Therapy Outcomes in Post-Acute Care Settings (TOPS) Study Chartbook

April 2021

Jointly Commissioned by

American Occupational Therapy Association

APTA American Physical Therapy Association

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Background & Objectives

Background

Occupational therapy and physical therapy services are a critical component of post-acute care (PAC).

New and emerging payment policies have the potential to impact therapy provision in PAC settings, including:

Home Health Agencies
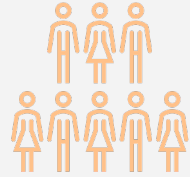
Skilled Nursing Facilities

Inpatient Rehab Facilities

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Objective #1: Beneficiaries Served in PAC Settings

How do **Beneficiaries Compare Across Settings?**

Race & Ethnicity

Dual-Eligible Status

Gender
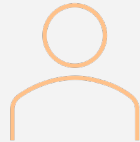
ICU Use & Comorbidities

Age
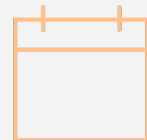
Diagnostic Groups

Objective #2: Service Intensity & Outcomes

How Does **Intensity** of **OT & PT** Services Relate to:

1 **Change in functional status** during first PAC episode?

Functional status includes ability to perform:

Dressing	Walking/ Locomotion	Toileting
Bathing	Transferring	Feeding

A score of 0 is dependent on all 6 items. A score of 36 is independent on all 6 items.

Objective #2: Service Intensity & Outcomes

How Does **Intensity** of **OT & PT** Services Relate to:

2 **Readmission to acute care** within 30 days from PAC discharge?

All models adjusted/controlled for:

Admitted to PAC 5 Days or Less After Hospital Discharge	PAC Interrupted by Acute Admission	Alzheimer's and/or Dementia	Depression
Hospital Length of Stay	Use of ICU in Hospital	Stineman Stage III ADL	Comorbid Conditions
Age	Gender	ESRD	Rural
Race/Ethnicity	Dual Beneficiary	Disability Status	State

Number of home health visits (for home health model only).

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Study Population

1.4 million

Medicare PAC stays with OT and/or PT services
following hospitalization in 2015 and 2016

552,000+
Home Health
Stays

693,000+
Skilled Nursing
Stays

197,000+
Inpatient Rehab
Stays

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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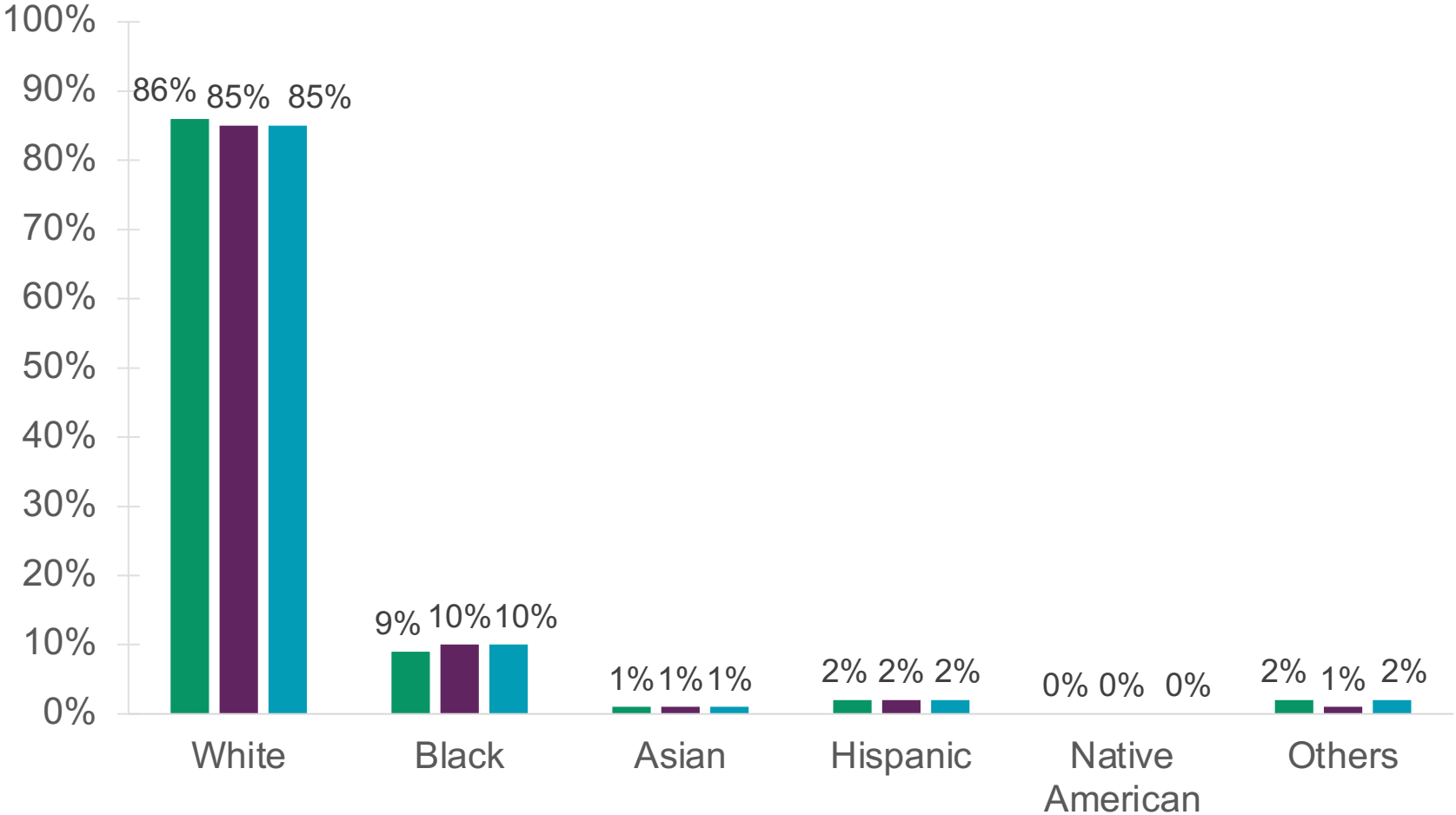
Key Findings:
How Do Beneficiaries Compare Across Settings?

Key Finding #1

Distinct people with **complex** conditions & comorbidities receive occupational therapy and physical therapy in each post-acute care setting.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Race & Ethnicity

Race & ethnicity of people receiving therapy services were mostly consistent in each setting.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Gender

In all settings, the majority of people receiving therapy was female.

Overall	HH	SNF	IRF
62% Female	60% Female	65% Female	57% Female

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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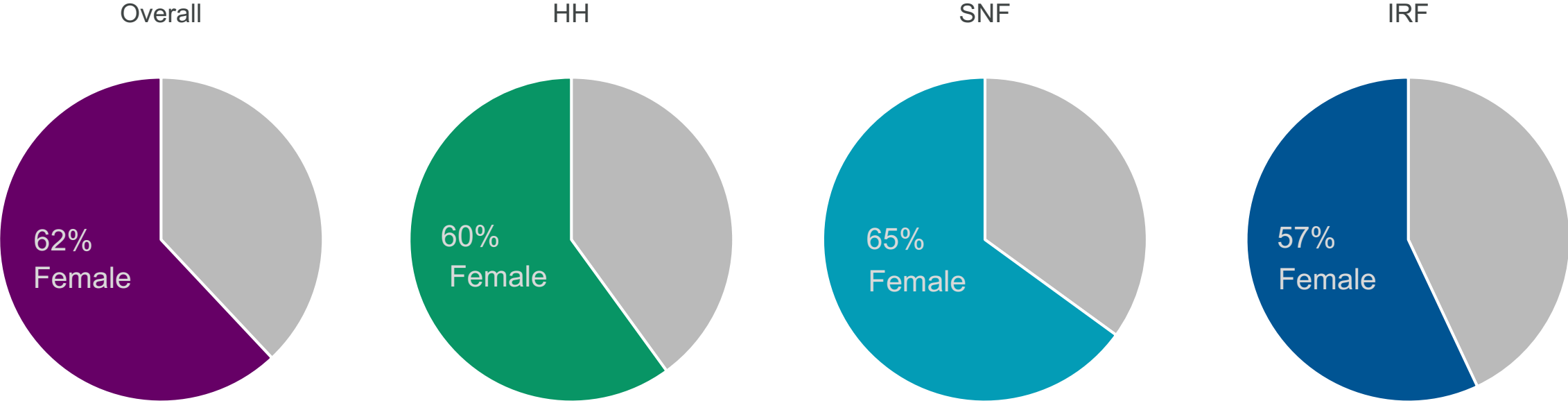
Age Groups by Setting

The largest age group receiving therapy in HH agencies was between 65 and 74 years old, in IRFs was between 75 and 84 years old, and in SNFs was 85 or older.

Home Health

Skilled Nursing

Inpatient Rehab

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
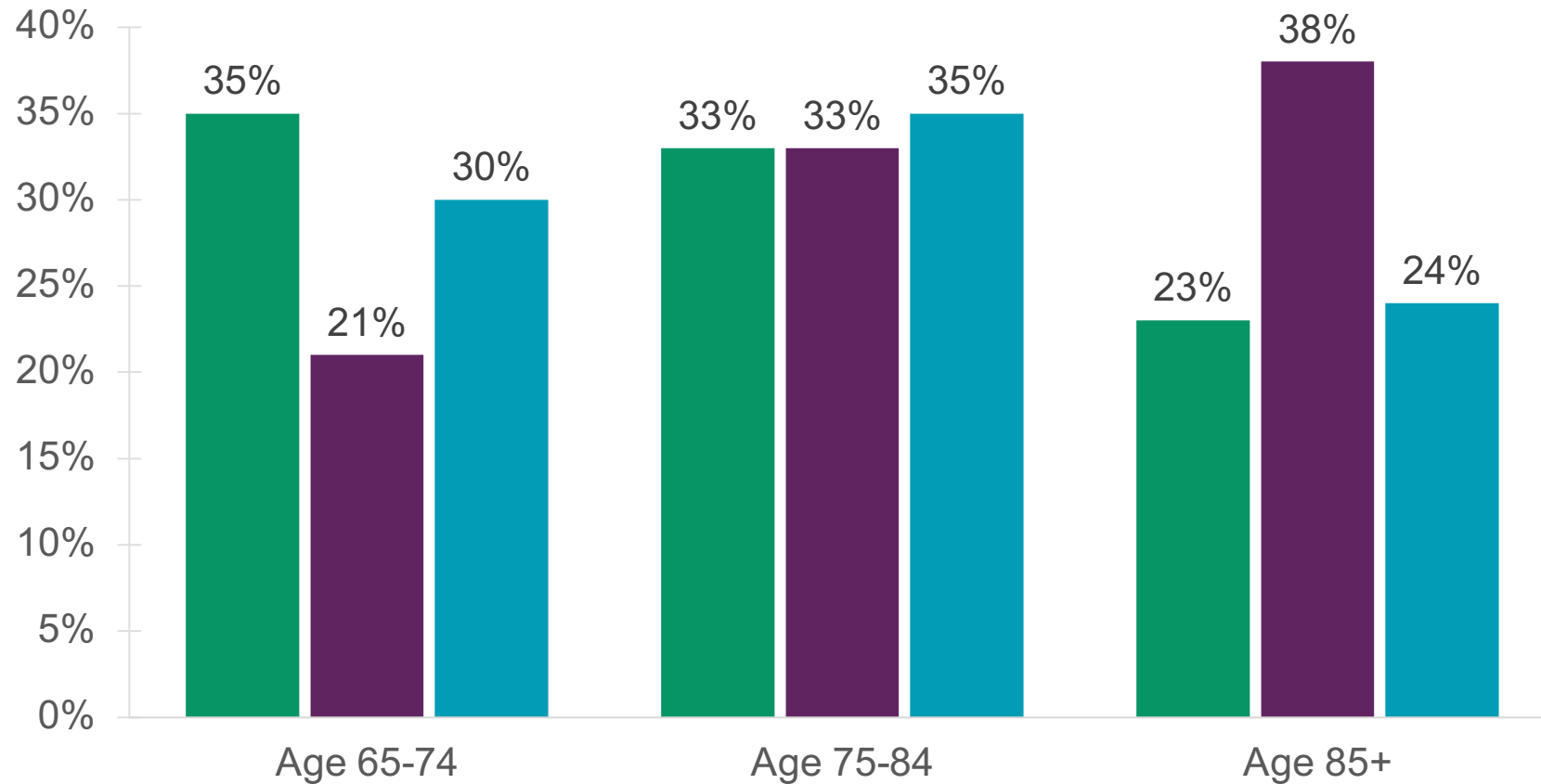
Medicare & Medicaid Dual Eligible

SNFs had are larger proportion than did HH and IRFs of dual-eligible people receiving therapy services.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
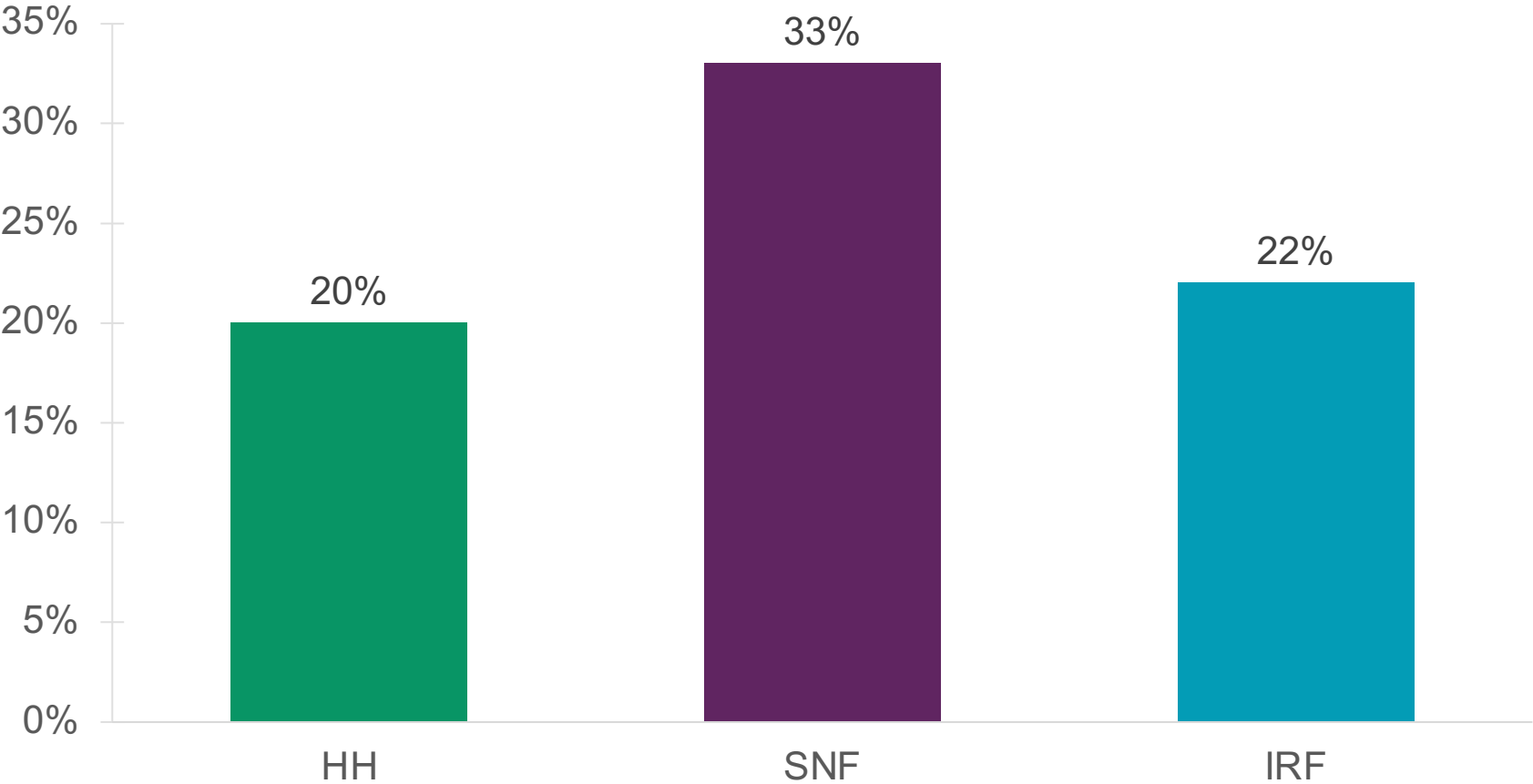
Alzheimer's Disease and/or Dementia

Nearly half of people in SNFs who receive therapy have dementia, compared with 20% in HH and 31% in IRFs.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
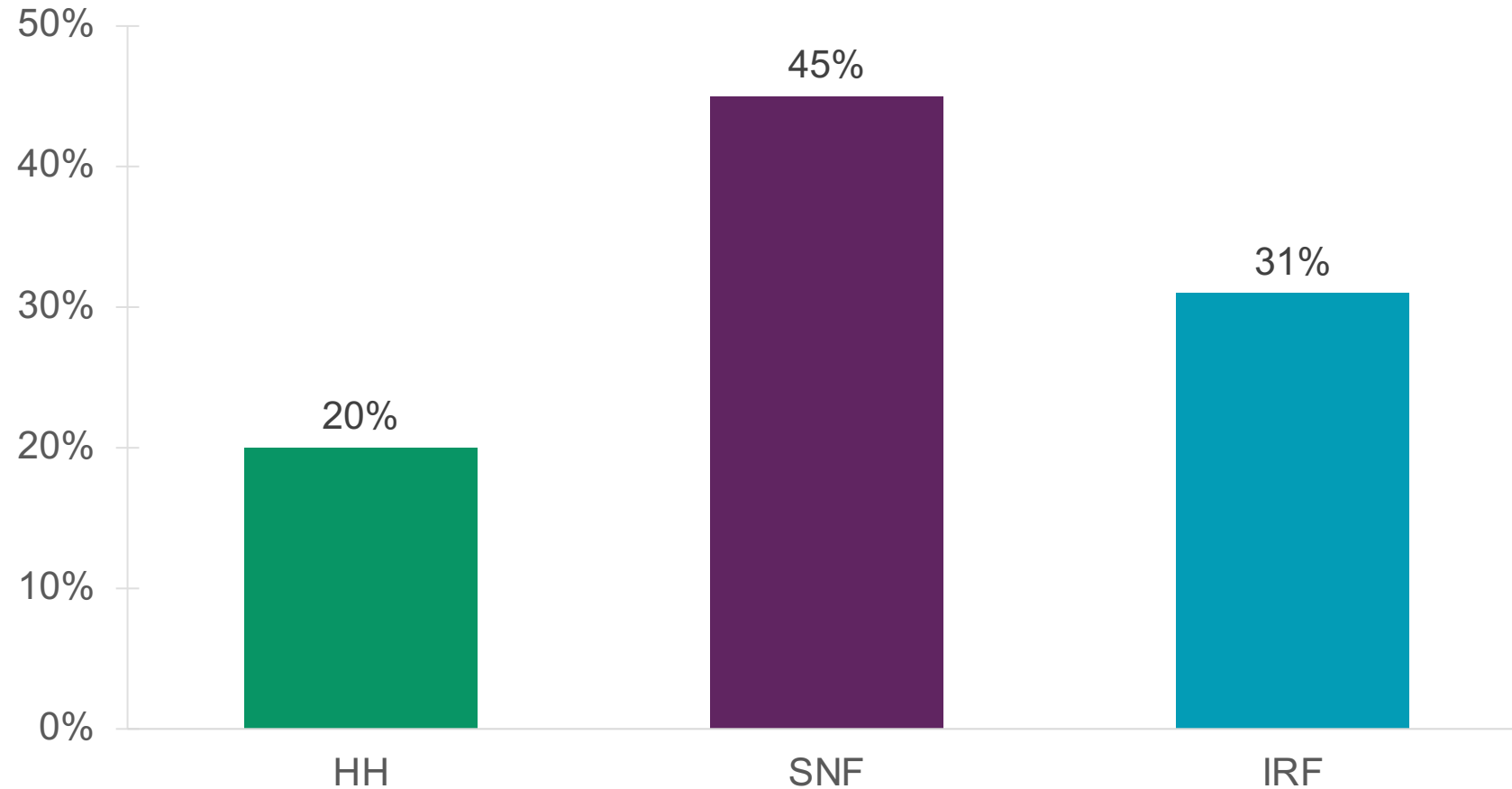
Depression

Depression was common in all settings. More than 40% of people receiving therapy in SNFs and IRFs had a diagnosis of depression.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
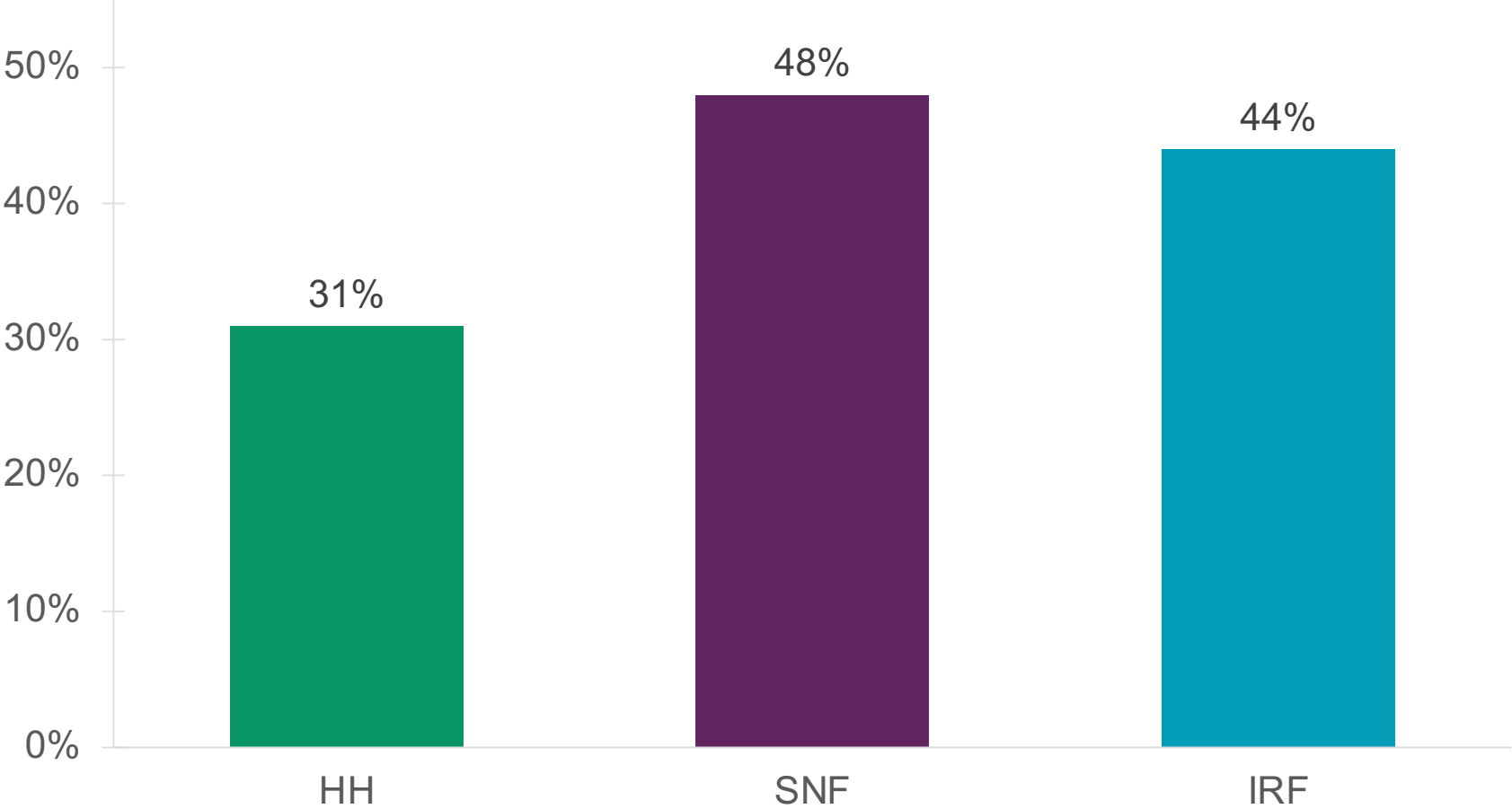
ICU Use During Hospitalization

Nearly 1 in 4 people receiving therapy in HH were admitted to the ICU during hospitalization. Nearly 30% of those in SNFs and 40% in IRF spent time in the ICU.

Home Health

Skilled Nursing

Inpatient Rehab

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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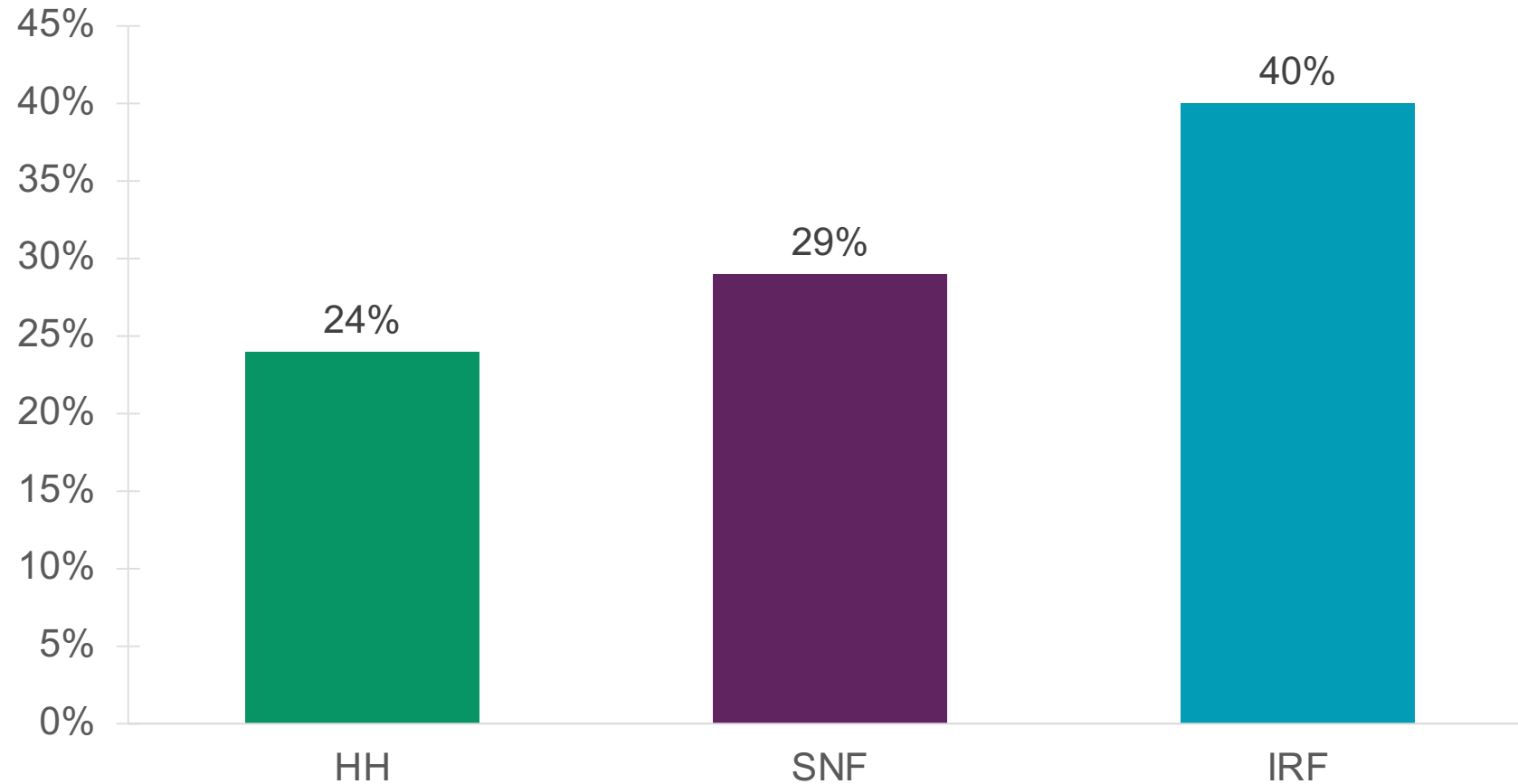
Major Diagnoses Across Settings

Although all major diagnostic groups are served in each setting, some groups are more prevalent in specific settings. Nearly half of people with stroke receive care in an IRF. Nearly half of people with congestive heart failure receive care in a SNF. Almost two-thirds of people with joint replacement received HH care.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
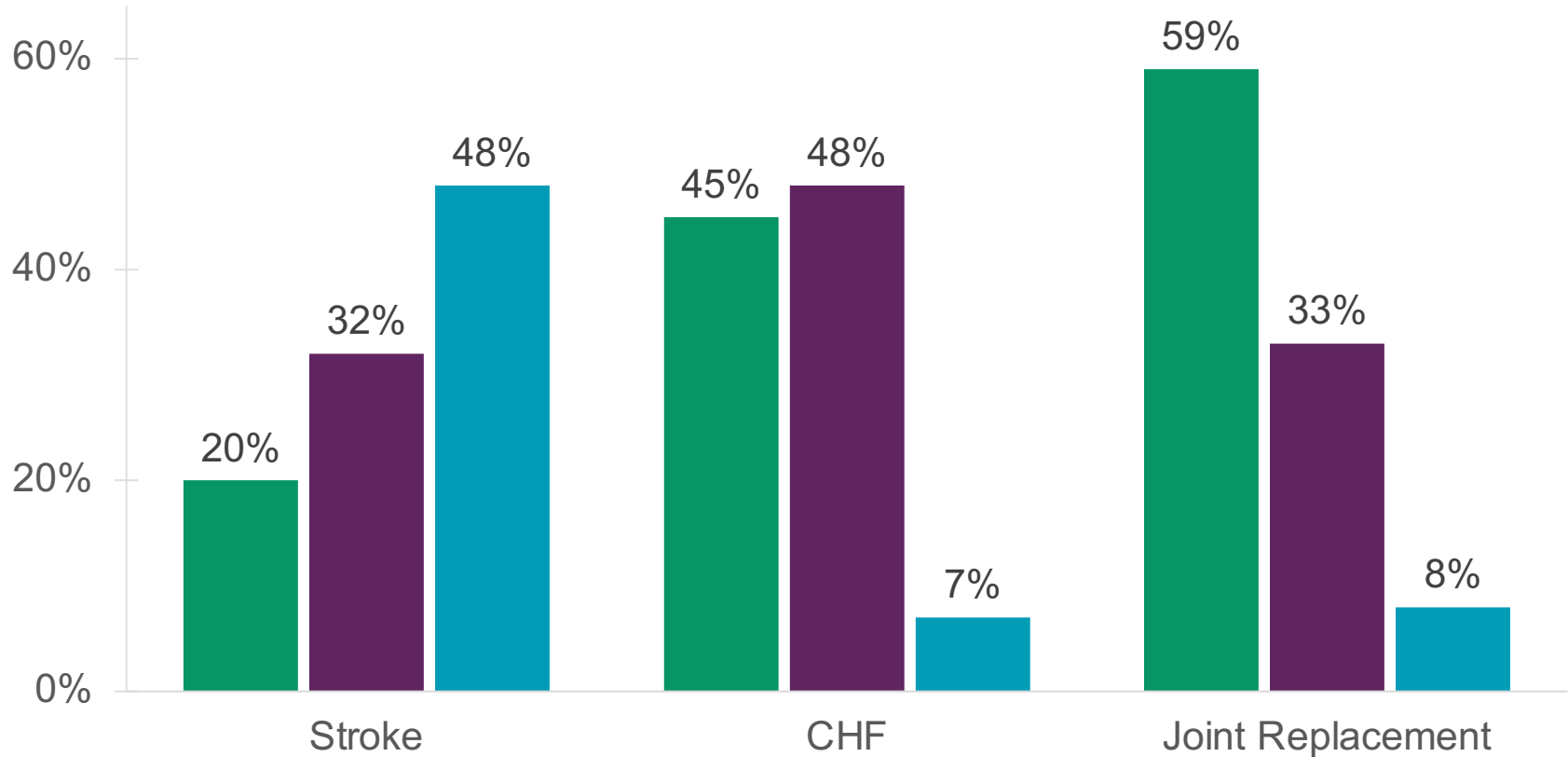
Functional Status at Admission

The median functional status of people admitted to PAC is highest (meaning most independent) in HH and lowest in IRFs.

Home Health

Skilled Nursing

Inpatient Rehab

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
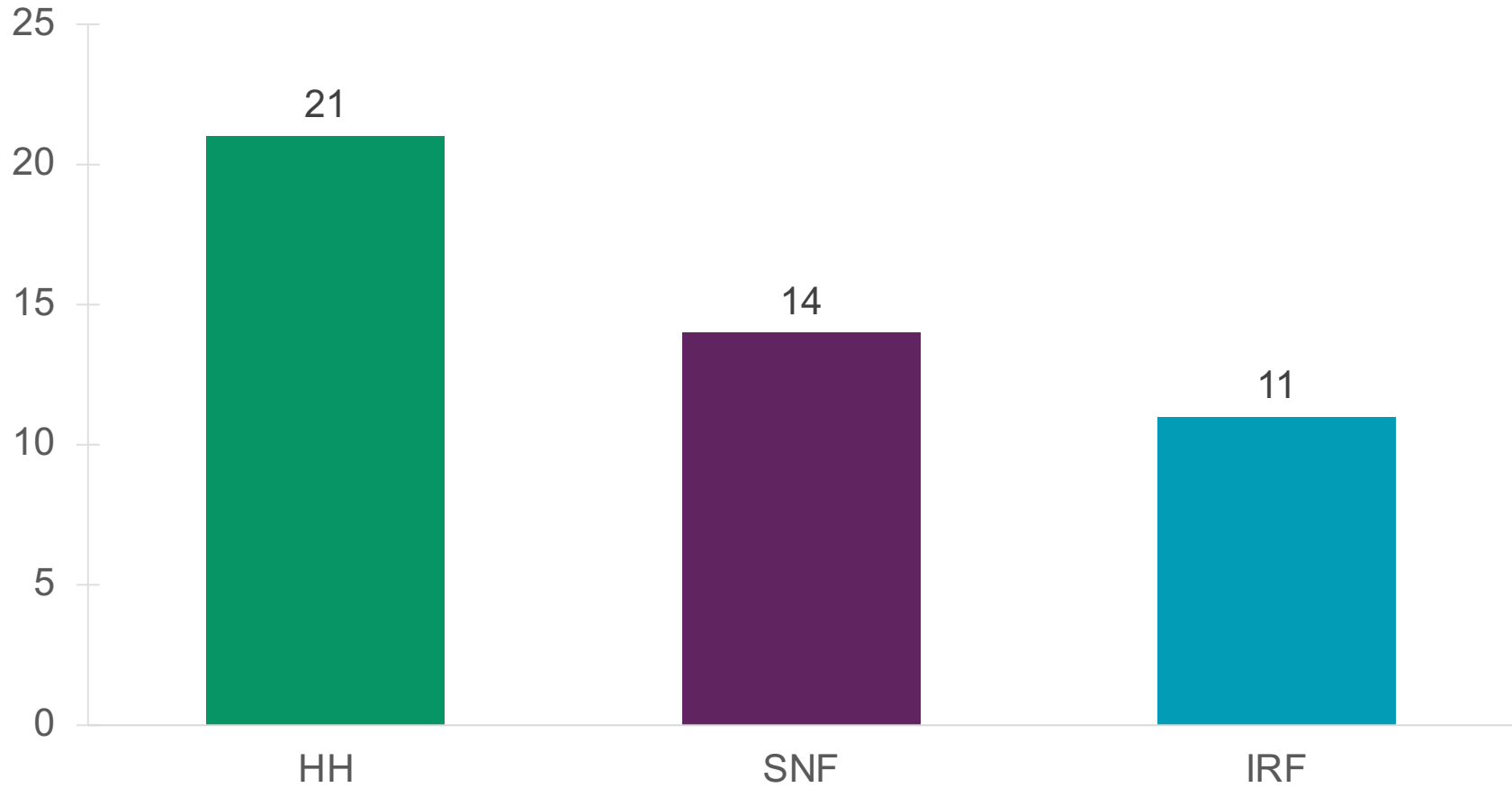
Key Findings:
How Does Intensity of OT & PT Services Relate to Functional Status & Readmissions?

Key Finding #2

The intensity of occupational therapy and physical therapy services is associated with **improved ability** to perform **everyday functional activities** such as bathing, dressing, and transferring.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Key Finding #3

People who received the **fewest minutes** of physical therapy and occupational therapy **were at the highest risk** for hospital **readmission** across all post-acute care settings.

These findings were consistent for patients with medical and surgical conditions, suggesting a robust impact across Medicare populations.

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Setting-Specific Findings

Home Health Agencies

Home Health Overview

Group	Total Hours of OT & PT			
	All Diagnoses	**Stroke**	**CHF**	**Joint Replacement**
Low-Intensity Group	Less than 1.6 hours	Less than 1.9 hours	Less than 1 hour	Less than 3.8 hours
Typical-Intensity Group	5.3 to 6 hours	6 to 7.3 hours	4.5 to 5.5 hours	6.3 to 7 hours
High-Intensity Group	12.5 to 30 hours	16.5 to 29.3 hours	12 to 21.3 hours	12.3 to 30 hours

People who received the **least** therapy across all HH stays are in the low-intensity group. People who received the **most** therapy across HH stays are in the high intensity group. Each group represents 10% of total stays. The low-intensity and high-intensity groups represent the low and high extremes of therapy.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Readmissions After Home Health: All Diagnoses

People in the low-intensity group had the highest readmission risk in HH.

30-Day Readmission Rate After HH Discharge:
All Diagnoses

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
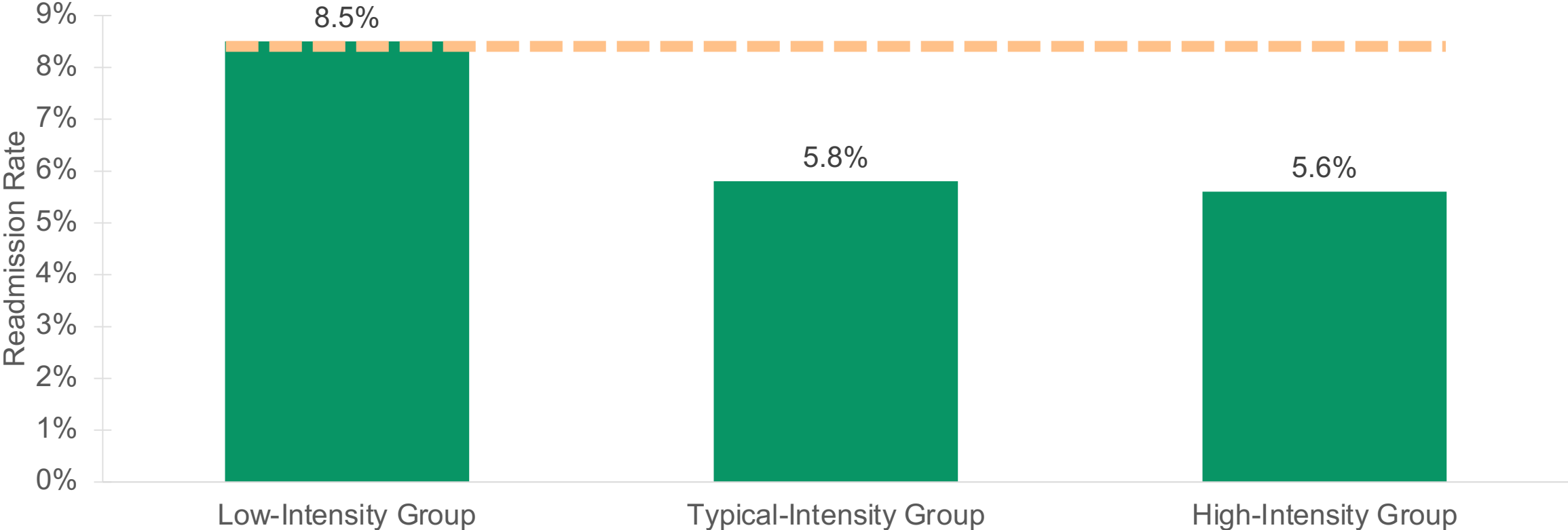
Change in Function in Home Health: All Diagnoses

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: All Diagnoses

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
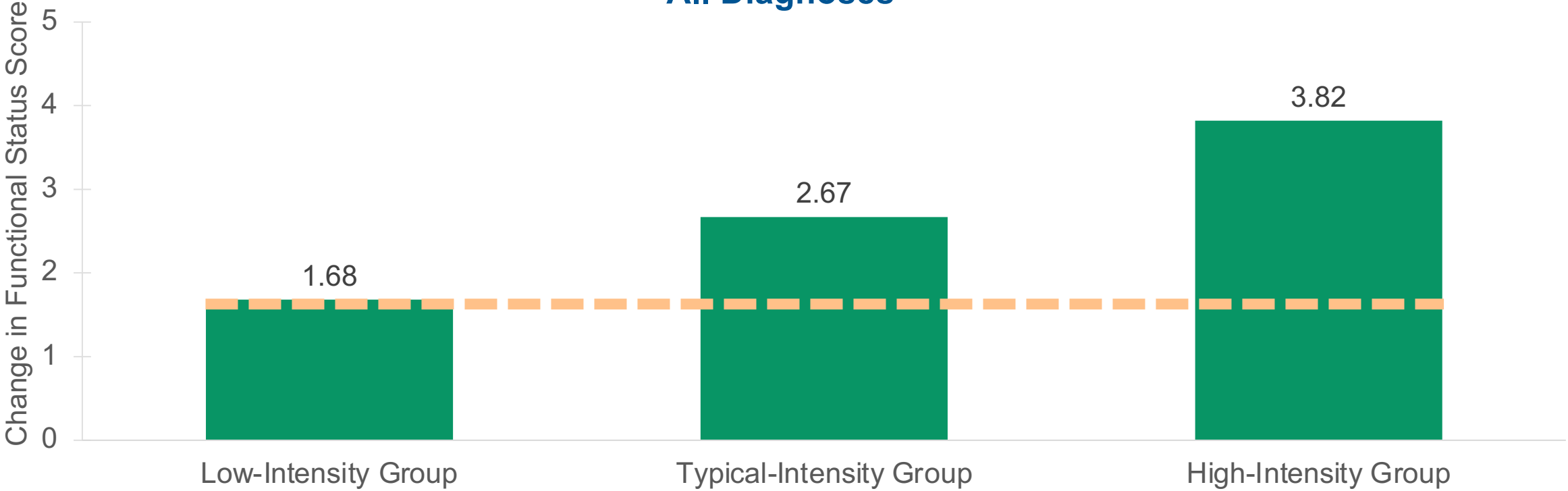
Change in Function in Home Health: Joint Replacement

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: Diagnosis of Joint Replacement

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Change in Function in Home Health: Congestive Heart Failure

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: Diagnosis of CHF

Bar chart showing Change in Functional Status Score by group:
- Low-Intensity Group: 1.79
- Typical-Intensity Group: 2.53
- High-Intensity Group: 3.58

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Change in Function in Home Health: Stroke

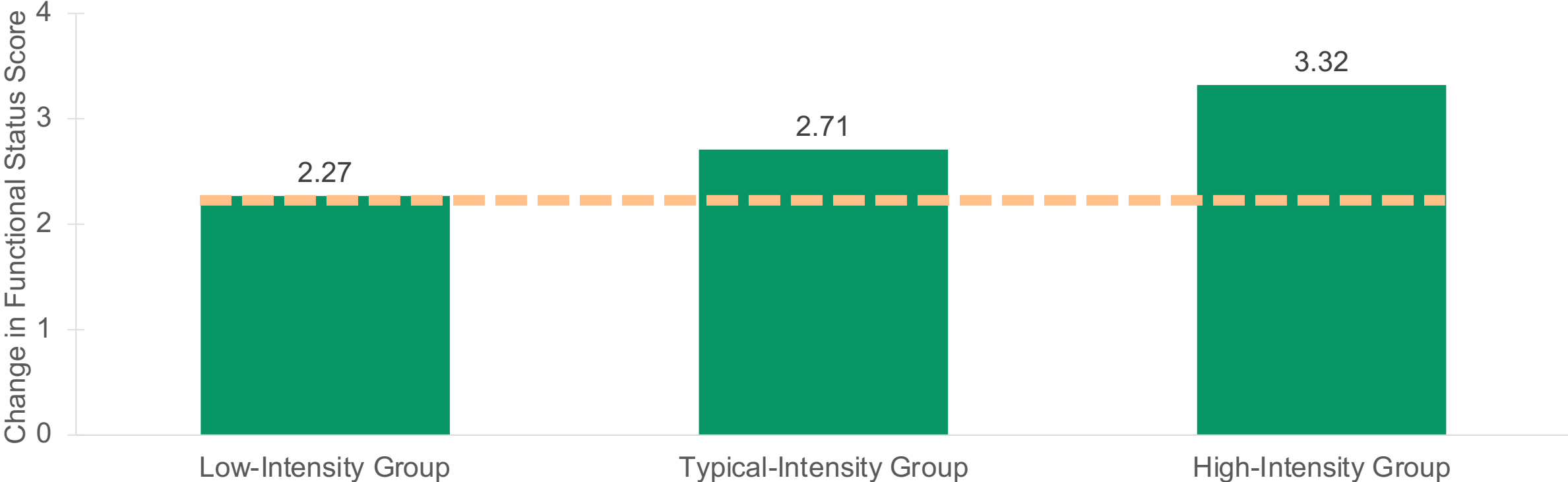Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

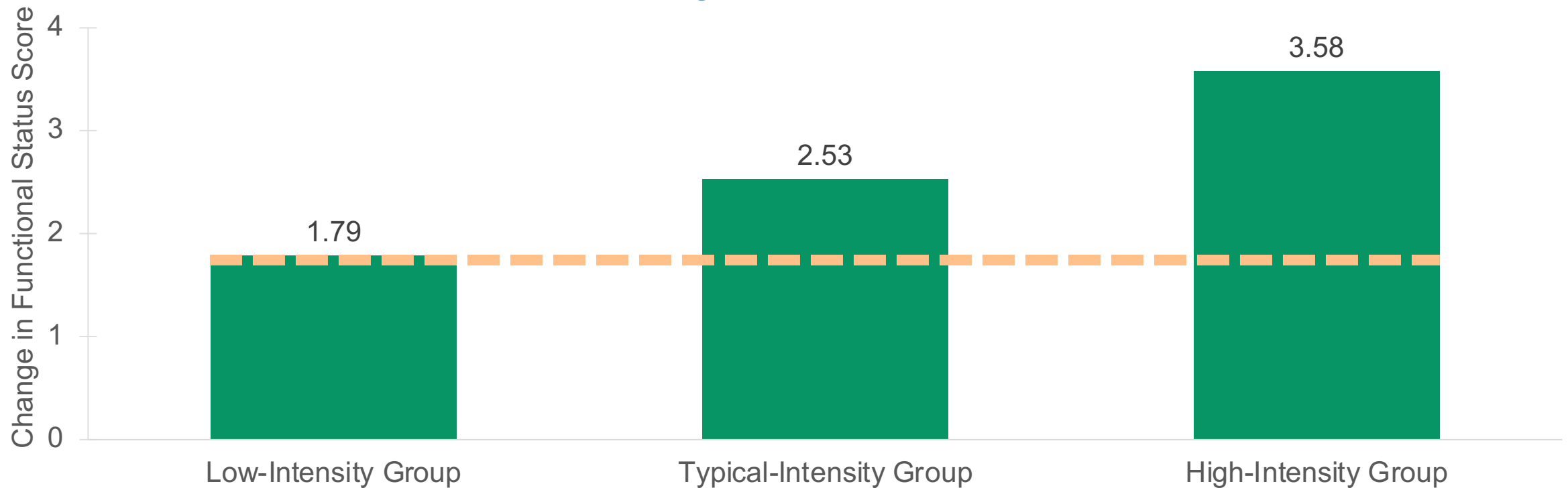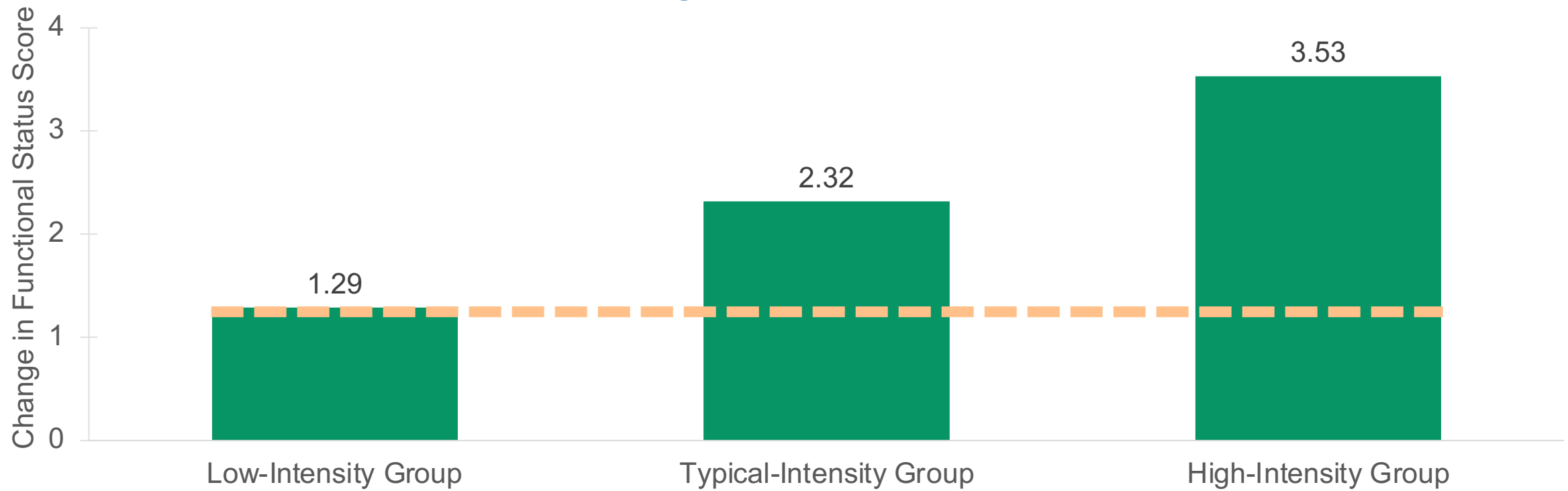**Function Status Change from Admission to Discharge: Diagnosis of Stroke**

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Setting-Specific Findings

Skilled Nursing Facilities

Skilled Nursing Facilities Overview

Decile	Total Hours of OT & PT			
	All Diagnoses	Stroke	CHF	Joint Replacement
Low-Intensity Group	Less than 6.3 hours	Less than 9.3 hours	Less than 6.9 hours	Less than 3.7 hours
Typical-Intensity Group	22.3 to 27.6 hours	29.6 to 39 hours	21.9 to 26.5 hours	13.7 to 17.5 hours
High-Intensity Group	90.1 to 219 hours	128 to 219.3 hours	80.1 to 165 hours	58.3 to 151.9 hours

People who received the **least** therapy across all SNF stays are in the low-intensity group. People who received the **most** therapy across SNF stays are in the high-intensity group. Each group represents 10% of total stays. The low-intensity and high-intensity groups represent the low and high extremes of therapy.

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Readmissions After Skilled Nursing Facility Stay: All Diagnoses

The high-intensity group had lowest readmission followed by typical intensity. The low-intensity group had the highest readmission rate.

30-Day Readmission Rate After SNF Discharge: All Diagnoses

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Change in Function in Skilled Nursing Facility Stay: All Diagnoses

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

**Function Status Change From Admission to Discharge:
All Diagnoses**

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Change in Function in Skilled Nursing Facility Stay: Stroke

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: Diagnosis of Stroke

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Change in Function in Skilled Nursing Facility Stay: Joint Replacement

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

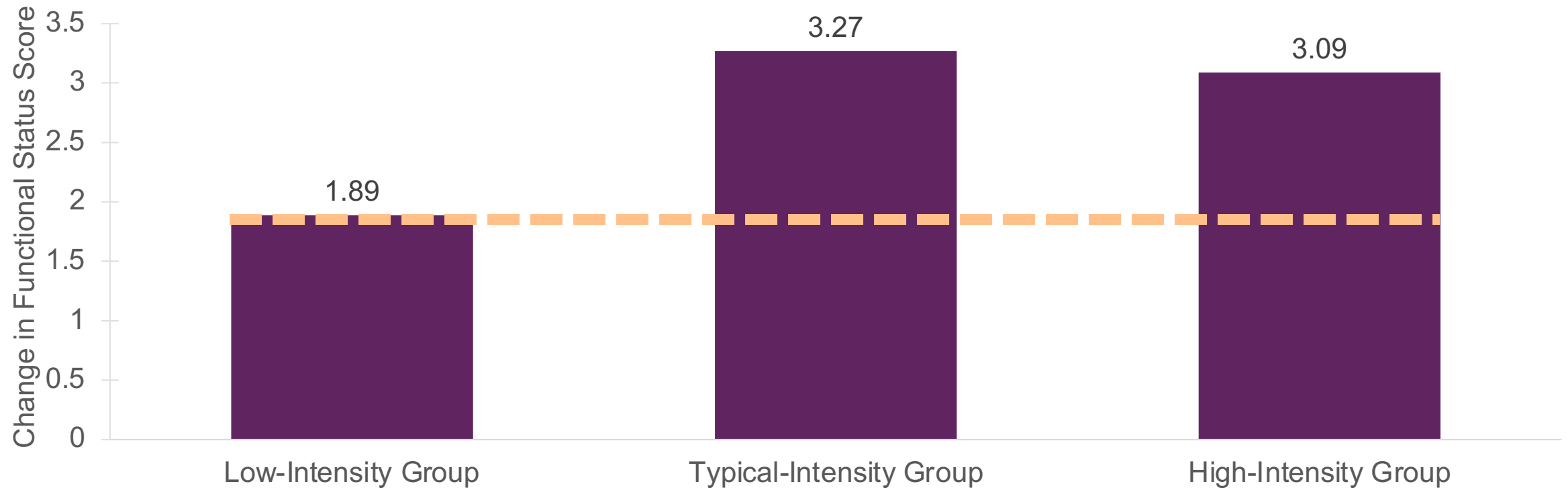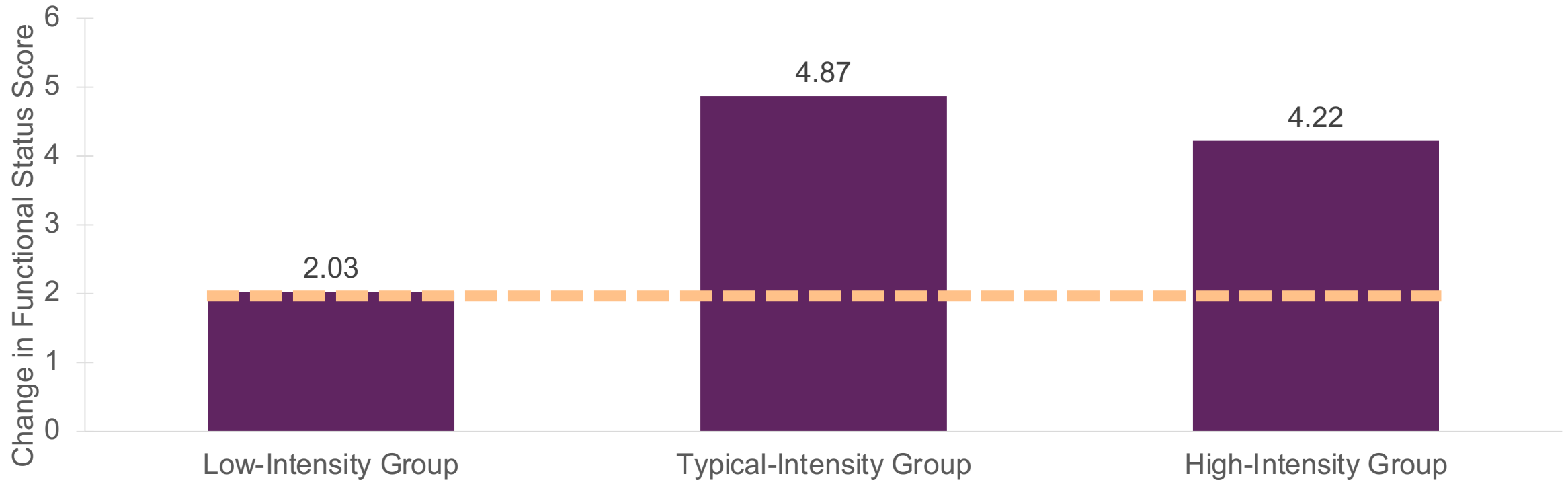**Function Status Change From Admission to Discharge: Diagnosis of Joint Replacement**

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Setting-Specific Findings

Inpatient Rehabilitation Facilities

Inpatient Rehabilitation Facilities Overview

Group	Total Hours of OT & PT			
	All Diagnosis	**Stroke**	**CHF**	**Joint Replacement**
Low-Intensity Group	Less than 13 hours	Less than 15.2 hours	Less than 12.9 hours	Less than 12.4 hours
Typical-Intensity Group	21.8 to 24.4 hours	27 to 30.6 hours	20.5 to 22.5 hours	19.2 to 21.2 hours
High-Intensity Group	41.1 & <=85	>54 & <=85	>34.7 & <=55.7	>33.3 & <=50.2

People who received the **least** therapy across all IRF stays are in the low-intensity group. People who received the **most** therapy across IRF stays are in the high-intensity group. Each group represents 10% of total stays. The low-intensity and high-intensity groups represent the low and high extremes of therapy.

Readmissions After Inpatient Rehabilitation Facility Stay: All Diagnoses

People who received the least OT & PT had the highest likelihood of readmission in IRF.

30-Day Readmission Rate After IRF Discharge: All Diagnoses
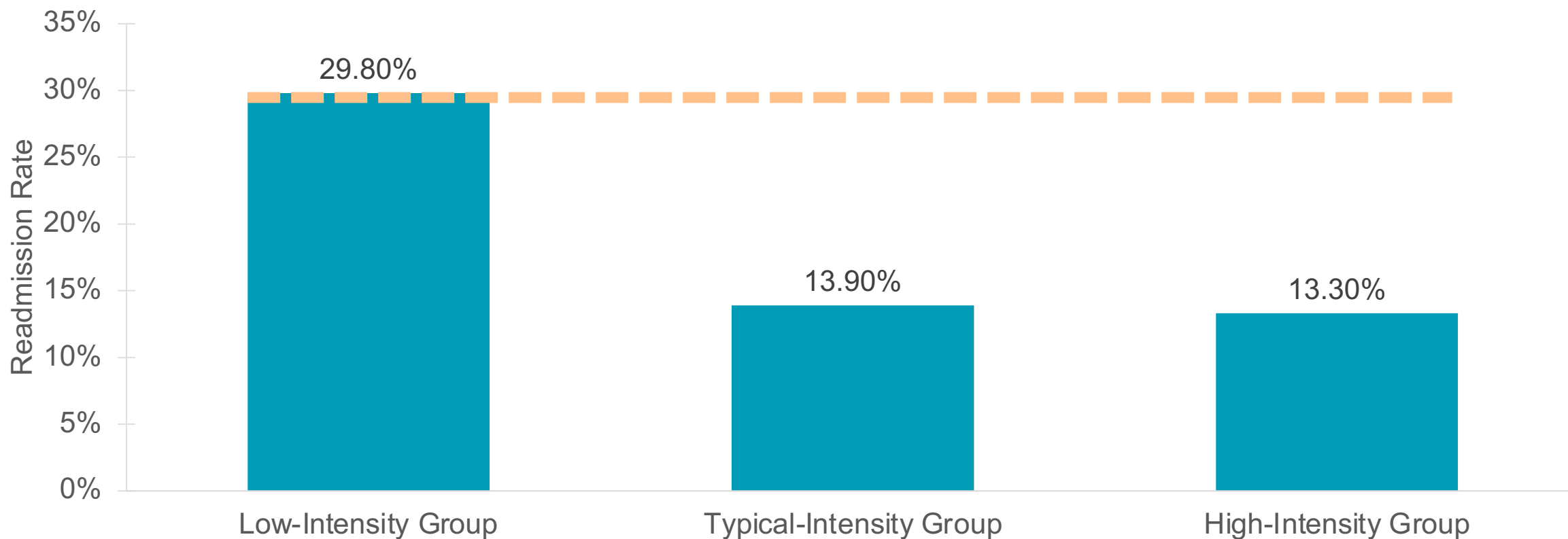
Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Change in Function in Inpatient Rehabilitation Facility Stay: All Diagnoses

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: All Diagnoses

Y-axis: Change in Functional Status Score (0 to 16)

- Low-Intensity Group: 9.7
- Typical-Intensity Group: 14.31
- High-Intensity Group: 13.15

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Change in Function in Inpatient Rehabilitation Facility Stay: Stroke

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: Diagnosis of Stroke

Bar chart showing Change in Functional Status Score by group: Low-Intensity Group = 8.8, Typical-Intensity Group = 12.35, High-Intensity Group = 12.18.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org
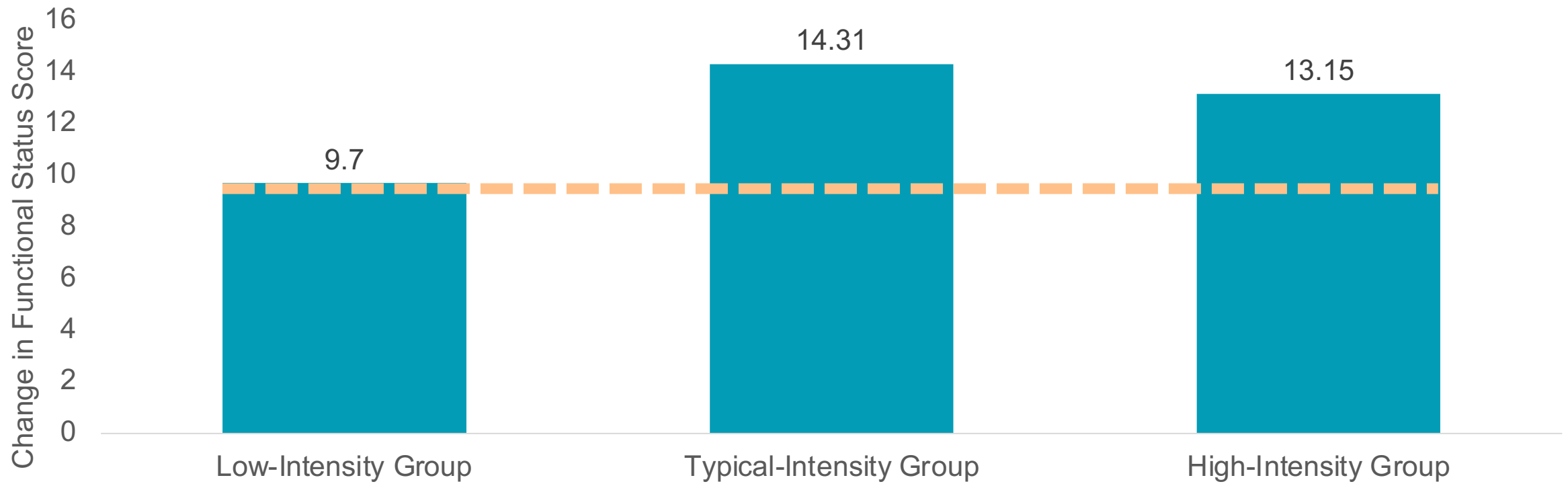
Change in Function in Inpatient Rehabilitation Facility Stay: Congestive Heart Failure

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.

Function Status Change From Admission to Discharge: Diagnosis of CHF

Y-axis: Change in Functional Status Score (0 to 16)

- Low-Intensity Group: 8.97
- Typical-Intensity Group: 14.14
- High-Intensity Group: 12.58

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Change in Function in Inpatient Rehabilitation Facility Stay: Joint Replacement

Both typical and high-intensity groups had significantly more functional improvement than the low-intensity group.
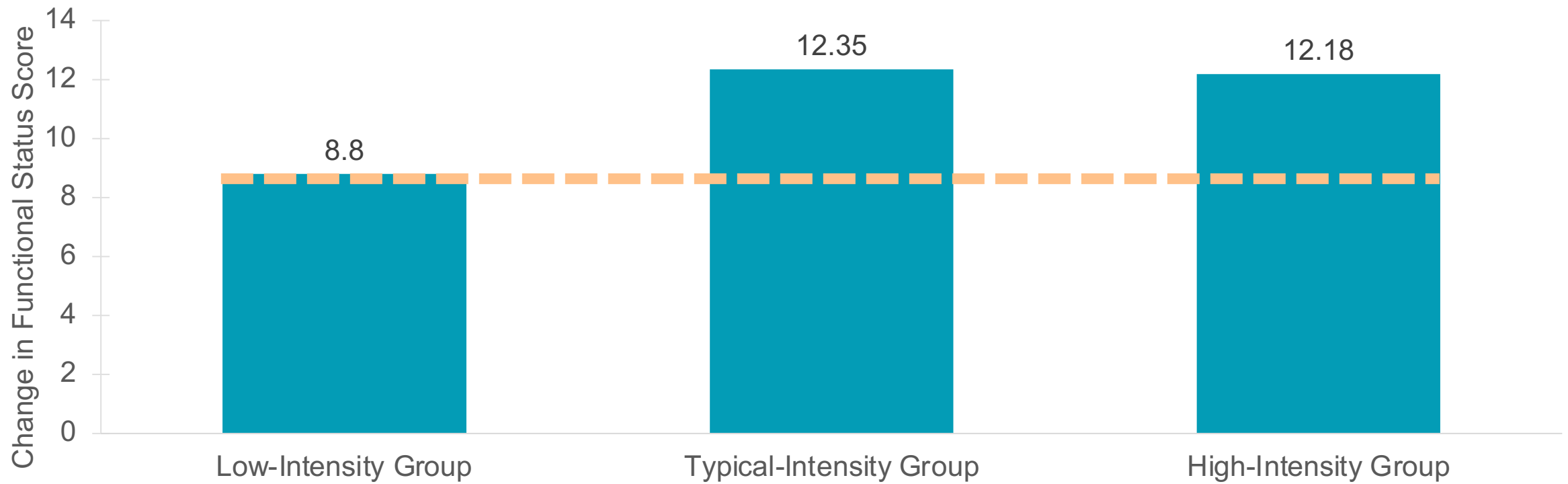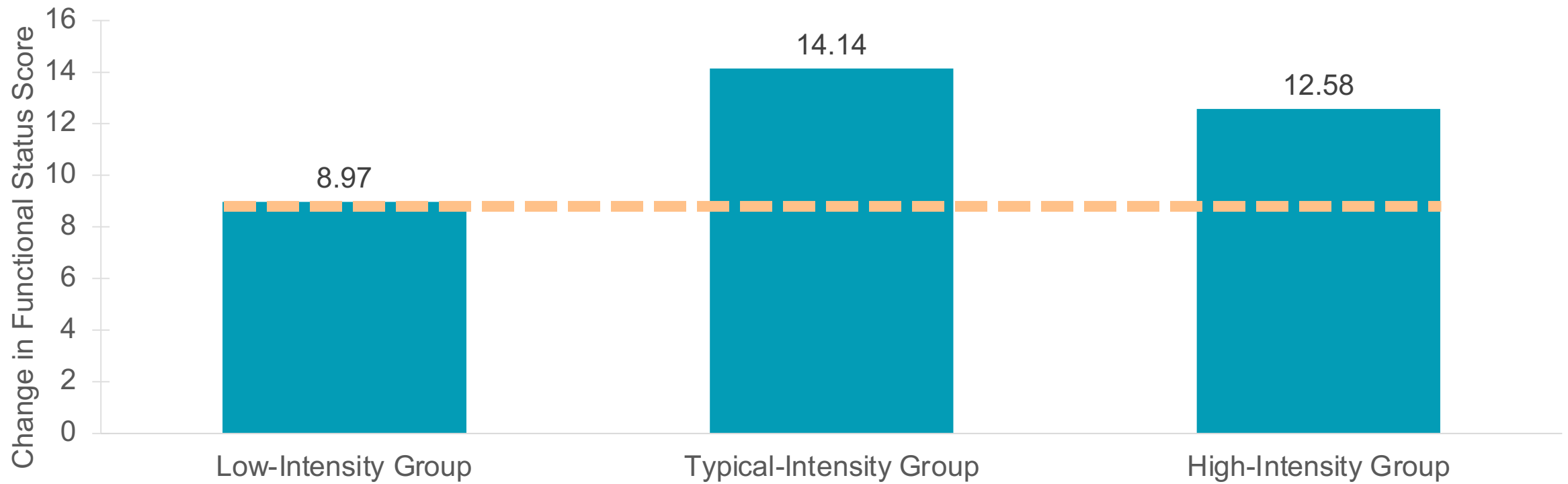
Function Status Change From Admission to Discharge: Diagnosis of Joint Replacement

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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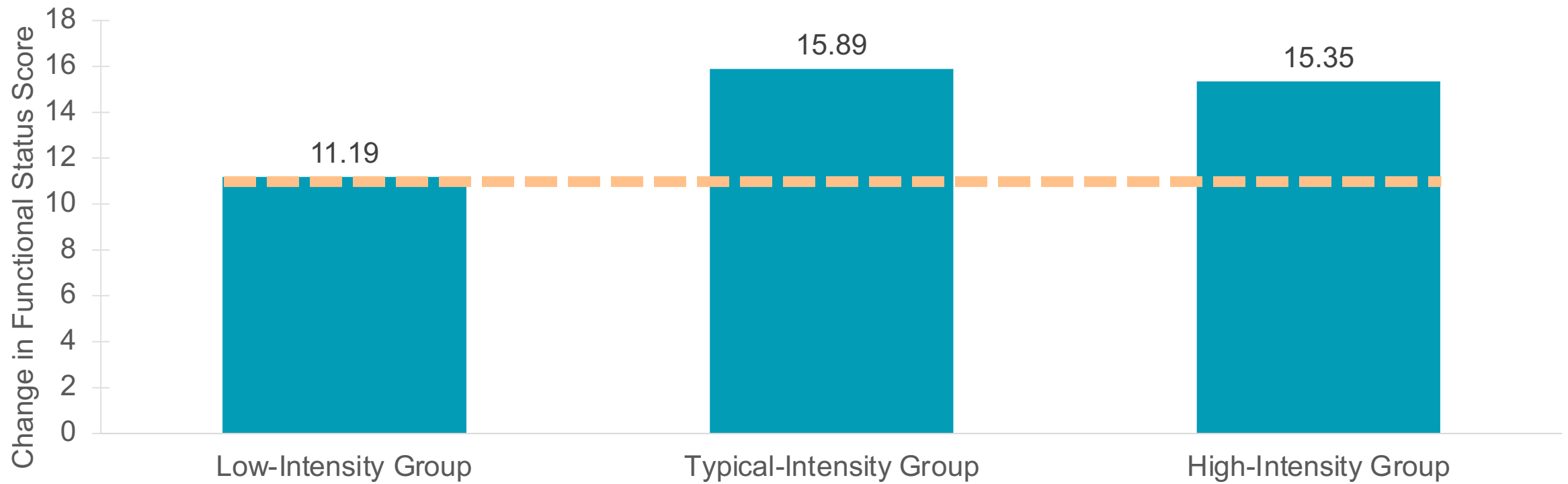
Discussion & Policy Implications

OT & PT Are Related to Improved Function

The study provides clear evidence that physical therapy and occupational therapy services improve patient outcomes across all PAC settings.

Findings consistently indicate that these services are associated with greater increases in function, suggesting a high potential for harm to patients who receive the fewest minutes of therapy.

These findings highlight the importance of matching delivery of therapy services to patient needs.

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OT & PT Are Related to Reduced Readmission

Thirty-day readmission rates to acute care hospitals following a PAC episode decreased after therapy and appear to have varying threshold effects within each setting.

Readmission rates help to reflect whether patients are receiving appropriate levels of care following discharge from the hospital.

Patients who receive physical therapy and occupational therapy during their initial PAC episode are less likely to be readmitted and more likely to have better outcomes, such as survival, functional ability, quality of life, and participation in daily living activities.

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

Policy Implications

The results of this report illustrate that the U.S. Centers for Medicare & Medicaid Services (CMS) should approach the research and development of a unified PAC prospective payment system slowly and thoughtfully.

Findings from the TOPS study provide strong evidence of the distinctions among post-acute care settings, with different patterns of rehabilitation delivered to patients who vary in needs and complexities in each setting.

Policymakers should not assume that there is clear overlap among the PAC settings for treating similar patients, as patients in each setting have different treatment goals and are at different points in their recovery.

These findings also indicate that CMS should monitor the level of therapy provided in PAC settings as payment incentives change in order to help protect patient access to medically necessary skilled therapy, especially patients with high rehabilitation needs.

For More Information

APTA: advocacy@apta.org

AOTA: regulatory@aota.org

The American Physical Therapy Association and the American Occupational Therapy Association jointly commissioned Dobson DaVanzo and Associates to examine provision of Medicare occupational therapy and physical therapy services within inpatient rehabilitation facilities, skilled nursing facilities, and home health agencies.

Download the AOTA and APTA Joint Statement and Chartbook at www.aota.org/TOPS and www.apta.org.

Appendix

Functional Scores

The researchers created a standardized functional scale using items from the MDS, IRF-PAI, and OASIS.

Assessment Names

ADL Category	OASIS Item	MDS Item	IRF-PAI Item
Dressing	Dress Upper Body (M1810)	Dressing G0110G1	Dressing – Upper 39D
	Dress Lower Body (M1820)		Dressing – Lower 39E
Walking/ Locomotion	Ambulation/Locomotion (M1860)	Locomotion: On Unit G0110E1 Off Unit G0110F1	Walk/Wheelchair 39L
Toileting	Toileting Hygiene (M1845)	Toilet Use G0110I1	Toileting 39F
Bathing	Bathing (M1830)	Bathing G0120A	Bathing 39C
Transferring	Transferring M1850	Transfer G0110B1	Transfers (Bed, Chair, Wheelchair) 39I
Feeding	Feeding or Eating M1870	Eating G0110H1	Eating 39A

36 Score of independent on all items

0 Score of dependent on all items

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

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Home Health Deciles

Each decile contains 10% of HH stays with the specified primary diagnosis.

Decile	Total Hours of OT & PT			
	All Diagnoses	Stroke	Congestive Heart Failure	Joint Replacement
1	<= 1.5	<= 1.8	<= 1	<= 3.8
2	> 1.5 & <= 3	> 1.8 & <= 3.3	> 1 & <= 2.3	> 3.8 & <= 4.8
3	> 3 & <= 4.3	> 3.3 & <= 4.8	> 2.3 & <= 3.5	> 4.8 & <= 5.5
4	> 4.3 & <= 5.3	> 4.8 & <= 6	> 3.5 & <= 4.5	> 5.5 & <= 6.3
5	> 5.3 & <= 6	> 6 & <= 7.3	> 4.5 & <= 5.5	> 6.3 & <= 7
6	> 6 & <= 7	> 7.3 & <= 8.8	> 5.5 & <= 6.5	> 7 & <= 7.8
7	> 7 & <= 8.3	> 8.8 & <= 10.5	> 6.5 & <= 7.8	> 7.8 & <= 8.8
8	> 8.3 & <= 10	> 10.5 & <= 13	> 7.8 & <= 9.5	> 8.8 & <= 10
9	> 10 & <= 12.5	> 13 & <= 16.5	> 9.5 & <= 12	> 10 & <= 12.3
10	> 12.5 & <= 30	> 16.5 & <= 29.3	> 12 & <= 21.3	> 12.3 & <= 30

Source: Therapy Outcomes in Post-Acute Care Settings, 2021 | www.aota.org/TOPS | www.apta.org

SNF Deciles

Each decile contains 10% of SNF stays with the specified primary diagnosis.

Decile	Total Hours of OT & PT			
	All Diagnoses	Stroke	Congestive Heart Failure	Joint Replacement
1	<= 6.3	<= 9.3	<= 6.9	<= 3.7
2	> 6.3 & <= 12	> 9.3 & <= 16.8	> 6.9 & <= 12	> 3.7 & <= 7.1
3	> 12 & <= 16.9	> 16.8 & <= 22.8	> 12 & <= 16.8	> 7.1 & <= 10.4
4	> 16.9 & <= 22.3	> 22.8 & <= 29.6	> 16.8 & <= 21.9	> 10.4 & <= 13.7
5	> 22.3 & <= 27.6	> 29.6 & <= 39	> 21.9 & <= 26.5	> 13.7 & <= 17.5
6	> 27.6 & <= 36.4	> 39 & <= 49.9	> 26.5 & <= 34.1	> 17.5 & <= 22.3
7	> 36.4 & <= 46.4	> 49.9 & <= 65.3	> 34.1 & <= 42.4	> 22.3 & <= 27.5
8	> 46.4 & <= 61.8	> 65.3 & <= 88.7	> 42.4 & <= 55.4	> 27.5 & <= 37.9
9	> 61.8 & <= 90.1	> 88.7 & <= 128	> 55.4 & <= 80.1	> 37.9 & <= 58.3
10	> 90.1 & <= 219	> 128 & <= 219.3	> 80.1 & <= 165	> 58.3 & <= 151.9

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IRF Deciles

Each decile contains 10% of IRF stays with the specified primary diagnosis.

Decile	Total Hours of OT & PT			
	All Diagnoses	Stroke	Congestive Heart Failure	Joint Replacement
1	<= 12.9	<= 15.1	<= 12.8	<= 12.3
2	> 12.9 & <= 16.5	> 15.1 & <= 19.8	> 12.8 & <= 15.9	> 12.3 & <= 15
3	> 16.5 & <= 19.3	> 19.8 & <= 23.6	> 15.9 & <= 18.1	> 15 & <= 17.3
4	> 19.3 & <= 21.8	> 23.6 & <= 27	> 18.1 & <= 20.5	> 17.3 & <= 19.2
5	> 21.8 & <= 24.4	> 27 & <= 30.6	> 20.5 & <= 22.5	> 19.2 & <= 21.2
6	> 24.4 & <= 27.1	> 30.6 & <= 34.3	> 22.5 & <= 24.5	> 21.2 & <= 23.4
7	> 27.1 & <= 30.2	> 34.3 & <= 39.1	> 24.5 & <= 26.8	> 23.4 & <= 25.9
8	> 30.2 & <= 34	> 39.1 & <= 45.8	> 26.8 & <= 30	> 25.9 & <= 29
9	> 34 & <= 41.1	> 45.8 & <= 54	> 30 & <= 34.7	> 29 & <= 33.3
10	> 41.1 & <= 85	> 54 & <= 85	> 34.7 & <= 55.7	> 33.3 & <= 50.2