



**Skilled Nursing Facility
Payment Models
*Technical Expert Panel***

Acumen, LLC
October 14th 2016

Outline

Sessions	
1	Introductions and Overview of Alternative Payment System
2	Recommendation for Revising Therapy Component
3	Recommendation for Non-Therapy Ancillary Component
4	Recommendation for Revising Nursing Component
5	Exploring Varying Per Diem Payments
6	Impact Analysis
7	Open Discussion

TEP Agenda

Session		Time	Topic
Morning	Session 1	9:00 to 9:45 AM	Introductions and Overview of Alternative Payment System
	Session 2	9:45 to 11:00 AM	Recommendation for Revising Therapy Component
	Break	11:00 to 11:15 AM	-
	Session 3	11:15 AM to 12:15 PM	Recommendation for Non-Therapy Ancillary Component
Lunch		12:15 PM to 1:15 PM	-
Afternoon	Session 4	1:15 – 2:00 PM	Recommendation for Revising Nursing Component
	Session 5	2:00 to 3:00 PM	Exploring Varying Per Diem Payments
	Break	3:00 to 3:15 PM	-
	Session 6	3:15 to 4:00 PM	Impact Analysis
	Session 7	4:00 to 5:00 PM	Open Discussion

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Session 1 Outline

Session Objective

- Introduce TEP participants and today's goals

Session Topics

- Present panelists and project team
- Explain project goals and main questions for the TEP
- Introduce the central elements of the alternative payment system recommendation

Session Time

- 45 minutes

Welcome

- CMS has contracted with Acumen, LLC to identify potential refinements and alternatives to the existing Prospective Payment System (PPS) for Medicare Part A SNF stays
- This TEP is an important venue for acquiring vital stakeholder and expert input during the research process
- Introduction
 - Panelists
 - Project team representatives

Overview of Project

- Three main project goals
 - Develop an alternative payment system that improves adequacy and appropriateness of payment
 - Evaluate performance of alternative payment system
 - Support implementation of alternative payment system
- To ensure a readily implementable alternative, the project will make recommendations under two constraints:
 - Statutory requirements (e.g. per diem payments, base rates)
 - Currently available data
- Project recommendations focus on all case-mix-adjusted components of the SNF PPS

Recommendations from Three Prior TEPs Have Been Incorporated into Alternative Payment System

- The June 2016 TEP recommended changes that are reflected in the updated alternative payment system, such as incorporating a more comprehensive cognitive status indicator and including additional comorbidities specific to residents receiving SLP
- The summary of the three TEP discussions and recommendations can be found online:
<https://www.cms.gov/Medicare/Medicare-Fee-For-Service-Payment/SNFPFS/therapyresearch.html>
- Additional comments about the TEPs or overall project research can be sent to SNFTherapyPayment@cms.hhs.gov

Goals of Today's TEP

- Present and obtain feedback on a comprehensive recommendation for an alternative payment system
 - Introduce the payment components of the alternative system
 - Describe the resident groups that would determine payment for each of the four case-mix-adjusted components
 - Explain use of varying per diem payments to adjust payment rates over stays
 - Examine impacts of alternative payment system on different types of residents and facilities

Questions for the TEP Focus on the Case-Mix Adjustments of SNF PPS Rates

- SNF PPS per diem rates depend on 3 main components
 - General base payment level
 - Case mix adjustments
 - Geographic payment adjustments
- Case-mix adjustments account for relative cost differences attributable to differences in resident health circumstances and characteristics
- Beginning FY 2019, value-based purchasing will be implemented at the SNF provider level, which complements the payment adjustments considered here
 - Goal of alternative payment system is to ensure payment reflects relative resource use, allowing providers with different case mix to provide quality care
 - VBP measures how effectively providers use resources at their disposal

Alternative System Adds Two Case-Mix Adjusted Components

- Current PPS consists of three components:

Therapy	Nursing	Non-Case-Mix
<ul style="list-style-type: none"> • Physical therapy (PT) • Occupational therapy (OT) • Speech-Language Pathology (SLP) • Evaluation for therapy 	<ul style="list-style-type: none"> • Nursing services • Social services • Non-Therapy Ancillary (NTA) services 	<ul style="list-style-type: none"> • Room and board • Administrative costs • Capital-related costs

- Recommended payment alternative consists of five components:

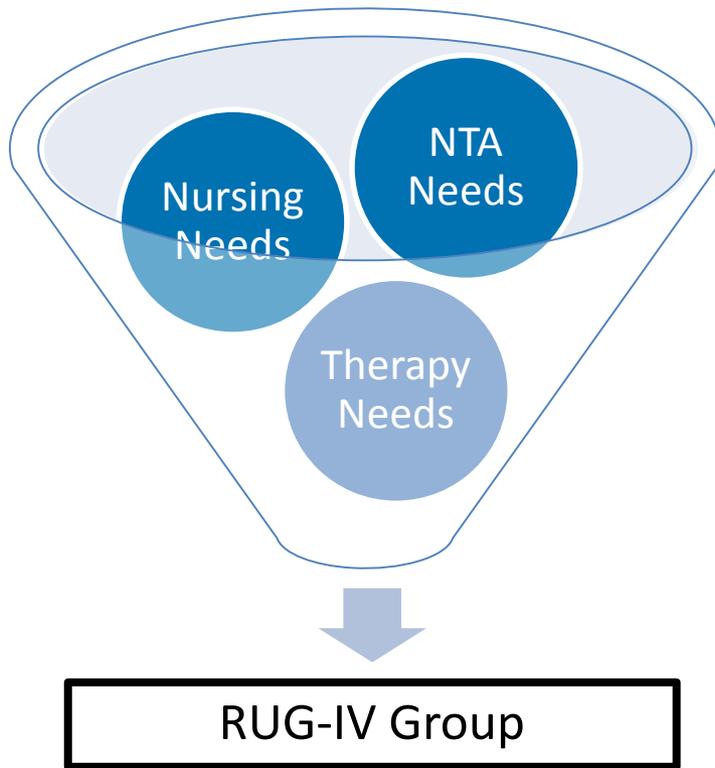
PT+OT	SLP	NTA	Nursing	Non-Case-Mix
<ul style="list-style-type: none"> • Physical therapy (PT) • Occupational therapy (OT) • Evaluation for therapy (PT+OT) 	<ul style="list-style-type: none"> • Speech-Language Pathology (SLP) • Evaluation for therapy (SLP) 	<ul style="list-style-type: none"> • Non-Therapy Ancillary (NTA) services 	<ul style="list-style-type: none"> • Nursing services • Social services 	<ul style="list-style-type: none"> • Room and board • Administrative costs • Capital-related costs

Alternative System Possesses Several Attractive Features

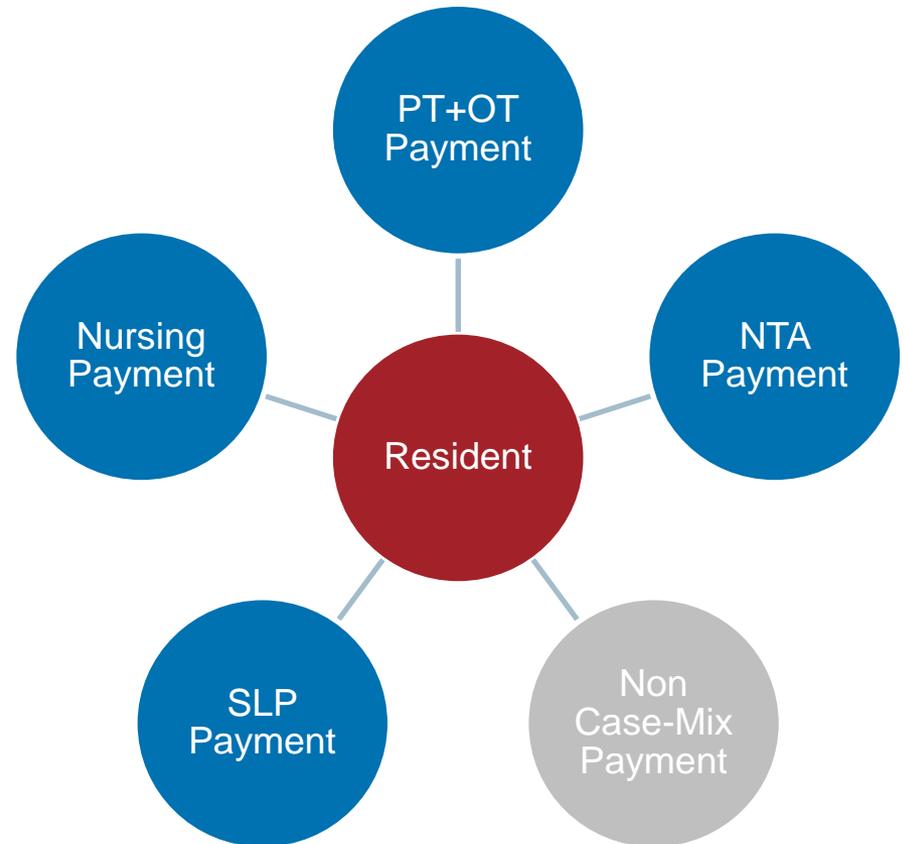
- Addition of NTA component improves payment accuracy by accounting for specific variation in NTA costs
- Removing the direct link between the therapy and nursing components eliminates arbitrary distinctions between rehabilitation and non-rehabilitation residents, leading to:
 - Improved identification of extensive services
 - Improved identification of functional abilities
 - Improved identification of clinical conditions and comorbidities
- Varying per diem payments by length of stay better captures underlying structure of cost

Resident-Centered Payment System Addresses All Aspects of Resident Care

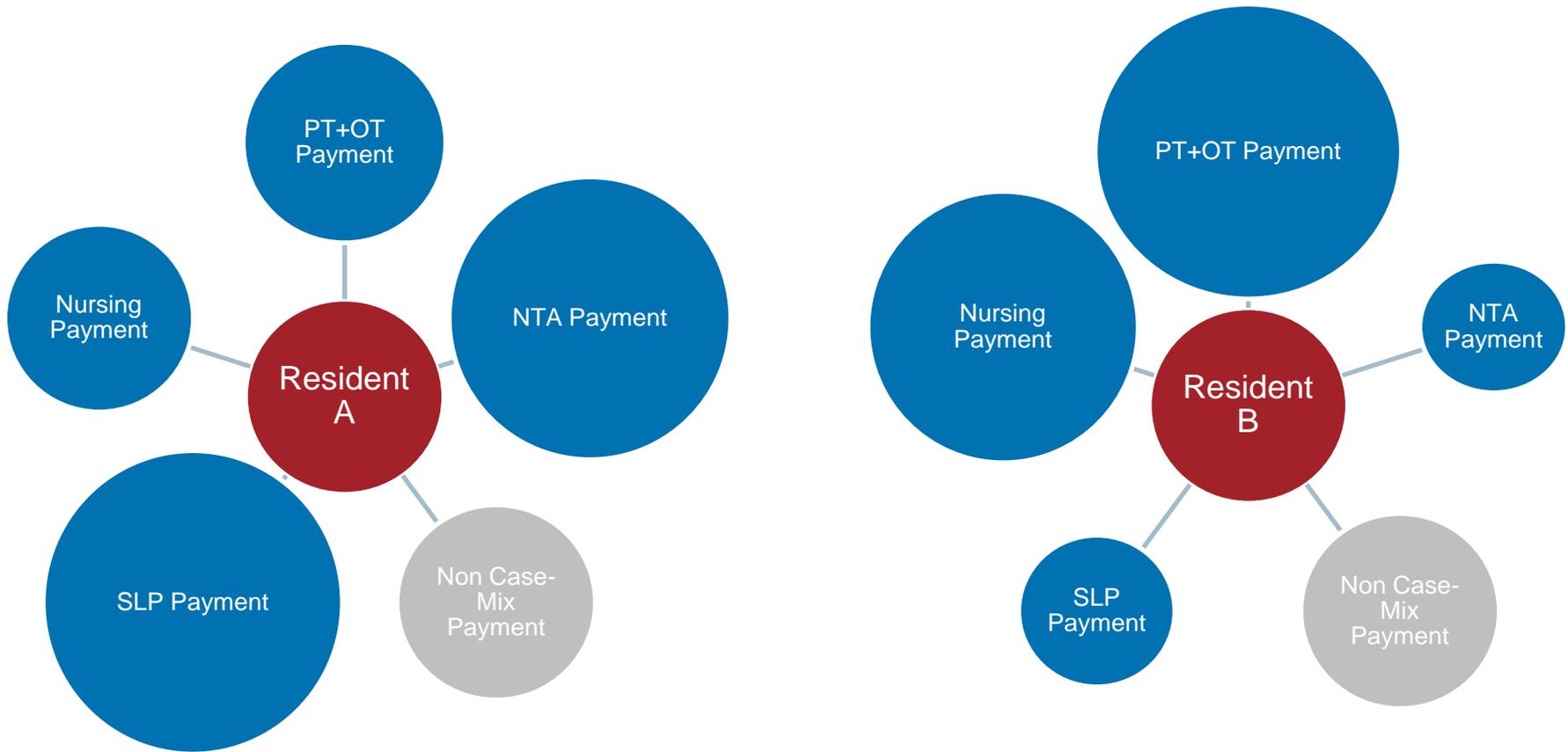
Current Payment System



Recommended Payment System



Alternative Payment System is More Reflective of Cost Differences across Resident Types



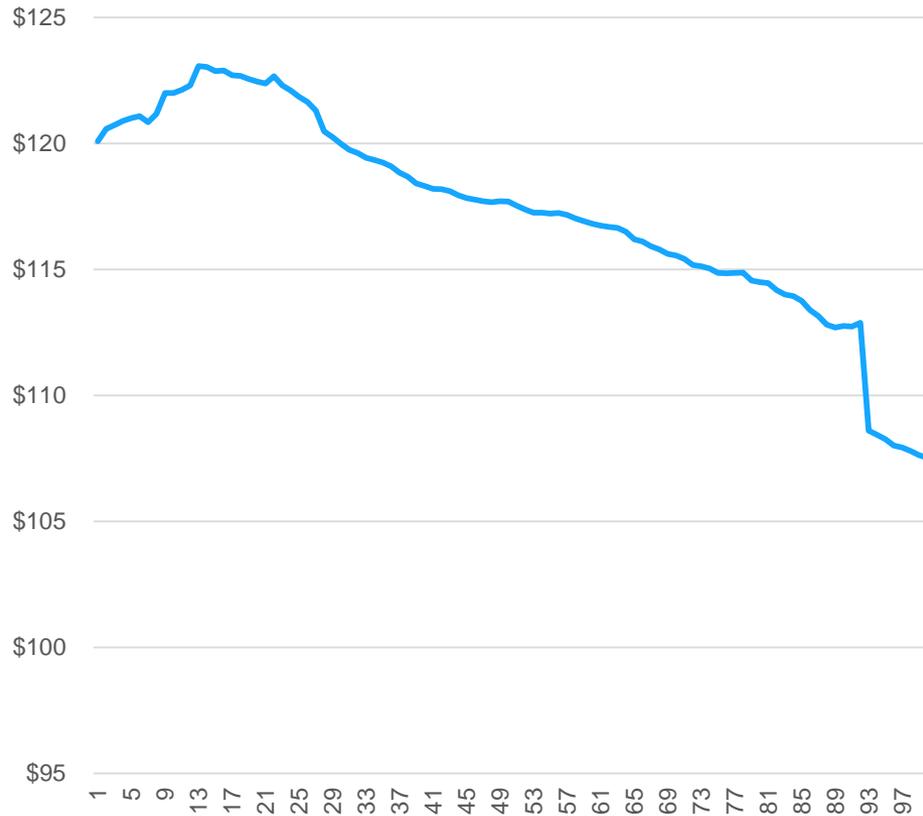
- In this example, Resident A has multiple comorbidities and had a stroke before the SNF stay, while Resident B comes from an orthopedic surgery

Resident Characteristics Determine Groups Used for Payment

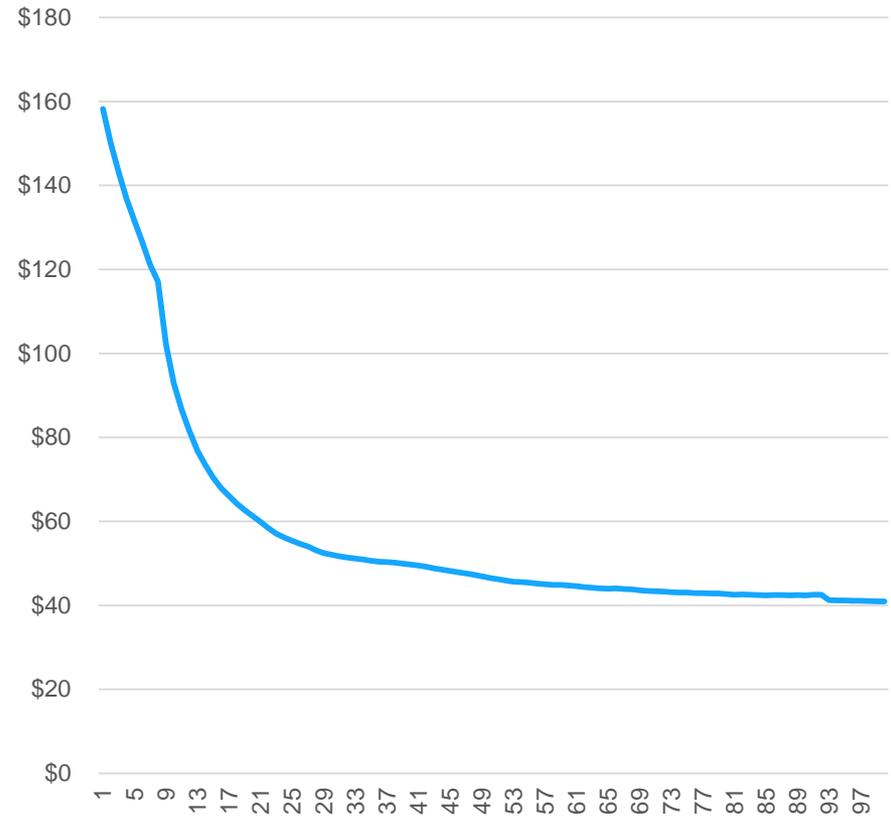
- Payment accuracy involves setting payments for each resident group reflecting average costs for that group
 - Costs per stay calculated by multiplying covered charges on individuals' claims by cost-to-charge ratios (CCRs) from their facility's cost report at the cost center level
 - Costs per day derived by dividing costs per stay by the number of utilization days in the stay
- Empirical analysis and clinical input were used to identify resident groups that explain substantial variation in costs per stay and day

Resource Utilization Per Day Not Constant Throughout Stay

Average PT+OT Costs Per Day (smoothed)
by Length of Stay



Average NTA Costs Per Day (smoothed)
by Length of Stay



Varying Per Diem Payments Address Changing Per Diem Costs

- Constant per diem rates do not accurately reflect changes in resource utilization throughout the stay, and may allocate too few resources for providers at beginning of stay
- Different structures of varying per diem payments can be used to address changes in resource utilization
 - Linear decline
 - Blocks
 - Non-linear functions
- Other Medicare payment systems use varying payments based on point in a stay or episode:
 - Home health PPS: early vs. late episodes
 - Inpatient Psychiatric Facility PPS: declining per diem payments

Alternative Payment System Complements Other Medicare Initiatives and Developments

- Value-Based Purchasing
- IMPACT Act
- Educational efforts related to *Jimmo v. Sebelius*
- Recently finalized LTC regulations
- Implementation of new functional and data items
 - Medicare Spending per Beneficiary
 - Section GG on MDS assessment
- Implementation of ICD-10 codes

Questions Addressed in Upcoming Sessions About Design of Alternative Payment System

- What resident groups should be used for each case-mix-adjusted payment component?
 - PT+OT, SLP [Session 2]
 - NTA [Session 3]
 - Nursing [Session 4]
- How should varying per diem payments be designed? [Session 5]
 - Constant vs. declining daily rate
 - Slope of decline
 - Beginning of decline
- How does the alternative payment system affect various populations? [Session 6]
 - Residents
 - Providers

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Session 2 Outline

Session Objective

Describe cost patterns of the two recommended therapy components and obtain feedback on the PT+OT and SLP resident groups

Session Topics

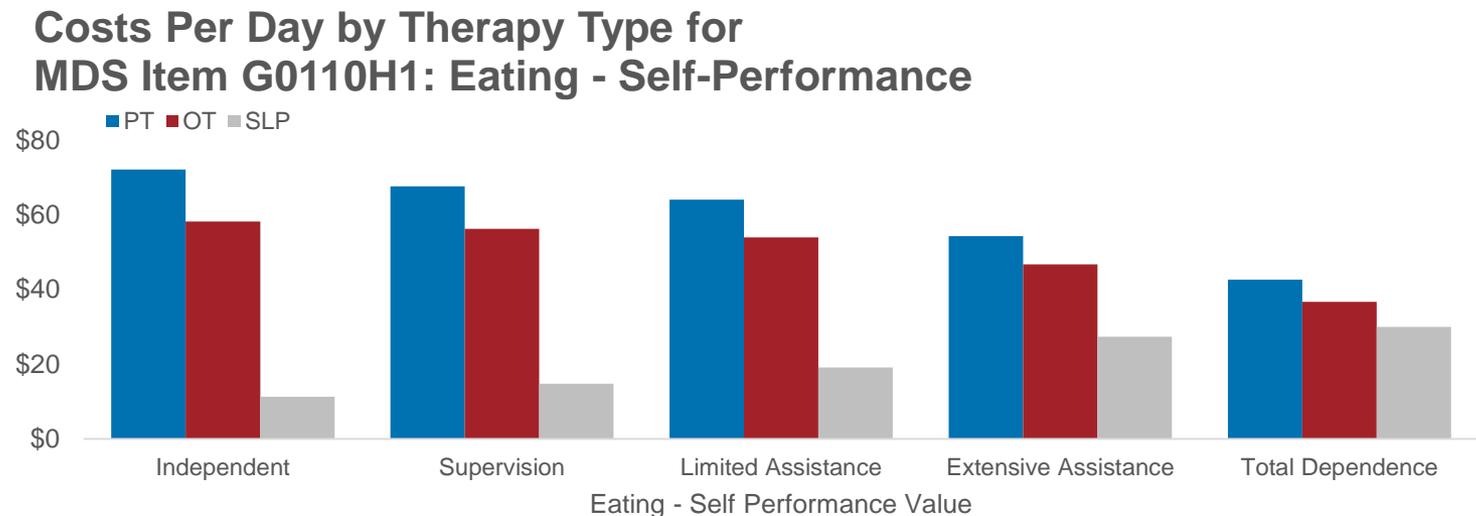
- Motivation to separate therapy into two components
- Description of recommended PT+OT and SLP resident groups
- Calculation of relative costliness

Session Time

1 hour and 15 minutes

Residents' PT+OT Costs per Day and SLP Costs per Day Do Not Always Align

- Correlation between PT+OT costs per day and SLP costs per day across stays is small (0.04)
- Focusing on total therapy costs therefore obscures differences between determinants of PT+OT and SLP utilization
 - Some resident characteristics have contrasting effects on PT+OT and SLP costs



Empirical Analysis Supports Combining PT and OT into a Single Payment Component

- Based on feedback from June 2016 TEP, Acumen investigated whether there should be separate components for PT and OT
- Various investigations supported having a combined PT+OT component
 - Strong correlation between PT and OT costs per day (0.62)
 - Predictors of PT costs are also good predictors of OT costs, and vice versa
 - Resident characteristics were better predictors of the sum of PT+OT costs than PT or OT costs separately in regression models
 - Clinicians identified “OT-specific” characteristics, however they did not improve predictive power

Clinicians and Prior TEPs Identified Resident Characteristics that are Potentially Predictive of PT+OT and SLP Costs

- Clinical reasons for prior inpatient stay and SNF stay
- Functional status
- Cognitive impairment
- Age
- Prior utilization of services (ER, acute inpatient, PAC)
- Comorbidities, during the SNF stay and in year prior to stay
- Services received during SNF stay

Regression Analyses Revealed the Characteristics Highly Predictive of Costs per Day

- Clinical reasons for inpatient stay, functional status, and cognitive impairment are strong predictors of PT+OT costs per day
- Clinical reasons for inpatient stay, cognitive impairment, swallowing ability, and SLP-related comorbidities identified by clinicians are strong predictors of SLP costs per day
 - Cognitive impairment and presence of an SLP-related comorbidity were combined into a single indicator because of a similar effect on SLP costs
- Subsequent discussion will focus on these predictive factors in depth

Clinical Categories Were Developed to Explain PT+OT and SLP Utilization

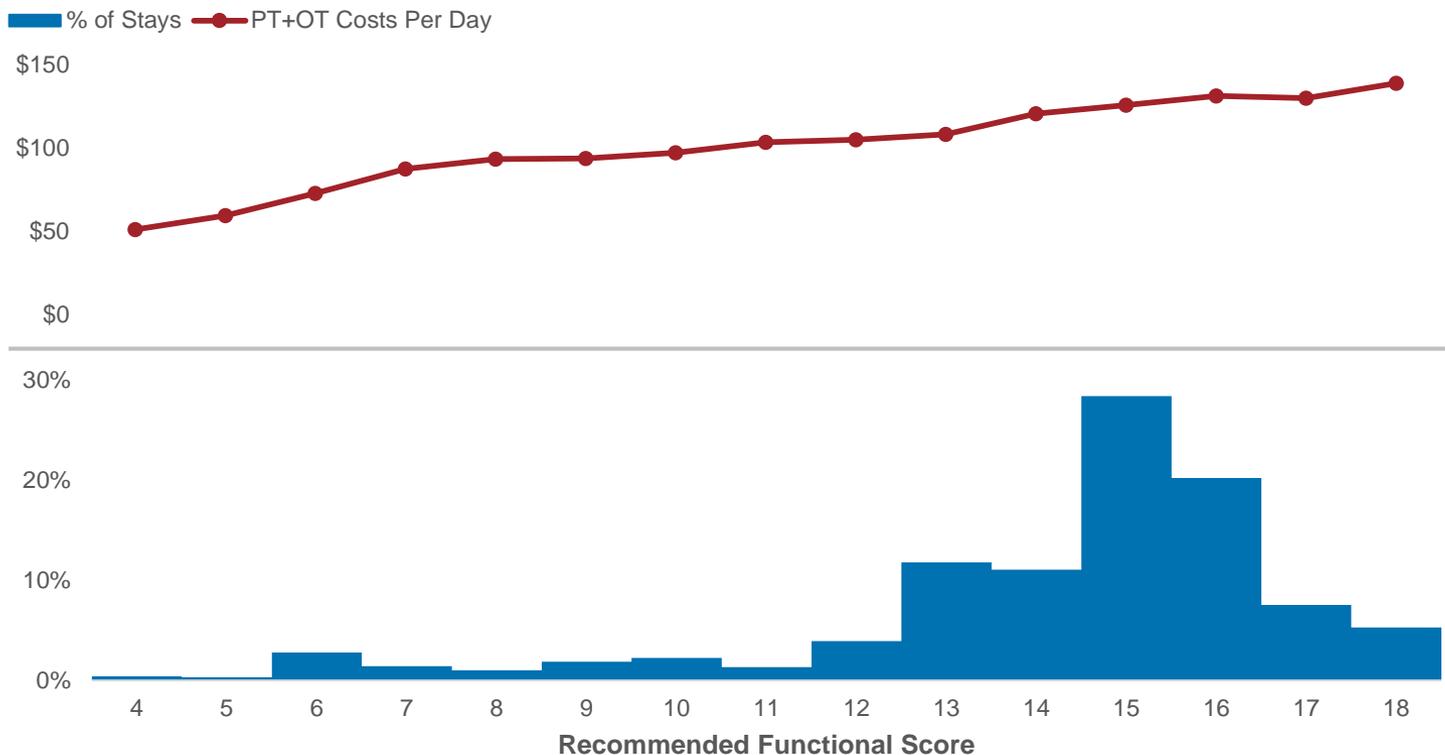
- Preliminary options to categorize residents based on prior inpatient stays were presented in November 2015 and June 2016 TEPs
- Based on feedback from the TEPs and subsequent analysis, clinicians identified clinical categories for use in predicting PT+OT and SLP costs
 - Categories were defined in research using MS-DRG from prior inpatient stay (or RIC for IRF transfers)
 - After implementation of the alternative payment system, categories could be defined using diagnoses from SNF claims, the MDS assessment, or qualifying inpatient stay

Functional Score was Calculated using Three ADL Items on the MDS Assessment

- The functional score is calculated using self-performance items for:
 - Transfer
 - Eating
 - Toileting
- Functional score uses 3 of 4 “late-loss” ADLs that factor into ADL score in current SNF PPS
 - Bed mobility excluded based on clinical feedback
- Support items excluded because they are service-based and do not align with Section GG
- Functional score is on a scale from 0-18
 - 0-6 points assigned for each ADL based on relative costliness associated with each response

Functional Score Has a Linear Relationship with PT+OT Costs

Distribution of Recommended Functional Score and PT+OT Costs Per Day



Cognitive Function Scale (CFS) used as Indicator of Cognitive Impairment

- CFS combines scores from the Brief Interview for Mental Status (BIMS) and Cognitive Performance Scale (CPS) on the MDS to create an indicator of cognitive status for all SNF residents
 - BIMS cannot be completed for around 12% of residents, therefore it cannot be the only indicator of cognitive status
 - CFS developed by Thomas et al. in a 2015 paper
- The CFS was incorporated after feedback from the June 2016 TEP

CFS Cognitive Level	BIMS Score	CPS Score
Cognitively Intact	13-15	-
Mildly Impaired	8-12	0-2
Moderately Impaired	0-7	3-4
Severely Impaired	-	5-6

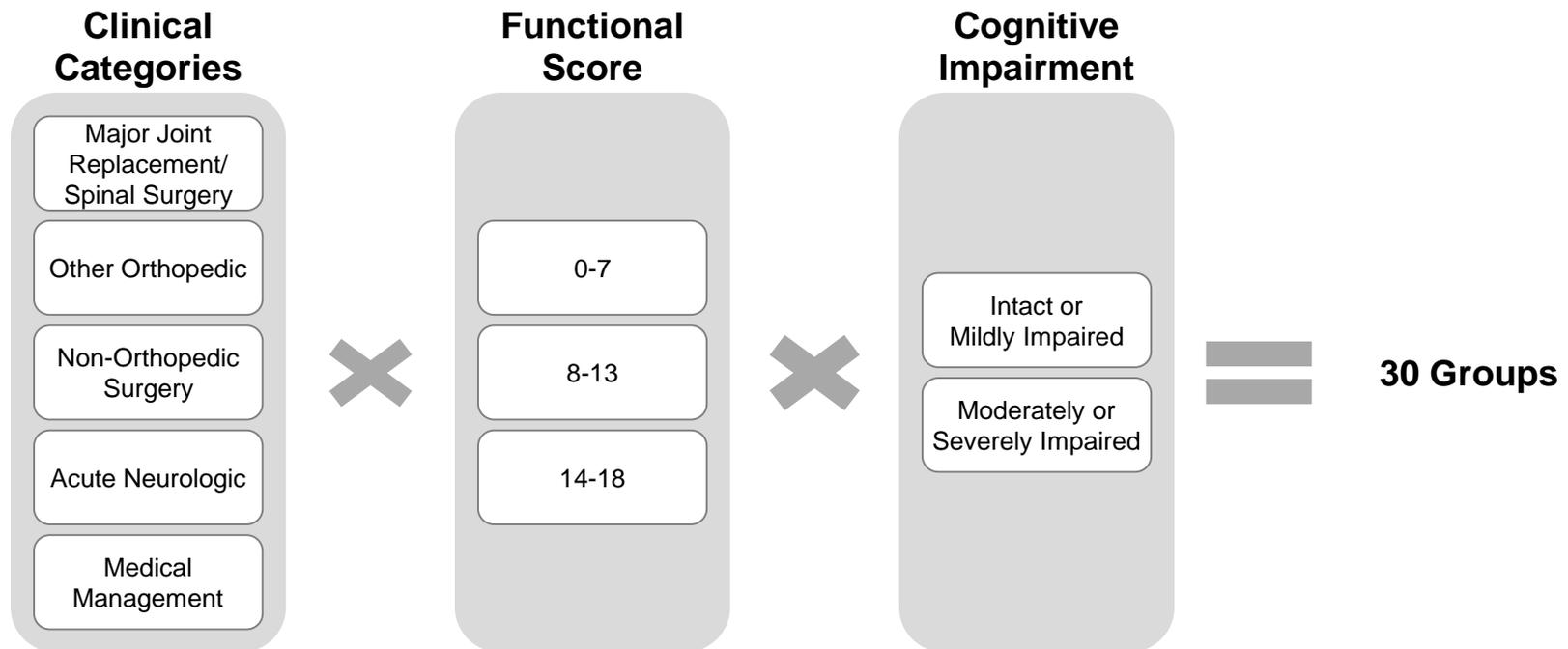
SLP-Related Comorbidities were Identified Using Clinical Input and TEP Feedback

- 12 items were identified by clinicians and the June 2016 TEP as being associated with high SLP costs per day
 - Conditions and services combined into a single SLP-related comorbidity flag
 - A resident qualifies if any of the conditions/services is present

MDS Item	SLP Comorbidity
I4300	Aphasia
I4500	CVA, TIA, or Stroke
I4900	Hemiplegia or Hemiparesis
I5500	Traumatic Brain Injury
O0100E2	Tracheostomy as Resident
O0100F2	Ventilator as Resident
-	Laryngeal Cancer
-	Apraxia
-	Dysphagia
-	ALS
-	Oral Cancers
-	Speech and Language Deficits

PT+OT Component Consists of 30 Case-Mix Classification Groups

- Classification based on clinical categories, functional score, and cognitive impairment



PT+OT Resident Groups Capture Differences in Average PT+OT Costs per Day

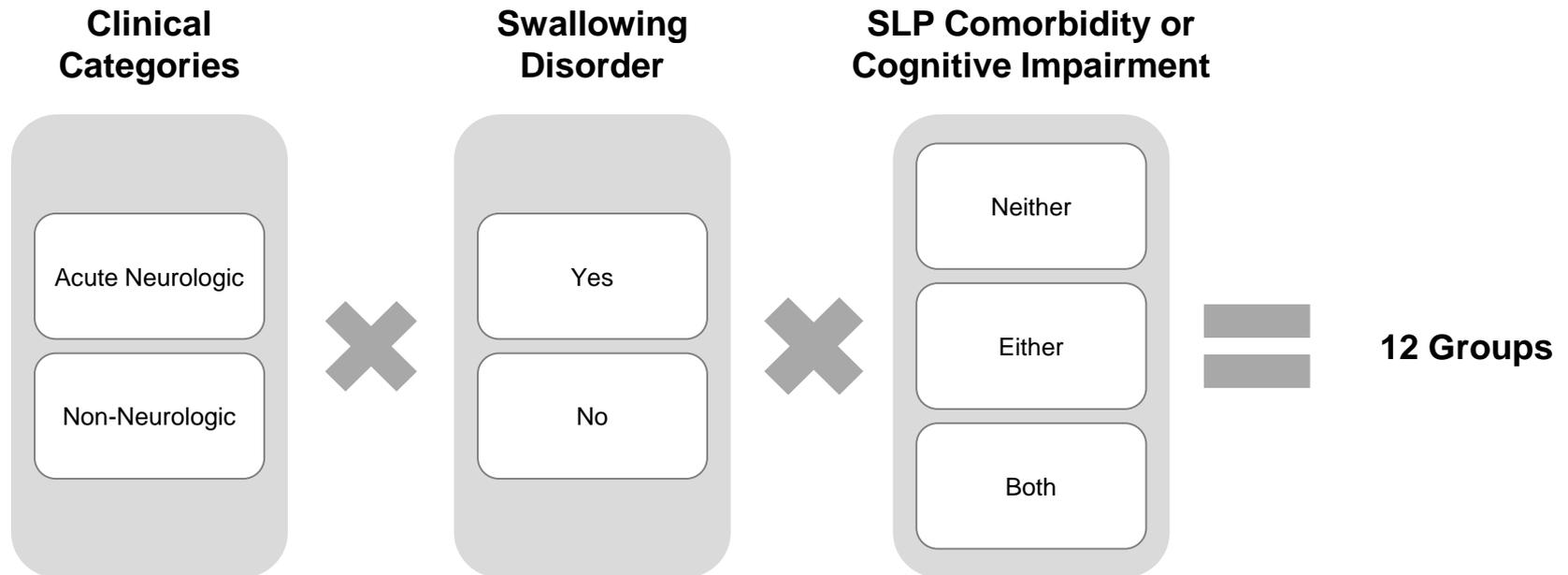
Clinical Categories	Function Score	Moderate/Severe Cognitive Impairment	% of Stays	Avg. PT+OT Costs per Day
Medical Management	0-7	No	0.9%	\$83
	8-13	No	8.4%	\$105
	14-18	No	33.4%	\$124
	0-7	Yes	2.6%	\$62
	8-13	Yes	5.8%	\$89
	14-18	Yes	7.1%	\$109
Acute Neurologic	0-7	No	0.1%	\$110
	8-13	No	0.8%	\$119
	14-18	No	3.2%	\$128
	0-7	Yes	0.4%	\$85
	8-13	Yes	0.9%	\$106
	14-18	Yes	0.9%	\$117
Other Orthopedic	0-7	No	0.1%	\$104
	8-13	No	1.6%	\$122
	14-18	No	9.7%	\$136
	0-7	Yes	0.2%	\$86
	8-13	Yes	1.0%	\$107
	14-18	Yes	1.4%	\$121

PT+OT Resident Groups Capture Differences in Average PT+OT Costs per Day

Clinical Categories	Function Score	Moderate/Severe Cognitive Impairment	% of Stays	Avg. PT+OT Costs per Day
Non-Orthopedic Surgery	0-7	No	0.2%	\$86
	8-13	No	1.7%	\$112
	14-18	No	7.6%	\$129
	0-7	Yes	0.4%	\$69
	8-13	Yes	0.6%	\$95
	14-18	Yes	0.7%	\$116
Major Joint Replacement or Spinal Surgery	0-7	No	0.0%	\$120
	8-13	No	0.8%	\$144
	14-18	No	8.6%	\$152
	0-7	Yes	0.1%	\$104
	8-13	Yes	0.3%	\$115
	14-18	Yes	0.4%	\$129

SLP Component Consists of 12 Case-Mix Classification Groups

- Classification based on clinical categories, swallowing ability, cognitive impairment, and SLP-related comorbidities



SLP Resident Groups Capture Differences in Average Costs per Day

Clinical Category	Swallowing Disorder	SLP Comorbidity or Cognitive Impairment	% of Stays	Avg. SLP Costs per Day	% of Group with Low SLP Costs (\$5 or less)
Acute Neurologic	Yes	Neither	0.0%	\$38	14%
	Yes	Either	0.2%	\$47	8%
	Yes	Both	0.4%	\$53	6%
	No	Neither	0.9%	\$18	54%
	No	Either	2.5%	\$30	33%
	No	Both	2.2%	\$41	18%
Non-Neurologic	Yes	Neither	1.3%	\$29	27%
	Yes	Either	2.6%	\$37	19%
	Yes	Both	0.8%	\$40	18%
	No	Neither	46.0%	\$8	77%
	No	Either	36.3%	\$20	53%
	No	Both	6.8%	\$27	40%

Discussion Questions

- Do the resident groups used to classify residents for PT+OT and SLP payment include the major determinants of costs for these therapy disciplines?
- Are there resident characteristics beyond those already considered that could predict high SLP utilization?
- Do the recommended functional score algorithm and the recommended cognitive indicator appropriately represent the impact of these characteristics on therapy utilization?
- Are there any potential adverse effects that should be considered if the recommendations for the PT+OT and SLP components are implemented?

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Session 3 Outline

Session Objective

Describe the non-therapy ancillary (NTA) component recommendation and obtain feedback on the NTA payment groups

Session Topics

- Motivation to create a separate NTA component
- Description of recommended NTA resident groups
- Calculation of relative costliness

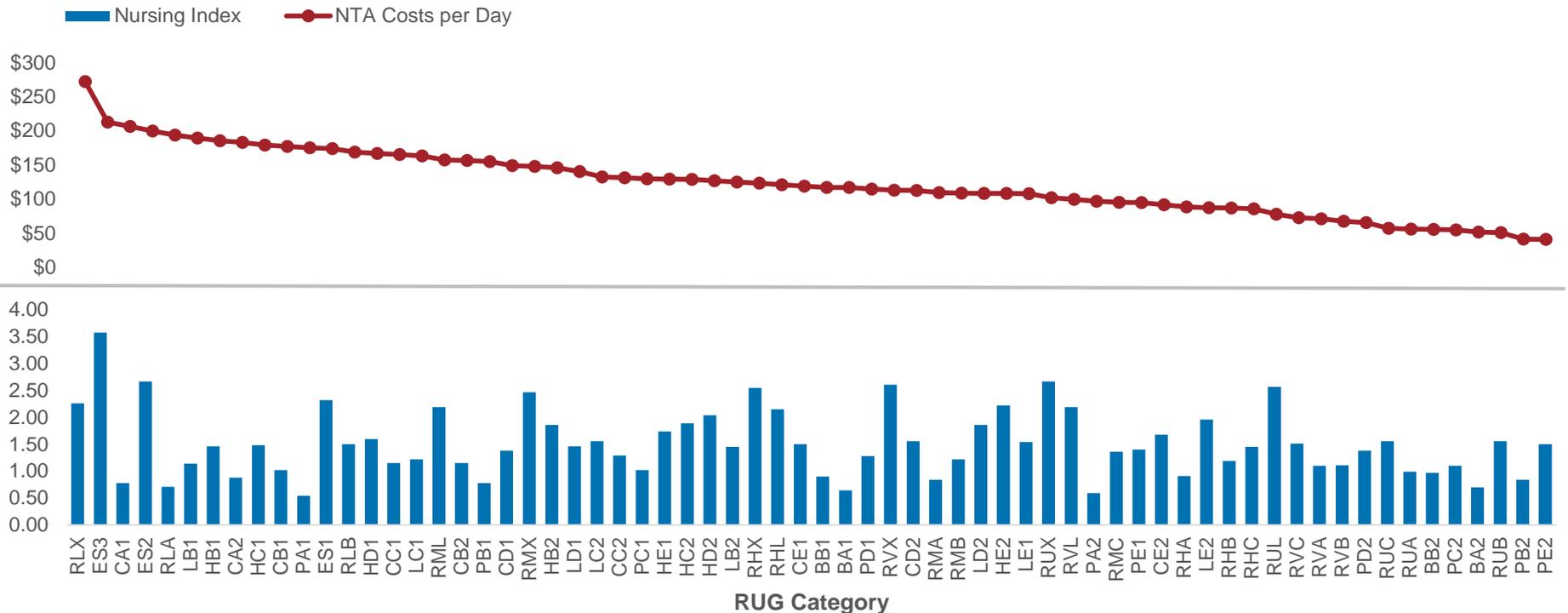
Session Time

1 hour

Current Nursing Payments Do Not Reflect Variation in NTA Costs Across Residents

- A separate NTA component will better account for variation in relative costs

Nursing Index and Average NTA Costs by RUGs



Clinicians and Prior TEPs Identified Several Sets of Resident Characteristics Potentially Predictive of NTA Costs

- Clinical reasons for prior inpatient stay
- Wide range of comorbidities
- Extensive services
- Age

Regression Analyses Revealed Three Sets of Characteristics Highly Predictive of Costs per Day

- Comorbidities, use of extensive services, and age are all highly predictive of NTA costs per day
- The population for regressions was restricted to stays with 8+ days due to frontloading of NTA costs
 - NTA costs per day are much higher for shorter stays because of frontloading
 - Including short stays would distort model predictions
- Subsequent discussion will focus in depth on how comorbidities, use of extensive services, and age are included in the recommended payment system
 - Comorbidities and extensive services were considered together to form one score

Comorbidities Based on Condition Categories (CCs) from CMS Part C Risk Adjustment Model

- Diagnosis codes were mapped to condition categories (CCs)
 - All CCs were considered regardless of inclusion in Part C model
- Diagnosis codes were obtained from the following sources:
 - SNF claim
 - Most-recent acute inpatient claim
 - Item I8000 of the MDS
 - For chronic conditions only: also use all acute inpatient, outpatient, and physician claims in the year prior to SNF admission
- These diagnosis sources were used for research purposes alone, and implementation of the payment system would rely only on SNF sources

Clinicians Identified Additional Conditions and Services Associated with High NTA Costs

- Feedback from the June 2016 TEP led to the consideration of high cost diagnoses and extensive services not included in the CCs used in the risk adjustment model
- Acumen investigated the relationship between the identified diagnoses/extensive services and NTA Costs, and included those associated with notably higher NTA costs in the model
- Some extensive services were not considered because their use for payment may create adverse incentives (e.g., parenteral/IV feeding, oxygen therapy)
 - IV medication is included based on feedback from the June 2016 TEP, subsequent investigations, and clinical input

Simplest Options to Incorporate Comorbidities are Problematic

- **Count of conditions:** Payment depends on number of comorbidities
 - Accounts for relationship between number of comorbidities and NTA costs
 - However, does not account for differences between more costly and less costly comorbidities, since all conditions have the same impact on payment
- **Tier system:** Residents placed into tiers based only on the costliest comorbidity present (similar to the IRF PPS)
 - Accounts for differences in relative costliness of comorbidities
 - However, does not account for higher costs associated with having multiple comorbidities

Recommended Comorbidity Score Considers Number of Comorbidities and Relative Costliness

- Recommended comorbidity score is a weighted count of comorbidities and extensive services
 - Comorbidities/services associated with high NTA costs grouped into very high, high, medium, and low cost tiers
 - Points assigned for each additional comorbidity/service present, with more points awarded for higher-cost tiers
 - High-cost services are also included in comorbidity score, as costly services and conditions influence costs similarly
- Comorbidity score accounts for both the relationship between number of conditions and NTA costs and differences in the relative costliness of comorbidities

Comorbidity Tiers are Comprised of 27 Conditions and Services Associated with High NTA Costs

Comorbidity/Extensive Service Description	% of All Stays	OLS Estimate	Tier	Points
O0100H2: IV Medication	8.5%	\$51.5	Very High	5
CC 1: HIV/AIDS	0.4%	\$49.9	Very High	5
O0100F2: Ventilator/Respirator	0.3%	\$43.8	High	4
O0100I2: Transfusion	0.3%	\$24.0	Medium	2
CC 5: Opportunistic Infections	0.6%	\$23.3	Medium	2
CC 128: Kidney Transplant Status	0.4%	\$22.6	Medium	2
DGN: Infection with multi-resistant organisms	0.8%	\$21.4	Medium	2
CC 107: Cystic Fibrosis	0.0%	\$20.4	Medium	2
I5200: Multiple Sclerosis (MS)	0.7%	\$20.0	Medium	2
CC 174: Major Organ Transplant Status	0.4%	\$19.6	Medium	2
CC 181: Chemotherapy	0.1%	\$18.8	Medium	2
O0100E2: Tracheostomy	0.9%	\$18.2	Medium	2
I6200: Asthma, COPD, or Chronic Lung Disease	26.5%	\$18.1	Medium	2
I2900: Diabetes Mellitus (DM)	35.0%	\$15.5	Medium	2

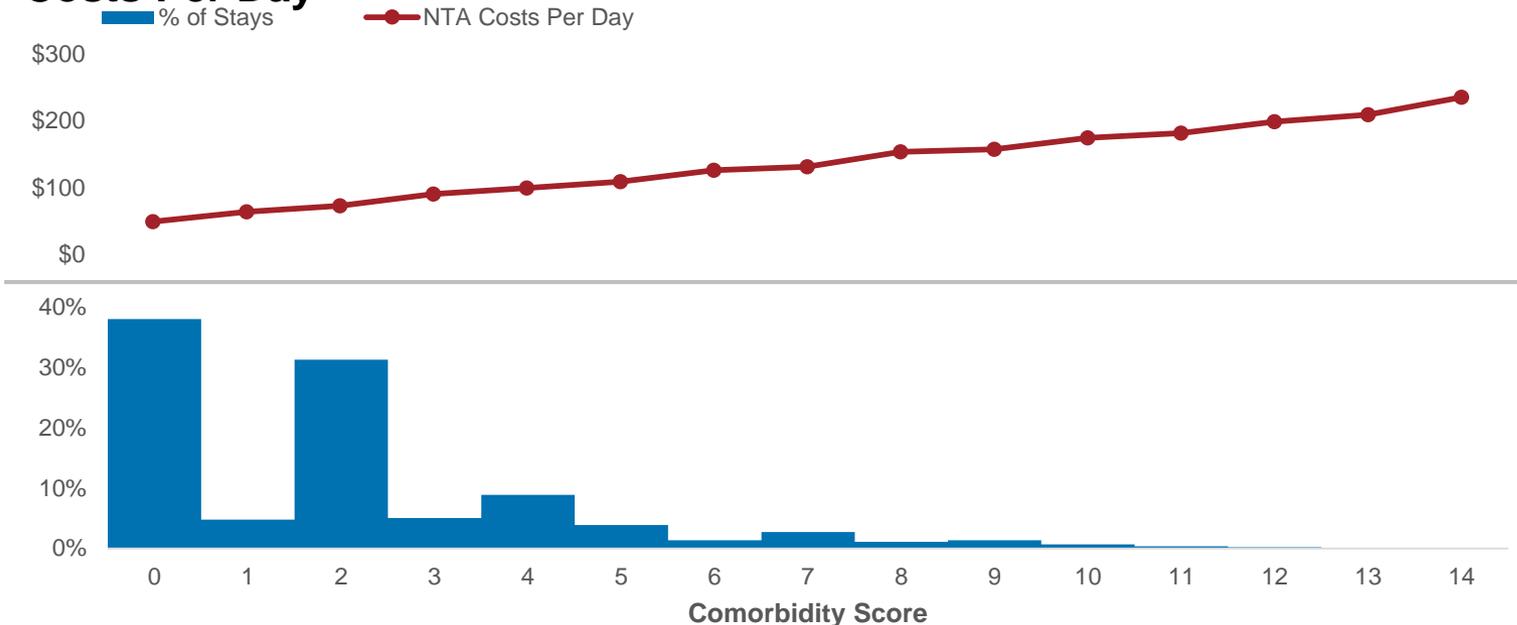
Comorbidity Tiers are Comprised of 27 Conditions and Services Associated with High NTA Costs

Comorbidity/Extensive Service Description	% of All Stays	OLS Estimate	Tier	Points
CC 25: End-Stage Liver Disease	2.3%	\$14.7	Low	1
DGN: Transplant	0.5%	\$13.7	Low	1
O0100M2: Infection Isolation	1.3%	\$12.9	Low	1
I2500: Wound Infection (other than foot)	2.2%	\$12.1	Low	1
DGN: MRSA	2.6%	\$11.9	Low	1
M0300: Highest Ulcer Stage is Stage 4	1.0%	\$11.7	Low	1
M1040B: Diabetic Foot Ulcer	1.0%	\$11.3	Low	1
O0100D2: Suctioning	1.0%	\$11.1	Low	1
CC 165: Other Complications of Medical Care	3.5%	\$11.1	Low	1
CC 37: Bone/Joint/Muscle Infections/Necrosis	3.2%	\$10.6	Low	1
DGN: Osteomyelitis and Endocarditis	2.9%	\$9.9	Low	1
CC 4: Tuberculosis	0.1%	\$9.3	Low	1
DGN: DVT/Pulmonary Embolism	4.2%	\$9.1	Low	1

Comorbidity Score Has Strong Linear Relationship with NTA Costs

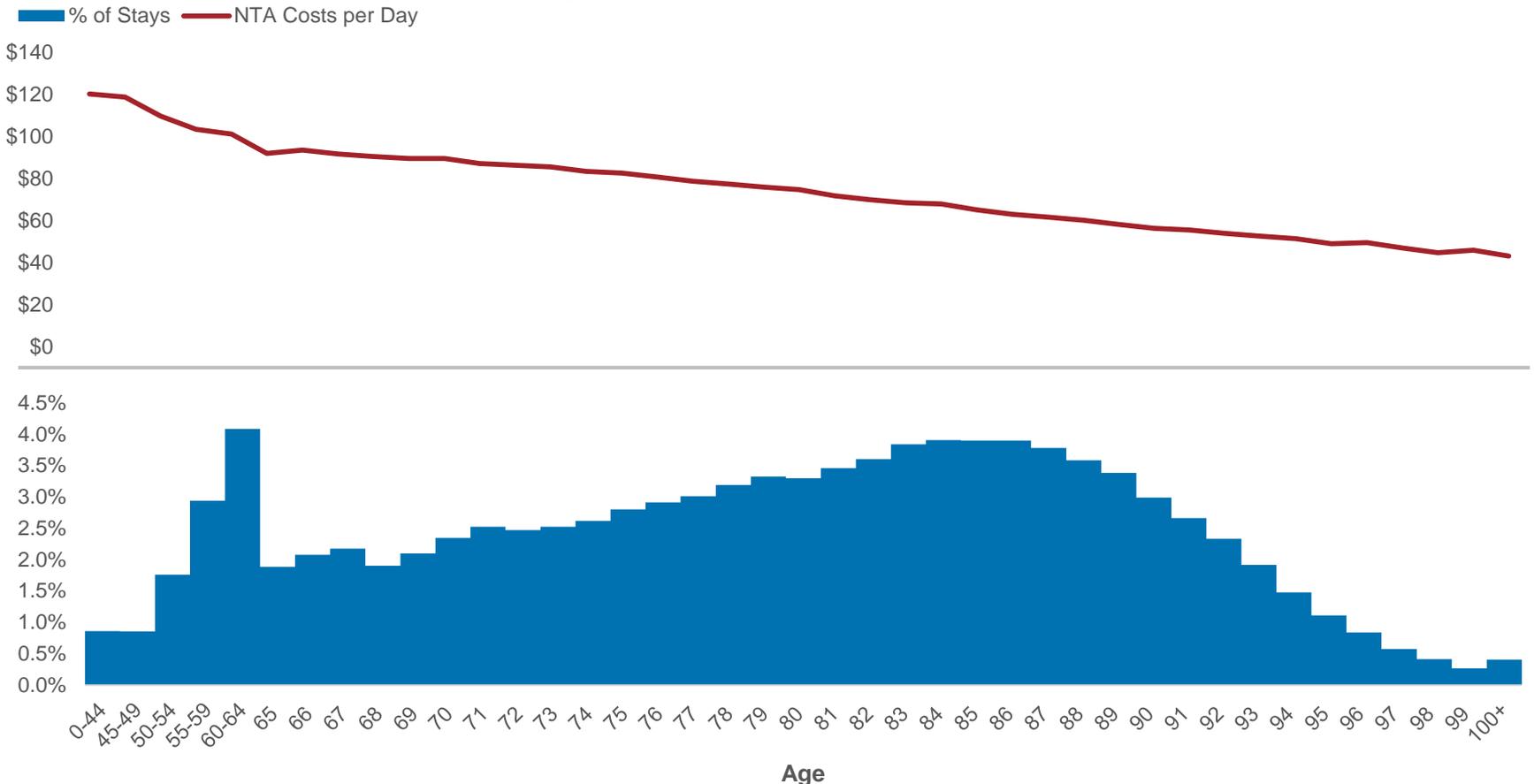
- Score theoretically ranks from 0 to 49, however no stay in the study population exceeded a score of 24. The graph includes only scores with at least 1,000 stays

Distribution of Recommended Comorbidity Score and NTA Costs Per Day



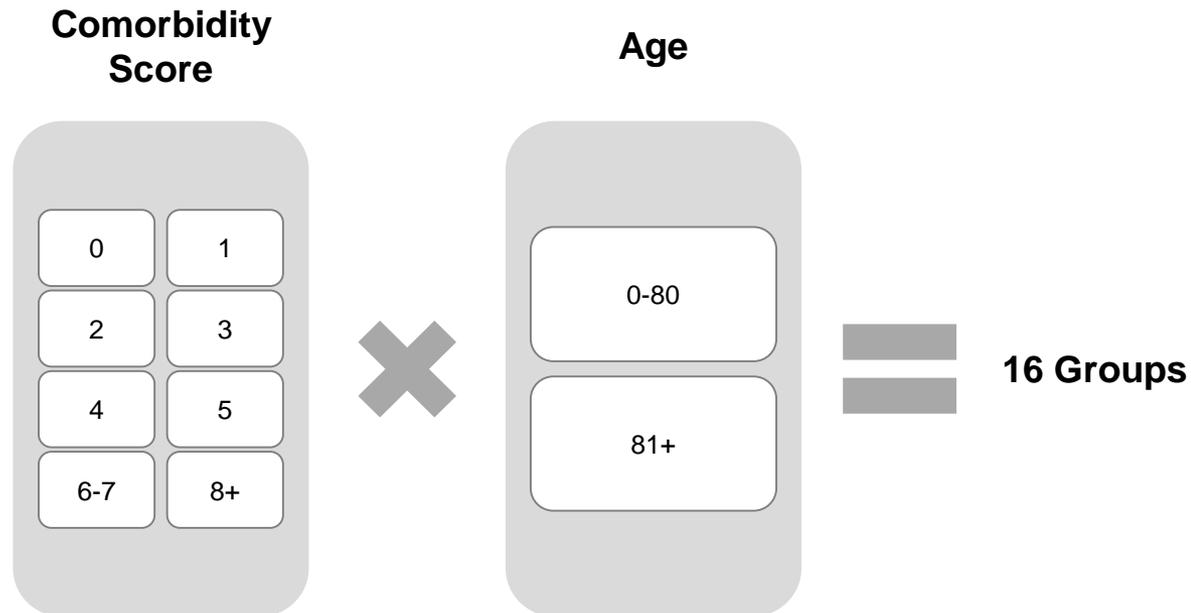
Age Has a Clear Negative Correlation with NTA Costs

Average NTA Costs per Day, by Age



NTA Component Consists of 16 Case-Mix Classification Groups

- Classification based on comorbidities/extensive services, and age



NTA Case-mix Groups Capture Differences in Average Costs per Day

Comorbidity Score	Age	% of Stays	Avg. NTA Costs per Day
0	0-80	14.4%	\$45
	81+	24.2%	\$37
1	0-80	2.2%	\$55
	81+	2.5%	\$45
2	0-80	16.3%	\$62
	81+	15.2%	\$51
3	0-80	3.0%	\$73
	81+	1.8%	\$59
4	0-80	5.6%	\$80
	81+	3.2%	\$66
5	0-80	2.2%	\$92
	81+	1.5%	\$75
6-7	0-80	2.5%	\$111
	81+	1.5%	\$94
8+	0-80	2.8%	\$144
	81+	1.0%	\$120

Discussion Questions

- Do the resident groups used to classify residents for NTA payment include the major determinants of costs for these services?
- Are there any additional comorbidities or services that should be considered for inclusion?
- Are there any comorbidities or services that should be excluded because of adverse incentives? Specifically, is it appropriate to include IV medication and infection isolation? Are there ways to make these services less vulnerable to payment incentives?
- Are there any potential adverse effects that should be considered if the recommendations for the NTA component are implemented?

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Session 4 Outline

Session Objective

Describe the recommended nursing component and obtain feedback on the methodology to calculate relative costliness

Session Topics

- Current design of nursing component
- Recommended methodology to assign residents to nursing groups and calculate relative costliness

Session Time

45 minutes

Current Payment System Makes Nursing Payments Dependent on Therapy Utilization

- Current system divides residents into “rehabilitation residents” and “non-rehabilitation residents” based on whether they receive therapy
- Nursing payments are different for rehab and non-rehab residents (generally higher for rehab residents)
- Nursing payments also depend on number of therapy minutes received, with higher therapy minutes often resulting in higher nursing payment
- Therefore, nursing payments are primarily a function of the amount of therapy received

Dependence of Nursing Payments on Therapy Necessitates Revisions to Nursing Payments

- Limited variation in therapy minutes leads to limited variation in nursing payments across residents, despite likely differences in nursing utilization
 - Nursing component could be revised to better reflect residents' nursing costs
- Recommended payment system would remove the link between therapy minutes and therapy payment
 - Nursing component must also be revised to end reliance on therapy utilization

Revision of Nursing Component Cannot Rely on Charges from Claims

- Nursing indexes are intended to reflect average nursing costs of resident groups relative to population average
- However, resident-specific nursing costs cannot be calculated from current data:
 - Nursing minutes are not reported on MDS assessments
 - Nursing charges on claims are reported within general revenue centers that also include “non-case-mix” services such as room and board, rather than revenue centers specific to nursing
 - Nursing+non-case-mix charges reported on claims often do not vary across different points in the stay or across different residents within each facility, even when comparing dissimilar RUGs

Recommended Approach Uses Non-Rehabilitation RUGs and STRIVE Data

- Assign all residents to non-rehabilitation RUGs
 - Non-rehabilitation groups are determined based on characteristics and services that capture variation in nursing resource use
 - Existing non-rehabilitation RUGs capture variation in nursing utilization in a granular way that rehabilitation RUGs do not
- Use STRIVE data to update nursing indexes
 - In the current system, non-rehabilitation nursing indexes were calculated to capture variation in nursing utilization among the non-rehabilitation population only
 - Updated nursing indexes should reflect nursing utilization for all residents

Residents Assigned to One of Four Broad Groupings of Non-Rehabilitation RUGs

- **Extensive Services:** Receives at least one extensive service (tracheostomy, ventilator/respirator, infection isolation)
- **Special Care High/Special Care Low/Clinically Complex:** Serious medical condition (e.g. comatose, radiation therapy) or condition requiring complex medical care (e.g. pneumonia, surgical wounds)
- **Behavioral Symptoms and Cognitive Performance:** Presence of behavioral or cognitive symptoms
- **Reduced Physical Function:** Primary needs are assistance with daily living and general supervision

Within Each Grouping, Resident Groups Are Determined by Specific Conditions and Services

- **Extensive Services:** Final group determined by combinations of three extensive services
- **Special Care High/Special Care Low/Clinically Complex:** Final group determined by ADL score and presence of depression
- **Behavioral Symptoms and Cognitive Performance:** Final group determined by ADL score and number of restorative nursing services
- **Reduced Physical Function:** Final group determined by ADL score and number of restorative nursing services

Nursing Indexes Updated After Assigning All Residents to Non-Rehabilitation RUGs

- Acumen replicated methodology from 2006-07 STRIVE study to update nursing indexes:
 - Calculate average wage-weighted staff time (WWST) for each STRIVE resident using 2015 SNF wages
 - Assign STRIVE population to non-rehabilitation RUG
 - Apply sample weights to WWST estimates to allow for unbiased population estimates (same as STRIVE)
 - Smoothing of WWST estimates that do not match RUG hierarchy (same methodology as STRIVE)
 - Calculate nursing indexes (average WWST for each RUG divided by average WWST for FY2014 study population)

Nursing Component Maintains Existing Case-Mix Groups

RUG Group	Non-Rehab RUG	% of Stays	Nursing WWST per Day	Case-Mix Index
Extensive Services	ES3	0.3%	427.5	2.69
	ES2	0.7%	323.1	2.03
	ES1	1.2%	308.7	1.94
Special Care High	HE2	0.3%	252.4	1.59
	HE1	1.6%	225.1	1.42
	HD2	0.4%	231.9	1.46
	HD1	4.0%	206.8	1.30
	HC2	0.4%	229.5	1.44
	HC1	4.6%	204.6	1.29
	HB2	0.1%	208.9	1.31
	HB1	1.9%	186.2	1.17
Special Care Low	LE2	0.3%	209.1	1.32
	LE1	2.5%	186.5	1.17
	LD2	0.4%	204.3	1.29
	LD1	5.3%	182.2	1.15
	LC2	0.3%	172.9	1.09
	LC1	5.2%	154.2	0.97
	LB2	0.1%	164.7	1.04
	LB1	1.5%	146.9	0.92

Nursing Component Maintains Existing Case-Mix Groups

RUG Group	Non-Rehab RUG	% of Stays	Nursing WWST per Day	Case-Mix Index
Clinically Complex	CE2	0.3%	204.9	1.29
	CE1	2.2%	177.7	1.12
	CD2	0.7%	193.8	1.22
	CD1	9.5%	168.1	1.06
	CC2	0.7%	166.3	1.05
	CC1	14.0%	144.3	0.91
	CB2	0.3%	152.6	0.96
	CB1	7.0%	132.4	0.83
	CA2	0.2%	114.6	0.72
	CA1	3.3%	99.4	0.63
Behavioral Symptoms and Cognitive Performance	BB2	0.0%	117.3	0.74
	BB1	1.6%	107.5	0.68
	BA2	0.0%	82.0	0.52
	BA1	0.6%	75.1	0.47

Nursing Component Maintains Existing Case-Mix Groups

RUG Group	Non-Rehab RUG	% of Stays	Nursing WWST per Day	Case-Mix Index
Reduced Physical Function	PE2	0.0%	178.0	1.12
	PE1	1.7%	163.1	1.03
	PD2	0.1%	164.8	1.04
	PD1	6.8%	151.0	0.95
	PC2	0.2%	137.2	0.86
	PC1	12.4%	125.7	0.79
	PB2	0.1%	109.3	0.69
	PB1	5.3%	100.1	0.63
	PA2	0.0%	76.0	0.48
	PA1	1.9%	69.6	0.44

Discussion Questions

- Do non-rehabilitation RUGs adequately reflect variation in nursing utilization and the clinical reasons for that variation?
- Is the methodology to calculate nursing weights appropriate? Are there ways it could be improved?
- Are there any potential adverse effects that should be considered if the recommendations for the nursing component are implemented?

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6	Impact Analysis
7	Open Discussion

Session 5 Outline

Session Objective

Describe motivation for varying per diem payments and obtain feedback on recommended payment structures

Session Topics

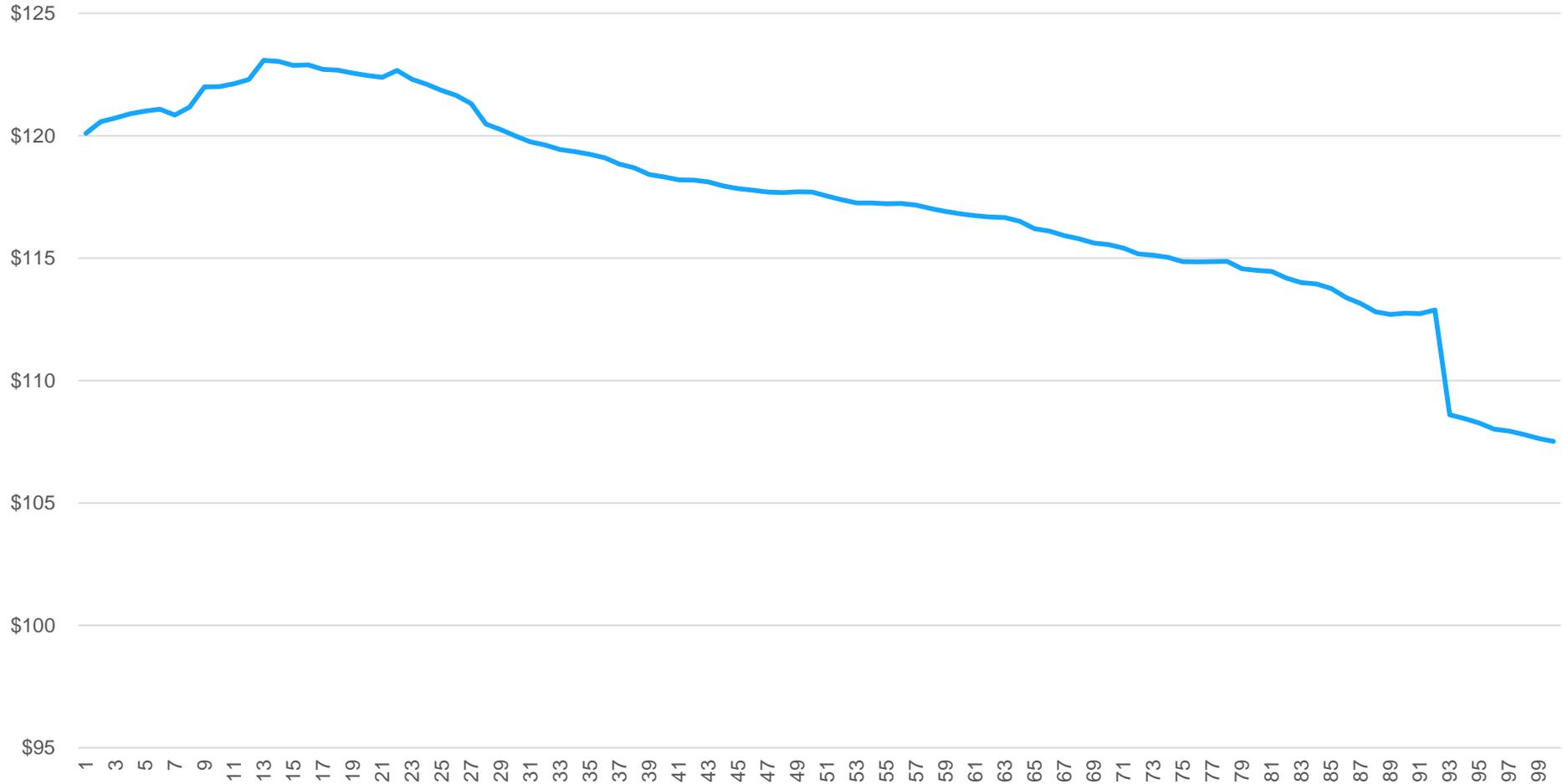
- Evidence of changes in per diem costs over stay lengths
- Introduction of varying per diem payments to accurately reflect varying cost over a stay
- Alternative payment structures for each component

Session Time

1 hour

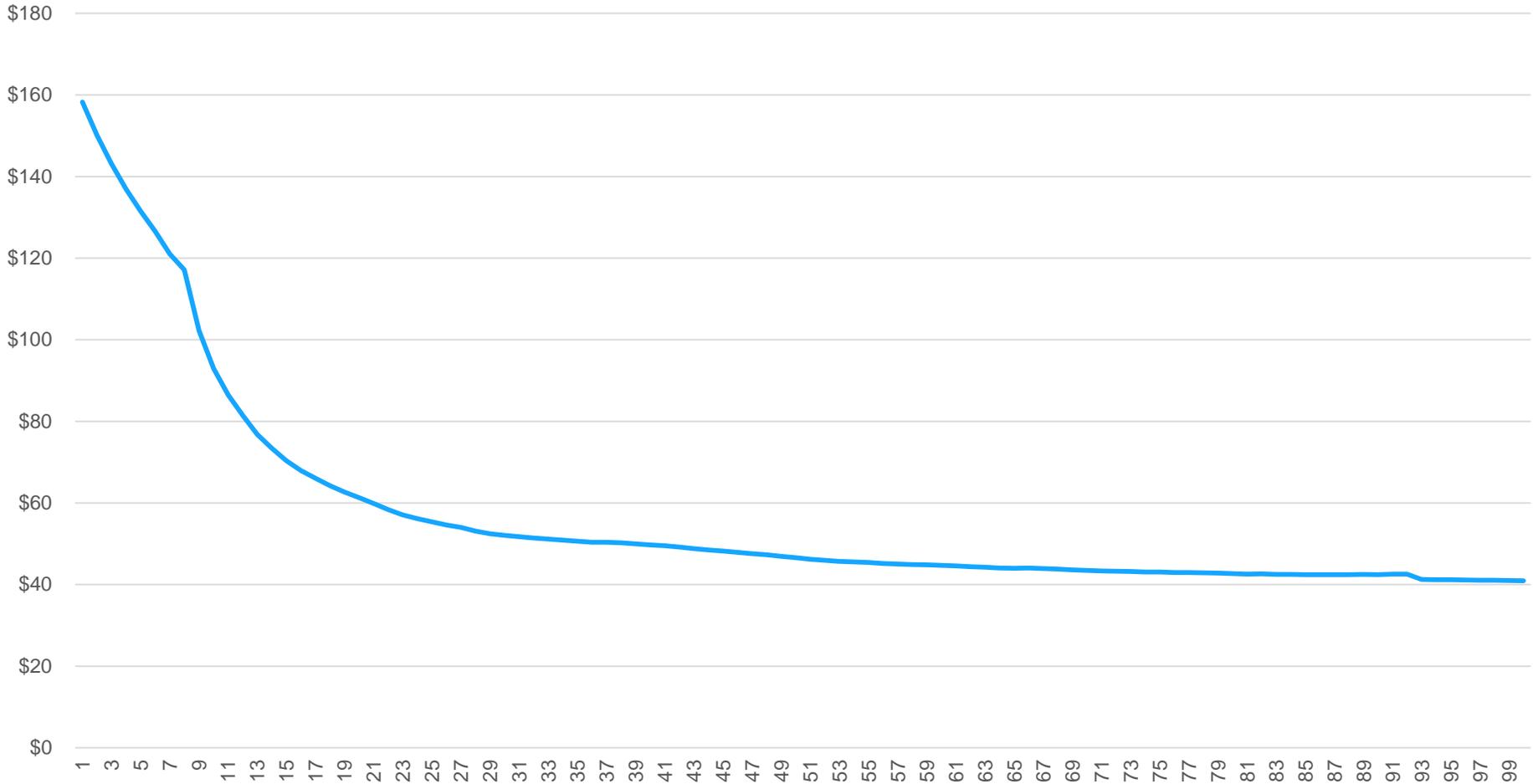
Average PT+OT Costs Per Day Decline by Length of Stay

Avg PT+OT Costs per Day (Smoothed) by Length of Stay



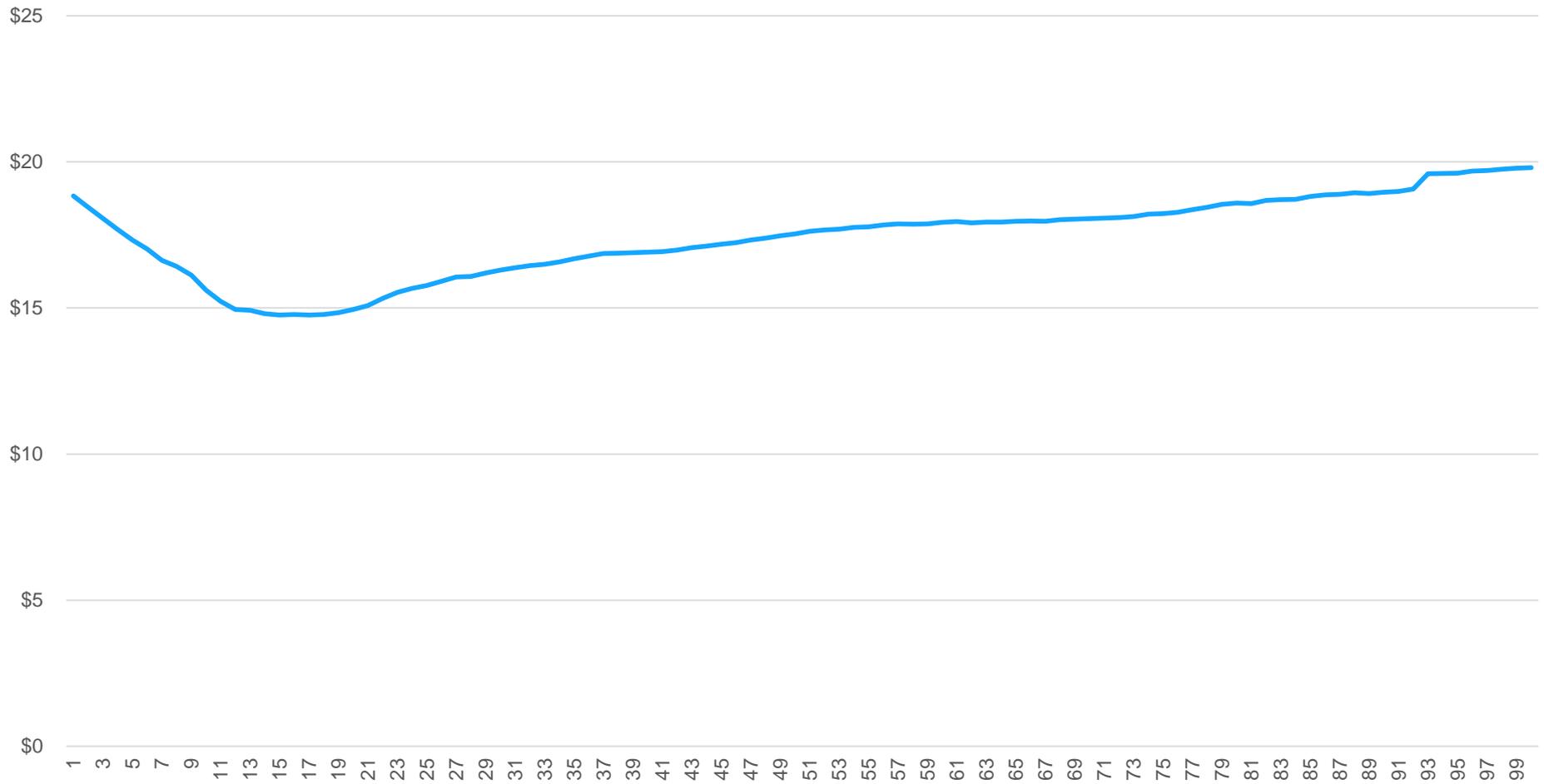
Average NTA Costs Per Day Also Decline by Length of Stay

Avg NTA Costs per Day (Smoothed) by Length of Stay



Average SLP Costs Per Day Remain Relatively Constant by Length of Stay

Avg SLP Costs per Day (Smoothed) by Length of Stay



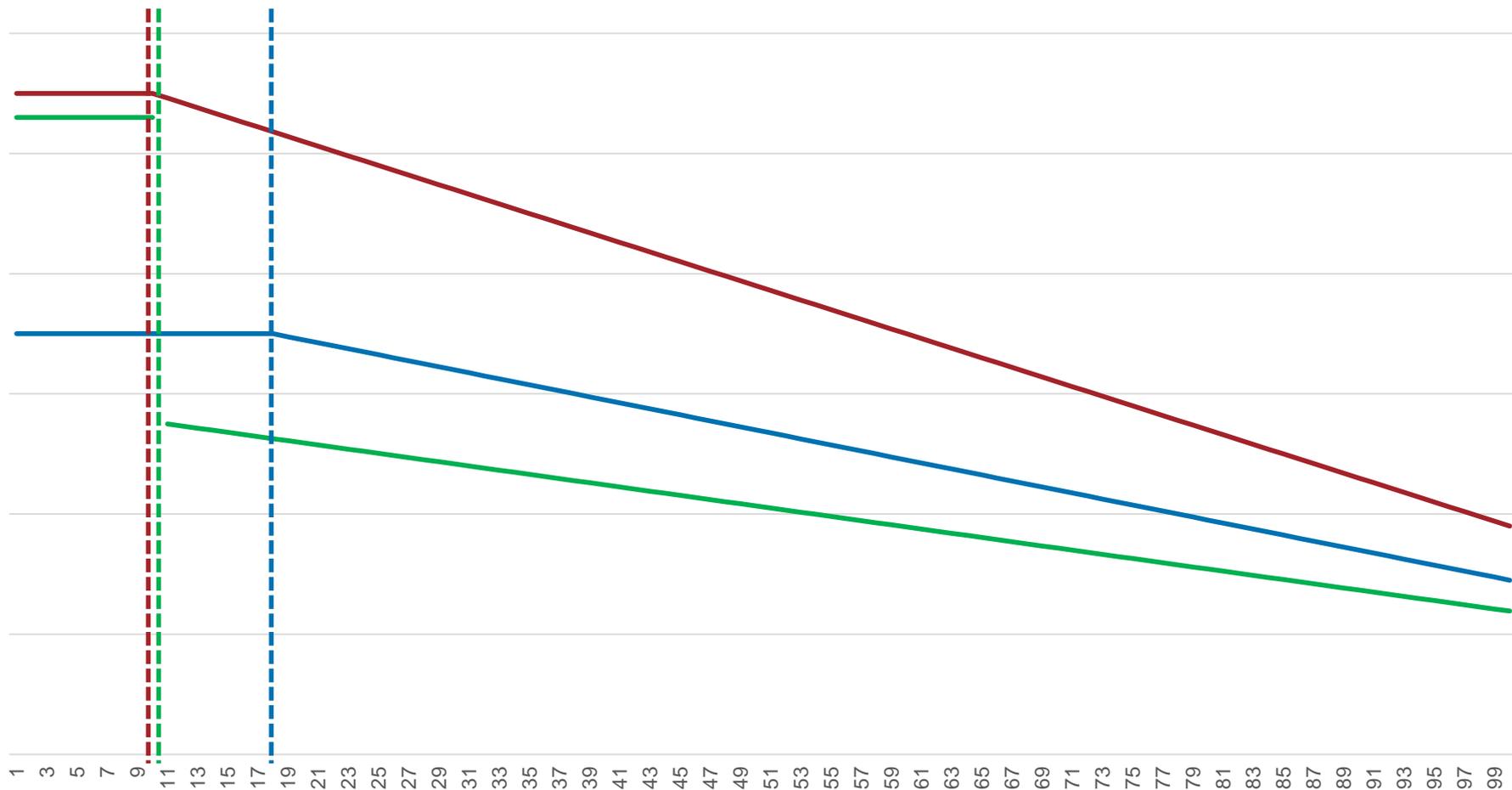
Average Costs per Day for PT+OT, NTA, and SLP Follow Different Patterns by Length of Stay

- PT+OT costs initially increase, and then decline steadily thereafter
- NTA costs, driven by drug costs, are concentrated at the beginning of a stay, and are low thereafter
- SLP costs are relatively constant, moving only within a narrow range over the stay
- Constant per diem rates cannot accurately reflect these distinct patterns of costs
 - Constant rates may lead to too few resources for providers at beginning of stay relative to end of stay

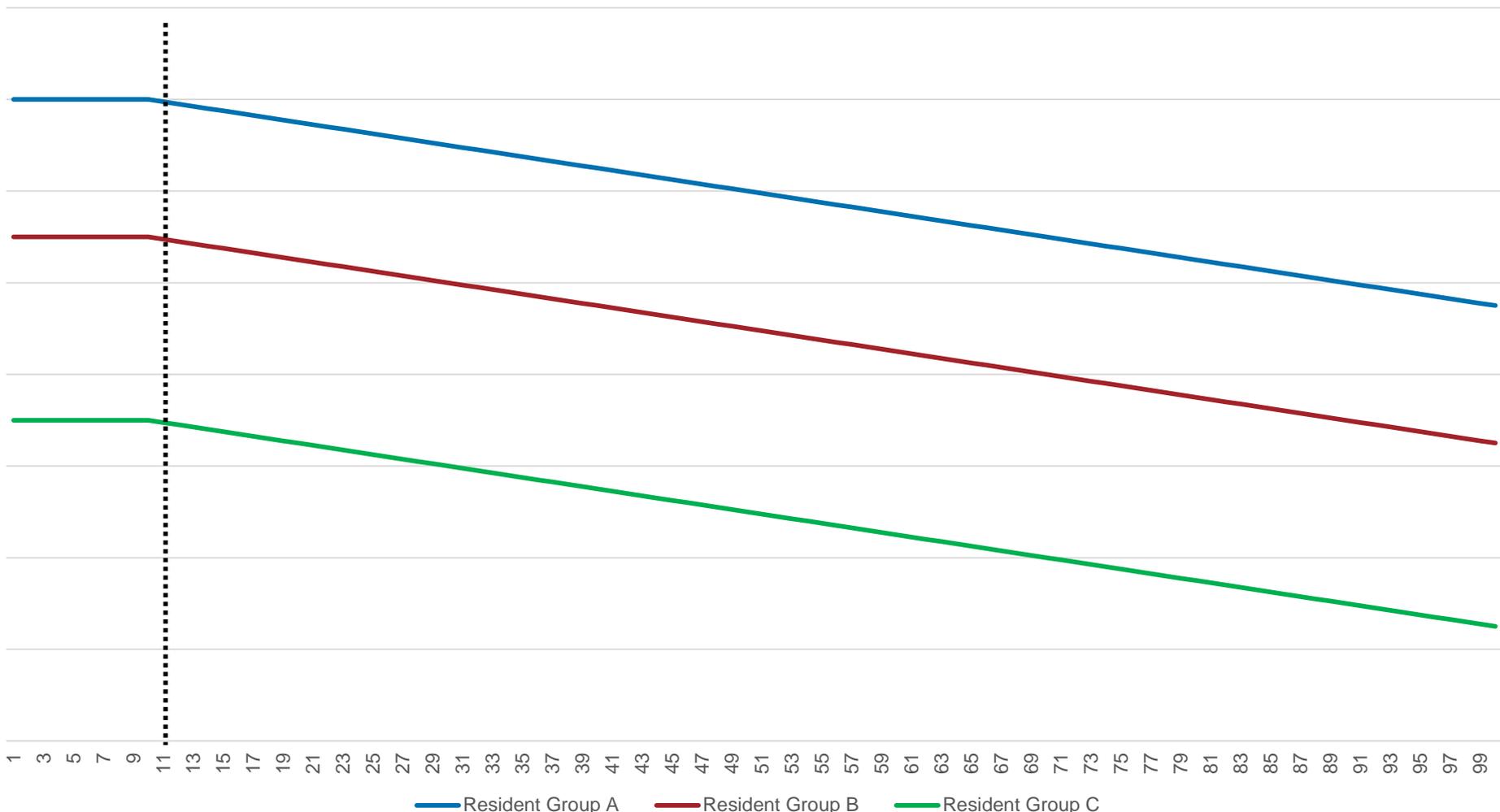
Varying Per Diem Payments Can Flexibly Reflect Varying Costs Over a Stay

- Three basic approaches to varying payments by day
 - Linearly changing rate
 - Blocks of days with distinct rates
 - Other non-linear functions
- Approaches can be combined to create wide array of simple, yet flexible, payment systems
 - Block/linear: Daily payment is constant for first set of days, and then declines linearly thereafter
 - Front-loaded/linear: Substantial fraction of payment for stay is made on first day, and remainder follows a linear function thereafter
 - Non-linear/Block: Non-linear declining daily payment with constant daily payments after a certain day
- Tradeoff between accurate tracking of relative costs over stay and complexity of system

Block/Linear Per-Diem Payment Functions Can Broadly Track Component Per Diem Costs



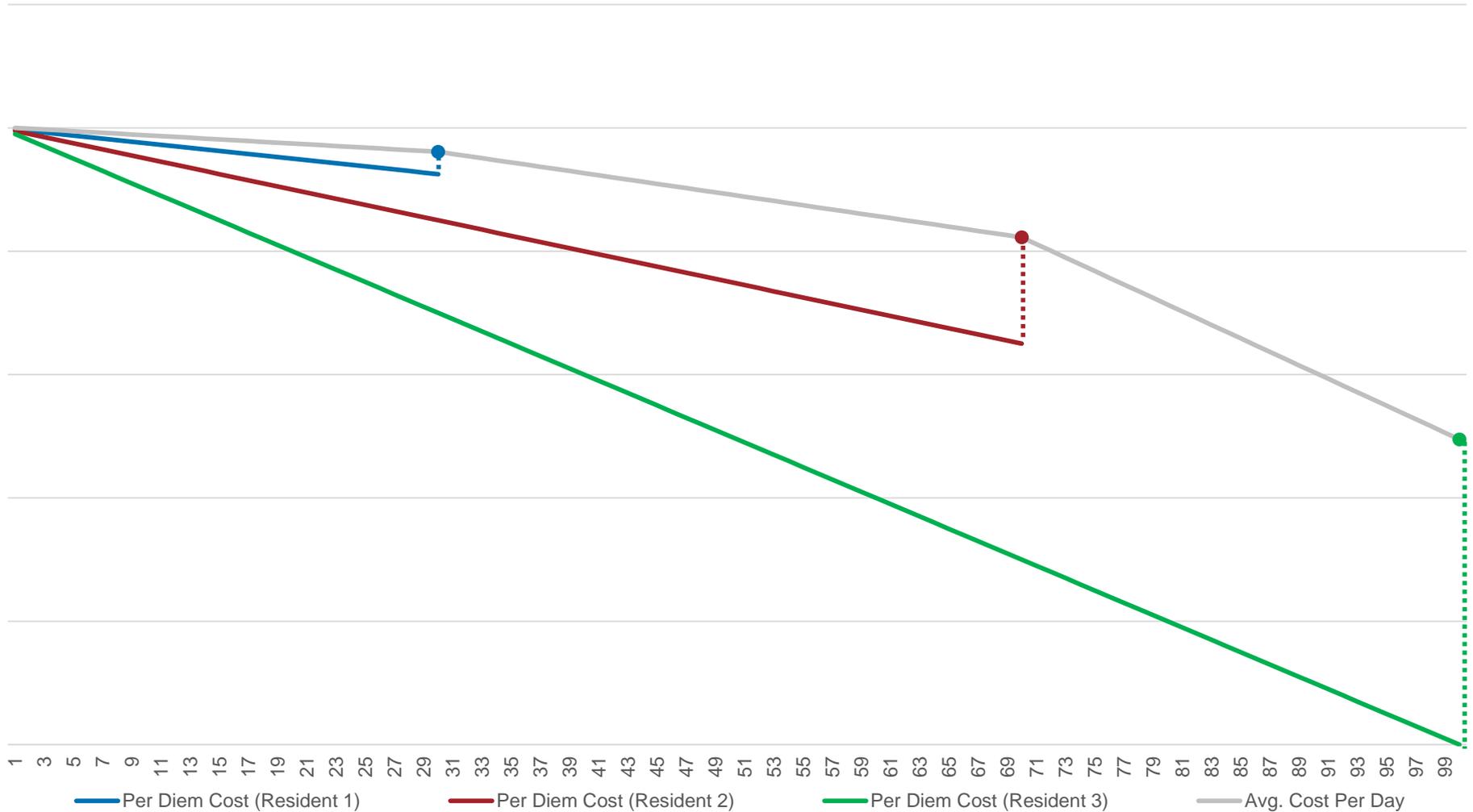
Examples of Rate Structures Covering Component Cost Differences Across Resident Groups



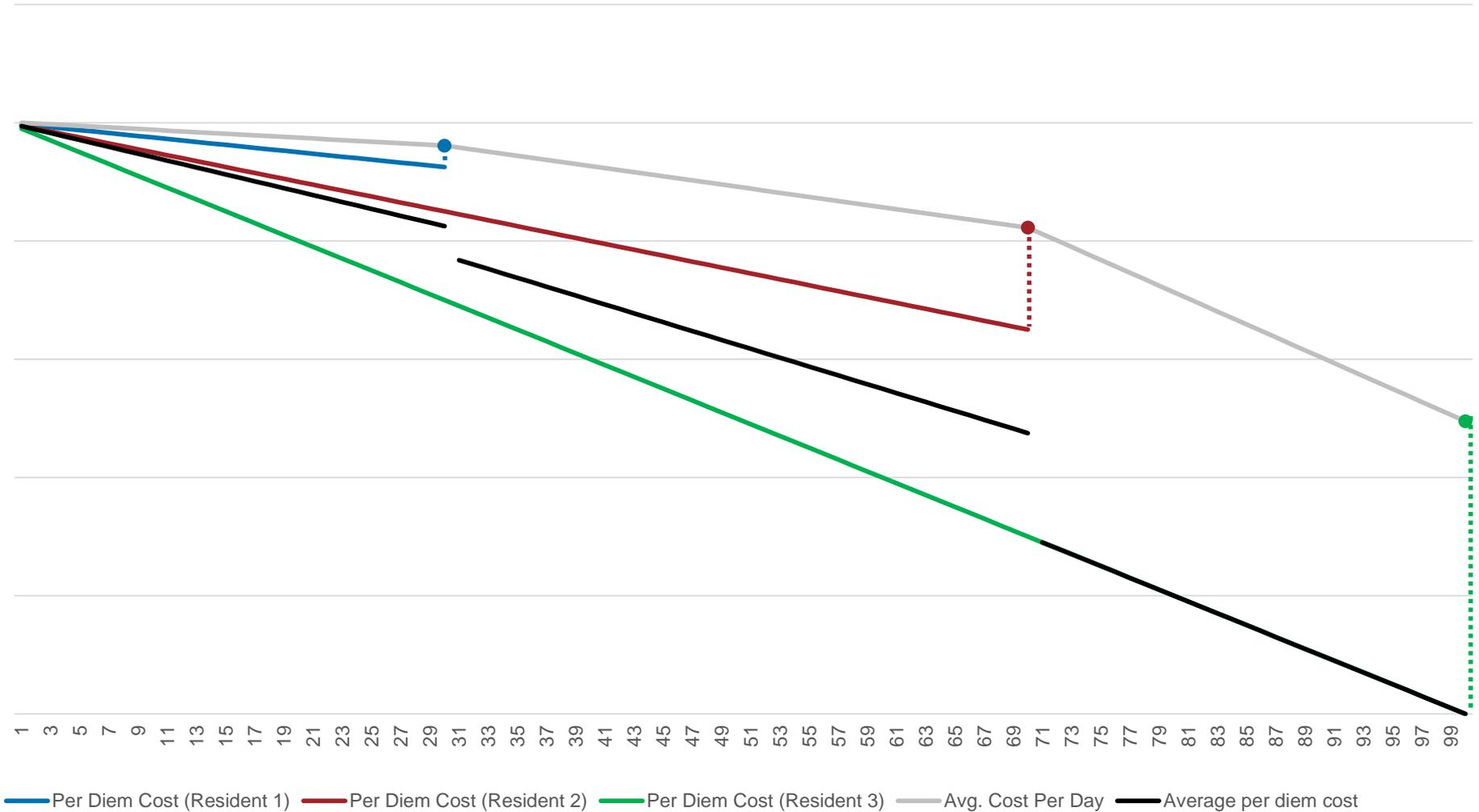
Per Diem Payments Intended to Track Per Diem Costs, Which Differ from Average Costs Per Day

- Average per diem cost is the average of the per diem costs across a resident population at a particular point in a stay length
- Average cost per day is the average of per diem costs for all days during stays for all residents who exited at a particular length of stay
- As illustrated on the following slides, average per diem costs decline more rapidly than average costs per day
- Implication: per diem payment for case-mix components should decrease over length of stay faster than decrease in average daily costs per day shown in previous analysis

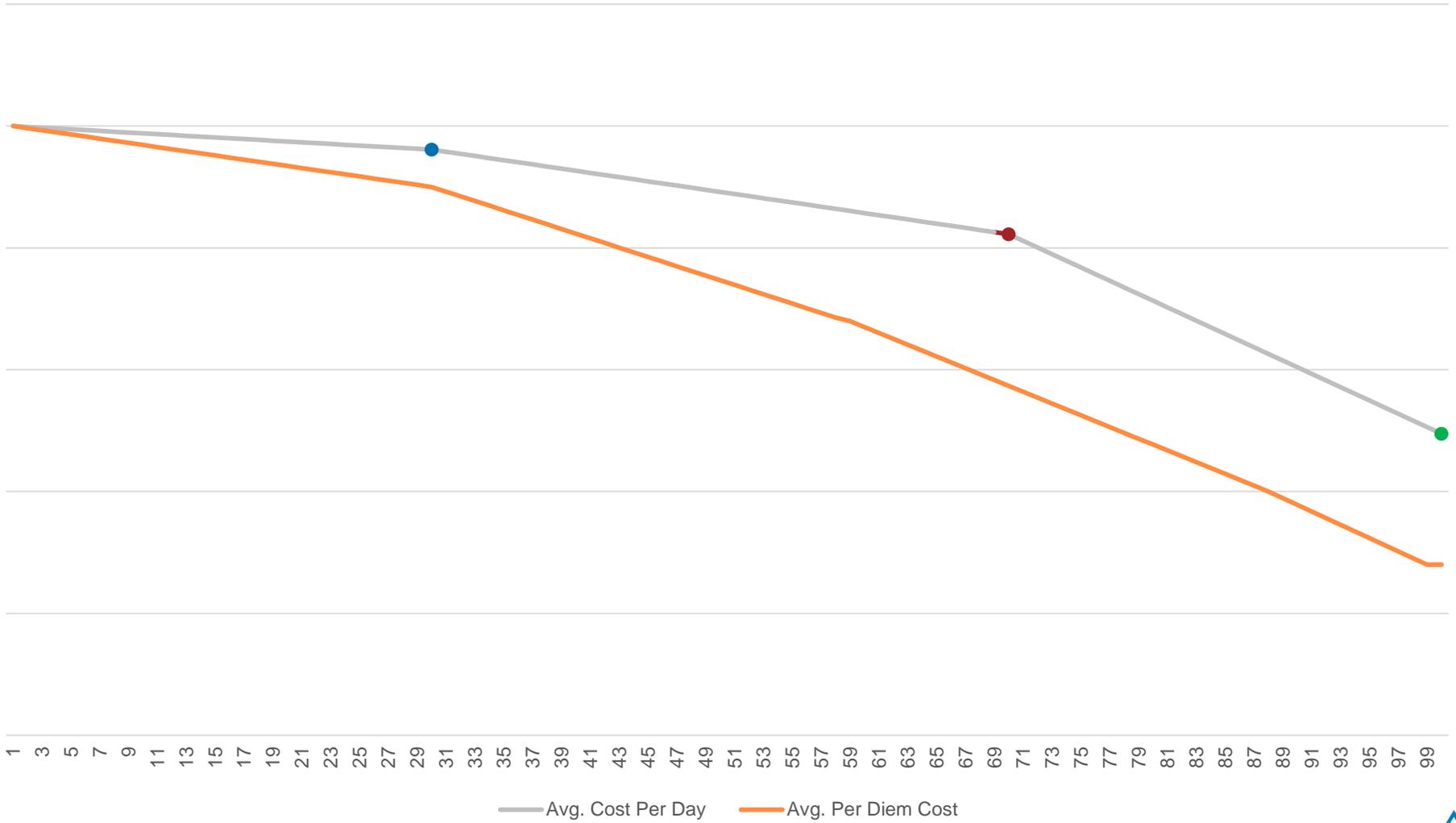
Relationship Between Average Cost per Day and Per Diem Cost: 3 Individual Example



Average Cost per Day Higher Than Average Per Diem Cost : 3 Individual Example



Average Per Diem Costs Decline Steeper Than Average Cost per Day in Resident Population



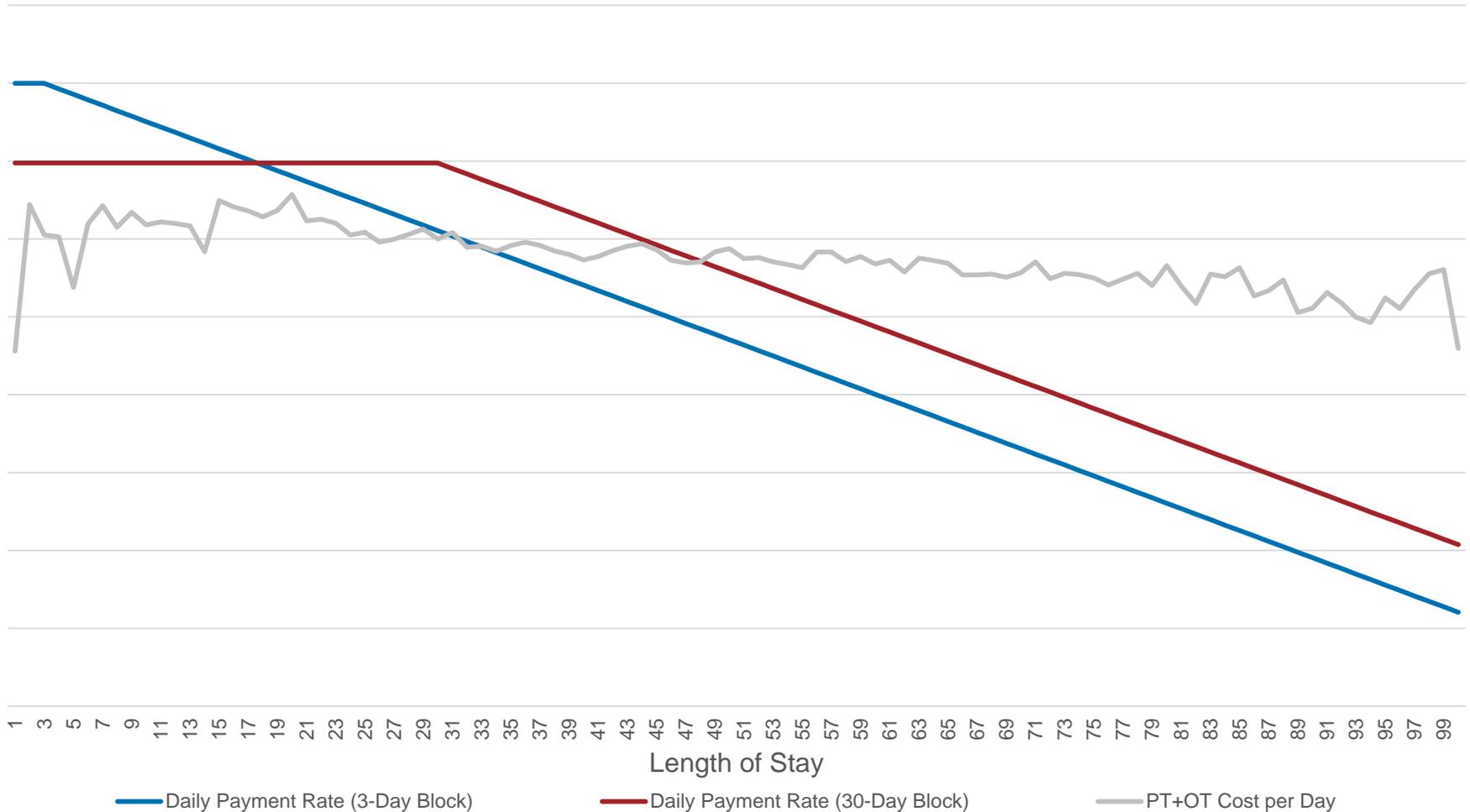
Block/Linear Payment System Offers Several Advantages for Setting Per Diem Payments

- Simple to understand, since only four parameters define the payment structure:
 - Initial payment rate
 - Length of constant period (before payment declines)
 - Post-constant period starting point
 - Linear rate of decline (slope)
- Parameters provide enough flexibility to capture wide range of cost patterns
- Easy to create payment structures that differ by resident group for any given component
 - Simplest approach uses same slope and length of initial block for every resident group, but different initial payment rate

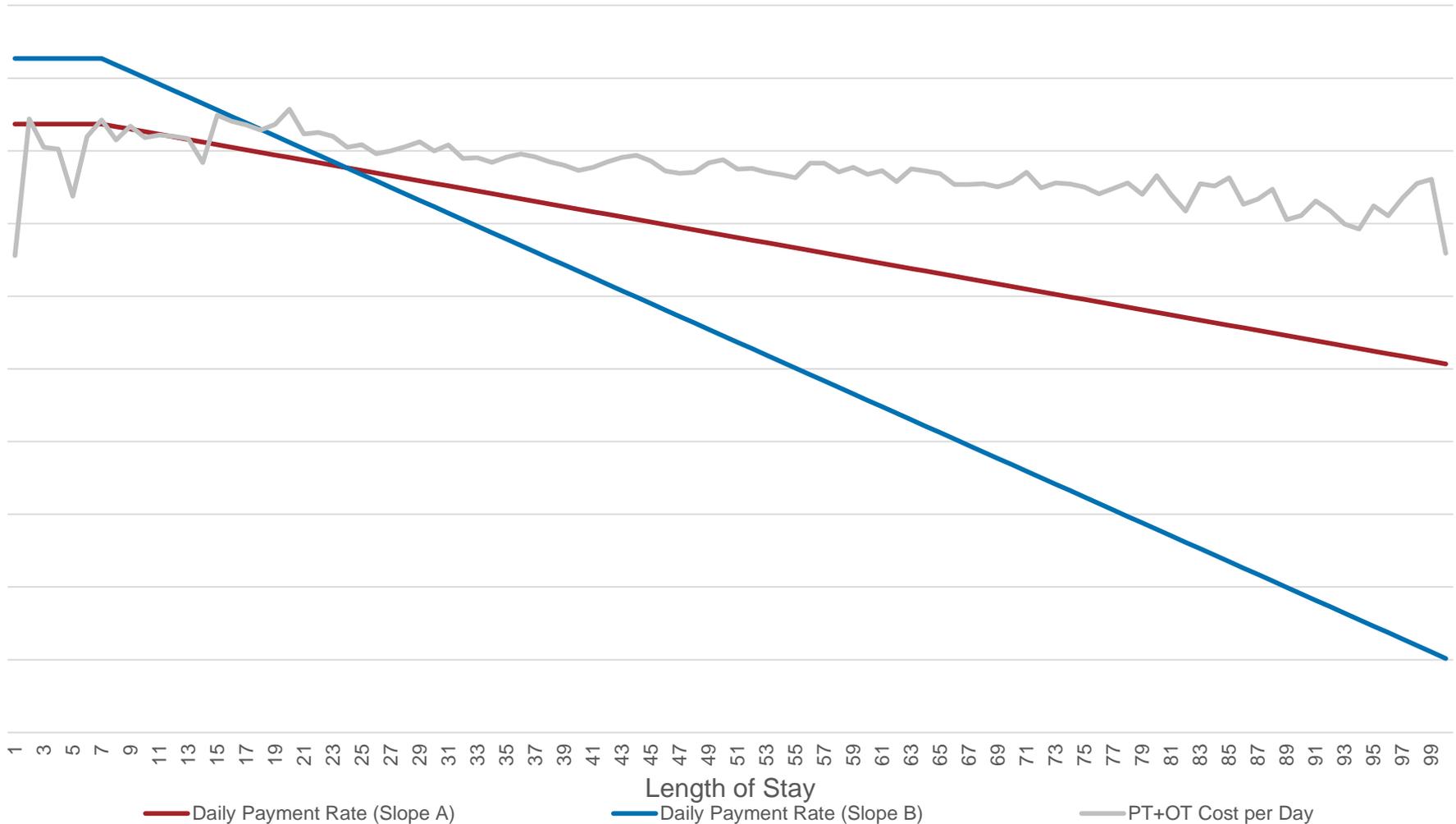
Parameters Provide Sufficient Flexibility to Capture Wide Range of Cost Patterns

- Figures in following slides illustrate the varying of length of initial block, slope, and post-constant period for PT+OT and NTA components
- Shorter initial block and steeper slope may be appropriate for NTA component, as compared to PT+OT component
 - Additional alternative is to set lower post-constant period payment for NTA component

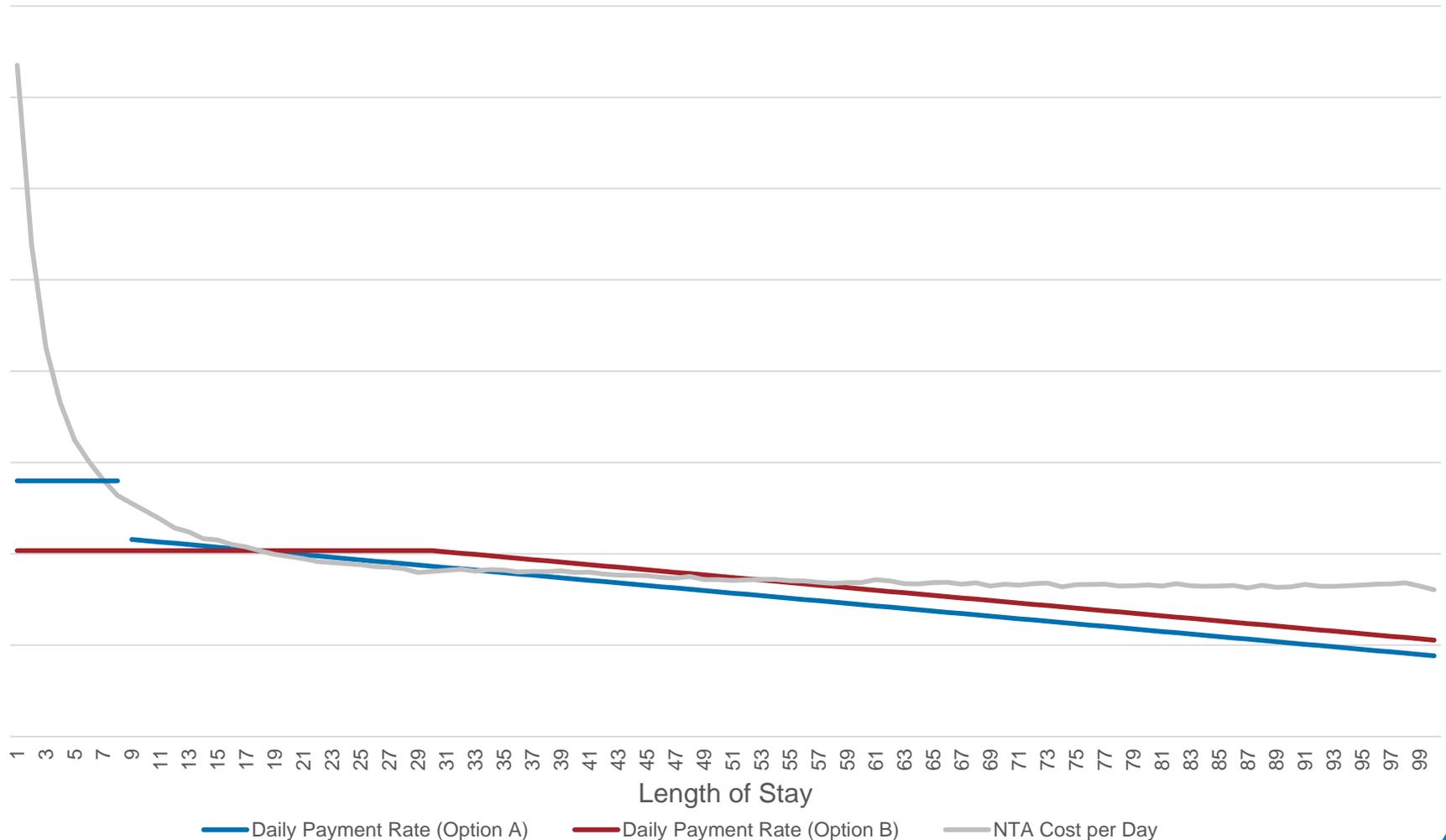
Two Illustrative Block/Linear Per Diem Payment Schedules Tracking Per Diem PT+OT Costs



Two Illustrative PT+OT Per Diem Payment Schedules with Different Slopes



Two Illustrative Block/Linear Per Diem Payment Schedules Tracking Per Diem NTA Costs



Discussion Questions

- Does the block/linear payment structure appropriately reflect resident costs over a stay, is a more complicated system needed, or would a simpler approach be sufficient?
- Within a given payment component (e.g. PT+OT), should there be a single slope for all resident groups or should the slopes vary across resident groups?
- Within a given payment component, should the length of the constant period vary across resident groups?
- Should the NTA payment component have a continuous per diem rate, or should there be a break between the starting rate and the later rates?
- Are there any potential adverse effects that should be considered if varying per diem payments are implemented?

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Session 6 Outline

Session Objective

Present impact analysis of candidate block/linear payment system and obtain feedback on methodology and results

Session Topics

- Candidate block/linear payment system
- Description of resident and provider subpopulations examined
- Description of impact metrics
- Summary of key results

Session Time

45 minutes

Impact Analysis Relies on Four Candidate Payment Structures

Component	Length of Initial Block	Slope
PT+OT	14	-0.5
SLP	100	0
NTA	2	-0.7
Nursing	100	0

- Evidence on relative resource use over course of stay used to set parameters
 - Slopes chosen to ensure that payments track costs
 - Initial payments calculated so that relative payments match relative resource use across resident groups, assuming current lengths of stay

Characteristics of Residents Examined in Impact Analysis of Alternative Payment System

- Resident populations stratified by demographic, enrollment, and service utilization characteristics
- Demographic
 - Sex
 - Age
 - Race/Ethnicity
- Enrollment
 - Original reason for Medicare enrollment
- Service utilization
 - Length of SNF stay
 - Length of qualifying inpatient stay
 - Therapy utilization
 - Number of therapy disciplines
 - Combination of therapy disciplines
 - Longest RUG level (RU/RV/RH/RM/RL/Non-Rehab)

Impact Analysis Also Examines Potentially Vulnerable Resident Populations

- Residents enrolled in both Medicare and Medicaid
- Residents with high NTA costs
 - Current PPS incorporates NTA into nursing base rate, and does not vary NTA payments across residents
- Residents receiving extensive services
 - Current PPS does not allow nursing payments for rehabilitation RUGs to reflect use of combinations of extensive services
- Residents with cognitive impairments, diabetes, wound infections, and IV medications

Attributes of Providers Examined in Impact Analysis of Alternative Payment System

- Provider populations stratified by administrative type, geographic location, size, and types of stays
- Administrative type attributes include
 - Institution type (freestanding/non-freestanding)
 - Ownership (for-profit/non-profit/government)
- Geographic location attributes include
 - Urban/rural
 - Census division
- Facility size, defined by number of beds
- Types of stays categories include
 - Proportion of stays with 100 utilization days
 - Proportion of days billed to ultra-high rehabilitation RUGs
 - Percentage of days billed to non-rehabilitation RUGs
 - Percentage of dual-enrollment stays (Medicare and Medicaid)

Impact Analysis Compares Payments in Current System to Recommended System

- Impact analysis focuses on how payments would be re-allocated across different resident and provider groups
- Analysis relies on following comparison metrics:
 - Difference in average per-stay payment
 - Recommended-to-current payment ratios
- Discrepancy between recommended and current payments may reflect differences in relative costliness across groups unaccounted for by current system

Impact Results Show Higher Payments Under Recommended System for Many Vulnerable Populations

- Subpopulations receiving higher per-stay payments in recommended system than in current system include:
 - Residents with high NTA costs
 - Residents using ventilator, respirator, tracheostomy, infection isolation
 - Dually enrolled residents
 - Residents with ESRD
 - Residents with longer qualifying inpatient stays
 - Residents with diabetes, wound infection, or IV medications
- Subpopulations receiving lower per-stay payments in recommended system include:
 - Residents in RU RUGs

Impact Results Suggest Some Re-allocations of Payments Across Different Provider Groups

- Subpopulations receiving higher per-stay payments in recommended system than in current system include:
 - Non-profit facilities
 - Government-owned facilities
 - Hospital-based and swing bed facilities
 - Small facilities
 - Facilities with large proportions of non-rehab residents and low proportions of RU residents

Discussion Questions

- Should impacts be explored for additional subpopulations of residents or providers?
 - Are there additional vulnerable subpopulations that should be examined?
 - Should some existing subpopulations be further stratified?
- Are there additional metrics that should be explored to evaluate payment impacts?
- Do the existing results suggest specific refinements that may be needed for the PT+OT, SLP, NTA, and nursing components? Are these refinements related to the resident groups or the features of per-diem payments (intercept/flat period/slope)?

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Session 7 Outline

Session Objective

- Provide opportunity for all TEP participants to offer feedback and thoughts

Session Topics

- Open Discussion

Session Time

1 hour*

*May be adjusted to accommodate for overtime in earlier sessions

Open Discussion

- All attendees, including observers, are encouraged to comment on day's discussion
- Speakers may offer comments or direct technical questions to project team representatives
- Please limit remarks to allow time for others to participate

Thank You

