

Functional Outcomes for Patients With Pain Syndromes Contextualized Against National Benchmarks in Inpatient Rehabilitation

Austin Fajkus ¹, Bilaal Hassan ¹, Puja Yatham ¹

¹. Physical Medicine and Rehabilitation, Texas Rehabilitation Hospital of Fort Worth, Fort Worth, USA

Corresponding author: Bilaal Hassan, bilaal.hassan711@gmail.com

Review began 09/23/2026

Review ended 10/12/2026

Published 10/21/2026

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DOI: 10.7759/cureus.118299

Abstract

Introduction

Pain syndrome (Rehabilitation Impairment Category (RIC) 16) is a recognized indication for admission to an Inpatient Rehabilitation Facility (IRF), yet national functional-outcome benchmarks specific to this population have not been published. This study aimed to describe 2025 national Uniform Data System for Medical Rehabilitation (UDSMR) functional outcomes among patients discharged from participating IRFs with RIC 16 pain syndrome and to compare these descriptively with overall UDSMR aggregate benchmark values.

Methods

This was a retrospective, descriptive benchmarking analysis of national aggregate UDSMR data for discharges occurring January 1-December 31, 2025. The pain syndrome cohort comprised 965 discharges (RIC 16). National aggregate values across all impairment categories (661,244 discharges) were used as a descriptive reference population. The pain syndrome cohort was included within the national aggregate; therefore, comparisons are non-independent and descriptive rather than comparisons between independent groups. The primary outcome was discharge functional status (Section GG discharge function score) and the proportion of patients meeting or exceeding risk-adjusted expected discharge function. Additional descriptive outcomes were functional change, functional efficiency, functional attainment, length of stay (LOS), and falls with major injury. Admission motor score, case-mix index, and Case Mix Group comorbidity tiers were examined as case-mix descriptors. Continuous variables were compared descriptively. Because the pain cohort is nested within the national aggregate, chi-square statistics, relative risks, confidence intervals, and p-values are reported as non-inferential descriptive summaries only and should not be interpreted as valid tests of a between-group hypothesis.

Results

Patients with pain syndrome had discharge functional values that were close to the national aggregate (discharge function score 54.5 vs 52.9). Despite higher admission motor scores (51.3 vs 44.4), functional change was similar (self-care 14.9 vs 15.1; mobility 38.0 vs 37.6). Functional efficiency was higher (5.39 vs 4.78 points/day), and LOS was shorter (11.2 vs 13.6 days). The proportion meeting or exceeding expected discharge function was close between groups (72.0% vs 73.3%). Case-mix index was lower (1.21 vs 1.43). Falls with major injury were infrequent in both groups (0.31% (n=3/965) vs 0.15% (n=992/661,244)); the small number of events (three) and wide uncertainty preclude any conclusion about relative safety.

Conclusions

In this first national description of the RIC 16 population, patients admitted to IRFs for pain syndrome had discharge functional values that could be descriptively contextualized against national aggregate benchmarks, despite higher baseline function and lower case-mix index, with shorter LOS. Because the pain syndrome cohort is nested within the national aggregate and the two differ systematically in case mix, these values should be interpreted as descriptive national context rather than as a controlled comparison or evidence of the effectiveness, efficiency, or appropriateness of IRF care. Patient-level studies using non-overlapping, clinically comparable reference groups and adjusted analyses are needed.

Categories: Pain Management, Physical Medicine & Rehabilitation

Keywords: adls, benchmarking, case mix group, functional outcomes, inpatient rehabilitation facility, length of stay, mobility, pain syndrome

Introduction

Pain syndrome (Rehabilitation Impairment Category (RIC) 16) is a recognized indication for inpatient rehabilitation within the Inpatient Rehabilitation Facility (IRF) prospective payment system [1]. Patients admitted for rehabilitation with pain syndrome present with functional limitations related to

How to cite this article

Fajkus A, Hassan B, Yatham P (October 21, 2026) Functional Outcomes for Patients With Pain Syndromes Contextualized Against National Benchmarks in Inpatient Rehabilitation. Cureus 18(10): e118299. DOI 10.7759/cureus.118299

musculoskeletal and spinal pathology, including neck pain, back pain, and extremity pain, in the absence of focal neurologic deficit [1]. Persistent spinal pain, including pain after lumbar surgery, may also be associated with pain-related disability and reduced function, supporting the clinical importance of measuring functional recovery in this population. Despite these patients being treated in IRFs, national functional outcome benchmarks specific to this population remain limited, and no published studies have described pain syndrome outcomes alongside national IRF benchmarks.

Inpatient rehabilitation outcomes are evaluated using standardized functional measures reported through the Uniform Data System for Medical Rehabilitation (UDSMR) [2]. UDSMR supports national benchmarking across impairment groups and provides risk-adjusted expected values for functional performance at discharge [2,3]. The Centers for Medicare and Medicaid Services (CMS) IRF Quality Reporting Program incorporates Section GG self-care and mobility measures to assess functional outcomes and enable comparisons across facilities and patient populations [4]. Section GG measures have shown acceptable reliability and concurrent validity in IRF populations, although their performance may vary across diagnoses and functional domains [5,6].

While prior studies have demonstrated that pain-related diagnoses are common across IRFs, with 70% of patients having at least one pain diagnosis, most published analyses have focused on diagnostic prevalence, impairment group distribution, or functional outcomes in neurologic and orthopedic cohorts [7]. There remains a lack of published data describing functional outcomes for patients admitted specifically with pain syndrome as the primary impairment and placing those outcomes alongside national IRF benchmarks. Describing how functional recovery in the pain syndrome population compares descriptively with the general IRF population may provide national context for this impairment group and inform expectations for functional improvement.

The purpose of this study was to describe 2025 national UDSMR functional outcomes among patients discharged from participating IRFs with RIC 16 pain syndrome and to compare these descriptively with overall UDSMR aggregate benchmark values. Primary outcomes included discharge functional status based on Section GG measures. Secondary outcomes included admission motor scores, functional change, functional efficiency, functional attainment, incidence of falls with major injury, length of stay (LOS), and Case Mix Group (CMG) comorbidity tiers. Because the national aggregate includes the pain syndrome cohort itself and is not a matched or independent comparator, no formal between-group hypothesis was tested. Instead, we expected that the pain syndrome cohort would show discharge function and length-of-stay values that could be descriptively contextualized against national aggregate benchmarks.

Materials And Methods

Study design and data source

This was a retrospective, descriptive benchmarking analysis of national aggregate data from UDSMR for discharges occurring January 1, 2025, through December 31, 2025. This study did not use a matched, independent, or concurrent control group. Instead, national aggregate benchmark values were used as a descriptive reference population. The pain syndrome cohort was included within the national aggregate; therefore, all comparisons are non-independent and descriptive. All data were analyzed at the national level, without facility or region-specific stratification.

UDSMR is a nationally recognized rehabilitation outcomes registry that collects standardized clinical and functional data submitted from IRFs across the United States and returns benchmarking and quality reports to participating facilities [2]. Participation is subscription-based; UDSMR is among the largest IRF data repositories in the country, with several hundred participating facilities contributing data on the majority of IRF discharges nationally, and its national aggregates have been shown to be broadly representative of the U.S. IRF population [2]. Data submitted to UDSMR are derived from the IRF-PAI and are used for benchmarking, quality reporting, and risk-adjusted outcome estimation [2].

Data structure and type received

The data used in this analysis were de-identified, facility-independent national aggregate summary statistics obtained from the Comprehensive Performance Report generated by the UDSPRO Central® software, that is, pre-tabulated group-level means, proportions, and counts for each measure, rather than individual patient-level records. No patient- or facility-level line data were re-analyzed. Because only aggregate summary values (means and proportions with denominators) were available, and measures of dispersion (standard deviations) were not reported for continuous measures, this constrained the statistical approach as described below. The phrase "national aggregate registry data rather than individual-level observations" refers to this reliance on pre-summarized group-level statistics.

To support reproducibility, the following report specifications are provided: Comprehensive Performance Report generated through UDSPRO Central® version 17.0.0, report generation date January 28, 2026, reporting period January 1-December 31, 2025. Two report extracts were obtained under otherwise identical parameters - discharge date as the date type and all primary payer types - with the RIC/CMG filter set to all

impairment categories for the national aggregate benchmark and to RIC 16 (Pain Syndrome) for the study cohort. Participating-facility coverage for the reporting period was approximately 900 IRFs nationally. UDSMR inclusion and exclusion rules, including measure-specific denominators and the handling of incomplete or excluded records, were applied as defined by UDSPRO Central® version 17.0.0. Missing data were handled at the aggregate level by UDSMR using measure-specific exclusions; no imputation was performed by the authors. The specific inclusion, exclusion, and risk-adjustment algorithms applied within UDSPRO Central® are proprietary and are not publicly available; consequently, exact external reproduction by parties without UDSMR subscription access is not possible.

Study populations

The Pain Syndrome Cohort comprised patients admitted to IRFs with a primary rehabilitation impairment category of Pain Syndrome (RIC 16), corresponding to IRF-PAI impairment group codes 07.1-07.3 and 07.9: neck pain (07.1), back pain (07.2), extremity pain (07.3), and other pain (07.9), including conditions such as spondylosis, intervertebral disc disorders, soft tissue disorders, sprains and strains of the sacroiliac or low back region, or other soft tissue disorders [1]. A total of 965 national discharges were reported during the study period. Sample sizes varied slightly across specific measures because of measure-specific exclusions defined by UDSMR.

The National Aggregate Reference Population comprised the total national IRF population reported to UDSMR during the same period, comprising 661,244 discharges across all impairment categories and all primary payer types (including Medicare Fee-for-Service and Medicare Advantage) [2]. The pain syndrome cohort (RIC 16) is a subset nested within this national aggregate; the 661,244-discharge total therefore includes the 965 RIC 16 discharges. Because the national reference includes the neurologic and other complex impairment groups that constitute the majority of IRF admissions, and because it contains the pain cohort itself, it is neither a neurologically matched nor an independent comparator but a descriptive reference population; this is addressed explicitly in the Limitations.

Variables

Numeric (continuous) variables, summarized as means: Section GG observed discharge function score, risk-adjusted expected discharge function score, admission motor score, change in self-care score, change in mobility score, functional efficiency (points/day), functional attainment ratios (self-care, mobility, overall), length of stay (days), and case-mix index.

Categorical variables, summarized as frequencies and percentages: proportion meeting or exceeding risk-adjusted expected discharge function (two levels: met/exceeded vs not met), falls with major injury (two levels: one or more vs none), and CMG comorbidity tier, with levels Tier A (no or minimal comorbidities), Tier B (high comorbidity level), Tier C (medium comorbidity level), Tier D (low comorbidity level), and a small Unassigned tier (<0.2%).

Outcome measures and case-mix descriptors

The primary outcome was discharge functional status, measured by the Section GG discharge function score - the sum of the standardized GG0130 self-care items and GG0170 mobility items, each rated 1-6, with higher scores indicating greater independence [3,4]. Risk-adjusted expected discharge function scores and the proportion of patients meeting or exceeding them were calculated using the CMS IRF QRP risk-adjustment model as reported within UDSMR [4]. The specific model version and coefficient set applied were the CMS IRF QRP Discharge Function Score risk-adjustment coefficients last updated October 1, 2023 [4]; CMS has not updated these coefficients since that date, so these values may not fully reflect current calibration and are reported descriptively [4].

Additional functional outcomes included functional change (discharge minus admission self-care and mobility scores), functional efficiency (functional change per day), functional attainment (observed-to-expected ratio of discharge function), LOS, and falls with major injury [3].

Admission motor score, case-mix index, and CMG comorbidity tiers were examined as descriptors of the case mix of the pain syndrome population rather than as treatment outcomes. Admission motor score reflects baseline (pre-treatment) function and, together with impairment category, age, and comorbidity tier, is a determinant of the CMG and payment weight under the IRF prospective payment system; it is therefore properly an input to case-mix classification, not a result of rehabilitation [1]. Likewise, the CMG comorbidity tier and case-mix index are classification variables that characterize the population being described and are reported here to contextualize the functional findings, not as outcomes of care. Of note, the CMG comorbidity-tier nomenclature (Tier A = no or minimal comorbidity, Tier B = high comorbidity, Tier C = medium comorbidity, Tier D = low comorbidity) originates from the CMS IRF prospective payment system classification as operationalized in UDS-PRO reporting.

Statistical analysis

Continuous variables were summarized as means and compared descriptively (absolute and relative differences); confidence intervals (CIs) were not calculated because variance estimates are not reported in the national aggregate data. Categorical variables were summarized as frequencies and percentages.

Because the pain syndrome cohort (n=965) is nested within the national aggregate (n=661,244) rather than drawn from an independent population, the assumption of independent groups required for Pearson chi-square tests, relative risks, CIs, and p-values is not met. These statistics are therefore reported only as non-inferential descriptive summaries to characterize the magnitude of differences and are not valid tests of a between-group hypothesis; they should not be interpreted as evidence for or against a true difference. Effect sizes (Cramér's V) are likewise reported descriptively. Because the analysis relied on pre-summarized aggregate data, no multivariable modeling or patient-level inferential testing was possible. Analyses were performed using the Microsoft Excel Data Analysis ToolPak (Microsoft Corporation, Redmond, USA).

Ethical considerations

This study analyzed only de-identified, pre-tabulated national aggregate summary statistics (group-level means, proportions, and counts) obtained from UDSMR. No individually identifiable private information and no patient- or facility-level records were obtained, accessed, or re-analyzed. Because the activity did not involve human participants, human tissue, or individually identifiable private information as defined under 45 CFR 46, it did not meet the regulatory definition of human subjects research. On this basis, the study was determined to be exempt from/not to constitute human subjects research per the North Texas Regional IRB policy. This determination reflects the nature of the data rather than the absence of direct patient interaction alone.

Results

Primary outcomes

Discharge Functional Status

The observed mean discharge function score was 54.5 in the pain syndrome cohort compared with 52.9 in the national aggregate reference population, an absolute difference of 1.6 points (Figure 1).

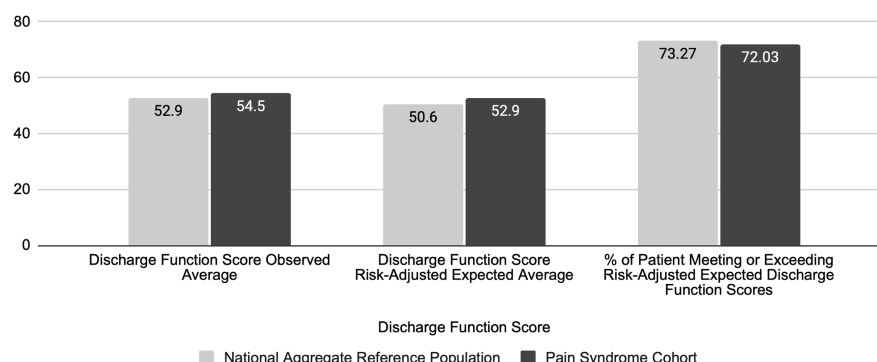


FIGURE 1: Comparison of the discharge functional status between the national aggregate reference population and pain syndrome cohort.

Comparison of discharge functional status between the national aggregate reference population (N=661,244) and the pain syndrome cohort (N=965). Observed and risk-adjusted expected discharge function scores are presented as group means; the proportion of patients meeting or exceeding expected discharge function is presented as a percentage with the corresponding count. Standard deviations were not available in the national aggregate data. Values shown (pain vs national): observed discharge function score 54.5 vs 52.9; risk-adjusted expected discharge function score 52.9 vs 50.6; met or exceeded expected discharge function 72.0% (n=695/965) vs 73.3% (n=484,494/661,244). The pain syndrome cohort is nested within the national aggregate, so differences are descriptive and non-independent.

The risk-adjusted expected discharge function score was 52.9 for the pain syndrome cohort compared with 50.6 for the national aggregate, an absolute difference of 2.3 points (Figure 1).

The proportion of patients who met or exceeded their risk-adjusted expected discharge function was close between groups: 72.0% (n=695/965) pain syndrome cohort vs 73.3% (n=484,494/661,244) national aggregate, an absolute difference of -1.3 percentage points (Figure 1).

Additional functional outcomes

Admission Functional Status

The mean admission motor score (a combination of selected self-care and mobility items) was 51.3 in the pain syndrome cohort compared with 44.4 in the national inpatient rehabilitation cohort (absolute difference: 6.9 points), indicating higher baseline functional status in the pain syndrome population (Figure 2).

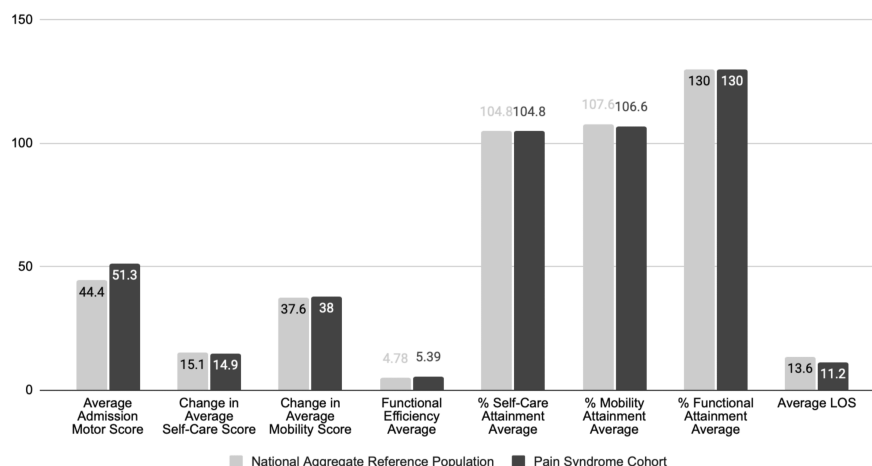


FIGURE 2: Comparison of additional functional outcomes between the national aggregate reference population and pain syndrome cohort.

Comparison of additional functional outcomes between the national aggregate reference population (N=661,244) and the pain syndrome cohort (N=965). All values are presented as group means; standard deviations were not available in the national aggregate data. Attainment values are mean observed-to-expected ratios expressed as percentages. Values shown (pain vs national): admission motor score 51.3 vs 44.4; change in self-care score 14.9 vs 15.1; change in mobility score 38.0 vs 37.6; functional efficiency 5.39 vs 4.78 points/day; self-care attainment 104.8% vs 104.8%; mobility attainment 106.6% vs 107.6%; overall functional attainment 130.0% vs 130.0%; length of stay 11.2 vs 13.6 days.

Functional Status Change

The mean change in the self-care score was similar between groups (14.9 vs 15.1; absolute difference -0.2 points). The mean change in the mobility score was also comparable (38.0 vs 37.6; absolute difference 0.4 points) (Figure 2).

Functional Efficiency

Mean functional efficiency was 5.39 points/day in the pain syndrome cohort compared with 4.78 points/day in the national aggregate (absolute difference 0.61 points/day) (Figure 2).

Functional Attainment

Mean self-care attainment was identical between groups (104.8% vs 104.8%). Mean mobility attainment was similar (106.6% vs 107.6%; absolute difference -1.0%). Mean overall functional attainment was identical between groups (130.0% vs 130.0%) (Figure 2).

Length of Stay

Mean LOS was shorter in the pain syndrome cohort (11.2 days) compared with the national aggregate (13.6 days), an absolute difference of 2.4 days (Figure 2).

Falls With Major Injury

Falls with major injury were infrequent in both groups (0.31% (n=3/965) pain syndrome cohort vs 0.15% (n=992/661,244) national aggregate). With only three events in the pain syndrome cohort, the data are too sparse, and the groups overlap (the pain cohort is contained within the national aggregate), to support any conclusion about relative safety. For descriptive purposes only, the non-inferential relative risk estimate was 2.07 (nominal 95% CI 0.66-6.48) with a negligible effect size (Cramér's V = 0.002); the wide interval crossing unity reflects the very low event count. Absence of statistical significance in this descriptive calculation does

not demonstrate equivalent fall-related safety (Figure 3).

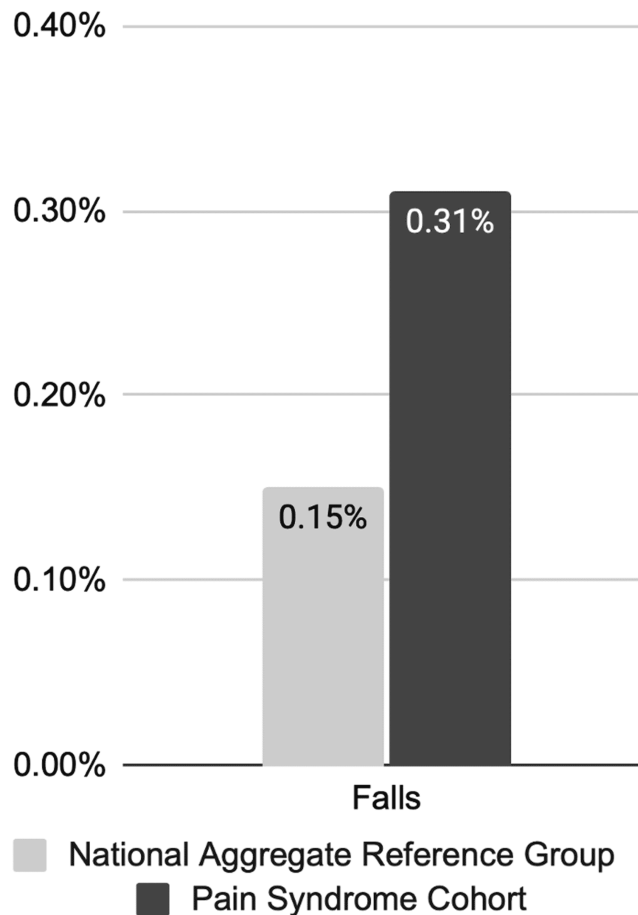


FIGURE 3: Comparison of the incidence of falls with major injury between the national aggregate reference group and pain syndrome cohort.

Comparison of the incidence of falls with major injury between the national aggregate reference population (N=661,244) and the pain syndrome cohort (N=965). Data are presented as percentages with corresponding counts: pain syndrome 0.31% (n=3/965) vs national 0.15% (n=992/661,244). The relative risk (2.07; nominal 95% CI 0.66–6.48) and Cramér's V (0.002) are descriptive, non-inferential summaries based on overlapping, non-independent groups and a small number of events.

Case-Mix Index and CMG Comorbidity Tiers

Mean case-mix index was lower in the pain syndrome cohort (1.21) compared with the national aggregate (1.43; absolute difference -0.22).

CMG comorbidity tiers are classified as Tier A (no or minimal comorbidities), Tier B (high comorbidity level), Tier C (medium comorbidity level), and Tier D (low comorbidity level); UDSMR also reported a fifth "Unassigned" tier (no qualifying comorbidity tier) comprising <0.2%. The descriptive CMG comorbidity tier distribution differed between the pain cohort and national aggregate, driven primarily by a lower proportion of Tier B (1.7% (n=16) vs 4.8% (n=31,740)) and Tier C (3.9% (n=38) vs 9.7% (n=64,141)) and a higher proportion of Tier A (37.4% (n=361) vs 31.9% (n=210,937)) and Tier D (57.0% (n=550) vs 53.4% (n=353,104)) in the pain syndrome cohort (Figure 4). The corresponding descriptive chi-square value ($\chi^2(4)=66.2$) and effect size (Cramér's V=0.01) are reported as non-inferential summaries only; the negligible effect size indicates minimal practical difference in distribution.

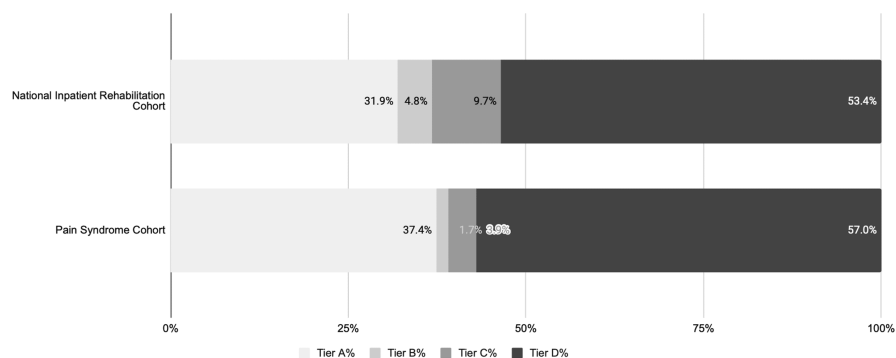


FIGURE 4: Comparison of Case Mix Group (CMG) comorbidity tier distribution between the national aggregate reference population and pain syndrome cohort.

Comparison of CMG comorbidity tier distribution between the national aggregate reference population (N=661,244) and the pain syndrome cohort (N=965). Data are presented as percentages with corresponding counts. Pain syndrome cohort: Tier A 37.4% (n=361), Tier B 1.7% (n=16), Tier C 3.9% (n=38), Tier D 57.0% (n=550). National aggregate: Tier A 31.9% (n=210,937), Tier B 4.8% (n=31,740), Tier C 9.7% (n=64,141), and Tier D 53.4% (n=353,104). The Unassigned tier (<0.2%) is not displayed. Reported chi-square and Cramér's V values are descriptive, non-inferential summaries based on overlapping groups.

Tier A: no or minimal comorbidities; Tier B: high comorbidity level; Tier C: medium comorbidity level; Tier D: low comorbidity level.

Discussion

Summary of findings and interpretation of results

In this national benchmarking analysis, patients admitted to inpatient rehabilitation for pain syndrome had discharge functional values that were close to national IRF aggregate benchmarks. Although patients with pain syndrome entered IRFs with higher baseline functional status (admission motor score 51.3 vs 44.4), discharge functional scores (54.5 vs 52.9) and the proportion of patients meeting or exceeding risk-adjusted expected discharge function (72.0% vs 73.3%) were close to those observed in the overall national aggregate. To our knowledge, this is the first study to describe functional outcomes for pain syndrome (RIC 16) alongside national IRF benchmarks. These findings provide descriptive national context for functional outcomes in this impairment group. Because the pain cohort is nested within the national aggregate and the analysis has no independent comparator, no pre-admission trajectory, and no treatment data, these values describe observed discharge outcomes only and cannot establish the effectiveness of IRF care or a clinical role beyond description.

Higher admission motor scores were observed among patients with pain syndrome compared with the national aggregate (51.3 vs 44.4; difference of 6.9 points). This is consistent with the defining characteristics of the pain syndrome impairment category, which includes patients with pain-related functional limitations in the absence of focal neurologic deficits [1,7]. Preserved neurologic function is plausibly associated with higher baseline scores at admission. Despite higher admission function, discharge functional values fell within national aggregate ranges, and this pattern may in part reflect a ceiling effect, wherein higher baseline functional status limits the magnitude of measurable functional gains.

Functional efficiency was modestly higher in the pain syndrome cohort (5.39 vs 4.78 points/day), and LOS was shorter (11.2 vs 13.6 days). These descriptive differences cannot be attributed to more efficient rehabilitation. In this aggregate analysis, shorter LOS and higher functional efficiency may instead reflect higher baseline function, patient selection, discharge disposition, treatment intensity, coding or classification differences, or other unmeasured factors, none of which could be assessed here. These data were not designed to, and cannot, inform payer-authorization or referral-appropriateness decisions, which were not studied. Critically, demonstrating that RIC 16 patients achieve expected functional gains in fewer days does not establish that an inpatient IRF level of care was superior or medically necessary relative to alternative post-acute settings. This aggregate benchmarking analysis included no comparison with skilled nursing facility, home health, or outpatient rehabilitation, and it cannot determine the setting in which these patients would have achieved comparable outcomes; such a determination would require a study designed with those alternative settings as comparators.

Functional attainment was similar between cohorts, with comparable overall, self-care, and mobility attainment values. Because CMS has not updated risk-adjustment coefficients since October 2023, these

findings should be interpreted descriptively [3,4]. Collectively, the findings describe inpatient rehabilitation discharge outcomes for pain syndrome that align descriptively with national aggregate expectations, rather than indicating inferior or atypical recovery patterns.

The low number of falls with major injury should not be read as evidence of comparable fall-related safety. With only three events in the pain syndrome cohort, wide uncertainty, and overlapping (non-independent) groups, the data cannot characterize relative safety. In addition, "major injury" lacks a standardized definition in IRF quality reporting, and injury classification has been shown to be imprecise and variable across settings, which further limits interpretability [8].

The descriptive CMG tier distribution showed fewer high-comorbidity cases (Tier B/C) and more minimal-comorbidity cases (Tier A/D) in the pain syndrome cohort, with a negligible effect size (Cramér's $V = 0.01$). The lower case-mix index in the pain syndrome cohort (1.21 vs 1.43) is consistent with the classification characteristics of this impairment category [1]. A lower case-mix index should not, however, be equated with lower medical complexity or acuity; case-mix index reflects impairment-based payment weighting and classification rather than a direct measure of clinical severity, comorbidity burden, or medical risk, which were not measured in this aggregate dataset.

Limitations

Several limitations warrant emphasis, the first of which is central to interpretation.

First, and most importantly, the pain syndrome cohort (RIC 16) is nested within the national aggregate reference population rather than drawn from an independent group. As a result, the chi-square tests, relative risks, CIs, and p-values reported here are based on non-independent, overlapping groups; they do not meet the assumptions required for valid inference and are presented only as non-inferential descriptive summaries. They should not be interpreted as hypothesis tests or as evidence of a true difference. This study is a descriptive benchmarking analysis, not a controlled comparison. The national reference is dominated by neurologic and other complex impairments, whereas RIC 16 is defined by the absence of neurologic deficit; the two differ systematically in baseline function and case mix. Differences should be read as contextual benchmarking against the overall IRF population - the way UDSMR benchmarks are ordinarily used - rather than as an estimate of a treatment effect or of pain syndrome outcomes relative to a comparable non-neurologic group. Patient-level data linking a non-overlapping, clinically comparable comparison group were not available.

Second, the analysis relied on de-identified national aggregate summary statistics rather than patient-level records, precluding multivariable modeling, patient-level hypothesis testing, and the calculation of confidence intervals for continuous measures [2].

Third, the analysis describes only patients who were referred to, admitted to, and discharged from participating IRFs under RIC 16. It cannot describe patients who were never referred, who were denied IRF admission, who were treated for pain syndrome in other settings (e.g., outpatient, skilled nursing, or home-based rehabilitation), or who were discharged to different destinations. Selection bias is therefore likely: patients referred for inpatient-level rehabilitation for pain syndrome may represent a subset with favorable functional potential and medical stability, limiting generalizability to the broader population of patients with chronic pain.

Fourth, the aggregate data could not account for facility-level clustering, treatment intensity, pain severity, medication or opioid exposure, psychiatric comorbidity, discharge destination, socioeconomic factors, or the clinical criteria driving IRF referral, any of which could influence the observed outcomes.

Fifth, RIC 16 is heterogeneous (spinal and non-spinal etiologies), and subgroup outcomes were not evaluated.

Sixth, risk-adjusted expected values rely on CMS coefficients not updated since October 2023 and are reported descriptively [3,4].

Seventh, the analysis reflects a single reporting year (2025), so temporal trends could not be assessed, and post-discharge and long-term outcomes were unavailable.

Conclusions

In this first national description of RIC 16 outcomes, patients admitted to IRFs for pain syndrome had discharge functional values that could be descriptively contextualized against national aggregate benchmarks, with shorter LOSs and higher functional efficiency, in the setting of higher baseline function and lower case-mix index. These data provide preliminary national aggregate context for RIC 16 discharge outcomes. Because the pain syndrome cohort is nested within the national aggregate, which is not a matched or independent comparator, the findings are descriptive and cannot evaluate the effectiveness, efficiency,

safety, or appropriateness of IRF care, nor justify referral or payer-authorization decisions. Patient-level studies using non-overlapping, clinically comparable reference groups, diagnostic subgroups, adjusted analyses, and post-discharge outcomes are warranted.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Bilaal Hassan, Austin Fajkus, Puja Yatham

Acquisition, analysis, or interpretation of data: Bilaal Hassan, Austin Fajkus

Drafting of the manuscript: Bilaal Hassan, Austin Fajkus, Puja Yatham

Critical review of the manuscript for important intellectual content: Bilaal Hassan, Austin Fajkus, Puja Yatham

Supervision: Bilaal Hassan, Austin Fajkus, Puja Yatham

Disclosures

Human subjects: All authors have confirmed that this study did not involve human participants or tissue.

Animal subjects: All authors have confirmed that this study did not involve animal subjects or tissue.

Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

Acknowledgements

Data are available on reasonable request. The data are stored as de-identified participant data which are available on request to Bilaal Hassan (Bilaal.hassan711@gmail.com). Austin Fajkus and Bilaal Hassan contributed equally to the work and should be considered co-first authors.

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