



SEP 19 2006

Administrator
Washington, DC 20201

TO: The Secretary
Through: DS _____
COS _____
ES _____

FROM: Administrator
Centers for Medicare & Medicaid Services

SUBJECT: Report to Congress on Patient Classification under Medicare's Prospective Payment System (PPS) for Skilled Nursing Facilities (SNFs)--**ACTION**

ACTION REQUESTED BY: AS SOON AS POSSIBLE

BACKGROUND

Medicare's SNF benefit utilizes a PPS that makes prospectively-determined per diem payments, adjusted for patient acuity (i.e., patient conditions and service needs), area wages, urban or rural status, and inflation. These payments encompass all covered Part A SNF services (i.e., nursing, therapy, non-therapy ancillary (NTA) services, administrative and capital-related costs) other than costs associated with operating approved educational activities. The SNF PPS employs a Resource Utilization Groups, version III (RUG-III) methodology to make a case-mix adjustment that reflects patient acuity.

In section 311(e)(1) of the Benefits Improvement and Protection Act of 2000 (BIPA, P.L. 106-554, Appendix F), the Congress directed the Secretary to "conduct a study of the different systems for categorizing residents in Medicare skilled nursing facilities in a manner that accounts for the relative resource utilization of different resident types." Section 311(e)(2) of the BIPA further directed the Secretary to issue a report on this study by January 1, 2005, which "shall include such recommendations regarding changes in law as may be appropriate." This report is submitted in response to the BIPA's legislative mandate.

CONTENTS OF THE REPORT

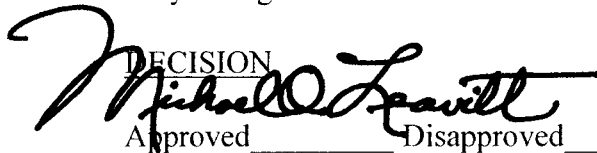
This report discusses the results of research conducted by the Urban Institute, which examined the accuracy of different data variables and methodologies in predicting the level of NTA usage. These methodologies include use of additional data variables within the RUG-III structure, the combination of SNF and hospital data to create a "New Profiles" approach for predicting ancillary utilization, and the adaptation of the inpatient diagnosis-related group data (that is, diagnostic data) to predict SNF stay costs.

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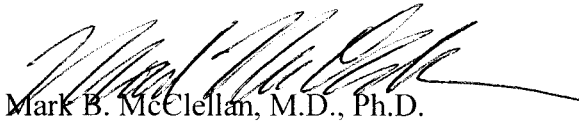
This research has improved our understanding of the effects of the current SNF PPS and allowed us to evaluate the potential for additional regulatory and legislative action that will better enhance and refine it. Further, by identifying areas where progress was constrained by insufficient or unreliable data, the research findings have suggested possible areas for improvement in data reporting and collection (as well as goals for the Center Medicare & Medicaid Service's current staff time measurement study) that could, in turn, facilitate future studies. The report also contains a series of next steps and recommendations for future regulatory and legislative action to enhance the effectiveness of the SNF PPS, as well as two Appendixes that provide a list of references and a description of the data sources and methodological approaches used in the research.

RECOMMENDATION

I recommend that you approve this report and transmit it to the President of the Senate and the Speaker of the House of Representatives. Transmittal letters have been prepared for your signature.


DECISION
Approved _____ Disapproved _____

Date DEC - 4 2006


Mark B. McClellan, M.D., Ph.D.

Attachments:

- Tab A - Letter to the President of the Senate
- Tab B - Letter to the Speaker of the House of Representatives
- Tab C - Report to Congress



THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

DEC - 4 2006

The Honorable Richard B. Cheney
President of the Senate
Washington, DC 20510

Dear Mr. President:

I am respectfully submitting the enclosed report, entitled "Patient Classification under Medicare's Prospective Payment System (PPS) for Skilled Nursing Facilities (SNF)." This report is being submitted to the Congress in response to the requirements of section 311(e) of the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000, which mandates the Secretary to "conduct a study of the different systems for categorizing residents in Medicare SNFs in a manner that accounts for the relative resource utilization of different resident types," and to submit a report to the Congress that "shall include such recommendations regarding changes in law as may be appropriate."

In the enclosed report, the Centers for Medicare & Medicaid Services describes the results of the research to date, along with a strategy for utilizing the knowledge that has been gained to update and improve the SNF PPS by more fully aligning payment incentives with efforts to monitor the quality of care in SNFs.

I am also sending a copy of this letter to the Speaker of the House of Representatives.

Sincerely,

Michael O. Leavitt

Enclosure



THE SECRETARY OF HEALTH AND HUMAN SERVICES
WASHINGTON, D.C. 20201

DEC - 4 2006

The Honorable J. Dennis Hastert
Speaker of the House of Representatives
Washington, DC 20515

Dear Mr. Speaker:

I am respectfully submitting the enclosed report, entitled "Patient Classification under Medicare's Prospective Payment System (PPS) for Skilled Nursing Facilities (SNF)." This report is being submitted to the Congress in response to the requirements of section 311(e) of the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act (BIPA) of 2000, which mandates the Secretary to "conduct a study of the different systems for categorizing residents in Medicare SNFs in a manner that accounts for the relative resource utilization of different resident types," and to submit a report to the Congress that "shall include such recommendations regarding changes in law as may be appropriate."

In the enclosed report, the Centers for Medicare & Medicaid Services describes the results of the research to date, along with a strategy for utilizing the knowledge that has been gained to update and improve the SNF PPS by more fully aligning payment incentives with efforts to monitor the quality of care in SNFs.

I am also sending a copy of this letter to the President of the Senate.

Sincerely,

Michael O. Leavitt

Enclosure



Report to Congress

**Patient Classification under Medicare's Prospective
Payment System for Skilled Nursing Facilities**

Michael O. Leavitt
Secretary of Health and Human Services
2006

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Executive Summary

When Medicare Part A (the hospital insurance program) covers a stay in a skilled nursing facility (SNF), it uses a prospective payment system (PPS) to make a comprehensive, per diem payment for virtually all of the services that a resident receives during the course of the covered Part A stay. Enacted in the Balanced Budget Act of 1997 (BBA, Pub. L. 105-33), the SNF PPS was the first PPS established in Medicare following the introduction of the original inpatient hospital PPS in 1983, and it also represents the first PPS established specifically for post acute care.

Drawing partially upon experience gained with the inpatient hospital PPS (which uses a diagnosis-related group (DRG) methodology to adjust for patient acuity level and resource use), the SNF PPS utilizes the Resource Utilization Groups, version III (RUG-III) methodology to adjust for case mix. This case-mix adjustment is intended to ensure that the level of payment made for a particular resident reflects the relative resource intensity that would typically be associated with that resident's clinical condition, as identified through the resident assessment process using the Minimum Data Set (MDS).

In the legislative history that accompanied the BBA, the Congress noted “. . . that under a prospective payment system that includes all services there may be incentives to decrease the use of ancillary services” (H. Rep. No. 105-149 at 1318). Following enactment of the BBA, the Congress continued to express interest in ensuring the SNF PPS's ability to account accurately for resource utilization, particularly with respect to non-therapy ancillary (NTA) services (e.g., respiratory therapy, prescription medicines). In this context, the Congress enacted several temporary payment adjustments to the SNF PPS in the Medicare, Medicaid, and SCHIP Balanced Budget Refinement Act of 1999 (BBRA), P.L. 106-113.

However, the BBRA constructed these payment adjustments narrowly to serve as incremental measures of fairly limited duration and specified that the most significant of the adjustments was to expire upon the Secretary's implementation of “a refined case mix classification system . . . to better account for medically complex residents” (section 101(c) of the BBRA). We discuss these temporary payment adjustments, and the incremental case-mix refinements that we developed in response to the BBRA's relatively limited mandate, later in this report.

Subsequently, in section 311(e) of the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 (BIPA), Pub. L. 106-554, the Congress directed the Secretary to conduct a broader study “. . . of the different systems for categorizing residents in Medicare skilled nursing facilities in a manner that accounts for the relative resource utilization of different resident types,” and to issue a report on this study that would “include such recommendations regarding changes in law as may be appropriate” In response to the directive contained in section 311(e) of the BIPA, we have developed this report to the Congress on case-mix classification under the SNF PPS. The purpose of this report is first to discuss the research that we have conducted in

this area (which has improved our understanding of the effects of the current payment system), and then to evaluate additional short-term regulatory and legislative action that will ensure a stable foundation for SNF reimbursement that can be integrated into our broader vision for the future of long term care.

In the context of this broader vision, the report also examines the ways in which our research, while specific to the SNF setting, could also serve more generally to help further a number of other major ongoing initiatives, such as Value-Based Purchasing (also known as “Pay for Performance,” which would link payment more directly to quality outcomes), the creation of an integrated payment system for postacute care, and the adoption of electronic health records. In addition, it is clear that the development of an integrated hospital discharge assessment (one of the initiatives discussed later in this report) will not only increase the accuracy of data currently used to determine SNF payment but will provide a more complete understanding of patient needs and services that can be used to make further refinements in the existing payment system.

Chapter 1 provides an historical overview of the evolution of the current payment system, along with the system’s case-mix classification methodology.

Chapter 2 describes the research to recombine MDS variables and identify new variables from SNF and hospital claims data that could serve to allocate payments more accurately under the SNF PPS. These methodologies include use of additional data variables within the RUG-III structure, the combination of SNF and hospital data to create a “New Profiles” approach for predicting ancillary utilization, and the adaptation of the inpatient DRG data (i.e., diagnostic data) to predict SNF stay costs.

Chapter 3 discusses data constraints that the researchers encountered and describes how these limitations affected the course of the research. This discussion also considers the feasibility of improving data collection and data reporting.

Chapter 4 outlines a series of next steps and recommendations for future administrative, regulatory, and legislative action to enhance the effectiveness of the SNF PPS.

Finally, we would like to take this opportunity to express our sincere appreciation to the Urban Institute and to Abt Associates for the extensive research that each group conducted in this area on our behalf, without which this report would not have been possible.

Chapter 1: Historical Overview

1.A. Background

From the late 1980s through 1997, SNF care was one of the fastest growing components of Medicare spending. During most of the two decades prior to 2000, total Medicare program payments grew at about 8 percent annually, while SNF spending climbed roughly 25 percent annually, peaking at \$11.3 billion in 1998.

At this same time, advocacy groups and the media raised concerns about deteriorating quality of care and poor treatment of beneficiaries. In 1987, Congress enacted the Omnibus Budget Reconciliation Act of 1987 (OBRA), Pub. L. 100-203. The OBRA nursing home reform legislation called for better oversight of nursing homes and for the development of a uniform assessment instrument based on a minimum data set that could be used for payment as well as to improve facility care planning and resident outcomes.

Building on earlier research, the Health Care Financing Administration (now the Centers for Medicare & Medicaid Services (CMS)) funded the development of the Multistate Nursing Home Case-Mix and Quality demonstration project in 1989. The purpose of the project was to design, implement, and evaluate a Medicare nursing home prospective payment and quality monitoring system across several states. The demonstration project focused on the ability of the RUG-III classification system to predict accurately the nursing and therapy resources needed to care for different categories of patients. Early analyses of the predictive performance of the RUG-III classification methodology found that the system explained 55.5 percent of the variance in combined nursing and therapy per diem resource use and 41.2 percent of the variance in nursing resources (Fries et al., 1994). The three-year demonstration was implemented in 1995 and introduced nationally in July 1998.

The introduction of the SNF PPS, coupled with industry efforts to respond to the growth of managed care and assisted living alternatives to SNF care, created additional incentives for a major restructuring in the nursing home industry. These changes were not limited solely to billing and reimbursement, but also involved utilization patterns, internal operating procedures, and nursing protocols. After implementation of the SNF PPS, researchers' attention focused more on RUG-III's variance explanation regarding Medicare patients (rather than all nursing facility patients). In a subsequent analysis of the sample used in the development of RUG-III, researchers found that RUG-III explained 39 percent of variance in routine and therapy resource use (staff time minutes) among Medicaid residents and 21 percent of variation in staff time minutes among Medicare SNF patients (Abt Associates 2000).

Instead of focusing on staff time minutes as most previous studies have, the Urban Institute (Urban), a non-partisan economic and social policy research group, focused on Medicare costs (as derived from charges), initially using 1999 data and later replicating the analyses with 2001 data (the most recent data available). Urban's studies using various Medicare cost components (e.g., costs for non-therapy ancillary services) as the

measures on resource use, instead of staff time minutes, show low explanation of variance (around 5 percent).

The introduction of the Medicare SNF PPS also had an impact on the utilization of NTA services. This cost component was added to the SNF PPS primarily in response to continuing concern about overutilization of ancillary services in this setting. In addition, the legislation required a “bundling” of NTA services that allowed CMS to monitor ancillary utilization more effectively by consolidating the reporting of these services to the Medicare Part A fiscal intermediary. Prior to the SNF PPS, claims for most ancillary services could be billed by either the SNF (to the fiscal intermediary) where claims were paid at cost or by the actual service provider (to the Part B carrier), which made it difficult to monitor for appropriate use and pricing of NTA services.

By contrast, the SNF PPS introduced an approach that makes a bundled per diem payment for a comprehensive *package* of services furnished during the covered SNF stay. In receiving this bundled payment, the SNF assumes the responsibility for using it efficiently and effectively to provide the various component services that comprise the package of needed and medically appropriate care. Thus, under the SNF PPS, SNFs were, for the first time, at risk for the provision and cost of most NTA services. This very significant restructuring of the Medicare payment structure generated concern within the nursing home industry that the system could be underfunded, and led industry representatives to call for quick action to refine the SNF PPS in a way that would more accurately reimburse SNFs for ancillary services. As discussed below, Congress responded to these concerns by enacting temporary funding adjustments that were intended to stabilize the payment system during the initial implementation of the SNF PPS.

Notwithstanding these concerns, it is clear that, from its inception, the SNF PPS has, in fact, succeeded in curbing the growth of Medicare spending for SNF services without creating any significant problems with beneficiary access or quality of care. For example, in 1999, the Office of the Inspector General (OIG) in the Department of Health and Human Services (DHHS) conducted two studies on beneficiary access under the SNF PPS that found no widespread access problems in placing Medicare beneficiaries in SNFs, and it confirmed these preliminary findings in a subsequent study conducted the following year. Moreover, as evidenced by recent industry profit margins calculated by the CMS Office of the Actuary (OACT) and the Medicare Payment Advisory Commission (MedPAC), most freestanding facilities were able to operate efficiently within the SNF PPS. (The experience of hospital-based SNFs under the SNF PPS is less clear, and will be discussed in the body of this report.) As the industry learned how to operate more efficiently within the SNF PPS structure, many providers would eventually become increasingly skeptical about the introduction of “refinements” that would reduce the aggregate funding levels and increase SNF expenditures to retool operating systems and retrain staff.

1.B. The SNF PPS

Until July 1998, SNFs were paid under a reasonable cost-based, retrospective system. In contrast, the SNF PPS introduced at that time established a prospectively-determined payment rate for a day of SNF resident care, adjusted for patient acuity (i.e., patient conditions and service needs), area wages, urban or rural status, and inflation. Thus, each facility is paid an adjusted daily rate based on the relative needs of individual Medicare residents. These payment rates cover the costs of all covered Part A services (i.e., nursing, therapy, NTA, administrative and capital-related costs), other than costs associated with operating approved educational activities, and bad debt.

Generally, the rate components were initially developed from the 1995 cost reports; i.e., the base year established in the BBA. The ancillary component could not be computed solely from cost-report data since, prior to the SNF PPS, other suppliers and practitioners were permitted to bill Medicare Part B directly for ancillary services furnished to beneficiaries in an SNF Part A stay. In establishing the SNF PPS, CMS developed the ancillary rate component by using claims data for all ancillary services billed for beneficiaries in Part A stays, regardless of the entity actually billing for the service, and established an ancillary per diem rate. (NOTE: Certain services were excluded from the SNF PPS by statute, and were not included in these calculations.)

Since the analysis of this NTA data showed a correlation between the RUG-III case-mix group and ancillary utilization, the per diem ancillary rate was incorporated into the nursing component. In this way, the ancillary rate would be case-mix adjusted in the same manner as the nursing component; i.e., the higher the RUG-III acuity level, the higher the payment for services. However, it quickly became apparent that, while there was a correlation between the RUG-III case-mix weight and the use of NTA services, the case-mix weight did not fully account for intra-group variability and was only a modest predictor of ancillary utilization.

The RUG-III classification system forms the basis of the SNF PPS and determines the payment for nursing, the largest nursing home cost component, as well as for therapy services. The classification system was designed using resident characteristic information and measures of wage-weighted staff time. Staff time measurement (STM) studies (i.e., time studies) were conducted in nursing homes in 1990, 1995, and 1997 and were used to establish the 44 RUG-III groups that serve to group patients needing similar levels of clinical resources. Each RUG-III group is assigned an index score that represents the amount of nursing time and rehabilitation treatment time associated with caring for the residents who qualify for the group. Payment is based on the intensity of resource use (i.e., hours of nursing or aide care or therapy needed per day) and/or other relevant factors (e.g., specific service needs, such as ventilator care or chemotherapy).

The MDS 2.0 contains all data necessary to classify a resident into one of the RUG-III groups. The MDS is a set of screening, clinical, and functional elements designed to ensure reliable interpretation of clinical information for quality assurance, payment, and health policy planning purposes and to serve as the basis for comprehensive care planning by nursing home staff. Using standardized software programs, facility staff encode MDS data, establish a RUG-III case-mix group, and transmit the MDS data to a

CMS contractor. The contractor validates the MDS data and RUG-III group, which SNFs then use to bill Medicare.

The original RUG-III system consists of seven major resident types. Forty-four groups form the seven major categories:

- Rehabilitation (14 groups)
- Extensive Services (3 groups)
- Special Care (3 groups)
- Clinically Complex (6 groups)
- Impaired Cognition (4 groups)
- Behavior Problems (4 groups)
- Reduced Physical Function (10 groups).

Virtually all Medicare residents fell into the first four of these seven RUG-III categories (or the upper 26 of the 44 RUG-III groups). In 1999, almost 80 percent were in the rehabilitation category, over 10 percent were in extensive services, and about 5 percent each were in the special services and clinically complex categories. However, since more than half of the States have adopted the RUG-III system for Medicaid nursing home reimbursement, it is important to calibrate all RUG-III groups accurately, even those more applicable to a long term or residential level of care.

During the past six years, SNF utilization and practice patterns have changed, at least partially due to the introduction of Medicare and Medicaid RUG-III systems, and the use of MDS data to monitor the quality of care furnished in nursing homes. To understand more fully the impact of these changes, CMS has funded a new time study that will begin collecting data in FY 2006. The primary purpose of this new time study is to recalibrate the RUG-III case-mix weights, and to evaluate the effectiveness of MDS data items used to classify patients into payment categories. In addition, CMS staff intend to utilize this opportunity to analyze further how these changes have affected the accuracy of therapy and NTA reimbursement under the SNF PPS.

1.C. Enactment of Temporary Payment Adjustments under the SNF PPS

The SNF PPS replaced the cost-based structure that had been in effect since the inception of the Medicare program. Under the SNF PPS, providers have more flexibility in the use of Medicare funds and are responsible not only for furnishing the full range of services to Medicare beneficiaries but for the cost effectiveness of their purchasing decisions. As under the inpatient hospital PPS, payment for all services (including therapy and other ancillaries, such as diagnostic tests, supplies, and certain medications) was for the first time included in the SNF Part A “bundle of services” and paid directly to the SNF rather than to the actual entity furnishing the service. In addition, in response to over a decade of rapidly rising Medicare SNF payments, the SNF PPS instituted controls to adjust for identified overutilization and inflated charge structures for therapy and other ancillary services. Restructuring the payment system to reflect a more appropriate expenditure level resulted in an aggregate decrease in Medicare expenditure levels.

This reduction in the SNF funding stream generated significant concerns about the adequacy of the SNF PPS rates to guarantee quality care, prevent under-utilization of needed direct care services including NTAs, and ensure access for beneficiaries with heavy care needs. These concerns were further complicated by financial turmoil within the industry with nine nursing home chains, representing 10 percent of all nursing home beds, filing for Chapter 11 bankruptcy protection. Although later studies demonstrated that the bankruptcies were caused by internal management practices rather than by the SNF PPS, Congress acted quickly to address the perceived financial instability of the nursing home industry.

Congress responded to these concerns by implementing a series of temporary payment adjustments to stabilize the system until the concerns could be fully evaluated:

- *20 percent add-on for selected RUG-III groups:* Section 101(a) of the BBRA provided for a temporary 20 percent increase in the per diem adjusted payment rates for 15 specified RUG-III groups. Section 101(c) of the BBRA provided that this temporary 20 percent increase was to remain in effect until the later of October 1, 2000 or the date on which the Secretary implemented “a refined case mix classification system . . . to better account for medically complex residents.”
- *4 percent across-the-board add-on:* Section 101(d) of the BBRA provided for a temporary, 4 percent across-the-board increase in the adjusted Federal per diem payment rates each year for fiscal years 2001 and 2002, exclusive of the 20 percent increase specified under section 101(a).
- *16.66 percent adjustment to the nursing/ancillary component of the PPS rate:* Section 312 of the BIPA provided for a temporary 16.66 percent increase in the nursing component of the case-mix adjusted Federal rate, for services furnished on or after April 1, 2001, and before October 1, 2002.
- *Correction of rehabilitation anomaly in the BBRA’s 20 percent add-on:* Section 314 of the BIPA corrected an anomaly in the add-on for three rehabilitation groups that had received a 20 percent increase under section 101(a) of the BBRA, resulting in higher payment rates for those particular RUG-III groups than the rates for other, more intensive rehabilitation RUGs that the BBRA had not designated to receive the add-on. Effective for services furnished on or after April 1, 2001, the 20 percent add-on for these three rehabilitation RUGs was replaced by a 6.7 percent add-on for all 14 rehabilitation RUGs. This add-on also was to remain in effect until the date the Secretary implemented the case-mix refinements to the SNF PPS noted in section 101(c) of the BBRA.
- *128 percent add-on for SNF residents with Acquired Immunodeficiency Syndrome (AIDS):* Section 511 of the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA, Pub. L. 108-173) increased the per diem RUG payment for SNF residents with AIDS by 128 percent. The MMA further provided

that the 128 percent increase in payment under the AIDS add-on is “. . . determined without regard to any increase” under section 101 of the BBRA (as amended by section 314 of the BIPA). As explained in the MMA Conference report, this means that if a resident qualifies for the temporary 128 percent increase in payment under the special AIDS add-on, “the BBRA temporary RUG add-on does not apply in this case . . .” (H.R. Conf. Rep. No. 108-391 at 662). This add-on expires after such date as “the Secretary certifies that there is an appropriate adjustment in the case mix . . . to compensate for the increased costs associated with [AIDS] residents.”

As a result of these actions, facilities were able to adjust to the new system and stabilize their operations. For example, MedPAC’s March 2002 report indicated that for freestanding SNFs, Medicare payments exceeded costs by almost 10 percent. More importantly, more recent analyses that have been conducted show continued profitability even after the September 2002 sunset of two of the temporary payment adjustments. While there is a performance differential by facility type (freestanding vs. hospital-based, for-profit vs. not-for-profit, etc.), both CMS and MedPAC have concluded that, in aggregate, Medicare SNFs have achieved positive profit margins.

1.D. Scope of Research

In 1998, CMS commissioned Abt Associates, Inc. (Abt), a non-partisan economic and social policy research group, to review the existing case-mix system with particular emphasis on the care needs of the medically complex Medicare beneficiaries and the variation in NTA services within the case-mix categories. Abt completed an interim draft, conducted a technical expert panel, and issued a report in 2000 recommending incremental improvements to the RUG-III system that also served to increase its complexity. Based on the interim report, CMS issued a FY 2001 proposed rule to expand the RUG-III hierarchy to recognize patients with both heavy rehabilitative and medical needs and to add an ancillary adjustment mechanism expected to allocate payments more effectively for services for all RUG-III classification groups.

However, subsequent validation analyses based on more recent data indicated that the refinements would afford only limited improvement in explaining resource utilization relative to the significant increase in complexity. In addition, the increased complexity had the potential to destabilize facility operations at a time when staff were still adjusting to the new SNF PPS. Thus, the modest increase in predictive power and the anticipated implementation costs (i.e., retraining SNF staff and upgrading facility, State, and Federal computer systems) led CMS not to proceed (see the FY 2001 final rule published July 31, 2000 (65 FR 46773)) but rather to continue to conduct research in this area.

In July 2001, CMS awarded Urban a multi-year contract to research both short-term refinements to the existing case-mix system and the long-term feasibility of an alternate payment system that could replace the SNF PPS. In conducting this work, Urban held two technical advisory panels in May 2003 and May 2004 to obtain input and suggestions for the study from industry, academic, and government experts. The results of these analyses are presented in the body of this report.

CMS has also utilized analyses by a program safeguard contractor, the Data Assessment and Verification Contractor (DAVE). This contractor assessed the accuracy and reliability of national SNF data including claims and the MDS, the clinical assessment instrument that forms the basis of CMS payment and quality monitoring systems. The results of the DAVE analyses were used to make decisions regarding the appropriateness of claim payments, to develop quality measures and other quality monitoring activities, and for short- and long-term planning and policy. Additionally, the DAVE contractor produced analytic and utilization trending reports that increase our understanding of the interaction between payment and the provision of care in SNFs.

Finally, this report utilizes analyses conducted by other government sources, including oversight agencies and payment commissions. For example, the Government Accountability Office (GAO) and the OIG have conducted studies to address concerns on the adequacy of the SNF PPS rate to maintain access to SNF care for heavy needs patients. MedPAC has also conducted numerous studies on the adequacy of the SNF rates and has examined the impact of the SNF PPS on hospital-based and freestanding facilities. A list of the reports consulted in the design and evaluation of the Urban research findings is attached in Appendix I.

The research discussed in the following chapters of this report describes attempts to develop more reliable ways to allocate NTA payments. The principal analyses rely on the 2001 Data Analysis Pro file as well as Medicare claims data to include charges for specific types of services (e.g., respiratory therapy, prescription medicine) used during the SNF and the prior hospital stays. The methodology used in creating this file is described in Appendix II.

Chapter 2: SNF PPS Refinement Models

2.A. Expanding the RUG-III Classification System

The RUG refinement models discussed here reflect a five-year effort to enhance the accuracy of SNF PPS reimbursement for non-therapy ancillaries within the existing RUG-III classification system; i.e., by adding additional data items to the existing RUG-III methodology. The RUG refinement models explored by Abt and Urban present methodologies that achieve some incremental improvements to the existing SNF PPS. We discuss below the major features of these refinement models and the feasibility of implementing the models on a national basis.

In 1999, CMS commissioned a study with Abt to review the RUG-III classification system with an emphasis on the care needs of medically complex Medicare beneficiaries and the variation in NTA services within RUG-III categories. The Abt researchers created a research database consisting of Minimum Data Set (MDS) assessments matched to Medicare SNF claims. Abt identified a variety of MDS measures linked to patient conditions, including items related to functional status, disease diagnoses, health conditions, nutritional status, skin conditions, and special treatments, as well as procedures that are associated with and predictive of higher NTA utilization. As a result, Abt found that individuals who qualified for both the “Rehabilitation Therapy” and “Extensive Services” sets of RUG-III categories had NTA costs that were much higher than average.

Based on these research findings, Abt developed and recommended potential models to refine the RUG-III system. The researchers recommended expanding the system to add 14 new classification groups at the top of the existing 44-group RUG-III hierarchy. This expanded RUG-III classification system (referred to as the RUG-58) was then used as a foundation for additional potential RUG refinement options that moved beyond focusing on a single sub-group to improving NTA payments across the entire population. Table 1 captures the four refinement options utilizing the RUG-58 as the foundation.

Abt continued the research effort using the RUG-58 model as a foundation. Researchers conducted sophisticated regression analyses and developed new ancillary utilization indices to supplement the RUG-III methodology. They retained the RUG-III system, and created an NTA index based on patient characteristics drawn from the MDS assessment to determine the total NTA payment rate. Thus, instead of having one level of ancillary payment for each RUG-III group, these new indices, Weighted Index Model (WIM) and Unweighted Index Model (UWIM), established a “sliding scale” of NTA payments based upon the expected ancillary utilization for patients with different clinical characteristics.

As summarized in Table 1, these models resulted in an improvement in predictive power and were presented in an SNF PPS proposed rule for FY 2001 (65 FR 19188, April 10, 2000). However, researchers working under extremely tight time constraints were unable to replicate the original findings, and were unable to identify an improvement in predictive power sufficient to justify the increased complexity of this approach. As a

consequence, CMS withdrew the proposal (65 FR 46773, July 31, 2000) and initiated additional research that would further explore potential refinement options.

Table 1. Abt RUG Refinement Options developed in 2000

Model	Model Description	Number of Groups
RUG-58	RUG-III with new category "Extensive Service and Rehabilitation"	58
WIM 1	Weighted Index Model applied to Extensive Services residents (includes new category "Extensive Services and Rehabilitation")	58 plus a six-group ancillary add-on system (Up to 143 if incorporated as new terminal splits)
WIM 2	Weighted Index Model applied to extensive Services residents (includes new category "Extensive Services and Rehabilitation") and to Rehabilitation, Special Care, and Clinically Complex residents	58 plus a six-group ancillary add-on system (Up to 258 if incorporated as new terminal splits)
UWIM	Unweighted Index Model applied to Extensive Services residents (includes new category "Extensive Services and Rehabilitation") and to Rehabilitation, Special Care, and Clinically Complex	58 plus a four-group ancillary add-on system (Up to 178 if incorporated as new terminal splits)

In 2001, CMS commissioned a study from Urban to investigate additional refinement options. The Urban researchers re-examined the prior Abt research and used the Abt methodology to test the RUG-58, WIM, and UWIM models with more recent data. In addition, Urban extended the research by testing additional variables and explored consolidation of RUG-III groups.

Construction of the RUG-58 and WIM-related indices followed the procedures that Abt had developed. In addition, Urban developed a variation of the WIM index, the Service Index Model (SIM). The SIM index contains some of the MDS variables used in the WIM and adds new variables from SNF claims data.

The SIM model mimics the basic approach of the WIM model with two important distinctions. First, the Urban researchers identified discrepancies between high cost services reported on the MDS and on the SNF claim. By eliminating MDS data that could not be confirmed on the SNF claim, the researchers produced a very sizeable increase in predictive power for two NTA services, intravenous (IV) medications and respiratory care. This adjustment was particularly important because both the Abt and Urban researchers had already identified IV medications and respiratory services as the two highest-cost services.

Utilization of these two services has also been particularly difficult to identify accurately, primarily because, under current MDS reporting requirements, services delivered in the hospital prior to the SNF admission and services provided after admission are both reported as a single MDS item. (See Chapter 3 for a detailed discussion of this data problem.) By developing a methodology to screen out hospital IV medication and respiratory services, the SIM model was more successful in assigning SNF cases to a more appropriate payment level.

Second, the researchers introduced several new measures of patient condition and history that appeared to add predictive value to the model and that appeared difficult to “game.” These variables were (a) age, (b) absence of infection, and (c) Major Diagnostic Category (MDC) for respiratory conditions.

Urban also tested variations of the RUG-III, RUG-58, WIM, and SIM models to determine whether combining the models could better predict high NTA costs. The results of these analyses are summarized in Table 2. (R-square is a measure of the power of a model to predict the level of NTA cost for particular cases. A higher value indicates greater predictive ability.) Although each of these combinations resulted in some statistical improvement, additional work would be needed to explore interactions between the components and to confirm clinical validity. For example, the RUG-58 model appears to have greater statistical power than the RUG-III model in predicting NTA utilization. However, when the SIM model is added to each of the RUG-58 and RUG-III models, the increased predictive power is virtually identical.

Table 2. Summary of Select Urban Institute RUG Refinement: Predictive NTA Cost Models

Model	Number of RUG-III Groups	R-square
RUG-III	44	6.4%
RUG-58	58	9.5%
RUG-58 and WIM	258	13.9%
RUG-58 and UWIM	178	--- ¹
SIM only	--- ²	18.9%
RUG-III and SIM	--- ²	21.4%
RUG-58 and SIM	--- ²	21.9%
RUG-58, WIM, and SIM	--- ²	23.3%

¹The researchers did not calculate an R-square for this model.

²The researchers did not develop these models to the point of creating the group hierarchies.

Discussion

Adding variables improves the predictive ability for the model. At the same time, the more complex the model, the greater the data requirements, and the more complex the

administrative procedures for implementing the classification system. Each of the models based on the RUG-III classification structure would require major expansion to the classification system from the original 44-group model up to 256 or more groups. Additional work is needed to evaluate the cost/benefit of these RUG-III refinement models on both the nursing home industry and CMS.

The research showed that most feasible addition to the RUG-III system is still the RUG-58 model originally developed by Abt (2000) and reevaluated by Urban (2004). The RUG -58 model does not represent a comprehensive system refinement, but addresses the needs of a specific sub-population; i.e., patients needing high levels of medical care (including ancillaries) as well as rehabilitative therapy. The benefit of implementing this refinement is to promote access to needed services for this high utilization and high cost sub-population.

The expansion to a RUG-58 system also requires a minimal increase in provider burden, as it simply combines two existing classification levels. While some retooling would be needed, this option represents the lowest level of burden on the provider community. As the new classification groups represent variations on the existing hierarchy, facility staff should not encounter major problems in understanding the new RUG-III categories and integrating the new groups into facility operations.

Adoption of the WIM, UWIM, or SIM models would present additional challenges. Adding new patient history and treatment variables add predictive value to the SNF model, but they utilize SNF and hospital claims data not presently collected from SNFs. Changes to the MDS would need to be coordinated to minimize burden on facilities as well as on the State and Federal agencies using the MDS data.

Finally, it is unclear whether the WIM, UWIM, and SIM models represent substantive improvements or simply highlight discrepancies in the MDS data as currently reported to CMS. (See Chapter 3 for a detailed discussion of data constraints.) The Urban researchers were able to identify additional variables from SNF claims and successfully used those variables to verify and/or adjust the SNF MDS data. Additional work is needed to determine whether increasing the accuracy of the MDS data reported to CMS (i.e., by changing the existing reporting requirements) would result in similar increases in predictive power within the RUG-III system itself.

Thus, the RUG-58 system appeared to offer a potentially meaningful improvement in terms of increased predictive power as well as feasibility. In fact, in response to the BBRA limited mandate mentioned earlier in this report, the incremental case-mix refinement that we ultimately adopted in the SNF PPS final rule for FY 2006 (70 FR 45026, August 4, 2005) essentially represented a variation of the RUG-58 system.

As explained in the proposed SNF PPS rule for FY 2006 (70 FR 29076 - 79, May 19, 2005), this incremental refinement approach retained many of RUG-58's potential advantages, while introducing certain modifications to reduce its complexity. For example, the new Rehabilitation plus Extensive Services category that we introduced at

the top of the existing RUG-III hierarchy encompassed 9 rather than 14 groups. Also, rather than incorporating one of the various models for a new NTA index (WIM, UWIM, or SIM), we instead decided upon an across-the-board adjustment to the rates for all RUG groups, by increasing the case-mix weight for the particular rate component that includes NTA costs.

This adjustment represented a permanent payment increase that was integrated into baseline spending levels, and it enabled us to reflect variations in NTA costs not fully captured in the RUG refinements, without introducing the inherent complexity that incorporating a separate NTA index inevitably would have entailed. In this way, we were able to develop an incremental refinement that satisfied the BBRA's limited mandate for "a refined case mix classification system . . . to better account for medically complex residents," while also proceeding with the longer-range research efforts envisioned in section 311(e) of the BIPA.

2.B. New Profiles Approach

As discussed throughout this report, increasing the ability to reimburse accurately for NTA costs has been a major focus of this refinements research. Historically, the RUG-III classification system has been shown to explain little of the variance in NTA resource use, only about 5 percent (Kramer et al. 1999, Abt 2000, Liu et al. 2002, Fries 2002) with drug costs as the single biggest contributor to NTA costs. Overall, Urban noted that nursing home residents receive an average of 7.3 routine medications (Briesacher et al. 2002) and the percentage of residents with at least nine prescriptions rose from 18 to 27 percent between 1997 and 2000 (Mendelson et al. 2002).

Thus, in addition to reexamining the RUG refinement options identified by Abt, Urban developed a new ancillary classification model radically different from the current SNF PPS. By "starting from scratch," researchers attempted to develop a clinically meaningful patient classification model using variables that offered minimal opportunities for gaming by SNF providers. The purpose of this classification model was to enhance the accuracy of NTA and therapy reimbursement.

New Profiles Classification Model: Urban first developed a framework for classifying SNF patients into a new set of clinical groups based on patient characteristics, prior hospital variables, and facility-level variables. Using these "New Profiles" classification groups, they developed a new NTA payment structure as well as a new model for determining the therapy component of the SNF PPS rate. The New Profiles classification system assigns patients using a Barthel Index score, a well-known tool to assess functional status in activities of daily living (ADLs), hospital diagnosis, and prior hospitalization history to classify patients into three groups, as follows:

- The *acute group* consists of patients admitted for skilled nursing care following an acute medical or surgical event such as an myocardial infarction (MI) or abdominal surgery. These patients have primarily skilled nursing care needs, such as wound care or IV medications, which are likely to be of relatively limited duration.

- The *chronic group* consists of chronically ill or deconditioned patients admitted for skilled nursing care following a hospitalization for a condition such as congestive heart failure (CHF) or chronic obstructive pulmonary disease (COPD), and who would require ADL assistance. These patients often require frequent re-hospitalization followed by short-term SNF stays. These patients may also be long-term nursing facility residents for whom discharge to home may not be feasible.
- The *rehabilitation group* consists of patients admitted primarily for rehabilitative services such as physical or occupational therapy to improve or restore function. Such patients may have diagnoses such as hip fracture or stroke, disability from medical/surgical conditions, and the need for intensive rehabilitation to regain independent function before being discharged home or to a more independent environment than an SNF.

The rehabilitation group is based upon functional impairment level. To measure functional ability, researchers used the Barthel Index (Mahoney and Barthel 1965) score calculated from items on the 5-day MDS assessment. The Barthel Index is an index of functional ability capturing several aspects of ADL capability, and normally ranges from 0 (worst function) to 100 (best function). Because the functional data were limited to MDS items, the Barthel Index was modified to exclude an assessment of ability to climb stairs, and therefore has a maximum score of 90.

The relationship between function and therapy services received was investigated using the Barthel Index score from the 5-day MDS assessment and several different measures of physical and occupational therapy. Physical and occupational therapy were measured using charges from the SNF stay, derived costs from the SNF stay, and charges from the preceding hospital stay, both separately and for physical and occupational therapy combined. In all cases, the relationship between function and therapy proved to be non-linear, wherein patients with moderate functional impairment received more therapy than patients with either substantial impairment or minimal impairment.

Patients with a Barthel Index score of 0 to 10 (extreme impairment) or 70 to 90 (minimal to no impairment) had substantially lower charges on average (\$206 lower for the 0 to 10 group, \$220 lower for the 70 to 90 group) than patients with a Barthel Index score of 15 to 65 (serious to moderate impairment). Therefore, the researchers used a Barthel Index score of 15 to 65 to define the rehabilitation patient group.

The relationship between function and therapy received in the SNF was very similar; patients with moderate functional abilities received much greater therapy than patients at either end of the functional scale. The relationship of function with therapy received in the SNF is somewhat muted by the effects of a temporary adjustment to the SNF PPS rates that changed the payment structure within the RUG-III hierarchy for rehabilitation groups, i.e., increasing the payment for three of the 14 groups by 20 percent. This anomaly at least partially explains why, using 2001 data, less variation in rehabilitation therapy is seen in the SNF.

In addition, using hospital data to determine SNF therapy needs may be problematic. Hospitals are constrained by their own PPS (which does not separately reimburse for therapy services), and the relatively short length of stay that typically characterizes the acute care setting can result in hospital patients sometimes being discharged before commencing the rehabilitation phase of their treatment. Accordingly, therapy received in the hospital also needs to be carefully evaluated: the level of hospital service provides a truer picture of patients' actual rehabilitation needs, but could also suggest that therapy services may be postponed until the patients are more stable and ready for post-acute care.

For patients not included in the rehabilitation group based upon function, principal diagnosis was used as a first step in selecting acute conditions. For modeling purposes, the primary diagnosis was determined from the primary diagnosis given on the last claim of the preceding qualifying hospitalization. The diagnoses listed on hospital discharge records tend to be more accurate and more complete than diagnoses listed on SNF admission records, perhaps due to incentives inherent in the diagnosis-related group (DRG) system (and the lack of such incentives in the SNF PPS). Potential acute conditions were identified from ICD-9-CM codes to include diseases in each major diagnostic category that could be an acute event. Only diseases that were clearly chronic in nature (e.g., diabetes mellitus) were excluded from the potential acute diagnosis list.

Many of the above diagnoses considered as potentially acute conditions can also occur in a more chronic form; pneumonia, urinary tract infection, and heart failure are three illustrative examples. Thus, diagnosis alone is not sufficient to distinguish acute and chronic patients. In developing this model, the chronic group includes patients with an underlying problem (or problems) that may require multiple hospitalizations to stabilize recurring acute episodes of disease(s); COPD provides the classic example. For this model, the definition of "chronic" includes not only patients with non-acute diagnoses, but also patients with acute diagnoses who have been hospitalized and admitted to an SNF in the six months prior to the qualifying hospitalization for the current SNF stay. This item is determined by reviewing the entire stream of Medicare MDS assessments for each resident, and using the assessment reference date to determine if the assessment occurred during the six-month period.

NTA Analysis: The researchers then examined the relationship between NTA use and an expansive list of potential predictors within each class. The list of predictors goes considerably beyond the MDS items considered by Abt (2000) in prior efforts to improve patient classification for NTA services.

The data for the initial analysis on NTA resource use is the 10 percent random sample of stays from the national patient-level stay file for 2001, described in detail in Appendix II. Resource use for non-therapy ancillaries was measured with per-day charge and cost variables for three components: drugs, respiratory therapy, and other non-therapy ancillaries (ONTAs). The per-day average of total NTA charges was \$141.53, whereas costs were estimated at \$61.71. Drugs were by far the largest component, with a per-day average charge of \$82.63 and cost of \$41.44. The researchers then used multiple modeling techniques to evaluate the variables.

The explanatory variables considered for this analysis fall into five groups:

- Demographic variables, including age and gender.
- Clinical diagnoses, identified through hospital and SNF claims diagnosis codes and from the MDS. These conditions are likely to be associated with specific drug regimens and treatments, as well as with the need for and extent of respiratory therapy and other NTA use.
- Service indicators, created from both hospital and SNF claims, including such items as the use of radiology services and the drug charges for the qualifying hospital stay. Discharge from the qualifying hospital stay may be up to thirty days prior to the SNF admission, but is generally the most recent stay prior to SNF admission. To the extent that these services are subsequently provided to the patient in the SNF, or identify more complex patients, qualifying hospital service information may predict NTA resource use.
- Functional indicators, derived from patient activities of daily living (ADL) scores. These indicators, for such items as mobility, may indicate NTA resource use of items such as pressure-relieving beds and wheelchairs.
- Facility characteristics: For instance, the NTA data used in this research were wage-adjusted, while the wage adjustment factor in the existing SNF PPS is applied only after the RUG-III nursing and ancillary component is calculated. In addition, hospital-based facility status is used as an indicator, on the assumption that hospital-based facilities furnish care to sicker patients (see Chapter 3 for a more detailed discussion of hospital-based status).

All three components had a significant percentage of stays with no charges recorded: drugs (6.4 percent), ONTAs (20.2 percent), and respiratory therapy (89.0 percent). The distributions display the enormous cost variation in each of these components. The charge distributions have a similar shape, but a greater range of values. Both charges and costs also were skewed, with broad upper tails indicating that each of the three components had a small percentage of stays that were extremely costly, as illustrated in Table 3.

Table 3. Distribution for NTA components

	% w/no use	95%tile	96%tile	97%tile	98%tile	99%tile
Costs						
Drugs	6.4%	\$141	\$160	\$188	\$232	\$330
ONTA	20.2%	\$91	\$100	\$112	\$131	\$220
Respiratory	89.0%	\$89	\$101	\$117	\$142	\$191
Charges						

Drugs	6.4%	\$332	\$384	\$462	\$577	\$806
ONTA	20.2%	\$376	\$415	\$465	\$548	\$716
Respiratory	89.0%	\$283	\$330	\$394	\$493	\$688

The researchers found that different variables affected the NTA component in very different ways across each of the three patient classification categories. Even variables with large effects on ancillary use in one patient classification category (e.g., acute) may not have had any effect on this component for other categories. Similarly, for variables that had an effect on resource use across multiple classification categories, researchers found large variances in the magnitude of the effects. For example, cellulitis has twice the effect on drug charges per day for Chronic stays (\$27.07) as compared to Rehabilitation stays (\$12.14). The same pattern emerged for two of the highest-cost services, IVs and HIV. The use of IVs increased costs directly by \$68.33, \$38.80, and \$65.36 in the Acute, Chronic and Rehabilitation profile groups, respectively, while an HIV diagnostic category was also associated with much higher NTA costs--\$153.78, \$138.79, and \$101.67, respectively.

A key feature of the New Profiles classification system is that patients are assigned to the three groups based solely on their clinical and functional characteristics and their medical histories. The researchers explicitly avoided including measures of resource use or service provision such as tube feeding or physical therapy, since inclusion of such items can possibly result in tautological relationships with dependent variables (e.g., using the number of therapy minutes provided to predict the amount of therapy resources used), or can create perverse incentives to provide sub-optimal care (e.g., encouraging the use of urinary catheters by providing higher reimbursement for such patients).

Researchers used two methods for modeling NTA resource use under the New Profiles approach. The first method was a two-stage traditional regression model used to identify NTA resource relationships with explanatory variables. The first stage identified which patients used any resources and a second stage identified variables associated with the extent of resource use. The second method for modeling was to use a Classification and Regression Tree (CART) model, because traditional regression models do not generally identify interactions between explanatory variables.

Table 4 shows the amount of variation in NTA resource use explained by each of the models described above for both costs and charges. Overall, the two-stage models explained the variations in NTA charges reasonably well, particularly for ONTAs and respiratory services. The models were able to explain the largest amount of variation in Acute stays and the least amount of variation in Chronic stays. The cost models generally had poorer variance explanation than did the charge models. The CART models explained somewhat less variation than the two-stage regression models, and did not have the same pattern in explanatory power across patient classifications or NTA components as the two-stage regression models.

Table 4. Explanatory power for all models

Variable	R-square			
	Acute	Chronic	Rehabilitation	All
Drug				
Two-Stage Charges	0.39	0.29	0.32	0.32
Two-Stage Costs	0.17	0.10	0.13	0.12
CART Tree Charges	0.21	0.20	0.22	0.21
CART Tree Costs	0.11	0.09	0.10	0.09
Respiratory Therapy				
Two-Stage Charges	0.45	0.44	0.51	0.46
Two-Stage Costs	0.47	0.48	0.45	0.48
CART Tree Charges	0.28	0.15	0.36	0.28
CART Tree Costs	0.20	0.20	0.21	0.21
Other Non-Therapy Ancillaries (ONTAs)				
Two-Stage Charges	0.46	0.40	0.42	0.44
Two-Stage Costs	0.31	0.15	0.26	0.25
CART Tree Charges	0.32	0.35	0.35	0.35
CART Tree Costs	0.16	0.15	0.17	0.16

Notes: R-square represents the amount of variation in resource use across all stays explained by the model.

The researchers recommended that these analyses could be used to develop an NTA payment model. Using this model, a per diem base rate for NTAs could be developed that would then be adjusted by any combination of additional factors including wage index, rural status, comorbidities, the presence of high cost services, or adjustments that reflect utilization differences in different parts of the SNF stay.

The researchers could not use the same methodology to address nursing costs that they used for NTA costs, as CMS does not currently collect patient-specific nursing cost data. Nursing data are collected through onsite time studies. As discussed in Chapter 4, CMS is preparing a new time study that will generate current data on nursing resources needed to care for various types of patients in SNFs. Thus, the New Profiles model creates a separate NTA payment structure that must be calculated in addition to the existing RUG-III system.

The New Profiles rehabilitation therapy (NP-Therapy): The NP-Therapy model also starts with the stratification of Medicare SNF patients into “Acute,” “Chronic,” and “Rehabilitation” groups. The NP-Therapy model then adds multiple functional and cognitive status condition variables from the MDS and diagnostic and therapy use data from prior hospital claims to indicate the patient’s need for therapy. In contrast to the RUG-III methodology, the NP-Therapy model payment levels are independent of the actual therapy furnished to the patient in the SNF. The NP-Therapy model showed a slightly higher explanation of variance than the existing SNF PPS, but the difference was statistically insignificant.

The therapy analysis did yield several interesting findings. First, usage patterns for speech-language pathology services are markedly different from those for physical and occupational therapy. Fewer than 20 percent of SNF patients receive speech-language pathology services, and the vast majority received relatively small amounts per day, with a median of \$33 per day. The usage pattern is quite different for physical and occupational therapy: 85 percent of Medicare beneficiaries receive either physical or occupational therapy but show much higher variability in the amount of services received.

For this reason, the researchers conducted separate analyses combining physical/occupational therapy and speech-language pathology services. For the combined physical/occupational therapy, the RUG-III system had significantly higher explanatory power than the NP-Therapy model (39 percent to 19 percent using the R-squared statistic). However, when applied solely to speech-language pathology services, the explanatory power of the New Profiles approach was higher, 19 percent versus 11 percent for the RUG-III system.

As discussed above, the researchers identified a non-linear relationship between functional status and therapy utilization; i.e., patients with either a high level of dependence or a high level of independence did not receive as much therapy as those with moderate functional impairment. They used this relationship to create a three-level ADL split representing independence, moderate dependence, and severe/total dependence. While this methodology may have promise, additional research will be needed to verify the medical appropriateness of the reduced therapy levels for two of the three classification groups.

Discussion

Although the New Profiles model for non-therapy ancillaries results in increased predictive power for NTA use, the results highlight several areas of concern. First, use of NTAs varies substantially among patients, particularly those patients in the highest utilization groups. As shown in Table 3, the average drug cost for the 95th percentile is \$141.95, but increases 232 percent to \$330 for the 99th percentile. This high level of intra-group variability makes it difficult to design an allocation methodology that will be uniformly effective.

Second, part of the difficulty in establishing the rehabilitation stay category and the therapy ancillary model relate to a Congressionally mandated payment adjustment that skewed the payment rates for three RUG-III rehabilitation groups. Adding a 20 percent payment adjustment to these three groups created an incentive to furnish a level of services that would qualify for the additional payments. The models should be reevaluated using more recent data that do not contain this anomaly (i.e., data for services furnished on or after April 1, 2001, when subsequent legislation eliminated this anomaly) and take the FY 2006 RUG-III refinements into account.

Finally, further work is needed to evaluate the reliability of the hospital variables that would be driving NTA payments to SNFs. For example, patients using high cost IV medications during the acute phase of an illness do not always need the same intensity of service during the post-hospital SNF stay. Similarly, hospital care tends to focus on treating a specific illness or condition such as pneumonia and might not be sensitive to other care needs that are not addressed in the primary and secondary diagnoses reported by the hospital. In this case, the cost of services and supplies needed to treat comorbidities such as pressure ulcers might not be captured with any degree of precision.

Administratively, the New Profiles model may be challenging for facilities to implement and manage effectively. Like the other RUG-III refinement models, the New Profiles approach adds a second classification system to the existing RUG-III methodology that increases the number of payment groups. In addition, the functional status variables that are key characteristics in both systems use different measurement criteria, i.e., the MDS for the RUG-III system and the Barthel Index for the New Profiles method.

In all likelihood, the use of multiple assessment techniques and classification categories would create confusion among nursing facility staff and add to the paperwork burden associated with the PPS. Thus, both CMS and the nursing home industry would need to develop extensive and ongoing training programs to ensure proper application of the new assessment and classification requirements.

The substitution of hospital stay variables for MDS items is more problematic, as the hospital information is not typically available to the SNF when the beneficiary is admitted. These options would require major restructuring of the SNF and hospital systems to ensure timely and standardized data transfer. In addition, for the SNF to report the information, it would be necessary to change either the MDS or the UB-92 claim form or both.

A few variables that are not currently captured in the MDS appear to be necessary to assess NTA costs accurately but could be included in the MDS with minor modifications. One of those variables is IV use in conjunction with relief bed use, which increases the NTA cost by \$55.74 in the Chronic category. Accurately identifying the provision of respiratory services is also important. Simple changes in the MDS instrument could identify the delivery of IV medications and respiratory services in the SNF. However, CMS is currently evaluating the feasibility of an integrated assessment instrument that could be used by hospitals at discharge from acute care and by SNFs (and other providers of post acute care). Once this instrument is developed, the New Profiles model should be reconsidered.

The NP-therapy model raised several important issues that merit further investigation. The Medicare RUG-III therapy rates are based on actual resource utilization, and the RUG-III therapy payments have been criticized as functioning more like a fee schedule than as a PPS. In fact, several State agencies and foreign health systems use the RUG-III nursing component, but have chosen not to adopt the therapy weights. Instead, these

payors pay for therapy separately and subject it to separate utilization review requirements. These other payors have generally adopted either cost-based or fee schedule methodologies rather than developing a second, separate prospective payment mechanism for therapy services.

It is also likely that utilization patterns have changed since 2001. More recent data show that, while a significant portion of the therapy time is still clustered at the lower end of the range for each RUG-III group, there is an increased distribution of therapy utilization in the middle to upper portions of the range. Additional analysis would be necessary to reevaluate the SNF PPS therapy component in light of these changes.

In addition, when evaluating alternative approaches to payment, the risk of underutilization and patient vulnerability should not be underestimated. Payment systems based on need are just as vulnerable to “gaming” as the current methodology, in that they contain an incentive to reduce the amount of therapy services actually provided below a clinically appropriate level. While the current system may encourage SNFs to furnish therapy to a greater number of residents, balancing conflicting incentives in a way that safeguards patients in alternative systems is a challenge.

Researchers also found that combining physical therapy, occupational therapy, and speech-language pathology services into a single payment category makes it more difficult to identify the actual degree of need associated with each type of service. Additional research appears indicated to evaluate a change in the payment structure that provides a separate payment category for speech-language pathology services. CMS intends to use data that will be collected during the SNF time study that is currently underway (see Chapter 4) to evaluate potential changes to the SNF PPS therapy payment structure.

2.C. Diagnosis-Related Groups (DRGs)

The Diagnosis-Related Group (DRG) patient classification system has formed the basis of Medicare’s inpatient hospital PPS since 1984 and has recently been adapted for use in the Medicare Long-Term Care Hospital PPS. DRGs were designed to group patients with similar clinical problems that are expected to require similar amounts of resources in short-term acute care hospitals. DRGs summarize patient diagnostic information and procedures performed within the hospital and are further divided by the presence or absence of comorbidities or complications indicated by specific secondary diagnoses. The DRG from the qualifying hospital stay is independent of the treatments actually provided in the SNF.

In contrast, the RUG-III system groups patients with dissimilar health conditions who need similar amounts of resources. As noted by the researchers, functional dependency is considered the most important driver of SNF nursing and therapy resource use, and there is evidence that DRGs by themselves do not sufficiently distinguish between patients with different levels of functional dependency. Prior to implementing the current SNF PPS, CMS examined the feasibility of using DRGs for Medicare SNF patient

classification (Cotterill 1986). At that time, DRGs were found to have little explanatory power for routine costs at the facility level but showed some potential for explaining ancillary costs.

The researchers of the current studies re-evaluated the potential of DRGs to predict ancillary as well as total stay costs. The researchers examined the ability of four DRG models to predict SNF utilization: the existing DRG and All Patient Refined (APR)-DRG systems, a DRG model expanded to include functional status variables, and a fully specified DRG model that used facility characteristics to predict total SNF stay costs.

The analysis of the existing DRG system essentially confirmed previous research. As a stand-alone methodology, DRGs do not sufficiently distinguish patients with different levels of functional dependency, a major factor in SNF utilization.

The researchers then evaluated a variation on the DRG methodology, the proprietary APR-DRG system developed by 3M Health Information Systems. APR-DRGs are an expansion of the DRGs used by CMS for Medicare and were designed to describe non-Medicare populations more fully. APR-DRGs have 355 base DRGs, and each base DRG has four subclasses of severity (1-minor, 2-moderate, 3-major, and 4-extreme), for a total of 1,422 APR-DRG groups--almost three times as many groups as the Medicare DRG system. The Urban researchers tested the severity of illness indicators to determine whether APR-DRGs were better able to account for patient comorbidities in the SNF population. The researchers found that the APR-DRG methodology provided only a modest improvement. In light of the additional complexity of the APR-DRG classification system, this model was not explored further.

The researchers then expanded their investigation by adding additional functional status and facility characteristic variables to the DRG model. They chose these functional variables from individual ADLs reported on the MDS, the Barthel Index, and the MDS Cognitive Performance Scale. The DRG + functional status variables explain 7.1 percent of per stay NTA and 12.5 percent of per stay therapy costs. Using this model, the researchers found that on average, higher NTA costs are associated with lower therapy costs. Additional work is needed to reconcile these findings with the RUG-58 analyses that identified a high volume of NTA costs for a significant subset of patients with both heavy medical and heavy rehabilitation costs.

Finally, the researchers attempted to expand the DRG methodology to predict total per stay costs. The purpose of this analysis was to determine whether DRGs could be used to create an alternative to the total SNF PPS payment structure. For this analysis, the researchers added specific facility characteristic variables including facility size, ownership status, and percent of patient days paid by Medicare, and achieved an extremely high predictive power of more than 50 percent of facility per stay costs. However, in considering the results, it is important to note these variables are predictive of variations in facility cost structures rather than the resource and service variables that are typically factored into a PPS.

Discussion

The DRG models, like the New Profiles models discussed above, show positive results when combined with SNF data; e.g., ADLs. However, while the functional variables used in these studies appear reliable, additional investigation is needed to determine clinical as well as statistical validity.

These DRG models use the DRGs from prior hospital stays, along with function and cognitive status measured during the SNF stay. Because the SNF stay is conceptually an extension of the prior hospital stay, the DRG of the prior hospital stay should differentiate, at least to some extent, between high- and low-cost SNF stays. However, one missing piece in this model is the medical complexity of patients during the SNF stay, which may include a different set of ancillary services than those furnished during the acute hospital stay. The RUG-III system more directly captures this medical complexity in its use of the extensive services, special care, and clinically complex groups.

A second area of concern is the sensitivity of the DRG models to changes in patient condition after admission to the SNF. While ADL and cognitive status changes are taken into account, changes in patient condition that require changes in medications or treatments are not.

Assuming that the researchers can verify the clinical reliability of the variables, one advantage of using the DRG methodology (as compared to the other models discussed in this chapter) is its potential use in evaluating utilization and Medicare expenditures across care settings. Thus, the DRGs would replace the RUG-III system rather than form an addition to the RUG-III system in the rate-setting methodology.

One major drawback to the DRG models is the difficulty in obtaining reliable DRG data quickly enough to make timely payments to SNFs. As discussed earlier in this chapter, administratively, this option would be extremely challenging to implement in the short term. In addition, while SNF clinical staff are familiar with diagnosis coding procedures, they are unlikely to have a detailed understanding of the DRG system. Extensive training would be necessary to retrain SNF staff on the DRG system.

When considering the cost benefit of these options, it is important to note that these preliminary results clearly indicate the importance of accurate diagnosis data in developing reliable enhancements to the SNF PPS. Additional work is needed to find ways of improving the quality of the data available to the SNF, including new protocols for transferring hospital discharge data to SNFs at the time of the SNF admission, such as an integrated hospital discharge/post acute care assessment instrument. The ongoing work on the development of an electronic health record support this type of approach. Once the more reliable diagnosis data can be obtained from the hospital, the use of these models could be reassessed. It is also entirely possible that, with improved accuracy of SNF diagnostic data, the explanatory power of the existing SNF PPS may increase.

Chapter 3: Database Design and Data Constraints

The research findings presented in this report can be characterized as a search for data variables that accurately predict the level of NTA usage. The initial intent was that, once identified, these new variables would be integrated into the RUG-III classification system, resulting in more accurate allocation of Medicare dollars to facilities serving heavy care patients. To accomplish this task, CMS researchers assembled data from a variety of sources, including sources that are currently unavailable to SNFs (such as claims data for inpatient hospital stays up to six months prior to the SNF admission) and conducted cross-verification analyses that compared MDS data with information from SNF and prior hospital claims. In addition, the researchers tested several different methodologies for reimbursing ancillaries, and considered alternatives to the SNF PPS that were discussed earlier in this report that have contributed greatly to our understanding of SNF PPS.

This research should also be viewed within the context of the broader health care delivery system. To the best of our knowledge, no other payors have introduced alternative payment systems that improve upon the SNF PPS and RUG-III methodology. In fact, during the past ten years, an increasing number of health care payors, including the Department of Defense (DOD) and a majority of State Medicaid agencies, have adopted a version of the SNF PPS. The RUG-III system is also being considered for use nationally by the Department of Veterans Affairs (DVA) and is in the design stage for use in several other countries, including Canada and Italy. While some State agencies and foreign health systems have not fully adopted the SNF PPS methodology for reimbursing ancillaries, they have not developed an alternative prospective payment mechanism for these services. Instead, ancillaries are generally paid on a cost or fee schedule basis.

The researchers have also identified a number of promising areas for further analysis. During the course of this research, we addressed a number of important analytical issues with implications for future research. By identifying areas where progress was constrained by insufficient or unreliable data, these findings point the way to changes in MDS and claims reporting requirements that will facilitate future studies. At the same time, the results of this research highlight issues of provider burden and encourage careful consideration of costs and benefits, i.e., whether (and which) incremental improvements sufficiently justify the increased burden associated with the data reporting and data validation procedures needed to implement those improvements. In the discussion presented below, we discuss the existing data constraints, the possibilities for capturing more relevant data, and the feasibility of integrating the new data elements into the SNF PPS.

3.A. Diagnostic Information

The Urban researchers found that patient diagnoses reported on SNF claims were often incomplete or missing. Presumably, since the data are not used for Medicare payment, SNFs do not emphasize this type of reporting by employing medical records professionals or staff with in-depth knowledge of the ICD-9 diagnostic coding system.

The problem is more noticeable in free-standing SNFs since hospital-based SNFs often follow the hospital coding protocols, even though the diagnoses do not affect their SNF payment. Still, it is not currently feasible to use SNF diagnoses to identify comorbidities that affect ancillary utilization. To compensate, the researchers looked at diagnostic data from the prior hospital stay and found that the hospital claims data were more accurate than the data reported on either the SNF claim or the MDS. Therefore, the researchers used prior hospital stay data to fine-tune the classification system.

Similarly, due to variations in contractor billing practices, hospital-based SNFs are likely (one-third of cases) to record the code “rehabilitation” as the primary diagnosis for the SNF stay, while freestanding SNFs rarely use this code. In analyzing costs, the researchers found that the “rehabilitation” code was a more accurate proxy for hospital-based SNF status rather than as a clear determinant of patient costs across the entire population.

However, these hospital data are not currently available for use during the normal SNF billing and payment cycle. For one thing, hospital coding efforts often result in billing delays, and it is common for the SNF claim to be filed before the hospital claim. Administratively, it would require major restructuring of both hospital and SNF billing requirements to ensure timely collection of hospital variables for use in an SNF payment system, and could result in payment delays and disruption of SNF cash flows. This option may become more feasible in the future with the adoption of an electronic health record that is transferable between sites of care. However, in the short term, it would increase the administrative burden on both hospitals and SNFs.

The administrative complexity of these program options should not lead us to reject the use of additional payment variables. Instead, we need to look at other collection methodologies. SNF coding on the UB-92 will improve (as did hospital coding after the introduction of the inpatient hospital PPS) if the data are used for determining payment. Some prior hospital stay data can be captured by the SNF at admission and reported on the MDS. Additional work is needed to determine the relative importance of the prior hospital stay variables and the feasibility of either incorporating those variables into existing data collection instruments (like the MDS) or of requiring more detailed diagnostic coding on the SNF claims. In addition, it will be important to take these issues into account in the design of an integrated assessment instrument.

3.B. MDS Data May Include Services Rendered Prior to the SNF Admission

Some of the MDS questions are posed in terms of “in the past 14 days,” which means that MDS assessments covering the first 30 days of care could include services that were actually delivered during the prior hospital stay rather than during the SNF stay; i.e., the 5-day assessment is used for payment of days 1-14 and the 14-day assessment is used for days 15-30. Since the average length of an SNF stay is under 30 days, the MDS reporting structure masks real SNF utilization. This MDS provision was implemented prior to the start of the SNF PPS, and was designed to assist SNF staff in care planning. The impact on SNF payment of reporting SNF and prior hospital data in the same MDS item was not recognized until after the introduction of the SNF PPS.

For example, one of the high-cost ancillaries identified in this study is IV medications. We found that, according to the 5-day MDS, approximately half of the SNF patients had received IV medications. We then compared the MDS responses on IV medications to Medicare SNF claims and found a very large discrepancy between the two sources. In almost all such instances, the MDS reflected the use of IV medications while the SNF claim did not, indicating that the IV medication use had likely occurred during the prior hospital stay and was captured in the MDS “look back” period. Thus, certain high intensity/high cost services reported on the MDS and used in the current SNF PPS are unreliable indicators of actual service use during the SNF stay itself. Clearly, any “RUG Refinement” approach will need to distinguish between services actually furnished by the SNF and those provided during an acute care hospital stay.

3.C. The MDS and SNF Claims Data Use Different Reporting Periods

CMS requires SNFs to submit claims on a monthly basis. However, the majority of MDS assessments used for payment (5-day and 14-day) each cover less than 30 days of the stay (14 days and 16 days, respectively). As a further complication, SNFs typically bill on a calendar month basis, while the MDS completion schedule is tied to the date of admission. As a result, it is common to encounter situations where one MDS often covers days reported on two separate claims or where multiple MDS assessments apply to a single billing period. Finally, while care needs change during the course of a stay, the changes cannot be identified on the SNF claim, since services are not currently reported by date of service or in enough detail to identify the specific ancillary services furnished to the patient.

In conducting this research, it was clear that a subset of the SNF population use unusually high levels of ancillary services measured either by service volume or by high unit cost, such as specialized IV antibiotics. However, neither the SNF claim nor the MDS currently allow us to identify the actual services with any degree of precision. For example, CMS originally planned to collect drug utilization data on the MDS (and some States still do collect drug utilization data), but this section of the MDS was not implemented, due to provider concerns about increased administrative burden. The Medicare UB-92 claims contain limited pharmacy charge data on each claim, but do not identify the specific drugs used. As a result, it has been difficult to identify a “refinement” that would target patients needing high-cost ancillary services, such as some IV medications.

When the SNF PPS was designed, CMS proposed line-item, date-of-service billing for SNF Part A claims. The purpose of this detailed billing was to identify and track utilization patterns more precisely throughout the course of a Part A stay through standard HCPCS coding, identify atypical stays, and monitor the effectiveness of the SNF PPS’s consolidated billing exclusion provisions. In addition, the availability of detailed service-level data would serve program integrity and quality monitoring purposes by facilitating medical necessity reviews and identifying potential over/underutilization situations.

Due to the complexity of the transition to the SNF PPS, there was substantial industry opposition to implementing a major billing change at the same time, and CMS withdrew the proposal. This decision needs to be reevaluated in light of the importance of detailed utilization data in monitoring the effectiveness of the SNF PPS and the adequacy of the payment rates for NTA services.

Finally, since patient care needs change throughout an SNF stay, more detailed utilization data could be used to reevaluate the submission schedule for MDS assessments used for payment (i.e., currently required on days 5, 14, 30, 60, and 90) and improve the alignment between the MDS schedule and the UB-92 claim.

3.D. Skewed Distribution of High-Cost Ancillary Services

The RUG-III system was designed to identify differences in nursing resources (the largest component of SNF costs) needed to care for different types of patients, and the RUG-III system is generally considered successful in predicting nursing as well as therapy costs. Most of our recent research has focused on predicting NTA utilization/costs, a component of the SNF PPS that was adopted only in the late stage of the case-mix demonstration project. During the initial program implementation, CMS data analysis showed that there was a correlation between the RUG-III nursing weights and NTA usage. Based on these results, the nursing weights were used as an adjuster for both the nursing and the NTA rate components.

It quickly became apparent that, while there was a correlation between the RUG-III group and NTA use, the RUG-III group was not a strong predictor of ancillary costs. During the course of this research, we have found that NTA resource use varies dramatically more than nursing resource use; i.e., NTA costs per day vary 18-fold, while RUG-III nursing component payment rates vary only 2-fold. We have also found that several of the highest-cost ancillary services, such as respiratory services, IV medications, and enterals/parenterals, are used only by small subsets of the SNF population.

In addition, the NTA utilization in these cases may be more directly related to comorbidities or chronic conditions than to the reason for the recent qualifying hospital stay. Linking the NTA payment to the RUG-III group, even through the use of additional variables, remains problematic. For other high-utilization populations such as AIDS patients, NTA use cannot be linked to a particular RUG-III group. In fact, the Congress specifically recognized this difficulty by enacting a payment add-on in section 511 of the MMA that is tied directly to an AIDS diagnosis rather than a RUG-III group.

3.E. Therapy payments are too closely tied to service utilization

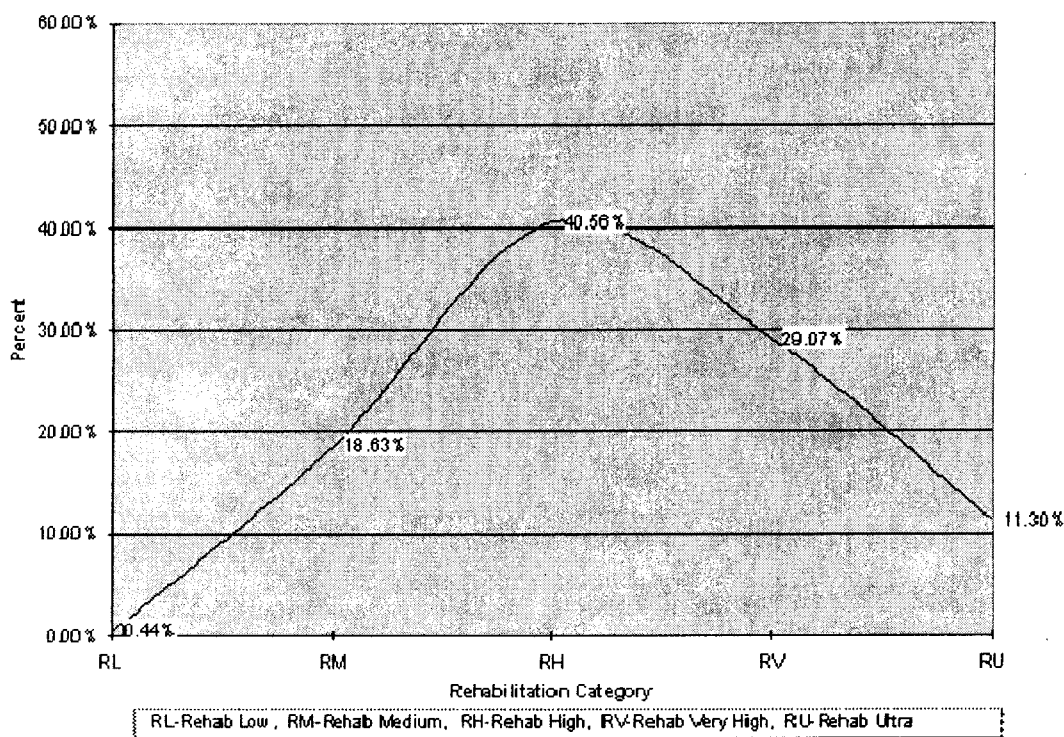
Under the original system, payment categories have been established for five levels of therapy care (low, medium, high, very high, and ultra-high rehabilitation) that are categorized by a range of therapy minutes furnished to the patient. For example, patients receiving between 150 and 324 minutes of therapy would be classified into the medium rehabilitation level.

Payment is then based on the utilization reported on the MDS (i.e., the amount of therapy actually received) rather than upon the relationships between residents' clinical and functional characteristics and amount of therapy services needed. Since RUG-III essentially pays for therapy as ordered, and because adding therapy to the mix of other skilled services generally increases payment, the PPS creates strong incentives to assign residents to the rehabilitation category.

The researchers found that, using data from 1999 and 2001 (a period when certain therapy categories were more profitable than others), the amount of therapy provided was clustered just above the break points for each of the most profitable RUG-III therapy groups. In other words, what was intended to be the low end of a range had become the therapy standard. Upon consideration of this utilization pattern, researchers attempted to develop an NP-Therapy model based upon expected needs rather than on actual utilization.

CMS staff have also conducted a variety of analyses related to therapy utilization. First, as noted in the discussion of the New Profiles models, once the payment anomaly was corrected, and the incentive to cluster all beneficiaries into the three most highly paid groups was eliminated, utilization in those three groups decreased. In Table 5, using 2003 MDS data, the level of therapy is more evenly distributed between the five rehabilitation levels.

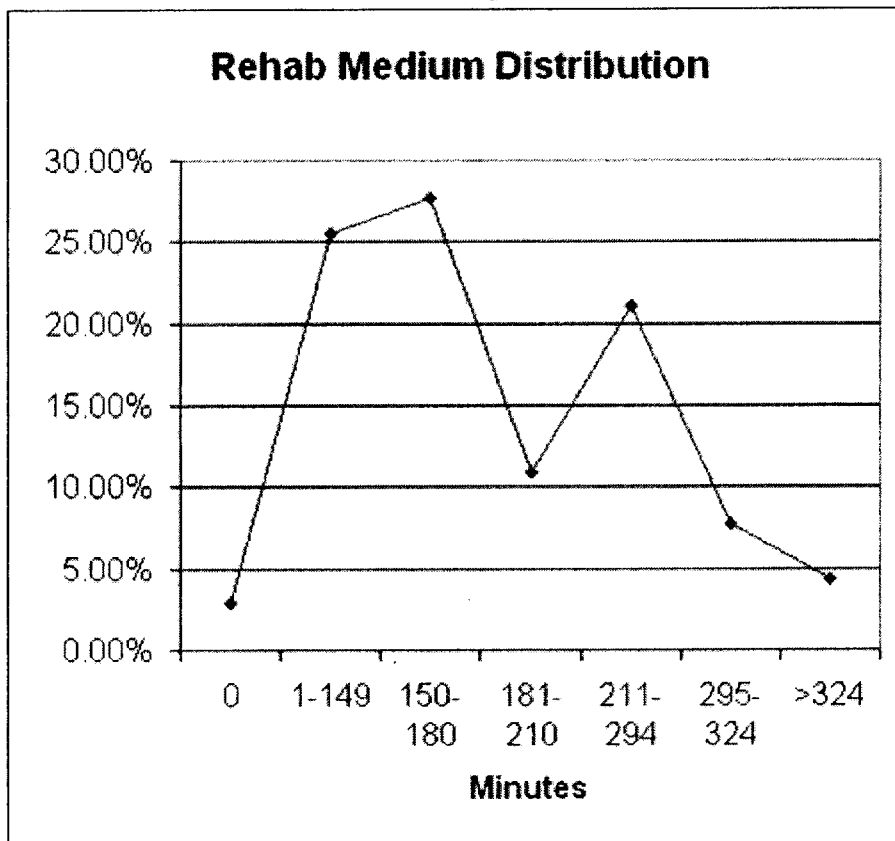
Table 5. 2003 Distribution of MDS Assessments for Rehabilitation Categories



In addition, the 2003 MDS data also show less intra-group compression. Table 6 focuses on the Medium Rehabilitation level, one of the categories that qualified for the 20 percent

payment adjustment that ended in April 2001. As indicated below, utilization is no longer clustered at the lowest level, and a significant percentage of beneficiaries are receiving care in the mid-range for that category.

Table 6. 2003 Distribution of Therapy Minutes: Medium Rehab



It is also important to note that the current methodology was adopted in response to concerns that a system based solely on need would be gameable and result in underprovision of services. Additional analysis is needed to identify appropriate variables and to develop controls and quality monitoring tools that will ensure appropriate provision of services. In addition, therapy utilization will be addressed in the SNF onsite STM project (i.e., time study) that is currently underway. Thus, for the short term, we can use the time study to recalibrate the therapy break points. At the same time, we can increase our understanding of appropriate therapy utilization and start to identify more accurate predictor variables.

Finally, the absence of any discharge assessment makes it impossible to identify and evaluate the outcomes of therapy furnished to beneficiaries. These outcomes data are needed to inform two new initiatives that will explore linking payment more directly to quality outcomes (“Pay for Performance”) and the creation of an integrated payment system for post-acute care.

3.F. The FY 2001 Database Used in this Study does not Reflect Current Payment or Utilization Levels

In conducting this research, Urban used FY 2001 data (the most recent claims, MDS, and cost report data available). However, during FY 2001, two temporary add-on payments (i.e., a 16.67 percent increase to the nursing component and a 4 percent across-the-board increase) were in effect that overstated the Medicare expenditure data used in analyses related to the adequacy of the SNF PPS rate. These two payment adjustments were discontinued as of October 1, 2002, and resulted in an aggregate decrease of approximately \$1 billion in SNF funding levels.

In addition, the FY 2001 data included a 20 percent increase to three of the 14 rehabilitation groups that created a strong incentive to match the level of therapy provided to the three groups with the highest payment. As a result, there was little variation in therapy utilization levels during this period, and this anomaly needs to be taken into account when evaluating the therapy rate component. This problem was addressed under section 314 of the BIPA, and the problem was eliminated effective with services furnished on or after April 1, 2001, by reallocating the add-on payments uniformly to all 14 rehabilitation groups. The resulting 6.7 percent increase restored payment equilibrium within the hierarchy of rehabilitation levels (from low to ultra high).

Additional work is needed to evaluate the effectiveness of the actual SNF PPS payment structure. First, payment data need to be cleansed to eliminate the effect of the three payment adjustments that are no longer in effect. Second, the adjustments attributable to the FY 2006 refinements need to be incorporated. Then, work can proceed to evaluate the overall adequacy of the SNF PPS and the effectiveness of models for change.

3.G. Differences Between Medicare and Medicaid Utilization Need to be Identified More Precisely

While many chronic, long-term Medicaid patients are still classified into the lower levels of the RUG-III hierarchy, others group into the RUG-III levels generally considered to meet Medicare skilled care criteria. Even though Medicare and Medicaid patients may often be classified into the same RUG-III group, there may be a considerable difference in resource needs and associated ancillary costs between the two populations. These differences are particularly important in States that are using the RUG-III system for Medicaid payment. In the current STM study, these differences will be explored.

3.H. Differences Between Hospital-based and Freestanding SNFs Need to be Explored

During the initial SNF PPS design phase, it was clear that hospital-based SNF costs were generally much higher than those of freestanding SNFs. However, the reasons for the differences were not, and are still not, clearly understood. Possible reasons for the different cost structures include hospital cost allocation strategies that shift costs from the hospital to the cost-based SNF, maintaining acute care staffing levels and more intensive

care protocols in the SNF units, inability to spread staffing costs due to small unit size, and providing a different level of services to a sicker population.

The 1997 STM study did compare hospital-based and freestanding SNF patients who grouped into the same RUG-III categories but did not find significant differences in acuity. Thus, in the Balanced Budget Act of 1997, the Congress chose to maintain a single rate-setting framework for all SNFs while recognizing some differences between freestanding and hospital-based SNFs, i.e., the SNF PPS rates were set at a level equal to a weighted mean of freestanding SNF costs plus 50 percent of the difference between the freestanding mean and a weighted mean of all SNF costs (hospital-based and freestanding) combined.

Both the Urban researchers and MedPAC have confirmed that hospital-based SNFs continued to report higher costs after the introduction of the SNF PPS. In fact, MedPAC determined that the aggregate Medicare profit margins (“payments less costs, divided by payments”) for hospital-based SNFs are negative, while the aggregate margins for freestanding SNFs are positive. For example, a 2003 MedPAC analysis found a margin of negative 36 percent for hospital-based SNFs, and a profit margin of 11 percent for freestanding SNFs. Profit margins for hospital-based SNFs have continued to decline.

MedPAC suggested various possible reasons for the lower margins for hospital-based facilities, including the possibility that hospital-based SNFs treat “a larger proportion [than freestanding facilities] of the less-profitable types of patients [who have] multiple complex needs” but do not require rehabilitation therapy; that hospital-based SNFs have “higher fixed costs” than freestanding SNFs; and, that hospital-based SNFs “may also offer a different product than freestanding SNFs, with more licensed staff and a much shorter average length of stay” than freestanding SNFs (MedPAC, *Report to the Congress: Medicare Payment Policy*, March 2003). However, a subsequent study was unable to identify any significant differences in the care needs of hospital-based and freestanding SNFs.

Additional research is needed to gain a better understanding of these two facility types, and to make informed policy decisions for the future. The differences between hospital-based and freestanding SNFs will be addressed in the current STM study.

In conclusion, the research findings discussed in this report have substantially increased our understanding of the SNF utilization and the strengths and weaknesses of the SNF PPS. In the final chapter of this report, we discuss a series of next steps and plans for future action.

Chapter 4: Next Steps

The “refinements” research discussed in this report has vastly increased our understanding of the strengths and weaknesses of the SNF PPS. Using 2001 claims data, the researchers found that the SNF PPS covered 95 percent of estimated SNF per stay costs, including the cost of NTA services. This finding is consistent with more recent MedPAC and CMS cost report data that show positive Medicare profit margins for aggregate SNF utilization, and places the scope and extent of the NTA payment issue in better perspective.

During the course of the research, it became clear that there is extremely high variability in NTA costs. The researchers contrasted the 18-fold variation in NTA costs to the 2-fold variation in nursing costs, and characterized the highest NTA utilization cases as almost random events. For example, as shown in Table 3, prescription drug costs varied 234 percent, from \$141 to \$330, from the 95th to the 99th percentile. Thus, the analyses that focused on fine-tuning the RUG-III methodology by creating multiple NTA rate components within each RUG-III group generated only modest improvements, without correcting the basic problem; i.e., these highly variable costs are not necessarily linked to the primary reasons for SNF care as defined by the RUG-III group.

In addition, the highest-cost ancillaries, IV medications and respiratory services, are used by a small subset of the population. Here again, the RUG-III refinements approach did not generate a comprehensive solution. The NTA per diem rate component is developed using aggregate costs adjusted for inflation. In effect, the per diem rate is determined by averaging aggregate costs across the entire population. Since the most expensive NTA services are used by a small percentage of patients (e.g., approximately 11 percent of SNF Part A beneficiaries receive respiratory care), the existing system will always under-reimburse those facilities that are actually incurring costs, regardless of how many NTA payment groups are established.

As a result of these findings, we introduced incremental case-mix refinements that went into effect on January 1, 2006. As described in the SNF PPS final rule for FY 2006 (70 FR 45026, August 4, 2005), these refinements introduced 9 new “Rehabilitation plus Extensive Services” RUGs at the top of the original 44-group hierarchy, for a total of 53 RUGs. The refinements also incorporated an across-the-board adjustment to the rates for all RUG groups, by increasing the case-mix weight for the particular rate component that includes NTA costs. This adjustment represented a permanent payment increase that was integrated into baseline spending levels, and helped account more fully for variations in NTA costs. These refinements collectively addressed the need to establish “a refined case mix classification system . . . to better account for medically complex residents,” in accordance with section 101(c) of the BBRA.

The researchers also explored an alternative method of reimbursing NTA services by constructing an outlier methodology. Medicare outlier payments are additional compensation to providers paid under PPSs for cases whose treatment costs are extraordinarily expensive (as determined by specific threshold criteria) relative to their

regular PPS payments. Generally, outlier payments are made on a budget-neutral basis, meaning that they would be self-financed through reductions made to the base payment rate. At present, the SNF PPS is the only Medicare PPS that does not include an outlier methodology. The results of the preliminary outlier analyses will be discussed in section A of this chapter.

The researchers were able to highlight areas where inconsistent, incomplete or misleading data constrained efforts to refine the SNF PPS. Many of the problems that the researchers encountered (such as poor diagnostic reporting by SNFs and discrepancies between claims and MDS data (see Chapter 3)) can be addressed administratively and will be discussed in section B of this chapter. In addition, further efforts to explore the differential impact of the SNF PPS on freestanding and hospital-based facilities will be presented in section C of this chapter.

Further, it is clear that, with the introduction of the SNF PPS, the nursing home industry has adjusted to new program incentives/disincentives by modifying admitting practices, treatment protocols, and utilization patterns. Yet, the SNF PPS payment for nursing costs is still based on STM studies conducted in 1990, 1995, and 1997, prior to the introduction of the Medicare SNF PPS. CMS has commenced a new time study in FY 2006 to recalibrate the RUG-III payment weights. In this study, CMS will also compare patient populations based on overall distribution patterns across the RUG-III hierarchy, and intra-group severity differences between the Medicare and Medicaid populations as well as between hospital-based and freestanding SNFs. This project is discussed in more detail in section C of this chapter.

Finally, the health care environment has evolved since the SNF PPS was designed. During the past 10 years, we have seen major advances in technology and treatments that have changed the way care is provided. The increasing availability of community-based services, such as home care and assisted living, has promoted their consideration as possible alternatives to SNFs. At the same time, institutional treatment sites, such as inpatient rehabilitation facilities (IRFs) and long term care hospitals, are providing post acute alternatives to SNF placement. We are now at a point where the traditional mechanisms for Medicare payment that are based on the site of care more closely reflect artificial site-based distinctions rather than the actual service needs of beneficiaries. In our evaluation of the SNF PPS, it is important to consider our next steps within the context of our broader initiative to integrate our post acute structures in ways that are patient-centered and equalize reimbursement across settings.

4.A. Development of an SNF Outlier Policy

The SNF PPS currently does not include an outlier policy. However as this project's Technical Advisory Panel members noted (SNF TAP, 2004), some stakeholders and analysts argued that an outlier policy should be a basic component of *any* PPS, and others suggested that an outlier policy could help address the SNF PPS case-mix classification system's specific limitations in matching NTA payments with NTA resource use—a limitation that became apparent only after the PPS had been introduced.

Under any PPS, the payment structure rewards prudent management and holds providers responsible for their operating decisions. Thus, while providers are rewarded for effective management, the potential for provider losses is necessary to retain the efficiency incentives of a PPS (Keeler et al, 1988). Unlike a cost reimbursement system that covers almost all reasonable costs, outlier payments defray only *some* of the losses incurred by providers for any given stay. They are intended, however, to reduce a PPS's incentive for providers to undertreat such cases--one of the major concerns underpinning the RUG refinements research presented in this report. Outlier policies are structured to compensate for the "upper" portion of a case's loss, and require that the provider bear the "lower" portion of a case's loss—that is, costs incurred above the PPS payment amount up to a specific threshold. This structure ensures that providers are compensated for extreme costs, but maintains the provider's management responsibility by making the initial portion of the financial loss ineligible for outlier payments.

Traditionally, Medicare outlier payment policies have been based on total stay costs. However, since payment for non-therapy ancillaries has been a major concern, the researchers developed two preliminary models, a total cost outlier model and a more targeted NTA outlier model. Researchers developed budget-neutral outlier simulations to accompany payment rates under the existing RUG-III case-mix classification system. That is, they calculated and applied outlier payments and the RUG-III base rate reductions necessary to maintain budget neutrality. Under both the total cost and NTA cost policy analyses, base rates are reduced to establish an outlier target level.

Researchers conducted these preliminary analyses using 2001 data, and it is important to note that the 2001 data include two Congressionally-mandated payment adjustments that are no longer in effect; i.e., a 16.67 percent adjustment to the combined nursing/NTA rate component and a 4 percent across-the-board adjustment to the calculated SNF PPS rate. In addition, the 2001 data include two different methodologies for paying therapy costs. For the first six months, payments to three of the 14 rehabilitation groups were increased by 20 percent. During the last six months of the year, the payment structure was changed to provide a 6.67 percent adjustment to each of the 14 rehabilitation groups. Thus, while additional work will be needed to validate the simulations using data that accurately reflect SNF PPS payments, the researchers were able to test an outlier approach and develop the preliminary findings noted below.

Under a total cost outlier approach, a stay is considered eligible for outlier compensation when its total costs passed a threshold relative to its full SNF PPS payment. The total cost policies allow for outlier payments due to extraordinary NTA and therapy costs that are subject to case-mix adjustment as well as for the high costs attributable to the other rate components (e.g., administrative and capital) that are priced and do not vary based on case mix. Urban found that, without an outlier, the SNF PPS covered 95 percent of per stay costs, and that the overall ratio of total payments to costs did not change with the addition of an outlier model. The per-stay outlier limitations are consistent with the finding that outlier cases are widely distributed (as would be expected if they are random events).

Under an NTA outlier approach, a stay in a given RUG-III classification group is eligible for outlier compensation only when its NTA costs pass a threshold relative to the estimated amount of that RUG-III payment that is attributable to NTA. Stays with NTA costs exceeding their threshold receive compensation for a portion of their NTA costs in excess of the threshold. As with the total stay outlier approach, the outlier policy does not produce changes in the overall ratio of total payments to total costs. However, using the NTA model, the researchers found that the SNF NTA cost distribution is more skewed than the SNF total cost distribution. As a result, the adoption of an NTA outlier should substantially improve the ratio of payments to costs for stays with high NTA costs.

In evaluating the two outlier models, total cost and NTA, researchers found a differential impact on providers. This result is unsurprising since “profitability” under the existing SNF PPS varies significantly by provider type. The total cost model improves facility payment-to-cost ratios relatively more for those facilities that are hospital-based, non-profit, government-owned, small size (49 or fewer Medicare-certified beds), and high Medicare volume (greater than 25 percent Medicare volume). The NTA model improves the ratios relatively more (or reduces the positive payment-to-cost ratios the least) for freestanding SNFs, for-profit facilities, larger facilities, and lower Medicare volume SNFs. Additional work is needed to evaluate the reasons for these differences and to determine the appropriate policy to recommend.

CMS intends to continue investigation of an SNF PPS outlier model as an alternative to the more limited RUG refinement approaches discussed in Chapter 2 of this report. Researchers will analyze both the total cost and the NTA models using data that accurately reflect SNF PPS payments to SNFs.

The purpose of this research is to identify options needed to establish the basic program components. This analysis will include an examination of the funding needed to maintain the adequacy of the base rate as well as the evaluation of outlier components described below:

- **Outlier Target Percentage:** The percentage of aggregate spending that can be used for outlier payments. The outlier target percentage also represents the amount by which the base rate will be reduced.
- **Costs Eligible for Outlier Payments:** Both total cost and NTA outlier models will be examined.
- **Loss Amount:** An SNF stay would qualify for outlier payments when its costs for covered services exceed a specified amount.
- **Loss-Sharing Ratio:** Since outlier payments are intended to cover roughly the *marginal costs* incurred, the researchers will test the model using different cost percentages.

- **Data Reporting and Verification:** New procedures may need to be developed to report SNF expenditures and determine outlier status. In addition, methods to monitor the accuracy of the data will be considered to ensure that outlier payments are made for medically necessary and appropriate care.

We believe that further research to identify a viable outlier methodology holds promise in two areas. First, it could address specific aspects of SNF care. In addition, the identification of these outlier conditions may help us to understand more clearly some of the determining factors in the placement of patients in different inpatient or community settings.

4.B. Improving the Quality of Data Used to Determine SNF PPS Payment

The SNF PPS that was introduced in July 1998 was Medicare's first PPS for post-acute care. As indicated throughout this report, researchers, with the benefit of hindsight, have identified several changes to CMS data collection and reporting requirements that will enhance our ability to monitor and evaluate the effectiveness of the SNF PPS. The researchers focused on constraints in the MDS assessment instrument and the UB-92 claims that limited the effectiveness of their analyses. As discussed previously, the impetus behind several of the analytical models was the need to find proxies for the available SNF data that had proven to be unreliable; i.e., SNF diagnoses and reporting of NTA utilization.

CMS intends to work with internal and external stakeholders to evaluate fully and, where appropriate, implement changes that will increase the accuracy of the data used for payment, planning, and program evaluation. Whenever possible, these changes will be coordinated with and integrated into related projects, such as the development of an integrated hospital discharge assessment that will either absorb or complement current work aimed at developing the next generation MDS (the MDS 3.0) and the development of an electronic health record structure, and will support the development of value-based purchasing outcomes measures as well as efforts to establish an integrated post acute payment system. The potential changes include:

SNF PPS - Specific Changes

- **Updating the MDS Manual:** For example, instructions can be revised to require reporting of certain NTA services only when the services are furnished to beneficiaries after admission to the SNF.
- **Including New MDS Items in the Design of the MDS 3.0:** CMS payment and quality monitoring staff work closely together on MDS issues, and regularly communicate research findings. Efforts will be made to include variables that increase the accuracy of the SNF PPS, including more accurate diagnosis data, in the development of the MDS 3.0.

- **Updating Billing Requirements:** The researchers identified several data constraints that limited their ability to identify and evaluate potential refinements. CMS intends to evaluate the feasibility of increasing the precision of SNF claims data for payment and analysis. For example, line-item, date-of-service reporting would be needed to evaluate fully the changes in utilization across SNF stays. This level of detail would provide valuable insight into the reasons behind the differential impact of the SNF PPS on different facility types.

Changes Needed to Support Longer-Range CMS Initiatives

- **Identifying Appropriate Items for Inclusion into the Integrated Hospital Discharge Assessment:** As discussed earlier, the lack of hospital discharge data has limited our ability to develop alternatives to the SNF PPS. For this reason, we are committed to the development of an integrated hospital discharge assessment that will allow us to collect the relevant hospital information and then to replace existing assessment instruments, including the MDS, in determining payment. New or revised clinical assessment items identified during the time study will be shared with OCSQ for integration into this new hospital discharge assessment.
- **Supporting the Integrated Post Acute Demonstration:** Ultimately, we intend to utilize the new integrated hospital discharge assessment tool as the basis for an integrated post acute benefit structure that will equalize reimbursement across care settings. As part of our STM study, we are collecting data on SNF beneficiaries receiving treatment for joint replacements. We believe this data will contribute to our understanding of the utilization and payment issues that will be studied in the demonstration.
- **Supporting the Electronic Health Record Initiative:** Research findings are being shared to make sure that items needed for accurate payment are incorporated into the design of electronic health records.
- **Facilitating the Design of Outcomes Measures in our Quality Monitoring and Value-Based Purchasing Programs:** Under the current system, we are unable to measure outcomes, because functional status is not reported at either the end of the therapy regimen, the end of Part A coverage of the stay, or at discharge from the stay itself. Better data will not only help us evaluate the therapy indexes but will also serve to inform two new payment initiatives. The first will explore linking payment more directly to quality outcomes (“Pay for Performance”). The second will provide for the creation of site-neutral payment across post-acute care providers for selected conditions.

4.C. Recalibrating the RUG-III Payment Weights through a New STM Study

The RUG-III classification system that forms the basis of the SNF PPS relies on STM data collected onsite at nursing facilities. These data are used first to calculate the

average amount of nursing and therapy time needed to provide quality patient care and then to reimburse nursing facilities for these two components of SNF care. CMS conducted time studies in 1990, 1995, and 1997, and used the data to calibrate the Medicare SNF PPS.

The SNF PPS reliance on STM data has generated the following concerns since its inception: the need for periodic update, the cost of conducting the time studies, and the reliance on a population subset to calculate the national payment rates. Urban was well aware of these concerns and attempted to address the concerns through their efforts to identify an alternative to the SNF PPS, such as the DRG model. However, Urban's findings suggest that many of the reasons for adopting the time study approach still exist.

For example, Urban's analyses all demonstrate the importance of ADL functional status in determining care needs. It is also clear that functional status is not directly linked to a particular diagnosis. Thus, almost all of the RUG-III categories are assigned by first establishing the general category, such as Special Care, and then establishing an ADL "end split" to assign the actual RUG-III group. Thus, when dealing with the frail, elderly population, resource needs cannot always be linked to a specific diagnosis or treatment protocol. For these reasons, CMS has commenced a new time study during FY 2006, the first such study since the introduction of the SNF PPS in July 1998.

CMS will be analyzing data to identify and evaluate differences between key populations, including Medicare and Medicaid patients, hospital-based and freestanding SNF patients, and possibly veterans receiving care under the VA benefit. CMS staff will also use the time study to validate MDS items for use in the RUG-III classification system. Finally, industry input will be crucial, and CMS intends to partner with the SNF industry to organize and conduct the time study.

In short, CMS intends to use the knowledge gained over the past six years to update and improve the SNF PPS and to align payment incentives more fully with efforts to monitor the quality of care in SNFs. CMS remains committed to working in partnership with the SNF industry and to implementing changes in ways that minimize the administrative burden on providers while improving the accuracy of the payment system.

4.D. Additional Recommendations of Changes Needed to Strengthen the SNF PPS

1. Changes requiring revisions in the existing law or regulations:

- a. Continue to investigate the feasibility of creating an outlier policy, with a focus on producing data for evaluating the policy's effectiveness specifically in terms of accounting for NTAs.
- b. Utilize CMS's ongoing STM study to collect data that can be used either to validate or update the existing RUG groups, relative weights, and GROUPER

methodology. Appropriate revisions could then be proposed through the rulemaking process.

- c. Develop a discharge MDS (could be proposed through the rulemaking process to help address some of the data constraints identified in Chapter 3 of this report, along with conforming revisions in the State Operations Manual and the regulations on required assessments).

2. Changes that do not require revisions in the existing law or regulations:

- a. Expand the existing requirement for Line Item Date of Service (LIDOS) billing on all Part B SNF claims to apply to Part A SNF claims as well, in order to improve the ability to identify high-cost ancillaries. This effort will be supported and enhanced by CMS's ongoing STM study, which is currently engaged in identifying utilization patterns for high-cost NTAs (such as pharmacy services).
- b. Utilize data from CMS's ongoing STM study to identify additional items that should be incorporated into the MDS 3.0 that is currently being developed.

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Appendix II: Data and Methods

This chapter contains the data sources and methodological approaches that Urban reported using in conducting its research. First, the Urban researchers described the data sources and the creation of the 2001 SNF analysis file. Second, they addressed the selection of units of observation, and described their approach for dealing with timing inconsistencies between claims data on charges and MDS data on patient characteristics. Third, they briefly described the dependent and explanatory variables that they examined. Fourth, they highlighted analytical issues that have implications for all classification models. Finally, they highlighted criteria for statistical evaluation of the different models.

I. Data Sources

The principal data source for this study is the 2001 Data Analysis PRO (DataPRO) file of Medicare SNF stays that are linked with MDS assessments, as well as information merged from the qualifying, or prior, acute care hospital stays. DataPRO was created to facilitate a medical review process of Medicare SNF residents following the implementation of the SNF PPS, and contains nationally representative information on Medicare SNF stays. Approximately 2 million such stays occur each year. The researchers enhanced the DataPRO stay records with additional information from Medicare claims, including charges for specific types of services (e.g., respiratory services, prescription drugs) used during the SNF and the prior hospital stays.

The MDS is part of an overall, standardized nursing home resident assessment system, required by the OBRA's Nursing Home Reform legislation, which was developed to improve the health and quality of life of nursing home residents. The MDS consists of over 300 questions grouped into 18 domains, such as patient diagnosis, cognitive status, functional status, and nutritional status. Of the roughly 300 items on the full assessment form, about 125 are used for PPS payment purposes. MDS assessments for SNF residents are made on a specified schedule approximately 5, 14, 30, 60, and 90 days from the start of the Medicare stay. In DataPRO, all MDS assessments for a resident are matched to each SNF stay, with selected items pulled for the file.

Medicare SNF and hospital providers submit claims for reimbursement for Medicare-covered services using form UB-92. Information on these claims includes periods of service, types of procedures furnished, primary and secondary diagnoses, and the institution's charges for services provided. Claims are submitted to Medicare fiscal intermediaries, contractors that conduct edits, review for appropriateness, and reimburse the provider according to Medicare eligibility, coverage, and payment rules. Claims from the Medicare intermediaries are ultimately sent to CMS.

Medicare-participating SNFs submit cost reports annually to fiscal intermediaries. Among other things, these reports itemize Medicare-related costs for routine and ancillary services, and the cost of capital. Urban used SNF cost report data to derive routine costs and ancillary service cost-to-charge ratios (CCRs) that were used to convert ancillary service charges from claims to estimated costs for those services. Because charges for routine services (e.g., nursing, accommodations) are not generally differentiated on the claims for residents in the same facility, the researchers assigned the

per diem routine costs of a resident based on each SNF's reported routine service costs in the cost reports.

II. Construction of the 2001 Analysis files

The analysis file for this study contained Medicare SNF stays with information on estimated Medicare costs for different service components. Given the need to estimate ancillary costs from claims by applying CCRs from cost reports to claims, the eventual analysis file had to contain 2001 SNF stays that: (a) had cleanly matched MDS information on resident characteristics, (b) came from facilities for which a 2001 cost report was available, (c) had consistent claims information on SNF and hospital services not captured by DataPRO, and (d) had internally consistent information from the multiple sources of data.

The researchers used the DataPRO SNF and prior hospital stays as the starting point for creating the analysis file. They examined the stays to identify potential integrity problems and non-Medicare coverage and found anomalies, such as overlapping claims records, zero covered days, and missing prior hospital stay information. They then examined the MDS assessments associated with each stay and found other anomalies, such as absence of assessments, irregular patterns of assessments, and mismatches between MDS assessments in DataPRO and MDS assessments from the MDS core data files. Next, they examined consistency of information between DataPRO stays and SNF stays that they created from raw claims data (which would be the source of service use information not originally collected by DataPRO). Medicare stays that were found to have inconsistent information were excluded from the analysis file.

The next step was to determine the intersection between the "clean" Medicare SNF stays and the SNF cost reports on record. SNF stays without corresponding cost report data—which could not have the claims amounts converted to estimated costs—were also excluded from the analysis files.

III. The Number of Cases Remaining After Specific Initial Edits

Reasons for Exclusion of Stays	Remaining Numbers
Total SNF stays in 2001 DataPRO	2,114,797
1. After exclusions for "Integrity Problems and Non-Medicare coverage"	1,900,036
Overlapping SNF stays, fragmented SNF stays, overlapping claims records within stays, no Medicare payment, no covered days (3 percent)	
Overlapping qualifying hospital stays, no qualifying hospital stay, overlapping claims records for the qualifying hospital stay, no Medicare payments (2.8 percent)	
Non-PPS stay (5.8 percent)	
Swing Bed stay (5.7 percent)	
2. After exclusions because of unavailability of MDS assessments	1,778,059

No MDS assessments (4.8 percent)
 No 5-day MDS assessment (.8 percent)
 Missing complete sequence of assessments (e.g., a stay with 5-day
 and 30-day assessments, but no 14-day assessment) (.7 percent)
 Mismatch between SNF stays' assessments and base MDS data set
 (.05 percent)

3. After exclusions because of mismatch of the DataPRO stays
 and Urban Institute stays¹ 1,768,761

Non-match of stays (SNF stays or hospital stays)

Stays with different SNF covered days

Stay with different hospital covered days

4. After matching with cost report information and wage-index
 file 1,722,987

(13,718 SNF providers matched)

5. After other exclusions 1,709,736

Length of stay is not equal to Medicare covered days (.8 percent)

Stays that have the same assigned MDS assessments (80 stays)

IV. Samples and "Base Case" Facility and Stay Data Exclusions

The original analysis file contained 1.7 million Medicare SNF stays in 2001, and the researchers created approximately 600 variables for each stay. Due to the enormous amount of data available, they chose to select a 10% random sample of stays for the purpose of developing case-mix classification models, which are referred to as the "10% stay file" or "simple random sample file."

A second sample was drawn for validation and facility-level analyses. A random 10% sample of facilities was identified and all stays in those facilities were included in the second sample. This file is called the "10% facility/stay file" or the "validation sample."

A uniform set of additional "base case" exclusion rules for facilities and stays were applied to both samples that are used across all approaches. The various resident classification approaches were compared using the results that obtain for the common base case, though some analyses may have considered alternative rules as well. The base case also entails a common set of statistical procedures discussed in other sections.

V. Facility data exclusion rules (flags)

The researchers next identified facilities whose data were likely to be unreliable and should be dropped from an analysis sample. There were three types of problems that

¹ Although covered days are the same on both SNF stays and qualifying hospital stays, there are a few thousand stays where total charges on the DataPRO SNF stays and the UI SNF/Hospital stays do not agree. Urban decided to use the UI constructed charges and per diem charges.

were encountered on facility cost reports that led to the creation of flags for specific facilities: 1) unreliable cost data on the cost report, 2) an inability to assign Medicare costs accurately from the total facility costs, and 3) unreliable CCRs.

a) Unreliable cost data

Unreliable cost data were determined based upon unlikely cost breakdowns or extreme cost levels. The researchers flagged facilities that had unacceptable ratios of ancillary to routine costs based upon ratios less than or equal to .005 or ratios greater than 5.0.

Inconsistent facilities that had total ancillary costs exceeding the sum of the costs of the ancillary cost components by a significant amount were identified as unreliable. They also flagged four facilities with the following extreme costs: routine cost per day of \$0.009, routine cost per day of \$36,409, routine cost per day of \$0.28, and NTA cost per day of \$8,815.

b) Unable to assign Medicare costs in a facility

The researchers needed to assign Medicare costs in a facility in order to generate CCRs for calculating costs for the observations in the file. Facilities that were missing data necessary to assign Medicare costs were flagged. These were facilities missing any of the following data: number of SNF beds, number of Medicare resident days, number of SNF participating unit days, and number of Medicaid nursing facility (NF) unit days.

c) Unreliable CCRs

Because of the interest in examining different levels of aggregation for ancillary services, information was “built up” to the desired levels. For example, the sum of department-specific costs for NTA services and the sum of department-specific charges for NTA services were used to construct the CCR for all NTA services (rather than using the “total” cost and charge fields on the cost reports).

The researchers sought to apply CCRs at disaggregated levels of SNF ancillary services. Technical Advisory Panel (TAP) members suggested separating rehabilitation therapy from NTA services. Because a major focus of this study is to develop classification of residents by NTA costs, the researchers explored the possibility of disaggregating NTAs into more distinct components: (1) drugs, (2) respiratory, and (3) all other NTAs. In the analysis, they examined the CCRs for those three components of NTAs, as well as for: (4) total NTAs, (5) rehabilitation therapy, and (6) total ancillary services.

The researchers conducted an analysis to determine which CCRs appeared to be “out of range.” They flagged SNFs with such ratios for any of the service components that they examined. It is important to note that there is no “right” answer, and this analysis served to help make decision rules. The goal was to be as inclusive as possible, while identifying particular SNFs that were likely to contribute erroneous data for the classification analysis.

Urban first explored ranges of CCRs that were used by other researchers in Medicare PPS-related research. In research on IRFs, RAND had settled on a range of .05-10.0 for departmental CCRs; when values were outside of this range, values were imputed based on like facilities. In earlier research on SNF refinements, Abt employed a range of 0.25-2.1 for ancillary services. In research on acute care hospital CCRs, Newhouse, et al.

(1989) employed limits for departmental CCRs that varied by size of hospitals; .01- 100 for hospitals with less than 100 beds and .01-3.0 for hospitals with 100 or more beds.

Urban conducted detailed analyses of CCR distributions for hospital-based and freestanding SNFs separately. They flagged SNFs with CCRs that appeared to be extreme values. From this analysis, they determined a range of .05 – 30.0 as a reasonable starting point for (a) total ancillary, (b) rehabilitation therapy, (c) total NTA, and (d) drugs. For respiratory and other NTA, the researchers determined that a higher cap would be appropriate. They selected the range of .05 to 100 for these last two components. Freestanding SNFs with CCRs outside these ranges were flagged. They flagged hospital-based SNFs with service-specific CCRs that fell outside of the .05-10.0 range.

The impact of applying these flag rules on number of SNFs and number of associated stays, separately for freestanding and hospital-based SNFs, is relatively minor. For freestanding SNFs, the 112 flagged SNFs and 1,175 associated stays are 0.9% of all freestanding SNFs and 0.9% of all freestanding SNF stays. For hospital-based SNFs, the flagged cases are 0.8% of all hospital-based SNFs and 0.3% of all stays in hospital-based SNFs.

Urban determined that the “generous” range of CCRs that it applied enabled it to include virtually all of the stays in freestanding and hospital-based SNFs, respectively. This high yield led the researchers to consider excluding the small number of stays from the analysis, and not attempt to impute values for them.

A related issue is that some claims were submitted for particular types of services (e.g., respiratory), for which CCRs could not be constructed using a facility’s cost reports. In these cases, Urban applied the available CCR from the next higher level of service aggregation. For example, if a claim for respiratory therapy was submitted, but the SNF did not have a respiratory CCR, the researchers applied the CCR for total NTA. Similarly, if a claim for rehabilitation therapy was submitted and no rehabilitation therapy CCR existed, they applied the CCR for total ancillary services.

Stay data exclusion rules (flags)

Finally, Urban eliminated stays with extreme values for total ancillary costs and charges out of concern for the validity of the data. The researchers dropped stays with logged total ancillary costs or charges 3 standard deviations from the logged mean. Most of the stays identified through costs overlapped those identified with extreme charges and so the process eliminated about 2.0% of the remaining observations. The number of stays in each sample before and after the base-case exclusions is shown in Table II.1.

Table II.1 Number of SNF Stay Observations in the 10% Stay and 10% Facility/Stay Analysis Samples

	10% Stay File (N)	10% Facility/Stay File (N)
Before exclusions	170,774	177,960
After facility exclusions	167,113	174,263
After stay exclusions	163,738	170,783

E. Selecting Units of Observation

The key limitation in the analysis file data is that ancillary service charges (and, thus, costs) are not reported for specific dates of service, but have to be averaged and applied to the entire SNF stay. Hence, the MDS assessments on resident conditions, which are recorded at specific dates during a stay, cannot be linked directly to specific cost information. Because approximately 60 percent of the SNF stays have multiple MDS assessments, it is important to consider if, and how, information from all the assessments can be employed in the prediction of costs.

Urban developed a procedure to make efficient use of all of the MDS assessments for each stay. The reasoning behind this approach is that the outcome (per diem cost measured over the entire stay) is a weighted average of the per diem costs measured over the MDS assessment periods, or segments. As a result, it is appropriate to examine cost variation with the weighted average of the resident conditions over the same assessment periods, or segments. This approach is achieved by defining segments for each MDS and weighting them together based on the proportion of time during the stay that is covered by each assessment.

F. Cost Variables

In its report, Urban analyzed stay-level cost data. The researchers examined predictors of major components of SNF services, such as routine, rehabilitation therapy, and NTA service costs, as well as total SNF costs. Because a major focus of this study is to predict NTA costs, they also investigated the determinants of 3 components of NTA; that is, prescription drugs, respiratory therapy, and other NTA components combined.

Because preliminary analyses indicated that a much higher proportion of the variance in costs per diem could be explained than that of costs per stay, Urban focused its analysis on costs per diem. In several analyses, the researchers also compared explanatory models in terms of their ability to explain charges per day, relative to costs per day. They believed that this type of comparison would be informative, given the wide range of CCRs that were calculated from the cost reports. Finally, in all of its analyses, Urban adjusted the SNF labor share of the cost and charge variables by the area wage index that CMS uses in its hospital and SNF payment systems.

G. Explanatory Variables

For the analysis of SNF costs and charges, Urban obtained explanatory variable data from four sources: the DataPRO stay files, the MDS, additional data from the SNF claims, and prior or qualifying hospital claims. The potential explanatory variables included demographics, primary diagnoses, service indicators, comorbid conditions (i.e., secondary diagnoses), functional status indicators and facility characteristics. Some variables, such as clinical diagnoses, were obtained from multiple sources. In order to facilitate a better understanding of the general characteristics of SNFs and SNF residents, some informative summary statistics at various levels appear below:

Stay characteristics

SNF residents have an average age of 80.0 years, and women incur nearly two-thirds of stays (65.9 percent). The average stay is 24.3 days. Most SNF stays do not involve prior

nursing home residents (84.1 percent). Further, most SNF stays do not result in resident nursing home placement (84.4 percent).

Clinical characteristics

SNF residents are medically complex. The average length of stay in the qualifying hospital is 9.15 days, as compared to the Medicare average for all acute hospital stays in 2001 of 6.1 days (MedPAC June 2003). Over a quarter of SNF stays (26.6 percent) have congestive heart failure, 23.7 percent are diabetic, and 23.6 percent have Chronic Obstructive Pulmonary Disease (COPD). Converting diagnosis codes into Major Diagnostic Categories (MDCs), at least five categories are present in 58.3 percent of stays. Approximately one-half of SNF admissions have cognitive impairment (49.3 percent) and more than one-third have at least moderate impairment (35.7 percent). Functionally, 54.5 percent of SNF residents are totally dependent in at least 1 of 10 ADLs at some point during their stay, and 28.7 percent are totally dependent in at least three.

Along with functional status, the MDS provides information on treatments and procedures received by residents and on clinical conditions related to their current health status. Finally, input from clinicians led to the creation of variables to capture some potential high-cost residents. These include variables that identify residents with solid organ transplants and stroke patients with poor function.

Characteristics of the qualifying hospital stay

Medicare claims data from the qualifying hospital stay provided diagnosis codes, as well as indicators and charges for a number of services. To the extent that these services must be continued in the SNF and that some services (such as intensive care unit (ICU) stays) represent sicker patients, information from the qualifying hospital may be highly predictive of costs for the SNF stay. For example, 21.1 percent of SNF stays involve stays in the ICU, and 14.6 percent of SNF residents received IV drug therapy during their qualifying hospital stay.

Facility characteristics

The DataPRO SNF stay file also provided data on some of the characteristics of SNFs for each stay. In the sample, 78.7 percent of stays took place in facilities located in a Metropolitan Statistical Area (MSA), while 23.4 percent were in hospital-based facilities and 60.2 percent were in facilities that were part of a multi-facility system. Three-fifths of stays (61.3 percent) occurred in for-profit SNFs, 34.4 percent in non-profit SNFs, and less than two percent in government-owned facilities.

SUMMARY STATEMENT

TITLE OF REPORT: Patient Classification under Medicare's Prospective Payment System (PPS) for Skilled Nursing Facilities (SNFs)

LEGISLATIVE DUE DATE: January 1, 2005

LEGISLATIVE AUTHORITY: Section 311(e) of the Medicare, Medicaid, and SCHIP Benefits Improvement and Protection Act of 2000 (BIPA), P.L. 106-554

MAJOR POINTS IN REPORT:

This report from the Secretary to the President of the Senate and the Speaker of the House of Representatives describes the results of a study of patient classification under the SNF PPS. Section 311(e)(1) of the BIPA directs the Secretary to “. . . conduct a study of the different systems for categorizing residents in Medicare SNFs in a manner that accounts for the relative resource utilization of different resident types.” Section 311(e)(2) of the BIPA requires the Secretary to submit a report to Congress on this study that “. . . shall include such recommendations regarding changes in law as may be appropriate.” The report contains the following major components:

- Chapter 1 provides an historical overview of the evolution of the current payment system, along with the system's case-mix classification methodology.
- Chapter 2 describes the research to recombine Minimum Data Set variables and identify new variables from SNF and hospital claims data that could serve to allocate payments more accurately under the SNF PPS. These methodologies include use of additional data variables within the Resource Utilization Groups-III structure, the combination of SNF and hospital data to create a “New Profiles” approach for predicting ancillary utilization, and the adaptation of the inpatient Diagnosis Related Group data (i.e., diagnostic data) to predict SNF stay costs.
- Chapter 3 discusses data constraints that the researchers encountered, and describes how these limitations affected the course of the research. This discussion also considers the feasibility of improving data collection and data reporting.
- Chapter 4 outlines a series of next steps and recommendations for future regulatory and legislative action to enhance the effectiveness of the SNF PPS.
- Appendixes provide a list of references and a description of the data and methods used in the study.

CONTACT: Sheila Lambowitz, CMS, (410) 786-7605