to 2019

UPCG	IRF	SNF	HHA	LTCH	LTCH-SN
MMTA: Cardiac			1.00		
MMTA: Endocrine			1.00		
MMTA: Gastrointestinal/Genitourinary			1.00		
MMTA: Infections			1.00		
MMTA: Respiratory			1.00		
MMTA: Surgical Aftercare			1.00		
MMTA: Other			1.00		
Lower Extremity Fracture (Including with Joint Replacement)	1.00	0.87	0.21	1.82	1.42
Major Joint Replacement Without Lower Extremity Fracture	1.00	0.74	0.18	2.32	1.99
Orthopedic Surgery (Not Joint Replacement)	1.00	0.93	0.20	2.13	1.81
Trauma	1.00	0.79	0.20	2.03	1.68
Limb Loss	1.00	0.81	0.21	2.11	1.78
Orthopedic (Other)	1.00	0.88	0.20	2.63	2.23
Stroke	1.00	0.77	0.20	1.51	1.25
Nontraumatic Brain Dysfunction	1.00	0.77	0.21	1.46	1.58
Spinal Dysfunction	1.00	0.74	0.19	1.70	4.36

UPCG	IRF	SNF	HHA	LTCH	LTCH-SN
Traumatic Brain Injury	1.00	0.74	0.20	1.74	1.28
Neurological (Other)	1.00	0.78	0.20	2.12	1.43
Respiratory	1.00	0.75	0.19	1.96	1.67
Cardiovascular	1.00	0.79	0.26	2.34	1.97
Behavioral Health			1.00		
Coma	1.00	0.82	0.23	2.92	2.55
Invasive Ventilator	1.00	0.90	0.19	2.20	2.10
Gastrointestinal & Hepatobiliary	1.00	0.77	0.20	2.42	1.97
Infections	1.00	0.76	0.16	2.02	1.72
Kidney & Urinary	1.00	0.78	0.17	2.12	1.38
Skin	1.00	0.91	0.25	2.58	2.17
Cancer	1.00	0.66	0.20	1.86	1.71
Transplant	1.00	0.69	0.19	1.76	1.65
Hematological	1.00	0.70	0.17	1.88	1.46
Other	1.00	0.83	0.21	2.44	1.91

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Table 2-24 shows the adjustment factors associated with each of the comorbidity groups. In all but one instance, PAC stays in a higher comorbidity group, on average, cost more than those in a corresponding lower comorbidity group. Spinal Dysfunction Comorbidity Groups 2 and 3 did not follow this pattern and were constrained equal. Adjustment factors for Comorbidity Group 2 ranged from 1.03 to 1.13 (meaning these patients were between 3% and 13% more costly than patients in Comorbidity Group 1 across UPCGs), and Comorbidity Group 5 ranged from 1.08 to 1.60.

Table 2-24. Comorbidity Group Adjustment Factors, 2017 to 2019

UPCG	Group 1	Group 2	Group 3	Group 4	Group 5
MMTA: Cardiac	1.00	1.10	1.14	1.16	1.25
MMTA: Endocrine	1.00	1.15	1.20	1.27	1.37
MMTA: Gastrointestinal/Genitourinary	1.00	1.12	1.17	1.19	1.27
MMTA: Infections	1.00	1.10	1.16	1.23	1.34
MMTA: Respiratory	1.00	1.10	1.15	1.19	1.29
MMTA: Surgical Aftercare	1.00	1.14	1.21	1.30	1.49
MMTA: Other	1.00	1.13	1.16	1.24	1.32
Lower Extremity Fracture (Including with Joint Replacement)	1.00	1.09	1.14	1.16	1.17
Major Joint Replacement Without Lower Extremity Fracture	1.00	1.06	1.12	1.21	1.40

UPCG	Group 1	Group 2	Group 3	Group 4	Group 5
Orthopedic Surgery (Not Joint Replacement)	1.00	1.10	1.16	1.19	1.22
Trauma	1.00	1.06	1.08	1.10	1.13
Limb Loss	1.00	1.04	1.08	1.12	1.21
Orthopedic (Other)	1.00	1.11	1.16	1.20	1.25
Stroke	1.00	1.05	1.07	1.09	1.14
Nontraumatic Brain Dysfunction	1.00	1.10	1.17	1.26	1.38
Spinal Dysfunction	1.00	1.13	1.14	1.18	1.26
Traumatic Brain Injury	1.00	1.06	1.11	1.16	1.27
Neurological (Other)	1.00	1.03	1.05	1.07	1.10
Respiratory	1.00	1.04	1.06	1.06	1.11
Cardiovascular	1.00	1.05	1.09	1.13	1.17
Behavioral Health	1.00	1.12	1.20	1.30	1.34
Coma	1.00	1.01	1.06	1.09	1.36
Invasive Ventilator	1.00	1.08	1.19	1.38	1.67
Gastrointestinal & Hepatobiliary	1.00	1.09	1.13	1.17	1.22
Infections	1.00	1.04	1.07	1.10	1.17
Kidney & Urinary	1.00	1.05	1.06	1.08	1.13
Skin	1.00	1.07	1.13	1.16	1.22
Cancer	1.00	1.09	1.10	1.16	1.22
Transplant	1.00	1.14	1.17	1.33	1.50
Hematological	1.00	1.06	1.08	1.12	1.15
Other	1.00	1.10	1.16	1.22	1.32

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Table 2-25 presents the rural adjustment factors associated with each UPCG. PAC stays with providers in rural areas were more costly in all but one UPCG (Coma). The rural adjustment factor ranged from 1.00 (Coma) to 1.20 (MMTA: Gastrointestinal/Genitourinary)

Table 2-25. Rural Adjustment Factors, 2017 to 2019

UPCG	Adjustment Factor
MMTA: Cardiac	1.16
MMTA: Endocrine	1.14
MMTA: Gastrointestinal/Genitourinary	1.20
MMTA: Infections	1.16
MMTA: Respiratory	1.16
MMTA: Surgical Aftercare	1.18
MMTA: Other	1.18
Lower Extremity Fracture (Including with Joint Replacement)	1.13

UPCG	Adjustment Factor
Major Joint Replacement Without Lower Extremity Fracture	1.18
Orthopedic Surgery (Not Joint Replacement)	1.15
Trauma	1.16
Limb Loss	1.10
Orthopedic (Other)	1.14
Stroke	1.13
Nontraumatic Brain Dysfunction	1.13
Spinal Dysfunction	1.09
Traumatic Brain Injury	1.16
Neurological (Other)	1.12
Respiratory	1.09
Cardiovascular	1.12
Behavioral Health	1.14
Coma	1.00
Invasive Ventilator	1.04
Gastrointestinal & Hepatobiliary	1.09
Infections	1.07
Kidney & Urinary	1.11
Skin	1.11
Cancer	1.10
Transplant	1.11
Hematological	1.15
Other	1.11

Note: Constraint applied, Coma UPCG = 0.000
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Part 3–PAC Landscape and Prototype Impacts

Landscape Analysis

To effectively construct a Unified PAC PPS, it is necessary to understand the current landscape of PAC providers as well as utilization of PAC under the Medicare FFS benefit. In this section, we present a descriptive analysis summarizing the providers of PAC from 2017 to 2019 (analysis of 2020 data can be found later in *Part 3*) and the beneficiaries they treated. Additional results can be found in ***Appendix I***.

Table 3-1 presents PAC providers with at least one claim billed to Medicare FFS in at least one of our years of data. A total of 27,445 unique providers submitted claims from 2017 to 2019, including 1,174 IRFs, 15,460 SNFs, 10,408 HHAs, and 403 LTCHs. The table presents characteristics of these providers, including ownership, bed size, and geographic area (urban vs. rural and census region).

Table 3-1. PAC Provider Characteristics by PAC Provider Type, 2017 to 2019

Provider Characteristic	IRF	SNF	HHA	LTCH
Total Providers	1,174	15,460	10,408	403
Ownership				
For-Profit	497	10,921	8,396	290
Nonprofit	470	3,622	1,594	85
Government/Other	207	917	418	28
Bed Size				
< 25	20	269	–	26
25–99	309	7,222	–	323
100–199	199	7,015	–	39
200 +	646	954	–	15
Urbanicity				
Rural	149	4,284	1,679	20
Urban	1,025	11,176	8,729	383
Census Region				
Northeast	187	2,606	853	38
Midwest	298	5,079	2,643	91
South	488	5,479	4,604	219
Pacific	201	2,295	2,308	55

– = not applicable
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

In ***Table 3-2,*** we examine these groups as a percentage of total PAC stays and compare them with the distribution of providers presented in ***Table 3-1.*** IRFs had the lowest percentage of stays occurring in for-profit facilities, and LTCH stays (including site-neutral stays) were most

likely to occur in for-profit facilities. Also of note is that institutional PAC settings (IRF, SNF, and LTCH) tended to have a higher percentage of stays occurring in for-profit settings relative to the percentage of providers that were for-profit, whereas the reverse was true for HHA. For example, 42% of IRFs were listed as for-profit from 2017 to 2019, but those IRFs cared for 59% of the PAC stays in our data. In contrast, 81% of HHAs were listed as for-profit, but those HHAs cared for only 61% of the HHA sequences we examined. In general, however, PAC utilization tended to align with provider prevalence across the provider characteristics we examined.

Table 3-2. Percentage of PAC Stays by PAC Provider Type and Provider Characteristics, 2017 to 2019

Provider Characteristic	IRF	SNF	HHA	LTCH	LTCH-SN
Overall	100.0%	100.0%	100.0%	100.0%	100.0%
Ownership					
For-Profit	59.3%	71.0%	61.9%	79.1%	81.7%
Nonprofit	30.1%	25.3%	35.9%	16.5%	15.0%
Government/Other	10.6%	3.7%	2.3%	4.4%	3.2%
Bed Size					
< 25	0.9%	1.4%		2.9%	3.7%
25–99	45.2%	32.7%		76.6%	71.3%
100–199	15.4%	55.2%		12.8%	16.8%
200+	38.4%	10.7%		7.7%	8.2%
Urbanicity					
Rural	6.3%	16.5%	12.0%	3.4%	7.1%
Urban	93.7%	83.5%	88.0%	96.6%	92.9%
Census Region					
Northeast	17.2%	21.6%	21.1%	11.5%	9.4%
Midwest	19.1%	25.1%	20.6%	21.7%	11.8%
South	50.0%	37.2%	40.4%	52.0%	68.0%
Pacific	13.7%	16.1%	18.0%	14.8%	10.9%

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

In ***Table 3-3***, we present the distribution of PAC stays by UPCG and PAC setting type. Percentages in the table represent the proportion of PAC stays within each PAC setting type assigned to each of the UPCGs. In general, IRF stays tended to be assigned to the Neurological (Other), Stroke, and Orthopedic (Other) UPCGs, whereas SNF stays were most often assigned to Respiratory, Cardiovascular, and Orthopedic (Other). In contrast, HHAs were most often assigned to Orthopedic (Other) or one of the MMTA UPCGs, and LTCH stays were typically assigned to the UPCGs for Respiratory and Invasive Ventilator.

Table 3-3. Percentage of PAC Stays by UPCG and PAC Provider Type, 2017 to 2019

UPCG	IRF	SNF	HHA	LTCH	LTCH-SN
MMTA: Cardiac			13.36		
MMTA: Endocrine			3.28		
MMTA: Gastrointestinal/Genitourinary			4.28		
MMTA: Infections			4.03		
MMTA: Respiratory			7.24		
MMTA: Surgical Aftercare			7.38		
MMTA: Other			2.06		
Lower Extremity Fracture (Including with Joint Replacement)	4.87	3.92	2.19	0.23	0.71
Major Joint Replacement Without Lower Extremity Fracture	4.49	4.79	8.51	0.16	0.71
Orthopedic Surgery (Not Joint Replacement)	6.33	7.04	2.93	0.56	1.48
Trauma	1.35	1.19	1.83	0.38	0.55
Limb Loss	2.80	0.97	0.32	0.79	1.88
Orthopedic (Other)	11.01	10.44	18.33	2.87	8.75
Stroke	18.55	4.81	3.66	1.16	1.14
Nontraumatic Brain Dysfunction	4.00	0.83	0.38	0.78	0.22
Spinal Dysfunction	0.47	0.03	0.01	0.04	0.01
Traumatic Brain Injury	2.45	0.53	0.37	0.16	0.16
Neurological (Other)	22.44	7.64	6.92	0.82	2.04
Respiratory	2.46	11.60	0.09	19.75	14.40
Cardiovascular	6.45	13.39	1.52	5.17	6.86
Behavioral Health			1.39		
Coma	0.28	0.11	0.01	2.11	0.85
Invasive Ventilator	0.81	0.34	0.03	38.30	14.09
Gastrointestinal & Hepatobiliary	0.59	4.37	0.28	3.48	4.22
Infections	0.55	4.34	0.16	7.68	7.78
Kidney & Urinary	0.44	6.24	0.12	3.34	4.84
Skin	0.54	2.65	5.31	3.37	13.07
Cancer	1.01	2.12	0.45	0.61	0.66
Transplant	0.25	0.04	0.03	0.30	0.28
Hematological	0.05	0.91	0.01	0.14	0.22
Other	7.80	11.71	3.53	7.79	15.10

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Predictive Ability of the Prototype

In this section, we examine the prototype's ability to effectively predict costs of care across key groups of beneficiaries and providers. Specifically, we examined the predictive ability of the model across (1) PAC setting type, (2) facility bed size (excluding HHA), (3) urban vs. rural CBSA, (4) U.S. Census Region, (5) UPCG, and (6) deciles of payment weight. Each of these represents a key group of beneficiaries or providers that are important to consider when ensuring that model payments remain proportional to costs of care. For example, deciles of prediction help ensure that the over- or underpayments are not concentrated near the extremes of the range of costliness (i.e., the least- or most-expensive patients).

For this analysis, average cost of the PAC stays was rescaled to 1 by calculating the overall average cost of PAC stays (weighted as described in Payment Weight Calculation) and dividing the total cost for each PAC stay by this overall average. These ratios can be interpreted as a measure of how well the model predicts the relative costliness of the PAC stays in that subgroup. A ratio of 1 indicates perfect prediction, a ratio greater than 1 indicates overprediction (or the prototype, on average, assigning a payment weight greater than average cost for that group), and a ratio of less than 1 indicates underprediction (or the prototype, on average, assigning a payment weight less than the average cost for that group). Because the relative weights are all scaled to 1 (as they would be for budget neutrality purposes when recalibrating for a given year), the overall payment-to-cost ratio will always be 1. We also estimated a regression model equating the structure of the prototype to examine the model fit of the prototype. Cost outliers were again excluded from the analyses presented in this section.

In ***Table 3-4****,* we present payment-to-cost ratios for key subgroups of PAC providers. Overall, model predictions were very strong across the groups we examined. Nearly all ratios were within 4% (0.04) of 1, and many were within 2%. IRF and LTCH were slightly overpredicted, SNF was slightly underpredicted, and HHA had nearly perfect prediction. The smallest and largest facilities tended to be underpredicted, whereas facilities with 25 to 99 beds were slightly overpredicted. PAC stays with providers in the South were also slightly underpredicted, while other regions were slightly overpredicted. Non-profit and government hospitals (both IRF and LTCH) were also underpredicted.

Table 3-4. Payment-to-Cost Ratios by Provider Characteristics, 2017 to 2019

Provider Characteristic	Payment Weight-to-Cost Ratio
Overall	1.00
Provider Type	
IRF	1.02
SNF	0.99
HHA	1.00
LTCH	1.02
Bed Size	
< 25	0.95
25–99	1.02
100–199	1.01

Provider Characteristic	Payment Weight-to-Cost Ratio
200+	0.95
Ownership	
IRF	
For-Profit	1.09
Nonprofit	0.94
Government	0.92
SNF	
For-Profit	0.99
Nonprofit	1.02
Government	0.89
HHA	
For-Profit	0.99
Nonprofit	1.03
Government	0.91
LTCH	
For-Profit	1.05
Nonprofit	0.92
Government	0.98
Urbanicity	
Rural	1.00
Urban	1.00
Census Region	
Northeast	1.04
Midwest	1.01
South	0.97
Pacific	1.01

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

As shown in ***Table 3-5***, payment-to-cost ratios were relatively consistent across UPCGs. All ratios were within 4% of 1 (0.04), and most were within 2%.

Table 3-5. Payment-to-Cost Ratios by UPCG, 2017 to 2019

UPCG	Payment Weight-to-Cost Ratio
MMTA: Cardiac	0.98
MMTA: Endocrine	0.98
MMTA: Gastrointestinal/Genitourinary	0.99
MMTA: Infections	0.99

UPCG	Payment Weight-to-Cost Ratio
MMTA: Respiratory	0.98
MMTA: Surgical Aftercare	0.99
MMTA: Other	0.98
Lower Extremity Fracture (Including with Joint Replacement)	0.99
Major Joint Replacement Without Lower Extremity Fracture	0.98
Orthopedic Surgery (Not Joint Replacement)	0.99
Trauma	0.98
Limb Loss	1.01
Orthopedic (Other)	0.98
Stroke	0.99
Nontraumatic Brain Dysfunction	1.01
Spinal Dysfunction	1.01
Traumatic Brain Injury	1.00
Neurological (Other)	0.99
Respiratory	1.02
Cardiovascular	1.01
Behavioral Health	0.98
Coma	0.98
Invasive Ventilator	1.04
Gastrointestinal & Hepatobiliary	1.02
Infections	1.02
Kidney & Urinary	1.02
Skin	0.98
Cancer	1.02
Transplant	1.01
Hematological	1.03
Other	1.00

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

A key concern when calibrating any payment system is ensuring that predictions are reasonable across the range of potential costliness. In other words, it is important to ensure that the model is accurately predicting costs for high-cost and low-cost (or relatively high-need and low-need) patients alike. In ***Table 3-6,*** we explore this question by examining payment-to-cost ratios across deciles of payment weights. Predictions were overall reasonable across deciles of payment weights. Most were within 2% of 1. The 4th decile showed the largest overprediction, with a payment-to-cost ratio of 1.04. Analyses for each individual year are included in ***Appendix I***.

Table 3-6. Payment-to-Cost Ratios by Deciles of Payment Weight, 2017 to 2019

Deciles of Payment Weight	Payment Weight-to-Cost Ratio
1st decile	0.99
2nd decile	1.01
3rd decile	1.00
4th decile	1.04
5th decile	1.02
6th decile	0.99
7th decile	0.98
8th decile	0.99
9th decile	0.99
10th decile	1.01

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

To further examine model predictions, we estimated a series of ordinary least squares regression models equivalent in structure to the prototype for each of the provider subgroups and UPCGs. This analysis was to better understand how much of the variation in costs of care for PAC can be explained by the factors used to set payment in the prototype Unified PAC PPS.

As shown in ***Table 3-7***, the prototype Unified PAC PPS explained 48% of the variation from 2017 through 2019. This was consistent across geographic regions. Individual PAC provider types (e.g., IRF, SNF) had lower overall model fit, ranging from 13% for SNF and HHA to 25% for IRF. This is likely because setting type remains a key predictor of overall cost of care under the existing PAC payment systems, which are setting-specific. The overall model includes four PAC settings and a setting specific indicator that is highly predictive of total costs.

Table 3-7. Model Fit Statistics by Provider Characteristics, 2017 to 2019

Provider Characteristic	Model Fit
Overall	0.48
Provider Type	
IRF	0.25
SNF	0.13
HHA	0.13
LTCH	0.21
Bed Size	
< 25	0.38
25–99	0.36
100–199	0.21
200+	0.25
Ownership	

Provider Characteristic	Model Fit
For-Profit	0.46
IRF	0.26
SNF	0.13
HHA	0.12
LTCH	0.22
Nonprofit	0.52
IRF	0.24
SNF	0.14
HHA	0.14
LTCH	0.19
Government	0.42
IRF	0.26
SNF	0.12
HHA	0.15
LTCH	0.20
Urbanicity	
Rural	0.38
Urban	0.49
Census Region	
Northeast	0.45
Midwest	0.48
South	0.49
Pacific	0.48

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Across UPCGs, model fit varied considerably. As shown in ***Table 3-8,*** higher model fit was observed in Rehabilitation UPCGs than in MMTA UPCGs and Medical UPCGs. In some cases, this may be a result of the motor function score used in case-mix adjustment in the Rehabilitation UPCGs, whereas the Medical UPCGs often only have one P-CMG. In other cases, lower model fit may simply be a result of smaller sample sizes. Analyses for each individual year are included in ***Appendix J.***

Table 3-8. Model Fit Statistics by UPCG, 2017 to 2019

UPCG	Model Fit
MMTA: Cardiac	0.10
MMTA: Endocrine	0.10
MMTA: Gastrointestinal/Genitourinary	0.13
MMTA: Infections	0.13

UPCG	Model Fit
MMTA: Respiratory	0.11
MMTA: Surgical Aftercare	0.14
MMTA: Other	0.10
Lower Extremity Fracture (Including with Joint Replacement)	0.36
Major Joint Replacement Without Lower Extremity Fracture	0.50
Orthopedic Surgery (Not Joint Replacement)	0.34
Trauma	0.45
Limb Loss	0.31
Orthopedic (Other)	0.49
Stroke	0.40
Nontraumatic Brain Dysfunction	0.39
Spinal Dysfunction	0.40
Traumatic Brain Injury	0.43
Neurological (Other)	0.39
Respiratory	0.25
Cardiovascular	0.23
Behavioral Health	0.11
Coma	0.44
Invasive Ventilator	0.26
Gastrointestinal & Hepatobiliary	0.25
Infections	0.25
Kidney & Urinary	0.16
Skin	0.47
Cancer	0.24
Transplant	0.44
Hematological	0.12
Other	0.32

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Prototype Impact Analysis

In this section, we examine the potential impact of the prototype by comparing the potential payment weights with actual payments made for PAC. As with the predictive ability analysis, we examined PAC provider type, facility bed size (excluding HHA), Urban vs. Rural CBSA, U.S. Census Region, UPCG, and deciles of payment weight.

For each group, we calculated the average payment weight generated by the prototype across all PAC stays in the group (rescaled to 1 and weighted as described in *Predictive Ability of the Prototype*) and compared this with the average allowed charge (i.e., Medicare payments plus cost-sharing, also rescaled to 1 as previously described). This impact ratio can be interpreted as

the impact or change in payments under the prototype compared with current PAC payment systems. A ratio of 1.0 can therefore be interpreted as payments under the prototype being, on average, equivalent under the prototype to existing PAC payment systems within a particular group. A ratio of greater than 1.0 indicates that payments would increase for that group, and a ratio of less than 1.0 indicates that payments would decrease for that group.

To draw equivalent comparisons, payment weights were multiplied by the provider's wage index and labor share, as is done for payments under the current payment systems. Cost outliers were excluded from the analyses presented in this section.

Table 3-9 presents impact ratios across different subgroups of PAC providers. Overall, payment weights were reasonably consistent with the current payment systems. For example, the impact ratio for SNFs was estimated at approximately 1.01, and IRF and HHA payments were estimated to decrease. In contrast, payments to LTCHs are projected to increase considerably (impact ratio 1.17). It is important to note that these findings are likely driven by the lower margins in LTCHs and the use of total costs in calibrating the payment weights. That is, use of costs to calibrate the payment weights assumes equal margins across PAC settings and does not account for other policy adjustments that may be built into any future testing or implementation. Payments would also increase for medium-sized providers and the smallest providers, rural providers, and providers in the Northeast and Midwest regions. Corresponding decreases are observed for larger providers and providers in the South and Pacific regions.

As shown in ***Table 3-10****,* impact ratios varied across UPCGs (range 0.91 to 1.21 for Behavioral Health and Transplant, respectively). Most, however, were within 0.06 of 1, and the UPCGs outside of this range tended to have a lower volume of PAC stays (e.g., Ventilator, Transplant).

Table 3-9. Impact Ratios by Provider Characteristics, 2017 to 2019

Provider Characteristic	Payment Weight Impact Ratio
Overall	1.00
Provider Type	
IRF	0.94
SNF	1.01
HHA	0.96
LTCH	1.17
Bed Size	
< 25	1.56
25–99	1.04
100–199	0.99
200+	0.94
Ownership	
IRF	
For-Profit	0.93
Nonprofit	0.96
Government	0.94
SNF	

Provider Characteristic	Payment Weight Impact Ratio
For-Profit	0.96
Nonprofit	1.17
Government	1.04
HHA	
For-Profit	0.91
Nonprofit	1.05
Government	1.07
LTCH	
For-Profit	1.18
Nonprofit	1.15
Government	1.13
Urbanicity	
Rural	1.03
Urban	1.00
Census Region	
Northeast	1.01
Midwest	1.04
South	0.98
Pacific	0.98

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Table 3-10. Impact Ratios by UPCG

UPCG	Payment Weight Impact Ratio
MMTA: Cardiac	0.99
MMTA: Endocrine	0.99
MMTA: Gastrointestinal/Genitourinary	0.99
MMTA: Infections	1.04
MMTA: Respiratory	1.00
MMTA: Surgical Aftercare	0.96
MMTA: Other	0.95
Lower Extremity Fracture (Including with Joint Replacement)	0.97
Major Joint Replacement Without Lower Extremity Fracture	0.97
Orthopedic Surgery (Not Joint Replacement)	0.99
Trauma	0.99
Limb Loss	1.05
Orthopedic (Other)	0.95
Stroke	0.96
Nontraumatic Brain Dysfunction	1.01

UPCG	Payment Weight Impact Ratio
Spinal Dysfunction	0.97
Traumatic Brain Injury	0.95
Neurological (Other)	0.93
Respiratory	1.05
Cardiovascular	1.03
Behavioral Health	0.91
Coma	0.97
Invasive Ventilator	1.07
Gastrointestinal & Hepatobiliary	1.06
Infections	1.05
Kidney & Urinary	1.02
Skin	1.08
Cancer	1.06
Transplant	1.21
Hematological	1.02
Other	1.05

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

Payment weights were overall comparable to current allowed charges across deciles. As shown in ***Table 3-11,*** most were within 5% of 1. The 4th and 5th deciles showed the largest overprediction, with impact ratios up to 1.10. Analyses for each individual year are included in ***Appendix K.***

Table 3-11. Impact Ratios by Deciles of Payment Weight

Deciles of Payment Weight	Payment Weight Impact Ratio
1st decile	0.95
2nd decile	0.93
3rd decile	0.95
4th decile	1.05
5th decile	1.10
6th decile	1.03
7th decile	1.00
8th decile	0.97
9th decile	0.95
10th decile	1.02

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0040

PAC Utilization in 2020

The year 2020 posed several important changes for the PAC industry. In addition to the COVID-19 pandemic and the regulatory waivers granted under the PHE, the Medicare FFS benefit introduced new payment systems in two of the four PAC settings (see *Part 1, Introduction and Background,* for additional detail). Together, these changes may have important implications for utilization and costs of care that should be considered in designing and calibrating a Unified PAC PPS.

In this section, we examine trends in Medicare-covered PAC use across key groups of PAC providers and beneficiaries and how those trends changed in 2020. We also examine the prototype's ability to predict costs in 2020 using payment weights calibrated with data from 2017 to 2019. As before, cost outliers were excluded from the analyses presented in this section. Estimates of average cost and length of stay also excluded short stays and decedents.

Trends in PAC Use and Costs of Care, 2017 to 2020

In this section, we examine trends in several key metrics of PAC utilization and spending across PAC provider types and UPCGs from 2017 through 2020. In particular, we examine the distribution of PAC stays, costs of care, and length of stay overall and for a select set of UPCGs. We also examine the proportion of PAC stays that were community entrants and the proportion of decedents during the PAC stay.

Table 3-12 shows the average total cost of PAC stays in each PAC setting from 2017 to 2020. Costs were reasonably consistent from 2017 through 2019 but, as anticipated, showed more-substantial changes in 2020 relative to prior years. Average cost per stay increased from 2019 to 2020 in IRF ($17,824 to $18,683) and LTCH ($44,534 to $46,477) and decreased in SNF ($13,775 to $12,823) and HHA ($3,040 to $2,797). Because of the timing of analyses and the availability of complete cost report data, we opted to apply the values derived from 2017 cost reports to 2018, 2019, and 2020 claims and to apply an inflation adjustment factor based on the market basket calculation for each PAC setting to express costs uniformly in 2017 dollars. This method is detailed in ***Appendix B***.

Table 3-12. Average Cost of PAC Stays by Setting, 2017 to 2020

PAC Setting	2017	2018	2019	2020
IRF	$17,756	$17,752	$17,824	$18,683
SNF	$14,246	$14,197	$13,775	$12,823
HHA	$3,166	$3,121	$3,040	$2,797
LTCH	$42,131	$43,778	$44,534	$46,477

Notes: Total cost of the PAC stay is adjusted to account for geographic variation in wages using the CMS wage index and labor share for each geographic area and PAC setting in each year. LTCH stays include stays paid under both the LTCH PPS and SN payment.
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Similar results can be observed at the UPCG level. ***Table 3-13*** presents average cost of the PAC stay by PAC setting and year for the four selected UPCGs: Lower Extremity Fracture (Including with Joint Replacement), Stroke, Respiratory, and Infections. As with overall trends,

costs were consistent from 2017 to 2019. In 2020, costs tended to increase in IRF and LTCH and to decrease in SNF and HHA, although the magnitude of these changes varied across UPCGs. Additional UPCGs are presented in ***Appendix L***.

Table 3-13. Average Cost of PAC Stays by UPCG and Setting, 2017 to 2020

UPCG and PAC Setting	2017	2018	2019	2020
IRF				
Lower Extremity Fracture (Including with Joint Replacement)	$17,136	$17,187	$17,371	$18,041
Stroke	$20,995	$20,930	$20,898	$21,639
Respiratory	$16,630	$16,362	$16,619	$17,398
Infections	$18,455	$18,068	$18,340	$19,328
SNF				
Lower Extremity Fracture (Including with Joint Replacement)	$16,324	$16,070	$15,577	$14,793
Stroke	$17,728	$17,612	$17,007	$15,135
Respiratory	$13,435	$13,302	$12,960	$12,423
Infections	$14,262	$14,331	$13,545	$12,945
HHA				
Lower Extremity Fracture (Including with Joint Replacement)	$3,584	$3,508	$3,397	$3,102
Stroke	$4,114	$4,155	$3,954	$3,484
Respiratory	$3,070	$2,829	$2,826	$2,405
Infections	$2,821	$2,881	$2,991	$2,831
LTCH				
Lower Extremity Fracture (Including with Joint Replacement)	$30,579	$30,513	$32,618	$36,231
Stroke	$33,861	$33,381	$38,589	$41,577
Respiratory	$32,107	$33,572	$35,052	$35,775
Infections	$35,674	$36,721	$36,732	$38,140

Notes: Total cost of the PAC stay is adjusted to account for geographic variation in wages using the CMS wage index and labor share for each geographic area and PAC setting in each year. LTCH stays include stays paid under both the LTCH PPS and SN payment.
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

An important caveat of these results, however, is that they were derived in part from 2017 cost reports. Although we expect a reasonable degree of year-over-year consistency from 2017 to 2019, changes in routine cost per day and cost-to-charge ratios may have been more substantial in 2020. We discuss this limitation further in *Part 4, Considerations for Implementation*.

Length of stay across PAC settings (expressed in visits for HHA) was more consistent overall. As shown in ***Table 3-14***, small increases in average length of stay were observed from 2017 to 2020 in IRF and LTCH, whereas SNF length of stay decreased and HHAs exhibited little to no

change in visits. These trends varied in magnitude but were overall consistent across UPCGs (see ***Table 3-15***). Additional UPCGs are presented in ***Appendix L***.

Table 3-14. Average Length of PAC Stays (in Days) by Setting, 2017 to 2020

PAC Setting	2017	2018	2019	2020
IRF	13.11	12.97	12.95	13.38
SNF	32.42	32.59	29.85	30.70
HHA	18.60	18.53	18.49	18.16
LTCH	27.28	27.66	27.83	28.66

Notes: LTCH stays include stays paid under both the LTCH PPS and SN payment. Values for institutional PAC settings represent calendar days. HHA values are shown as visits reported during the sequence of episodes.
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Table 3-15. Average Length of PAC Stays by UPCG and Setting, 2017 to 2020

UPCG and PAC Setting	2017	2018	2019	2020
IRF				
Lower Extremity Fracture (Including with Joint Replacement)	13.06	12.96	13.02	13.28
Stroke	15.30	15.09	15.05	15.48
Respiratory	11.47	11.18	11.21	11.58
Infections	12.42	12.10	12.32	12.79
SNF				
Lower Extremity Fracture (Including with Joint Replacement)	36.03	35.30	33.16	32.98
Stroke	41.39	41.62	37.46	36.18
Respiratory	31.11	30.96	28.23	29.75
Infections	31.36	31.73	28.54	29.70
HHA				
Lower Extremity Fracture (Including with Joint Replacement)	21.45	21.31	21.05	18.74
Stroke	24.12	24.67	24.04	20.69
Respiratory	18.66	17.15	17.12	13.57
Infections	16.06	16.01	17.29	16.13
LTCH				
Lower Extremity Fracture (Including with Joint Replacement)	21.56	22.64	23.40	26.48
Stroke	24.58	23.64	26.27	27.40
Respiratory	21.70	22.41	23.11	23.76
Infections	24.64	25.09	25.39	26.36

Notes:
1. LTCH stays include both stays paid under the LTCH PPS and SN payment.

2. Values for institutional PAC settings represent calendar days. HHA values are shown as visits reported during the sequence of episodes.

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

In ***Table 3-16***, we examine trends over time in PAC stays being preceded by a prior acute inpatient hospitalization. As previously discussed, SNF is the only PAC setting that explicitly requires that a stay be preceded by an inpatient admission, although direct admissions to IRF and LTCH are subject to the Part A deductible. The 3-day acute hospital stay requirement for SNF was waived in 2020 nationwide as part of the COVID-19 PHE. HHA has historically been much more likely to care for community entrants. These trends are reflected in the results in ***Table 3-16***. Direct admissions to IRF and LTCH remained relatively consistent from 2017 to 2020. SNF was the most likely to have an acute stay in the prior 90 days but exhibited a decrease in 2020 (because of the PHE waiver). Community entrants in HHA also increased in 2020, which may reflect changes in patient preferences for community-based PAC during the pandemic.

Table 3-16. Percentage of PAC Stays Not Preceded by an Acute Stay by PAC Setting and Year

PAC Setting	2017	2018	2019	2020
IRF	12.4%	12.9%	13.7%	12.2%
SNF	4.4%	4.7%	4.7%	21.0%
HHA	37.2%	37.1%	38.6%	43.6%
LTCH	8.4%	8.3%	8.0%	8.0%

Notes: LTCH stays include stays paid under the LTCH PPS and SN payment.
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Each of the institutional PAC settings exhibited an increase in patients not surviving the PAC stay in 2020. These results are shown in ***Table 3-17.*** This finding was not surprising given the impact of COVID-19 on health care facilities. It may also be driven, in part, by healthier patients choosing HHA over facility-based PAC during the pandemic (Fout & Plotzke, 2021). In contrast, the rate of decedents remained constant for HHA from 2019 to 2020.

Table 3-17. Percentage of PAC Stays Discharged Dead by PAC Setting and Year

PAC Setting	2017	2018	2019	2020
IRF	0.2%	0.2%	0.2%	0.3%
SNF	2.9%	2.8%	2.4%	3.9%
HHA	0.9%	1.0%	0.9%	0.9%
LTCH	13.0%	13.7%	14.8%	16.6%

Notes: LTCH stays include stays paid under the LTCH PPS and SN payment.
Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Prototype Unified PAC PPS Predictions in 2020

It is common for costs of care to evolve as practice patterns change and new technologies are introduced. Therefore, it is important that the design of any Unified PAC PPS be robust to these changes over time. That is, the model's ability to predict costs for a given year should be reasonably consistent so the payment weights generated as the model is recalibrated over time continue to be a reasonable representation of the costs of care across payment groups. In this section, we examine the model's ability to predict costs in 2020 and compare with the predictions and model fit statistics generated using data from 2017 to 2019. We also use payment weights generated using data from 2017 to 2019 to predict costs incurred in 2020. Although the changes to the SNF and HHA payment systems and the COVID-19 PHE represent a more substantial shock than is typical on an annual basis, these analyses offer important insights into how a future emergency could affect provider revenues under a Unified PAC PPS.

In ***Tables 3-18 to 3-19***, we present the model fit statistics (R2) for 2020. These can be interpreted as the model and its payment grouping structure's ability to predict costs in 2020. Overall, the prototype Unified PAC PPS explained 48% of the variation in 2020—slightly higher than the predictions from 2017 to 2019. Model fit for key subgroups of PAC providers and beneficiaries were consistent with prior years. Of note is that although costs in 2020 differed considerably from prior years, model fit statistics were quite similar. This suggests that the framework of the prototype is clinically sound and emphasizes patients that are important to differentiate for payment purposes even as costs shift over time. We discuss this in greater detail in *Part 4, Considerations for Implementation.*

Table 3-18. Model Fit Statistics by Provider Characteristics, 2020

Provider Characteristic	Model Fit
Overall	0.48
Provider Type	
IRF	0.23
SNF	0.11
HHA	0.12
LTCH	0.21
Bed Size	
< 25	0.41
25–99	0.38
100–199	0.21
200+	0.28
Ownership	
For-Profit	0.46
IRF	0.24
SNF	0.11
HHA	0.11
LTCH	0.21
Nonprofit	0.53

Provider Characteristic	Model Fit
IRF	0.23
SNF	0.12
HHA	0.14
LTCH	0.22
Government	0.46
IRF	0.26
SNF	0.12
HHA	0.15
LTCH	0.32
Urbanicity	
Rural	0.39
Urban	0.49
Census Region	
Northeast	0.45
Midwest	0.50
South	0.49
Pacific	0.48

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Table 3-19. Model Fit Statistics by UPCG, 2020

UPCG	Model Fit
MMTA: Cardiac	0.10
MMTA: Endocrine	0.09
MMTA: Gastrointestinal/Genitourinary	0.12
MMTA: Infections	0.13
MMTA: Respiratory	0.11
MMTA: Surgical Aftercare	0.13
MMTA: Other	0.11
Lower Extremity Fracture (Including with Joint Replacement)	0.39
Major Joint Replacement Without Lower Extremity Fracture	0.52
Orthopedic Surgery (Not Joint Replacement)	0.35
Trauma	0.48
Limb Loss	0.35
Orthopedic (Other)	0.51
Stroke	0.40
Nontraumatic Brain Dysfunction	0.43
Spinal Dysfunction	0.43
Traumatic Brain Injury	0.43

UPCG	Model Fit
Neurological (Other)	0.34
Respiratory	0.26
Cardiovascular	0.23
Behavioral Health	0.12
Coma	0.37
Invasive Ventilator	0.27
Gastrointestinal & Hepatobiliary	0.27
Infections	0.23
Kidney & Urinary	0.15
Skin	0.50
Cancer	0.23
Transplant	0.50
Hematological	0.20
Other	0.34
COVID-19	0.23

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

As expected, payment-to-cost ratios varied more in 2020 than in prior years. However, in most cases, payment weights were still within 10% of average costs across the provider and patient groups we examined. In ***Tables 3-20*** to ***3-22***, we present payment-to-cost ratios generated using payment weights from 2017 to 2019 and costs from 2020, and then costs from 2017 to 2019 combined for comparison. The purpose of this analysis is to demonstrate how payment weights calibrated using data from prior years would perform in the context of an economic shock such as the COVID-19 PHE.

Across PAC setting types, the payment-to-cost ratios ranged from 0.90 for LTCH to 1.06 for HHA. These results are presented in ***Table 3-20.*** However, compared with 2017 to 2019, ratios in 2020 were lower in IRFs and LTCHs, but higher for SNFs and HHAs. This result is not surprising because the newly introduced payment systems in SNF and HHA resulted in a reduction in the provision of therapy services, and thus lower costs of care, relative to previous years when such payment systems had case-mix adjustment methodologies that resulted in the over-provision of therapy to maximize payment. This point was raised by several TEP members as well. Ratios also increased for the smallest providers, providers with 100 to 199 beds, and rural providers, and decreased for providers with 25 to 99 beds and 200+ beds.

Table 3-20. Payment-to-Cost Ratios by Provider Characteristics in 2020 Using Payment Weights from 2017 to 2019

Provider Characteristic	Payment Weight-to-Cost Ratio: 2020	Payment Weight-to-Cost Ratio: 2017–2019
Overall	1.00	1.00
Provider Type		
IRF	0.93	1.02

Provider Characteristic	Payment Weight-to-Cost Ratio: 2020	Payment Weight-to-Cost Ratio: 2017–2019
SNF	1.03	0.99
HHA	1.06	1.00
LTCH	0.90	1.02
Bed Size		
< 25	0.88	0.95
25–99	0.99	1.02
100–199	1.03	1.01
200 +	0.92	0.95
Ownership		
IRF		
For-Profit	0.98	1.09
Nonprofit	0.86	0.94
Government	0.86	0.92
SNF		
For-Profit	1.03	0.99
Nonprofit	1.03	1.02
Government	0.93	0.89
HHA		
For-Profit	1.07	0.99
Nonprofit	1.04	1.03
Government	0.93	0.91
LTCH		
For-Profit	0.91	1.05
Nonprofit	0.82	0.92
Government	0.87	0.98
Urbanicity		
Rural	1.04	1.00
Urban	0.99	1.00
Census Region		
Northeast	1.03	1.04
Midwest	1.02	1.01
South	0.98	0.97
Pacific	1.01	1.01

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

At the UPCG level, differences in payment-to-cost ratios in 2020 relative to prior years varied. As shown in ***Table 3-21***, the largest decreases in payment-to-cost ratios were observed in "Invasive Ventilator," "Coma," and "Major Joint Replacement (Without Lower Extremity

Fracture),” while the largest increases were observed in “MMTA: Cardiovascular,” “MMTA: Endocrine,” and “Behavioral Health.” Additionally, nearly all payment-to-cost ratios remained within 10% of average costs, with the exception of “Major Joint Replacement without Lower Extremity Fracture” (0.89) and “Coma” (0.87).

Table 3-21. Payment-to-Cost Ratios by UPCG in 2020 Using Payment Weights from 2017 to 2019

UPCG	Payment Weight-to-Cost Ratio: 2020	Payment Weight-to-Cost Ratio: 2017–2019
MMTA: Cardiac	1.06	0.98
MMTA: Endocrine	1.08	0.98
MMTA: Gastrointestinal/Genitourinary	1.04	0.99
MMTA: Infections	1.02	0.99
MMTA: Respiratory	1.05	0.98
MMTA: Surgical Aftercare	1.00	0.99
MMTA: Other	1.05	0.98
Lower Extremity Fracture (Including with Joint Replacement)	1.00	0.99
Major Joint Replacement Without Lower Extremity Fracture	0.89	0.98
Orthopedic Surgery (Not Joint Replacement)	1.02	0.99
Trauma	1.00	0.98
Limb Loss	0.98	1.01
Orthopedic (Other)	1.01	0.98
Stroke	1.02	0.99
Nontraumatic Brain Dysfunction	0.97	1.01
Spinal Dysfunction	0.96	1.01
Traumatic Brain Injury	0.97	1.00
Neurological (Other)	0.99	0.99
Respiratory	1.01	1.02
Cardiovascular	1.05	1.01
Behavioral Health	1.06	0.98
Coma	0.87	0.98
Invasive Ventilator	0.92	1.04
Gastrointestinal & Hepatobiliary	0.99	1.02
Infections	1.01	1.02
Kidney & Urinary	1.04	1.02
Skin	1.00	0.98
Cancer	1.01	1.02
Transplant	0.90	1.01
Hematological	1.04	1.03
Other	0.98	1.00

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Results were similar across deciles of payment weights. As shown in ***Table 3-22,*** the largest decrease in payment-to-cost ratio occurred in the least costly decile, and the largest increase was observed in the 3rd decile. Again, all ratios were within 10% of average costs except for the 4th decile (1.11).

Table 3-22. Payment-to-Cost Ratios by Deciles of Payment Weight in 2020 Using Payment Weights from 2017 to 2019

Deciles of Payment Weight	Payment Weight-to-Cost Ratio: 2020	Payment Weight-to-Cost Ratio: 2017–2019
1st decile	0.94	0.99
2nd decile	1.06	1.01
3rd decile	1.07	1.00
4th decile	1.11	1.04
5th decile	1.00	1.02
6th decile	0.99	0.99
7th decile	1.02	0.98
8th decile	1.01	0.99
9th decile	1.02	0.99
10th decile	0.96	1.01

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2020
RTI Program Reference: UPAC_BS0040

Part 4–Considerations for Implementation

Assumptions and Limitations of the Prototype Design

Our analyses found that the prototype predicted costs of care well across the different UPCGs and PAC providers. From 2017 to 2020, the model explained approximately 48% of variation in costs across the PAC stays examined. This aligns with (or exceeds) levels achieved by existing PAC payment systems (Acumen, 2018; Morley et al., 2019; Plotzke et al., 2018). Although PAC setting type remained a key predictor of costs and model fit was lower when stratifying by PAC setting (ranging from 0.25 in IRF to 0.13 in HHA), model predictions were within 4% of average cost within setting and across most of the key patient and provider subgroups we examined. Additionally, setting-specific model fit and overall predictions are likely to improve as additional standardized data elements are introduced into the PAC admission assessment instruments. In addition, payment weights calibrated using data from 2017 to 2019 still predicted costs in 2020 reasonably well despite the COVID-19 public health emergency (PHE). However, the prototype Unified PAC PPS framework and analyses presented in this report are subject to important assumptions and limitations. In this section, we discuss their implications for potential testing and implementation.

COVID-19 PHE

The COVID-19 pandemic has had an enormous impact on health care systems across the globe. In the United States, health care facilities in general, and nursing homes in particular, were especially hard-hit. As of June 2021, residents and staff of long-term care facilities constituted 5% of total COVID-19 cases in the United States and 31% of deaths (Kaiser Family Foundation, 2021), and there is evidence to suggest that a considerable number of additional deaths went unreported in the early months of the pandemic (Shen et al., 2021). Further, racial and ethnic disparities have been observed in the rates of COVID-19 deaths in nursing homes (Gorges & Konetzka, 2021).

In response to the pandemic, CMS waived many facility regulations (generally known as “conditions of participation”) governing each of the PAC settings as part of the PHE. Almost all of these waivers will expire at the end of the PHE. In April 2022, CMS released a PHE waiver update: https://www.cms.gov/medicareprovider-enrollment-and-certificationsurveycertificationgeninfopolicy-and-memos-states-and/update-covid-19-emergency-declaration-blanket-waivers-specific-providers.

For IRFs, The Coronavirus Aid, Relief, and Economic Security Act (CARES Act) revised the intensity of therapy requirement (“3-hour rule”), which requires an IRF to provide patients with at least 15 hours of therapy per week for the duration of the COVID PHE [§ 3711(a) of the CARES Act]. In addition to implementing this temporary suspension in rulemaking, CMS also provided that IRFs and IRF units could exclude patients who were admitted specifically because of the PHE from their calculation of compliance with the “60 percent rule” [85 FR 27550, 27572-73]. For SNFs, CMS suspended the 3-day prior hospitalization rule pursuant to section 1812(f) of the Social Security Act. Other waivers included the preadmission screening rule and the requirement for physicians and non-physicians to provide in-person visits for SNF residents. For LTCHs, a blanket waiver was issued regarding the 25-day average length of stay when patients are admitted or discharged to meet the demands of the PHE. Site-neutral payment rules for

LTCHs were also suspended under the CARES Act for the duration of the PHE [§ 3711(b)(1) and (2) of the CARES Act]. Several waivers were implemented for HHAs, including allowing for the initial assessment and determination of a patients' homebound status to be conducted either remotely or by record review, extending the comprehensive assessment 5-day completion requirement to 30 days, and narrowing the scope of the Quality Assurance and Performance Improvement program to concentrate on infection control. A complete list of waivers issued for PAC providers under the PHE is posted on the CMS website (CMS, 2021p).

Researchers and policymakers are only beginning to understand the full extent of the impact COVID-19 and the waivers introduced for the PHE had on the U.S. health care system and on PAC providers in particular. As discussed in *Part 3, PAC Landscape and Prototype Impacts*, there were important changes in both the utilization of PAC services and total costs of care in 2020. It remains unclear whether any of these changes to utilization and total costs of care will persist after the PHE. In addition, Technical Expert Panel members expressed concern that care and practice patterns across PAC settings have changed in response to COVID-19.

Because the analyses presented in this report were generated using data largely collected before the COVID-19 pandemic, we cannot be sure how well the prototype will predict costs of care for PAC users after the PHE ends. However, as we show in *Part 3,* the proposed prototype model predicted costs of care for PAC stays in 2020 reasonably well when compared with prior years. Therefore, although the prototype's payment weights will certainly require recalibration and testing and may benefit from further refinement prior to any future implementation, our results suggest that the overall framework for case-mix adjustment may adequately predict costs across the spectrum of PAC patients and levels of care.

No Standardized Item for UPCGs

The foundation of the prototype Unified PAC PPS presented in this report is the UPCGs. These groups represent the first level of clinical classification, and each step of additional case-mix adjustment is done within these groups. However, the process by which we assigned PAC stays to these groups for the prototype draws upon multiple independent sources of information, including prior acute and post-acute claims and PAC admission assessment data. This was possible for retrospective analyses such as the prototype work, but it is not operationally feasible for payment purposes. Although each PAC assessment instrument currently includes items for clinical diagnosis codes, the items are not standardized across PAC providers. We discuss implementing a standardized set of items across each of the PAC assessment instruments that could be used to assign the beneficiary to the appropriate UPCG. In this section, we present a draft of a set of items that could serve this purpose.

The items would need to be designed so they provide the specificity needed to assign PAC patients to the appropriate clinical group with clear instructions about assignment rules. For example, if a patient could be assigned to more than one primary PAC condition (patient requires an invasive ventilator for more than 96 hours and the patients' underlying condition is a respiratory condition), the assignment would be based on the order of the categories (category "condition requiring invasive ventilator for more than 96 hours" would be listed before "respiratory condition"). Furthermore, the data needed to complete the items should be information that would be expected to be documented in patients' medical record and thus could be extracted from existing data.

Table 4-1. Hypothetical Data Element for UPCG Identification

Item	Description
I0010A	**Primary PAC Condition:** Indicate the primary condition category that best describes the reason that the patient is receiving PAC. If more than one condition category applies, enter the first (lower) code that applies.
I0010B	**Etiologic Diagnosis:** Enter between one and three ICD-10 code(s) to indicate the etiologic diagnoses that led to the condition for which the patient is receiving PAC.
I0010B1	
I0010B2	
I0010B3	
I0010C	**MMTA:** Is the PAC primary focused on MMTA? Enter "Y" for Yes and "N" for No.

Table 4-2. Primary PAC Condition Category Codes

Category	Sub-Category	Description
1		MMTA (Home Health)
	1.1	Cardiac or circulatory condition for MMTA
	1.2	Endocrine condition for MMTA
	1.3	Gastrointestinal or genitourinary condition for MMTA
	1.4	Infections for MMTA
	1.5	Respiratory condition for MMTA
	1.6	Surgical aftercare for MMTA
	1.7	Other condition for MMTA
2	2	Behavioral health condition—Assessment, treatment, and evaluation of psychiatric conditions, including substance use disorder (Home Health)
3	3	Condition requiring invasive ventilator > 96 hours
4		Orthopedic conditions
	4.1	Status post–joint replacement without lower extremity fracture
	4.11	Status post–hip replacement
	4.12	Status post–knee replacement
	4.2	Orthopedic surgery (not joint replacement)
	4.3	Lower extremity fracture (including w/ joint replacement)
	4.4	Multiple trauma (without traumatic brain injury or spinal cord injury)
	4.5	Status post–limb loss (not for wound care)
	4.51	Lower extremity limb loss
	4.52	Upper extremity limb loss
	4.6	Other orthopedic
5		Neurological conditions
	5.1	Stroke
	5.2	Brain disorders

Category	Sub-Category	Description
	5.21	Coma (disorders of consciousness)
	5.22	Nontraumatic brain disorder
	5.23	Traumatic brain injury
	5.3	Spinal dysfunction (traumatic and nontraumatic)
	5.31	Nontraumatic spinal disorder
	5.32	Traumatic spinal injury
	5.4	Other neurological
6	6	Respiratory Condition (Not Requiring Ventilator > 96 hours)
7	7	Cardiovascular Conditions
8		Cancer
	8.1	Breast cancer
	8.2	Respiratory cancer
	8.3	Endocrine cancer
	8.4	Gastrointestinal cancer
	8.5	Bone/soft tissue cancer
	8.6	Blood cancer
	8.7	Skin cancer
	8.8	Other cancer
9		Infections
	9.1	HIV/AIDS
	9.2	Viral hepatitis
	9.3	Other
10	10	Septicemia or Severe Sepsis
11	11	Hematological Conditions
12	12	Gastrointestinal and Hepatobiliary Conditions
13		Status Post-Transplant
	13.1	Liver transplant
	13.2	Lung transplant
	13.3	Kidney/pancreas transplant
	13.4	Bone marrow transplant
	13.4	Other transplant
14	14	Kidney and Urinary Conditions
15	15	Skin Conditions
16	16	Other

Limitations of Standardized Data Elements on Assessment Instruments

As noted in our description of the creation of the motor function score, the full set of standardized self-care and mobility data was not available on the OASIS item set until January 2019. Because we did not have all the standardized self-care and mobility data in the 2017 and 2018 data files, we created motor scores with the available HHA-specific data and mapped them to the standardized data for IRFs, SNFs, and LTCHs.

We also noted that the standardized data elements focused on cognitive function, the Brief Interview for Mental Status and the Confusion Assessment Method, and the standardized communication items addressing comprehension and expression were not available on all of the PAC assessment instruments from 2017 through 2020. In 2019, CMS finalized implementation of new assessment instruments to be introduced in October 2020 and January 2021. However, implementation was delayed because of the COVID-19 PHE. In 2021, CMS finalized that the new IRF Version 4.0 and LTCH Version 5.0 assessment instruments will be implemented beginning October 1, 2022, and the new OASIS E will be implemented with episodes of care beginning January 1, 2023 [86 FR 62240-62431].

Cost Report Limitations

The analyses presented in this report and used to develop the prototype Unified PAC PPS use a dependent variable of claim cost derived from Medicare cost reports. The limitations of these cost reports and their use in calculating claim level costs have been well-documented (Coomer et al., 2017); however, absent a viable alternative, they typically serve as the basis for setting payment rates under the Medicare benefit.

A related limitation is that all of the cost report data used for this work were collected in 2017 and adjusted for inflation accordingly. Although this approach allows for a more-consistent comparison across years, it fails to account for potentially important changes in routine costs and cost-to-charge ratios arising from the COVID-19 PHE and the payment system changes in SNF and HHA in 2020. Unfortunately, at the time these analyses were conducted, cost report data from 2020 were not complete enough to be included in our analyses. Future testing or implementation should therefore leverage the latest available cost report data to better understand changes in the underlying costs incurred by PAC providers.

Other Limitations

The analyses presented in this report and used to develop the prototype Unified PAC PPS utilized a 50% random sample of PAC users from each year of data. Independent samples of beneficiaries were identified from each year to assess the consistency of the results. This approach was selected to reduce computational burden while maintaining a valid estimate. However, it does present some limitations. Most notably, it is not possible to consistently track beneficiaries or follow a trajectory of PAC use across years. This is especially challenging in the case of HHA, where care can span multiple episodes. Because we rolled up these sequences of HHA episodes, we were limited to episodes that began after March 1 and ended before October 31 in each year. Future recalibration associated with implementation would benefit from examining 100% of PAC claims and assessment data across years.

Additionally, the PAC setting adjustment factor was included to account for setting-specific differences in costs of care that are independent of patient clinical characteristics and

associated with setting-specific regulations and service offerings. It was not possible to differentiate these factors from potentially unnecessary setting-specific differences in care patterns, so the PAC setting adjustment may inadvertently be adjusting payment on the basis of those differences. However, the PAC setting adjustment was designed to allow for modification over time if the statute and regulations contributing to cost differences are aligned across the different levels of PAC in the future. Such a modification would help reduce the impact of this limitation in the long run. While we may explore ways that the statute and regulations can be aligned, there will be inherent differences that will likely remain. SNF, IRF, and LTCH are facilities, and home health is home-based.

Considerations for Future Testing or Implementation

Reductions and Changes in Framework for Payment

One key aim of the Unified PAC PPS is to implement a framework where PAC is paid for based on patient case mix in a unified approach, minimizing the degree to which payment is dictated by setting-specific factors. However, as discussed in *Post-Acute Care Under the Medicare FFS Benefit* (under *Part 1),* there are important differences between PAC provider types in terms of the regulatory environment in which they operate and the types of services they are required to offer. These differences inevitably translate to differences in costs of care for similar types of patients across settings. In some cases, these differences may be important for ensuring that PAC providers are equipped to safely provide high-quality care to the patients they typically treat. However, there are also some types of patients who could conceivably be cared for by multiple types of PAC providers. For such patients, differences in structural, staffing, and service offering requirements may be contributing to unnecessary variation in costs of care. Other factors may contribute to decisions on care such as caregiver availability and proximity to family.

Although a Unified PAC PPS can help to align payments across PAC settings, care must be taken to ensure quality, safety, and equity for patients and providers alike. As discussed in *Part 2, Building a Prototype Unified PAC PPS*, this was a key reason why the prototype Unified PAC PPS presented in this report adjusts payment based on the relative costliness of the different PAC settings. However, this adjustment was also designed to be easily modified in future years should changes be introduced to unify the payment systems.

In this section, we examine some key differences in these requirements between PAC settings that likely contribute to differences in cost and could potentially be modified to align with a uniform approach to payment. In particular, we explore three options: (1) creating unified beneficiary eligibility criteria for PAC; (2) standardizing staffing and quality reporting requirements by patient needs instead of provider type; and (3) structuring the payment framework around competencies instead of setting type. The waivers under COVID-19 PHE, as discussed for each PAC setting in *Part 1, Introduction and Background,* could provide valuable insight on what could be examined in detail before future testing or implementation of the prototype.

Creating a Unified Beneficiary Eligibility Criteria

Each of the four PAC settings has distinct beneficiary eligibility requirements, generally established by statute. Within a Unified PAC PPS, where clinically similar patients are paid

more-similar rates, beneficiary eligibility requirements could become more-standardized across settings, moving towards more-unified beneficiary eligibility criteria.

Standardizing Quality Reporting Requirements

Patient assessments are required in each of the four PAC settings, and each setting implements its own assessment with items tailored to the patients typically cared for in that setting. Many of the assessment items are standardized across settings, although there are some setting-specific assessment items. Additionally, the frequency of the assessments varies across PAC settings; although all settings conduct assessments at admission and discharge, some have additional reporting requirements.

Items from these patient assessments are used in the prototype Unified PAC PPS, and further standardizing these patient assessments across settings—in terms of both the items they contain and the frequency with which they are collected—would support the aim of establishing a unified payment system across settings.

Structuring the Payment Framework Around Competencies

A unified PAC PPS could allow PAC providers to offer general PAC services as well as options to add specialized services to patients with complex needs based on demonstrated competencies. That is, structuring the payment framework around patient needs related to specific conditions or clinical complexity rather than type of PAC provider. Providers could demonstrate one or more competencies for specialty care (e.g., patients requiring invasive ventilator care, traumatic brain injury, spinal cord injury) and would receive payment under a Unified PAC PPS. This would represent the most-significant departure from how PAC is currently regulated and paid for by Medicare, but would align with the broader unifying PAC goal to pay for care based on patient characteristics, not setting (MedPAC, 2020).

Performance Measurement and Alignment with Existing and Future VBP Programs

Value-based purchasing (VBP) refers to performance-based payment strategies that link financial incentives to providers' performance on a set of specified measures. One type of VBP is pay-for-performance, which refers to a payment arrangement in which providers are penalized (reductions in payments) or rewarded (additions to payments) based on performance on quality measures relative to preestablished targets or benchmarks. The payer identifies a set of objectives and financial incentives intended to influence provider behavior to achieve those objectives. VBP has been incorporated into payment for numerous Medicare services over the past decade. The purpose of VBP programs is to incentivize efficient and high-quality care by realigning payment to reward quality of care rather than quantity of care. VBP programs support CMS's three-part aim of better care for individuals, better care for populations, and lower cost (CMS, 2021l). The hospital VBP program for acute care inpatient hospitals was established in 2013, the SNF VBP Program was established in 2018, and the Home Health VBP demonstration program was established in 2016. In the CY 2022 Home Health Prospective Payment System [86 FR 62240-62431], the Home Health VBP (HHVBP) model was expanded to all Medicare-certified HHAs in the 50 states, territories, and District of Columbia beginning January 1, 2022. CY 2022 is designated as a pre-implementation year, CY 2023 will be the first performance year, and CY 2025 will be the first payment year. The maximum payment adjustment in CY 2025, upward or downward, will be 5 percent. The expanded model would

generally use benchmarks, achievement thresholds, and improvement thresholds based on CY 2019 data to assess achievement or improvement of HHA performance on applicable quality measures. HHAs would compete nationally in their applicable size cohort, smaller-volume HHAs or larger-volume HHAs, as defined by the number of complete unique beneficiary episodes for each HHA in the year before the performance year. All HHAs certified to participate in the Medicare program before January 1, 2022, are required to participate and would be eligible to receive an annual Total Performance Score based on their CY 2023 performance. This information may be updated in the future by CMS.

In constructing the Unified PAC PPS, it is important to consider whether to align existing PAC VBP programs or potentially whether to implement a new PAC VBP tailored to the new unified framework. Although designing such a framework is beyond the scope of this report, in this section, we explore key factors to consider if VBP were to be incorporated into the Unified PAC PPS. Key components for consideration include (1) identifying quality measures and calculation of a Total Performance Score, (2) specifying benchmarks or thresholds, and (3) defining the withhold amount and incentive payments.

We begin by reviewing the existing setting-specific VBP programs and identifying key areas that could inform VBP under the Unified PAC PPS. Each of the existing VBPs uses a different design. **Table 4-3** summarizes the differences in the incentive payments across programs, **Table 4-4** summarizes the differences in the quality measures across programs, and **Table 4-5** provides additional development details.

Table 4-3. Current VBP Programs: Incentive Payment

Setting	Funding	Incentive Payment
Hospital	The program is funded by reducing hospitals' base operating MS-DRG payments by a percentage specified by law (2%).	CMS finalized a linear exchange function to translate Total Performance Scores into value-based incentive payments. Hospital VBP payment adjustments based on performance approximately 2 years prior (varies by measure domain) are applied to the base operating MS-DRG payment amounts for each discharge in a fiscal year.
SNF	The program is funded by reducing the applicable adjusted federal per diem rate by 2%, as required by statute.	The total amount of incentive payments distributed to SNFs is 60 percent of the total amount withheld from SNFs' Medicare payments for that fiscal year. Facilities with SNF VBP performance scores ranked in the lowest 40 percent nationally will receive a payment rate lower than they would otherwise receive without the SNF VBP Program. SNF VBP payment adjustments are applied to the per diem amounts in a fiscal year based on performance two years prior.
Home Health Demonstration (CMS, 2021q)	Maximum payment adjustment of: 3% in 2018 5% in 2019 6% in 2020 7% in 2021 8% in 2022	The HHVBP model is currently implemented in nine states: Arizona, Florida, Iowa, Maryland, Massachusetts, Nebraska, North Carolina, Tennessee, and Washington. CMS finalized the expansion of the HHVBP model to all 50 states, territories, and the District of Columbia beginning January 1, 2022. CY 2022 is designated as a pre-implementation year. CY 2023 will be the first performance year and CY 2025 the first payment year, with a maximum payment adjustment, upward or downward, of 5%.

Source: [86 FR62240-62431, 86 FR 42424-42525, 86 FR44774-45615]

Table 4-4. Fiscal Year (FY) 2021 VBP Programs: Quality Measures

Setting	Quality Measures and Weights for the Total Performance Score
Hospital	Safety: 25% • Catheter-Associated Urinary Tract Infection (CAUTI) • Central Line-Associated Blood Stream Infection (CLABSI) • *Clostridium difficile* Infection (CDI) • Methicillin-Resistant *Staphylococcus aureus* (MRSA) • Surgical site infection—Colon Surgery • Surgical site infection—Abdominal Hysterectomy Clinical Care: 25% • Acute Myocardial Infarction (AMI) 30-Day Mortality Rate (MORT-30-AMI) • Heart Failure (HF) 30-Day Mortality Rate (MORT-30-HF) • Pneumonia (PN) 30-Day Mortality Rate (MORT-30-PN) *updated cohort for FY 2021 • Total Hip Arthroplasty (THA)/Total Knee Arthroplasty Complication Rate (TKA) (COMP-HIP-KNEE) • Chronic Obstructive Pulmonary Disease (COPD) 30-Day Mortality Rate (MORT-30-COPD) Efficiency and Cost Reduction: 25% • Medicare Spending per Beneficiary Person and Community Engagement Domain[1]: 25% • Communication with Nurses • Communication with Doctors • Responsiveness of Hospital Staff • Communication about Medicines • Cleanliness and Quietness of Hospital Environment • Discharge Information • Overall Rating of Hospital • Care Transition
SNF	SNF 30-Day All-Cause Readmission Measure rates.
Home Health Demon-stration	Home Health Consumer Assessment Healthcare Providers and Systems Survey measures • Emergency Department Use without Hospitalization • Acute Care Hospitalization During the First 60 Days of Home Health Use • Total Normalized Composite Change in Mobility/Total Normalized Composite Mobility • Total Normalized Composite Change in Self-Care/Total Normalized Composite Self-Care • Improvement in Dyspnea • Improvement in Management of Oral Medications • Discharged to Community

[1] Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Dimensions

Notes: Because of the COVID-19 PHE, the FY 2022 revised performance period for SNF readmission measure calculations will include data from April 1, 2019, through December 31, 2019, and July 1, 2020, through September 30, 2020. Eligible SNF stays with admissions during this revised 12-month period will be included for the FY 2022 SNF VBP Program.

Under the Consolidated Appropriations Act, 2021, the Secretary may apply additional measures (up to 10 measures) under the SNF VBP Program, beginning October 1, 2023. These may include measures of functional status, patient safety, care coordination, or patient experience.

Source: [86 FR 62240-62431, 86 FR 42424-42525, 86 FR44774-45615]

Table 4-5. Value-Based Purchasing Programs

Program	Start of Program	How Were Quality Measures Selected?	Impact on Providers	Impact on Beneficiaries
Hospital VBP	Fiscal Year (FY) 2013	Adopted National Quality Forum (NQF)–endorsed measures that were first specified under the Hospital Inpatient Quality Reporting Program.	In FY 2020, more than 55% of participants, about 1,500 hospitals, received positive payment adjustments. Average net increase is 0.60%, and average net decrease is −0.39%.	0.4% increase in average Total Performance Score for hospitals from FY 2019 to FY 2020.
SNF VBP	FY 2019	The Protecting Access to Medicare Act of 2014 specified the adoption of an all-cause readmission measure and a potentially preventable readmission measure. Initially adopted the NQF-endorsed SNF 30-Day All-Cause Readmission Measure and developed the SNF Potentially Preventable Readmission measure. Both were designed to harmonize and align with CMS's Hospital Wide All-Cause Unplanned Readmission Measure. The Consolidated Appropriations Act, 2021, included a provision to allow the use of up to 10 measures in the SNF VBP. CMS issued rulemaking and solicited comments on particular measures that could be used to expand the program.	In FY 2021, 9,298 (62.6%) of SNFs received an incentive payment multiplier. Approximately $320.4 million was returned to SNFs, plus a low-volume adjustment of $8.1 million (Andersen et al., 2020; Daras et al., 2021; Hefele et al., 2019; Qi et al., 2020; Sharma et al., 2020; Sharma et al., 2021).	

Program	Start of Program	How Were Quality Measures Selected?	Impact on Providers	Impact on Beneficiaries
HHVBP demonstration	Calendar Year (CY) 2016	Selected a broad range of measures that capture the complexity of HHA services; balance patient experience, process, and outcome measures; and incorporate flexibility for future inclusion of the IMPACT Act.	Among the 2,035 HHVBP agencies with at least one Medicare claims-based or OASIS-based home health episode in CY 2017, 1,616 (79%) were eligible to receive a payment adjustment to their FFS claims in CY 2019. The average and median payment adjustment across HHAs was -0.118% and -0.09%, respectively, and ranged from -5% to 4.96%. Among the 1,616 HHAs with an adjustment, 28.7% had adjustments between -5% and -1%, 23.7% had adjustment between -1 and 0%, 24.3% had adjustments between 0 and 1%, and 23.3% had adjustments between 1% and 5% (Arbor Research Collaborative for Health & L&M Policy Research, 2020).	Total Performance Scores were 4% higher among HHAs in HHVBP states than HHAs in non-HHVBP states in 2018. There were somewhat greater gains in functional improvement among home health patients in HHVBP states for most measures tested. Unplanned hospitalizations and SNF use declined among FFS beneficiaries receiving home health care. Emergency department use among FFS beneficiaries receiving home health care was somewhat greater. There was no measurable impact of HHVBP on patient experience with care, the use of home health services among Medicare FFS beneficiaries, or the overall case mix of home health patients. There was a decline in total Medicare spending in HHVBP states during and 30 days after home health episodes of care, as measured by the average spending per day among FFS beneficiaries receiving home health services (Arbor Research Collaborative for Health & L&M Policy Research, 2020; CMS, 2021m).

Notes: Because of the COVID-19 PHE, the Centers for Medicare & Medicaid Services (CMS) has given providers in value-based purchasing (VBP) programs the option to submit data from the fourth quarter of 2019 (October—December) and the first two quarters of 2020 (January–March, April—June). Moreover, claims between January 1, 2020, and June 30, 2020, will be excluded in calculating performance in VBP programs.

With regard to a VBP program, each component has complexities that would need to be considered. For example, it is important to consider the potential for both achievement and improvement as well as funding and incentives when selecting quality measures. Each of these considerations is explained in detail below and would be guided by the goals of a PAC VBP program.

Selecting Quality Measures: Ongoing monitoring of quality of care under a Unified PAC PPS will be important to prevent access barriers and ensure provision of needed care, but it will also be important to consider ways to incentivize quality and efficiency more broadly across PAC settings. The quality reporting programs across the PAC settings have expanded over the last several years and include quality measures focused on health care-acquired pressure ulcers/injuries, falls with a major injury, successful discharge to community, self-care and mobility functional outcomes, and Medicare spending per beneficiary. ***Appendix M*** lists the existing quality measures for the SNF, HHA, IRF, and LTCH quality reporting programs. Many of these quality measures were developed to be aligned across settings but use setting-specific data. For some, the lack of standardized data across settings has led to the specifications varying across settings. Additional considerations may include exploration of a unified VBP or setting-specific VBP programs. For example, exploration to determine to what extent the quality measures and calculation of measures would be consistent across PAC providers, or setting-specific. Each setting currently has quality measures that are important to patient outcomes in that particular setting but may not be relevant in the other settings.

Existing VBP programs include a variety of performance measures, including measures of clinical process, intermediate outcomes, patient safety, patient experience, outcomes (e.g., readmissions, mortality, complications, total cost of care), and structures (e.g., health information technology [HIT] adoption). A PAC VBP program could have measures that are specific to each facility type, measures that are fully aligned across PAC settings, or a combination. Any PAC VBP program that may be considered should have a portfolio of performance measures addressing a range of quality domains, including patient experience and cost measures, and considering structures, processes, and outcomes. With multiple performance measures, the importance of each measure or each domain should be considered so that performance measure scores can be weighted when calculating a Total Performance Score.

Benchmarks/Thresholds: An important design element of any VBP program is the performance benchmarks or thresholds that are used to determine who will receive an incentive payment. They can be absolute, fixed benchmarks or relative benchmarks (e.g., provider's performance must be in the top 30th percentile of performance). Some VBP programs reward providers for attaining specific benchmarks, improving over time, or a combination of attainment and improvement.

Funding and Types and Amount of Incentives: CMS pay-for-performance programs are funded by withholding a small portion (i.e., 2%) of payments. Providers can earn incentives based on performance scores that meet or exceed benchmarks of established thresholds. The frequency (e.g., annual) and magnitude of the incentives in any new program would need to be specified.

The development of a PAC VBP would benefit from engagement with affected stakeholders, including providers and beneficiaries, who could provide feedback about the design of the program and about recommending and choosing performance measures.

Since 2019, MedPAC has discussed potential features of a Value Incentive Program for PAC. They recommended a uniform Value Incentive Program for all PAC providers when a PAC PPS is implemented. They recommended the program incorporate a small number of risk-adjusted, claims-based measures (all-condition hospitalization within the PAC stay, successful discharge to the community, Medicare spending per beneficiary) (Tabor & Carter, 2019). The program would pool data over multiple years to ensure that the measure scores were reliable for low-volume providers and could include as many providers as possible. To address social risk factors, providers with similar shares of dual-eligible beneficiaries would be compared to determine the providers' reward or penalty (i.e., comparisons among peer providers). MedPAC recommended that the program score performance using an absolute, prospectively set target and a 5% withhold that would fund the incentive payments. Finally, they recommended that the initial overall composite performance score be setting-specific, recognizing the variations in length of stay, conditions of participation, and share of dual-eligible beneficiaries. These considerations will be of particular importance, as the Consolidated Appropriations Act of 2021 (Division CC, section 111(b) of P.L. 116-260) required MedPAC to submit a report to Congress on establishing a prototype VBP program under a unified PPS for PAC providers. This report was published in March 2022 (MedPAC, 2022).

A Unified Approach to Beneficiary Cost-Sharing

Cost-sharing is an important element of any payment system. Effective cost-sharing rules help protect Medicare and other payers against unnecessary utilization without creating undue access barriers for beneficiaries requiring care. Existing PAC payment systems differ significantly in cost-sharing policies. Aligned cost-sharing may reduce the role of potential out-of-pocket spending on choice of PAC setting. Therefore, a Unified PAC PPS will require consideration of cost-sharing rules applied across all PAC settings. In this section, we describe the existing cost-sharing requirements for each of the PAC settings and review publicly available information on total cost-sharing paid across those settings. We then outline potential approaches to cost-sharing that could be included in the prototype Unified PAC PPS, including discussion of the incentives, advantages, and disadvantages of each approach.

Existing Cost-Sharing Requirements: Deductibles

Deductibles are fixed amounts that a beneficiary must pay before Medicare pays for care. Unlike co-payments, which accrue as utilization increases, deductibles apply at the start of care and therefore affect all users. IRFs and LTCHs are classified as hospitals, so their patients are subject to the Part A deductible. However, the inpatient deductible is applied per benefit period (i.e., "spell of illness"), which includes any acute inpatient hospitalization discharged within 60 calendar days of the PAC stay [§ 1813(a) of the Act]. Only those IRF and LTCH stays not preceded by an acute inpatient admission (i.e., community entrants) are subject to the Part A deductible. These deductibles constituted less than 7% of out-of-pocket expenses for the PAC stays we examined from 2017 to 2019. There are no deductibles applied to SNF stays or care provided by HHAs.

Existing Cost-Sharing Requirements: Co-payments

Co-payments are fixed dollar amounts paid by the beneficiary for a service or unit of service (e.g., a day of care). Daily co-payments may be applied to care provided by SNFs, IRFs, and

LTCHs, though the point at which the cost-sharing begins varies by setting [§ 1813(a) of the Act]. For the first 20 days of each SNF stay, the beneficiary incurs no co-payment costs. Beginning on day 21, there is a daily co-payment ($194.50 in 2022), which continues until the end of the benefit period (100 days in total), after which beneficiaries are responsible for 100% of the cost of care. Patients in IRFs and LTCHs incur no cost-sharing for the first 60 days of the stay. Beginning on day 61 through the end of the benefit period (90 days in total), the beneficiary pays a daily co-payment ($389 in 2022). At the end of the inpatient benefit period, patients may elect to draw upon an additional 60 one-time use "lifetime reserve days" at a higher daily co-payment ($778 in 2022). Once "lifetime reserve days" have been exhausted, beneficiaries are responsible for 100% of the cost of care in the IRF and LTCH settings. HHA services do not have any co-payment requirements, although any covered durable medical equipment, disposable negative pressure wound therapy, and a covered osteoporosis drug are subject to a 20% coinsurance under Medicare Part B and a covered osteoporosis drug is subject to the Part B deductible (42 CFR 409.50 and 1833(a)(2)(F), 1833(b)(2)).

Coinsurance, similar to co-payments, is a type of payment made by the beneficiary in addition to the payment from Medicare. However, rather than a fixed dollar amount, coinsurance is typically a fixed percentage of the total payment for services furnished. Because of this, coinsurance payments, even with the same percentage applied across setting, will vary by setting and intensity of care. Coinsurance is not currently used in any PAC setting except for certain services under the home health benefit as noted above. It could result in significantly more financial responsibility to beneficiaries for patients in need of more-intensive services than the current daily co-payment structure.

Cost-Sharing Across PAC Settings

To better understand cost-sharing across the PAC settings, we examined deductibles and daily co-payment amounts from the claims used in developing the prototype. We describe the results of this analysis in this section.

Because beneficiaries receiving care from HHAs do not generally incur cost-sharing under Part A or Part B, results presented are limited to institutional PAC settings. As shown in ***Table 4-6***, SNF beneficiaries incurred 93% of the total cost-sharing expenses for PAC in our samples of beneficiaries from 2017 through 2019. They were also responsible for 95% of the daily co-payments, which was expected, given that SNFs are not subject to the Part A deductible but have a greater proportion of the stay potentially subject to the daily co-payment. IRF stays, in contrast, generated less than 3% of total cost-sharing paid in from 2017 to 2019, but 91% of the out-of-pocket costs associated with the Part A deductible and only 1% of the co-payments. The remaining approximately 4% of cost-sharing was attributable to LTCH stays, which constituted 9% of deductible costs and 4% of co-payments.

Table 4-6. Percentage of Total Cost-Sharing Dollars Paid by Medicare Beneficiaries for PAC Services, 2017 to 2019

PAC Setting	Deductible	Co-payments	Total Cost-Sharing
IRF	90.9%	1.1%	2.6%
SNF	0.0%	94.9%	93.3%
HHA	0.0%	0.0%	0.0%

PAC Setting	Deductible	Co-payments	Total Cost-Sharing
LTCH Overall	9.1%	4.0%	4.1%
LTCH	2.4%	3.0%	3.0%
LTCH-SN	6.7%	1.0%	1.1%

Source: RTI International Analysis of Medicare Claims and Administrative Data, 2017 to 2019
RTI Program Reference: UPAC_BS0030

Policy Considerations for Cost-Sharing Under a Unified PAC PPS

The significant differences in co-payments that currently exist across PAC settings, the higher probability of beneficiary liability in SNFs, and the potential disparate impact of these co-payments for patients who do not have other sources of coverage (e.g., Medigap policies) all highlight the importance of careful consideration of options for cost-sharing in a Unified PAC PPS. In this section, we begin with a general discussion of the advantages and disadvantages of cost-sharing for Medicare-covered PAC. We then discuss several approaches to cost-sharing as part of a Unified PAC PPS: (1) co-payments, (2) coinsurance, (3) deductibles, and (4) coverage limits.

Cost-sharing is an important tool that payers use to reduce potentially unnecessary health care spending. Thoughtful implementation of cost-sharing and alignment of these policies across the four PAC settings could minimize unnecessary utilization while ensuring beneficiary access to the level of care most appropriate for their needs. However, cost-sharing can also introduce barriers to access if not properly balanced with patient needs and overall affordability. About 80% of beneficiaries enrolled in traditional Medicare in 2018 had some form of supplemental coverage potentially insulating them from cost-sharing liabilities, and the remaining 20% are more likely to be lower-income and more susceptible to cost-related access barriers (Koma et al., 2021). In addition, beneficiaries are often not aware of their cost-sharing responsibilities for services like PAC in advance. The disparate cost-sharing rules across the PAC settings make them especially difficult for beneficiaries to understand, and it is not clear the extent to which these liabilities may influence their decision-making.

Currently, beneficiaries receiving PAC can receive up to 60 days in an IRF or LTCH without daily co-payments, but only 20 days in a typically less-costly SNF. This difference stems from the fact that IRFs and LTCHs are classified as hospitals, whereas SNFs are separately defined in the statutes governing how they're paid. Although SNF stays are not subject to the Part A deductible like IRFs and LTCHs, they must be preceded by an acute inpatient stay lasting at least 3 days, which would almost certainly satisfy the Part A deductible regardless. As prior work has shown, beneficiary choice of PAC setting is more often driven by factors such as location, proximity, and availability rather than anticipated out-of-pocket cost (Balentine et al., 2018; Burke et al., 2018; Gadzinski et al., 2014; Konetzka et al., 2018; Krishnan et al., 2019; Makam & Grabowski, 2021).

These factors present a compelling argument for not including additional beneficiary cost-sharing in the Unified PAC PPS, or at least tying it to any prior acute utilization, as is done for IRF and LTCH. If the purpose of cost-sharing is to minimize unnecessary utilization, costs that (1) beneficiaries are often unaware of until after the service has been rendered, (2) are often covered by a secondary payer, and (3) are typically not key drivers of utilization would not seem

to be particularly effective. Although simplifying and standardizing cost-sharing across PAC settings in a unified framework may improve beneficiary understanding and awareness, it would also likely impose new cost-sharing on a setting where there previously was none (HHA), increasing costs to patients and potentially introducing access barriers. In a 2019 presentation, MedPAC reported that current aggregate PAC cost-sharing is approximately 9% of PAC Medicare Part A spending (Carter & Soucie, 2019). This could serve as a starting point for examining co-payment options to establish a budget-neutral impact on Medicare expenditures.

Co-payments. Currently, co-payments may be required for stays in IRFs, SNFs, and LTCHs, depending on the length of stay (see *Part 1, Introduction and Background*). No PAC stays require co-payments at the outset of care, and co-payments are not required for care provided by an HHA.

Whether co-payments should be the same for each PAC setting: Currently co-payments differ for the PAC settings. An approach that could incentivize lower cost settings is to charge a lower co-payment for those settings. However, charging a higher co-payment for higher-cost settings could lead to access barriers for some sicker patients for whom more-intensive care is medically necessary.

At what point co-payments should begin: Currently, co-payments do not begin in any PAC setting until a specified number of days after care begins. The exact number of days varies by PAC setting, and factors such as typical length of stay for different types of patients should be carefully considered to ensure patients are not penalized for obtaining necessary care. For a unified PAC PPS, an approach could be to progressively increase cost-sharing with length of stay. However, this too risks creating access barriers for the sickest patients, whose length of stay may be out of their control.

Whether co-payments should apply to individual stays or a broader trajectory of care: Currently, co-payments for SNF stays are based on individual stays, whereas IRF and LTCH co-payments are based on total utilization during a "spell of illness" benefit period that typically includes a prior acute stay. Although the length of the prior acute day is often relatively short, such a change could have important implications for beneficiaries who receive care from multiple PAC settings during a benefit period. If the aim of co-payments is to minimize overuse, care should be taken to ensure that significant beneficiary liabilities do not accrue before needed care is received.

Deductibles. Under current Medicare policy, a deductible is applied to each "spell of illness" benefit period for hospital care and applies to IRF and LTCH stays where the deductible is not satisfied by a prior acute admission. As discussed in *Part 3, PAC Landscape and Prototype Impacts,* 13.7% of IRF stays and 7.3% of LTCH stays in 2019 had no prior acute stay within 90 days and would therefore be subject to the Part A deductible. SNF stays and HHA care in general are not subject to the Part A or Part B deductible. If a deductible were applied to SNF stays, it is unlikely to affect many stays, as they must be preceded by a qualifying 3-day inpatient stay. However, this requirement has been suspended under the COVID-19 PHE and for participants in certain Advanced Alternative Payment Models (Medicare Shared Savings Program, 2021). If a deductible were selected for inclusion in the Unified PAC PPS, the following factors should be considered when balancing unnecessary utilization with affordability and access:

Whether the deductible would be the same for each PAC setting: As with co-payments, the size of the deductible could be applied to different levels of PAC in a way that reflects the relative costliness of those settings and to incentivize lower-cost care.

Whether a deductible should apply to individual stays or a broader trajectory of care: As previously discussed, the Part A deductible as currently applied does not affect PAC preceded by an acute inpatient stay because that stay typically satisfies the deductible (and because the deductible is not applied to SNF stays or HHA episodes more generally). This approach is reasonable and avoids beneficiaries being effectively charged twice for the same overall course of treatment. Should a deductible be applied across PAC settings, a similar approach could be taken to cover all PAC utilization with a preceding acute inpatient stay for a specified benefit period with a single deductible. However, approximately 38.3% of HHA sequences in our data were community entrants, and a deductible associated with this level of care could present a significant access barrier for such patients.

The existing coverage limit for SNF stays is 100 days, whereas IRF and LTCH stays are limited to 90 days with the option of drawing on an additional 50 lifetime reserve days. There is no coverage limit for home health care, but providers must recertify beneficiary eligibility every 60 days. Should a similar policy be desirable under the Unified PAC PPS, it will be important to examine the distribution of length of stay across different clinical conditions.

These policy options are not mutually exclusive, and different combinations may be part of a Unified PAC PPS. For example, a single deductible could be applied to an overall benefit period lasting no more than 100 days that begins with an acute inpatient stay, with co-payments beginning after a specified number of days for IRF, SNF, and LTCH, but not HHA. This would largely resemble the existing cost-sharing rules but would standardize them under a single framework. It would also ensure a maximum out-of-pocket liability for beneficiaries receiving PAC for a given benefit period, although additional consideration should be given to whether annual or lifetime out-of-pocket spending limits are warranted.

Health IT Integration and Value of Hospitals Collecting Data at Discharge

The IMPACT Act includes language requiring this report to review the value of acute care hospitals [42 USC § 1395ww(d)(1)(B) and 42 USC § 1395ww(d)(1)(B)(v)] and critical access hospitals [42 USC § 1395i–4(c)(2)(B)] collecting and reporting standardized data. In this section, we review the current status of acute care and critical access hospital data collection, the potential value of hospital data collection and reporting (i.e., submission), and considerations to help facilitate the collection and submission of these data.

The Unified PAC PPS prototype relies on information collected by PAC providers or available to PAC providers at admission to the PAC setting. Many patients admitted to PAC have been recently discharged from an acute care or critical access hospital. For patients with a prior acute hospitalization, data collected during a patient's hospital stay may provide additional information on patients' characteristics, initial recovery trajectory, and clinical status as they enter PAC. However, this information is not collected in a uniform manner across acute care providers and is often not readily available to PAC providers upon admission to the PAC setting. Examples of the type of data typically collected includes history of the present illness, medical and surgical procedures with results, known allergies, medications, vital signs, advance directives, co-existing conditions, and social determinants of health (education, housing, employment).

Hospital staff gather this information from clinical assessments, laboratory results, and patient interviews and document it in medical records during hospital stays and at hospital discharge. However, documentation of this information is not standardized, and submission of data is not required by the Medicare program.

The IMPACT Act requires the collection of standardized assessment data across PAC providers, but this requirement did not extend to acute care or critical access hospitals. Standardized data collection and submission of data to CMS at acute care hospital discharge has been tested in the past. For example, data collection with submission to CMS at hospital discharge was tested as part of the PAC Payment Reform Demonstration (CMS, 2021d). Items tested in that data collection effort included allergies, pressure ulcer/injury data, mobility and self-care function, instrumental activities of daily living, cognition, caregiver availability, and caregiver abilities. Some items tested under the PAC Payment Reform Demonstration were also incorporated into the B-CARE assessment (CMS, 2021d), which was developed as a streamlined set of standardized items considered for use within the Bundled Payment for Care Improvement Initiative, including at acute care hospitals. However, B-CARE ultimately was not used in the initiative because of considerations about data collection logistics and burden.

Though acute care and critical access hospitals may have their own data collection and documentation policies and procedures, with the exception of billing claims, there is currently no system in place for them to submit acute care clinical and other data to CMS. However, the submission of assessment data to CMS has been established for all PAC providers, two of which are licensed as hospitals (LTCH and IRF).

Though electronic health records (EHRs) are not necessary for data submission to CMS, the presence of electronic data collection infrastructure could decrease burden and help facilitate data submission and other types of data exchange. More than 95 percent of acute hospitals have EHRs (Parasrampuria & Henry, 2019), and almost half of hospitals engage in all domains of interoperability (electronically find, send, receive, and integrate data) (Pylypchuk et al., 2020), indicating the potential to build upon existing provider infrastructure to support data submission in the future. Although PAC settings not included in EHR incentive programs, EHR adoption in PAC settings is increasing. According to the Office of the National Coordinator (Henry et al., 2018), in 2017, 78% of HHAs and 66% of SNFs had adopted EHRs. However, key indicators of interoperability (electronically find, send, receive, and integrate data) remain low in PAC settings, though data submission to CMS is required.

Potential Value of Hospital Data Available at Discharge

There are several areas of potential value in the availability of hospital data at hospital discharge. Standardizing data collection in the hospital setting would allow providers to assess patients and document findings using a uniform approach, which could help clinicians when considering discharge options and support communication across acute and PAC providers. These data could help support patient safety and quality of care, advance equity, and encourage a person-centered approach to care with strengthened communication starting at hospital discharge.

Data from the prior hospital stay could also be used to inform a Unified PAC PPS. The prototype presented in this report relies primarily on data collected upon admission to the PAC setting. If clinical data collected at hospital discharge were to become available in the future, it could be tested for inclusion in the case-mix adjustment framework for the Unified PAC PPS. For

example, acute care hospitals could provide data about the primary medical condition and comorbidities. Although not all beneficiaries using PAC have a prior acute hospitalization, for those that do, incorporating data from the acute hospital stay into the case-mix adjustment could be extremely valuable and may improve the overall explanatory power of the model. Furthermore, data available at hospital discharge could be incorporated into quality measures for the hospital quality reporting program and inform the hospital VBP program. Additionally, there has been an increased focus on value between acute hospitals and PAC settings, and having standardized information at hospital discharge in addition to admission to the PAC settings could help facilitate clinical integration between acute hospitals and PAC providers.

The IMPACT Act required the collection of standardized data across PAC providers, but this did not extend to acute care hospitals. Standardized data collection at hospital discharge has been tested in the past. For example, collection at hospital discharge was tested as part of the CMS Post-Acute Care Payment Reform Demonstration (PAC PRD).

Though acute care hospitals may have their own discharge assessment and data collection processes in place, there is currently no requirement to submit standardized patient assessment data to CMS. A future approach would require exploration of benefits, costs, and burden.

Considerations to Facilitate Collection and Submission

Over the last several years, there has been significant focus on moving the IT infrastructure forward for acute care hospitals and PAC providers. Though PAC providers have lower use of EHRs than acute care hospitals, the Medicare program requires that all PAC providers collect and submit assessment data to CMS. PAC providers submit data to CMS using the Internet Quality Improvement and Evaluation System (iQIES). This system is internet-facing and cloud-based and is built to be reliable, intuitive, secure, and accessible to all providers (CMS, 2021r).

The iQIES infrastructure could support data submission for acute hospitals in addition to PAC providers. The availability of data in existing EHRs in acute care hospitals may reduce the potential burden of data collection and submission if it is possible to build linkages between data in existing EHRs and the iQIES system. Work is underway to represent the CMS assessment instruments using standardized terminologies that can be exchanged using the Health Level Seven International (HL7) Fast Healthcare Interoperability Resources (FHIR) standard. iQIES is testing use of FHIR for submission of assessments. It may also be possible to learn from the procedures and infrastructure (e.g., data submission software) that LTCHs have put into place over the last several years as they have adapted to new requirements for mandatory data submission at admission and discharge.

The CMS Data Element Library, the centralized resource for CMS assessment instrument data elements and their associated HIT standards, may also help in the acute hospital context. The Data Element Library is the resource that supports interoperability of CMS assessment content. These mappings meet acceptable HIT standards, such as Logical Observation Identifiers Names and Codes, and have been developed with the goal of use within PAC EHRs or vendor systems. These data elements with HIT standards could potentially be transferrable to the acute hospital context. These interoperable data elements can reduce provider burden by allowing the) use and exchange of health care data and can support provider exchange of electronic health information for care coordination; person-centered care; and real-time, data-driven clinical decision-making.

With the potential submission of data from acute care hospitals and PAC providers, it is also possible to consider ways to facilitate information sharing across acute and PAC providers as beneficiaries transfer across settings. Information sharing may be feasible within the iQIES system, as the building blocks of such a system are currently under development. Such sharing would significantly improve provider communication and beneficiary-centered care.

CMS, specifically the Division of Post- Acute Care (DCPAC) and the Mitre Corporation, established the Post-Acute Care Interoperability Workgroup (PACIO) to facilitate collaboration among interested parties. The objectives of PACIO are to advance interoperable health data exchange between PAC and other providers, patients, and key stakeholders across health care and to promote health data exchange in collaboration with policy makers, standards organizations, and industry through a consensus-based, case-driven approach. The overall goal of the PACIO Project is to gain industry adoption by establishing a framework for the development of FHIR implementation guides and reference implementations that will facilitate health data exchange through standards-based application programming interfaces.

The PACIO workgroup has developed implementation guides (IGs) for the motor functional status and cognitive status data elements using patient assessment data derived from the MDS, IRF–PAI, LCDS, OASIS, and other sources. Additional implementation guides focused on Advance Directives and Re-Assessment Timepoints are currently in ballot while Quality Measures and SPLASCH (Speech, Language, Swallowing Cognitive communication and Hearing) implementation guides are under development. The assessment content in the IGs for motor function and cognition are being used in multiple FHIR initiatives including an eCare Plan FHIR app and eLTSS initiative with Medicaid providers and states.

Recent Relevant Regulations

Since 2019, several relevant regulations have been finalized related to discharge planning, interoperability, and electronic patient event notifications.

With regard to discharge planning, in September 2019, CMS finalized revisions to the requirements that hospitals, HHAs, and critical access hospitals must conform to in order to participate in the Medicare and Medicaid programs (i.e., the Conditions of Participation). Specifically, the Discharge Planning final rule [84 FR 51836] implemented the discharge planning requirements mandated by the IMPACT Act by modifying the Conditions of Participation for acute care hospitals, IRFs, LTCHs, psychiatric hospitals, children's hospitals, cancer hospitals, and critical access hospitals. The rule also modifies discharge planning requirements for HHAs.

Although the final rule did not include a requirement to collect standardized patient assessment data, it did revise the discharge planning process requirement, which requires hospitals to transfer necessary medical information, at the time of discharge, to patients or the subsequent care settings. CMS noted that they believe that hospitals and critical access hospitals should be required to send certain necessary medical information to a receiving facility upon a patient's transfer but recognized that mandating specific data elements may be burdensome to providers. CMS expects facilities to send certain necessary medical information that is critical to the care of the patient and pertinent to the patient's specific medical status at the time of discharge, and that facilities should have discretion to send the most-relevant information within the required necessary medical information, consistent with ''clinical relevance,'' as defined in the Medicare

and Medicaid Electronic Health Record Incentive Program final rule (80 FR 62761, October 16, 2015) (‘‘2015 Meaningful Use Rule’’).

The May 2020 CMS Interoperability and Patient Access final rule [85 FR 25510] built on the Discharge Planning final rule by modifying Conditions of Participation requiring hospitals, including psychiatric hospitals and critical access hospitals, to send electronic patient event notifications of a patient's admission, discharge, and/or transfer to another health care facility or to another community provider or practitioner.

In the 21st Century Cures Act final rule [85 FR 25642], published in May 2020, the Department of Health and Human Services finalized content and vocabulary standards for payers and developers to use, including the *United States Core Data for Interoperability (USCDI), July 2021, Version 2 (v2)* (HealthIT.gov, n.d.-b). The USCDI is a standardized set of health data classes and component data elements for nationwide, interoperable health information exchange.

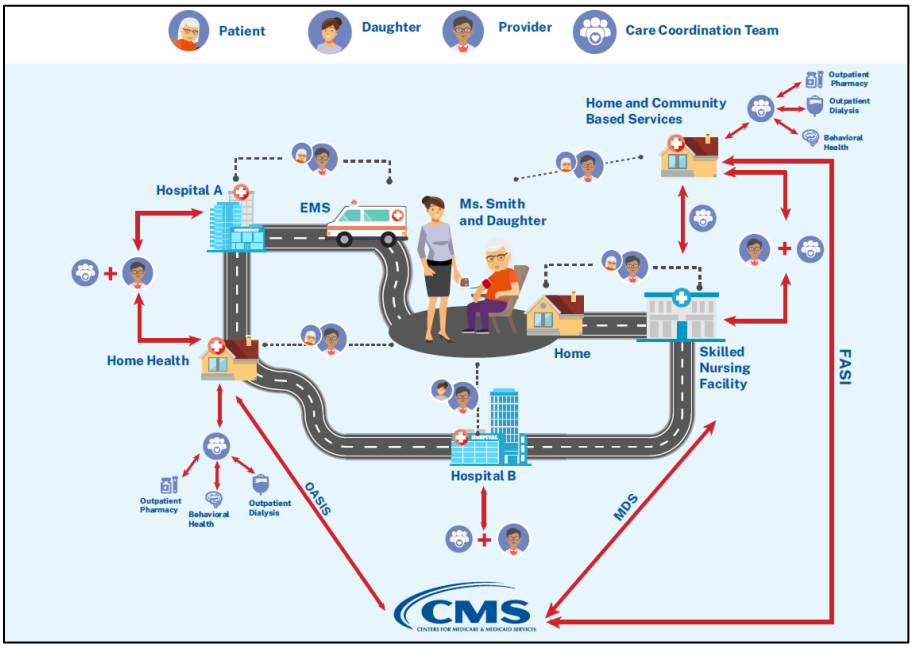
The USCDI sets a foundation for broader sharing of electronic health information to support patient care. The USCDI standard will follow the Standards Version Advancement Process (HealthIT.gov, n.d.-a) described in the Cures final rule to allow HIT developers to update their systems to a newer version of USCDI and provide these updates to their customers.

The Potential Role of Patient Navigators

The care trajectory for an individual beneficiary can be complicated. Many beneficiaries receive PAC services from more than one provider in their care trajectory. For example, of beneficiaries discharged to a SNF after an acute hospitalization in 2017, 63.1 percent go on to use another acute or PAC service within 90 days, and of beneficiaries discharged to an IRF, 79.1 percent use another acute or PAC service within 90 days (data not shown). Transitions of care can present significant challenges for both beneficiaries and providers, as they involve the transfer of information between patients, caregivers, and providers, which can be complex (**Figure 4-1**)

Because beneficiary centeredness is an important goal of high-quality care delivery, it is important to consider ways we can ease the challenges of care transitions in the context of the Unified PAC PPS. Technical expert panel members informing the development of the Unified PAC PPS prototype have noted the importance of patient and family education and discharge planning guidelines in successful transitions.

Figure 4-1. Patient Pathways in Acute Care and PAC



Source: CMS

An idea that was discussed at panel meetings during the prototype development is the potential role for a patient navigator. Goals for such a role could include providing additional patient and family education regarding transitions of care and ensuring the transfer of relevant information across providers. This role would primarily focus on handoffs at admission and discharge. Facilitating smoother transitions and improving patient and family education at discharge would support a beneficiary-centered approach to care, help ensure health equity, and could be valuable for beneficiaries and for the Medicare program. For example, by ensuring smoother transitions in care, it may be possible to reduce complications or hospital readmissions.

The concept of the navigator was discussed at a technical expert panel. Panelists were generally supportive of the idea and of strengthening the roles of providers in patient education and discharge planning. Panelists noted that greater provider engagement and incentive alignment across settings would better support patient safety and patient outcomes. Several panel members suggested that the role cover a patient's overall course of treatment, and not just transition periods, noting the value of maintaining a line of communication among providers throughout a beneficiary's trajectory of care. For example, one panelist highlighted the positive impact that navigators had on the patient experience in bunded payment models. Panel members also found that navigators were most useful "on-the-ground," in hospital settings, where they could directly communicate with the patient and family.

In thinking about how to operationalize this role in the context of a PAC PPS, several questions need to be considered. For instance, what type of clinician could provide patient navigator services, and how might the provision of these services relate to provider conditions of participation and larger PAC payment reform as well as Medicare payment for these services? Other considerations include organizational relationships between providers, administrative burden, and interoperability between settings to support information transfer.

Part 5–Conclusions

Unifying Medicare's payment systems across the four key types of PAC providers while still capturing important differences in the types of patients they care for and the regulatory environment in which they operate is challenging. In this report, we present a prototype for a Unified PAC PPS that aims to achieve this goal, as called for in the IMPACT Act. The proposed framework applies a uniform approach to case-mix adjustment across all beneficiaries receiving PAC for different types of PAC providers while accounting for factors independent of patient need that are important drivers of cost across PAC settings.

Our results indicate that the prototype Unified PAC PPS presented in this report could achieve the goal of a unified approach to payment for PAC in the future. However, several key steps will need to be taken before any future testing or implementation can begin.

Part 6–Recommendations for Legislative Action

This report does not include legislative recommendations, as additional analyses would need to be done prior to testing or implementation of a Unified PAC payment system. We note that universal implementation of a Unified PAC PPS could not be done under CMS's existing statutory authority. The additional analyses that could be done include the following:

- Recalibration of the prototype using newer data, including data collected after the COVID-19 public health emergency
- Further development of a Quality Metrics and Value-Based Purchasing (VBP) Program to accompany the prototype provided in this report
- Further analysis of the existing PAC regulatory requirements that could be unified under a unified PAC payment system
- Further exploration of how copayments and co-insurance would operate under a unified PAC payment system
- Development of a uniform way of reporting the primary reason for treatment in each Medicare PAC setting (i.e., on the patient assessment instrument versus the Medicare claim form)
- Further analysis of the need for hospital collection of standardized patient assessment items at discharge
- Consideration of a patient navigator who could educate and support Medicare beneficiaries and their families by helping them to understand the handoffs and choices at admission and discharge across Medicare provider settings and whether that could be operationalized in fee-for-service Medicare

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A Simple Plan to Improve Care in Maryland Nursing Homes.

1) Bring Maryland SNFs into the Maryland Total Cost of Care system with rate control by the HSCRC.
    a. Guarantee that SNFs, in total, will never be paid less than Medicare PDPM rates for Medicare covered stays and services.
    b. Reward quality of care with 25% of savings generated by improved quality.
        i. Reduced total cost of care would be calculated based on decreased hospitalization, LOS, etc.
        ii. SNFs would receive care management savings payments based on measurable criteria including:
            1. Admission rates of Long Term Care patients to hospital care.
            2. Admission rates of Short Stay rehab patients to hospital care (re-admission rates.)
            3. Other measurable quality criteria
                a. Decubitus ulcers
                b. Vaccination rates
                c. Falls
                d. Staffing level
                e. Medical staffing – NPs and physicians
    c. 10% of base Medicare payments would be adjusted based on the quality measures. (This would create a strong QIP program as recently suggested by CMS.)
2) Health systems could retain 60% of the savings if they participated in collaborative models with SNFs to reduce nursing home admission rates and readmission rates.
    a. Care transition issues are the top reason for readmission.
    b. CRISP has built the backbone for SNF and hospital collaboration.
    c. Where clinically appropriate, nursing homes could pilot admits from emergency departments to nursing homes to avoid unnecessary hospital admissions.
3) Add two SNF members to the HSCRC.
4) Add quality measures to the Maryland Medicaid reimbursement to SNFs.
    a. Same measures as above.
    b. To be funded with future payment increases.
    c. Base 10% of payments on quality measures.
5) Create a SNF quality review board.
    a. Would decide the quality measures to be used above.
    b. Would oversee the program and make suggestions to the HSCRC.
    c. Members

i. Three members representing the SNF industry.
ii. One community patient representative.
iii. One geriatric specialist physician with an academic background.
iv. One representative of CRISP with knowledge of available measurable data.

d. Under the umbrella of the HSCRC.

6) If targets are achieved regarding total cost of care, the state and HSCRC would work with the industry to obtain a waiver to the three-day qualifying stay rule.

HSCRC Post Acute/ Total Cost of Care Work Group
Initial Meeting
October 26, 2022

Attendance:
Elizabeth Biell, Intern with HFAM
Ryan Burdick, Maryland Medicaid
Linda Cole, MHCC
Willem Daniel, HSCRC
Laura Goodman, Maryland Medicaid
Joe De Mattos, HFAM
Kevin Heffner, Lifespan
Danna Kauffman??
Paul Miller, Lifespan
Sharon Neely, Maryland Medicaid
Paul Parker, MHCC
Scott Rifkin, Physician and Nursing Home Administrator
Tricia Roddy, Maryland Medicaid
Erin Schurmann, HSCRC

Introductions and Purpose:

Mr. Parker welcomed everyone and explained that this initial meeting is a brainstorming session. The objective is to explore where the Total Cost of Care Model is working, or not working, for post acute care, specifically skilled nursing facilities (SNFs). He encouraged participants to share innovative ideas.

Mr. Daniel said that he is excited to move forward with this group.

Ms. Schurmann explained the timeline. HSCRC has established six priority areas. Progression plans are due for each area by the end of next year, with drafts due by spring of 2023.

Discussion:

Dr. Rifkin opened discussion with his draft plan, distributed to the group prior to the meeting. He stated that nursing home operators want to do a good job by lowering the cost of care while also providing good quality care. The nursing homes are often private businesses, with many recent acquisitions, and new owners are eager to maximize revenue. They need incentives to lower the total cost of care.

Dr. Rifkin stated that we need data on trends in readmissions to hospitals. He cited a recent BRG study showing that 50% to 70% of hospitalizations could be prevented by using Special Needs Plans. The goals should be lower lengths of stay and lower hospitalizations.

Mr. De Mattos agreed and stated that recent trends show costs increasing, acuity among Medicaid patients increasing, and nursing home utilization declining. The pandemic had a huge impact on nursing home occupancy rates; most CCFs are currently operating in the 70% to high 80% range with bed occupancy only increasing gradually.

He noted that Institutional Special Needs Plans (I-SNPs) are plans that restrict enrollment to Medicare Advantage eligible individuals, who for 90 days or longer, have had or are expected to need a SNF level

of care. Mr. De Mattos said that these plans align resources, costs, and quality. The clinical and financial measures put nursing homes in charge of their own destiny.

Dr. Rifkin said that hospitals should share savings with nursing homes. Mr. De Mattos said that hospitals often view nursing homes as vendors, rather than partners.

Mr. Heffner said that he and his association are in lock step with Dr, Rifkin and Mr. De Mattos. He also mentioned a recent program where the Governor provided funding to HFAM, Lifespan, and CRISP to allocate resources where the highest need exists. The CRISP system helps to identify and prevent hospitalizations. The program links 65 nursing homes, using real-time electronic medical records to a call center staffed by nurses who make recommendations. It also includes pandemic surveillance. This program does not, however, result in shared savings.

Dr. Rifkin said that buy-in is needed from Maryland hospitals. He suggested that HSCRC could guarantee the Medicare rate and mandate shared savings. He said that it is like a Quality Improvement Program (QIP) under which better performers are paid more by Medicaid.

Data Needs:
Mr. De Mattos said that there is a lot of ownership turnover in the nursing home industry in Maryland. He estimated that since the pandemic close to half of nursing homes have had ownership changes. All stressed the need to use 2022 data.

Mr. Parker said that he had reviewed data from the MHCC's Long Term Care Survey where Medicare as a proportion of total patient days increased from 2010 to 2015 and then declined. He wanted to know how Maryland data compared to national data with respect to: hospital readmissions; length of stay in the hospital after readmission from SNF; and length of stay in SNF.

Mr. De Mattos noted that Maryland has a very low penetration rate for Medicare Advantage. Mr. Miller stated that this is due to the fact that Maryland has a rate setting system, so Medicare Advantage plans cannot negotiate lower hospital rates.

Mr. Daniel said that Maryland had lower per capita SNF, Home Health Agency, and Hospice use than nationally, before the HSCRC model waiver. Since the model, the growth in SNF use is down, but there is higher growth in home health and hospice than has been observed nationally.

Ms. Roddy said that the tricky part of these proposals is financing. An increase in Medicaid rates is now doable. She asked why hospitals do not want to enter into agreements with nursing homes?

Mr. Daniel suggested that the hospitals and nursing homes need to be encouraged to work together, rather than having the state force these relationships. Mr. De Mattos recommended that some funding be set aside for this purpose with a governing set of principles. Mr. Daniel suggested that there could be a financial penalty for avoidable admissions from nursing homes. Shared savings would need to be worked out between hospitals and nursing homes. He also suggested that hospital staff could provide training on intensive care management in nursing homes to prevent hospitalizations.

Next Steps:
Mr. Parker said that this discussion has been productive with respect to the use of rate regulation and creating new types of incentives. Ms. Goodman questioned whether the charge included only SNFs or other types of home and community-based services. Mr. De Mattos stated that both are needed, but in a phased process. SNFs could be considered first and then home and community-based services, including other participants.

Mr. Parker thanked the participants and said that he would be sending out information for the next meeting, including an agenda.