

Long-Stay Nursing Home – Falls with Major Injury Respecification

Technical Specification Report

Prepared for

**Center for Clinical Standards and Quality
Centers for Medicare & Medicaid Services**
7500 Security Boulevard
Baltimore, MD 21244-1850

Prepared by

RTI International
3040 E. Cornwallis Road
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November 2025



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1. Introduction

The Centers for Medicare & Medicaid Services (CMS) develops and maintains quality measures to improve care quality and enable Medicare beneficiaries and their caregivers to make informed choices when selecting health care providers. CMS routinely evaluates and refines measures included in program measure sets to ensure cross-setting alignment, facilitate and implement improvements, and maintain measure effectiveness as care practices change and CMS priorities evolve over time.

The CMS Division of Chronic & Post-Acute Care in the Quality Measurement and Value Incentives Group contracted with RTI International and Abt Global to support quality measurement as part of the *Development, Maintenance, and Support for Quality Reporting and Value-Based Purchasing Programs and Nursing Home Care Compare* and the *Home Health Quality Measurement, Value-Based Purchasing Model and Hospice Assessment Instruments Development and Maintenance* projects (RTI Contract No. 0216593.001.000.200; Abt Contract No. 75FCMC18D0014).

1.1 Falls with a Major Injury and Quality of Care in Home Health and Post-Acute and Long-Term Care Settings

Approximately 20% to 30% of older adults (≥ 65 years old) experience one or more falls each year. These falls are associated with substantial burden to the health care system, individuals, and families from resulting injuries, fractures, and reduced functioning and quality of life.¹ Evidence from national surveillance data indicates falls are the leading cause of injury-related death in people 65 years of age or older.² In addition, falls among older adults are estimated to cost \$30 billion in direct U.S. health care costs annually, in addition to the psychological and physical impacts.³ However, falls can be prevented, as studies show that multifactorial interventions may reduce the rate of falls compared with usual care or attention control.⁴

The Falls with Major Injury (FMI) (Consensus-Based Entity ID 0674) quality measure was adopted by the Nursing Home Quality Initiative for long-stay (LS) nursing home (NH) residents in 2011. Following the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014, home health (HH) and post-acute care (PAC) providers are required to report data on the incidence of major falls in clinical assessments of patients. An application of the LS NH FMI

¹ Pillay, J., Gaudet, L. A., Saba, S., Vandermeer, B., Ashiq, A. R., Wingert, A., & Hartling, L. (2024). Falls prevention interventions for community-dwelling older adults: systematic review and meta-analysis of benefits, harms, and patient values and preferences. *Systematic Reviews*, 13(1), 289.

² Colón-Emeric, C. S., McDermott, C. L., Lee, D. S., & Berry, S. D. (2024). Risk assessment and prevention of falls in older community-dwelling adults: A review. *JAMA*, 331(16), 1397–1406.

³ Hosseini, H. (2024, Oct–Dec). Optimizing falls-related planning and intervention for nursing facilities by ownership type. *Hospital Topics*, 102(4), 231–236.

⁴ Hopewell, S., Adedire, O., Copsey, B. J., Boniface, G. J., Sherrington, C., Clemson, L., Close, J. C., & Lamb, S. E. (2018). Multifactorial and multiple component interventions for preventing falls in older people living in the community. *Cochrane Database of Systematic Reviews*, 7(7).

measure was adopted by the Skilled Nursing Facility (SNF), Inpatient Rehabilitation Facility, Long-Term Care Hospital (LTCH), and HH Quality Reporting Programs (QRPs).

The current version of this quality measure reports the percentage of patients, stays, or episodes with one or more FMI (major injuries are defined as including bone fractures, joint dislocations, and closed-head injuries with altered consciousness, or subdural hematoma) during the stay or episode. The FMI measure is largely consistent across care settings, such that an FMI is identified when both a fall and major injury are indicated on the patient assessment (i.e., numerator includes item J1800, identifying that a fall was indicated on the assessment, and item J1900C, identifying that a major injury was indicated on the assessment).

1.2 FMI Respecification

FMI measure respecification is recommended based on recent research and a report from the U.S. Department of Health & Human Services Office of the Inspector General documenting substantial underreporting of falls with a major injury in the current measure. Sanghavi et al.⁵ found that only 57.5% of claims-identified FMI events were reported in the Minimum Data Set (MDS) assessment data, and a 2023 report reviewing the HH setting released by the Office of the Inspector General found that only 45% of claims-identified FMI events were reported in HH patient assessment data.⁶ CMS tasked the RTI and Abt Global teams with exploring approaches to address underreporting of FMI events as documented in these studies.

The RTI and Abt Global teams received and incorporated input from a variety of stakeholders throughout the measure respecification process. CMS sought feedback from patients, caregivers, and technical expert panels (TEPs) on different respecification approaches for the current cross-setting FMI measure used in the HH, IRF, LTCH, SNF, and NH settings.

This report presents the technical measure specifications for the FMI measure as calculated for LS NH residents for the Nursing Home Quality Initiative (NHQI). Future updates will be reflected in the NHQI MDS 3.0 QM User's Manual. **Section 2** provides an overview of the measure and is a high-level summary of the key features of the respecified measure. **Section 3** describes the methodology used to construct the FMI measure, including its data sources, study population, measure outcome, and steps for calculating the final measure score. **Section 4** discusses measure testing, including the measure's reportability, variability, reliability, and validity results. Last, the Appendices show the assessment-based items used to assess falls and resultant level of injury (**Appendix A**), a table listing the diagnosis codes used in assessing major injury status (**Appendix B**), and a table listing external cause of injury codes used in assessing falls (**Appendix C**).

⁵ Sanghavi, P., Pan, S., & Caudry, D. (2020). Assessment of nursing home reporting of major injury falls for quality measurement on nursing home compare. *Health Services Research*, 55(2), 201–210.

⁶ Maxwell, A. (2023). *Home health agencies failed to report over half of falls with major injury and hospitalization among their Medicare patients* (OEI-05-22-00290). U.S. Department of Health & Human Services, Office of the Inspector General.

2. Overview

This section provides an overview of the FMI measure, summarizing the key points contained in the rest of the document. A more-detailed explanation of the measure specifications is available in **Section 3**.

2.1 Measure Name

Falls with Major Injury

2.2 Measure Type

Outcome

2.3 Care Setting

Long-Stay Nursing Home

2.4 Data Sources

MDS, Medicare fee-for-service (FFS) claims, Medicare Advantage encounter data, and Medicaid claims data

2.5 Brief Description of Measure

The respecified quality measure reports the percentage of LS NH residents with one or more FMI events (with major injury including, but not limited to, traumatic bone fractures, joint dislocations/ subluxations, internal organ injuries, amputations, spinal cord injuries, head injuries and crush injuries) in the target period or look-back period. Lower scores on the FMI measure indicate better quality

The measure uses MDS assessment data, claims data, and encounter data to identify falls with a major injury that occurred during the target period or look-back period within a resident's most-recent NH episode. Specifically, the measure identifies an FMI event using the MDS J1800 and J1900 items to determine whether any falls resulted in a major injury (see *Numerator Calculation Step 1 in Exhibit 1*).

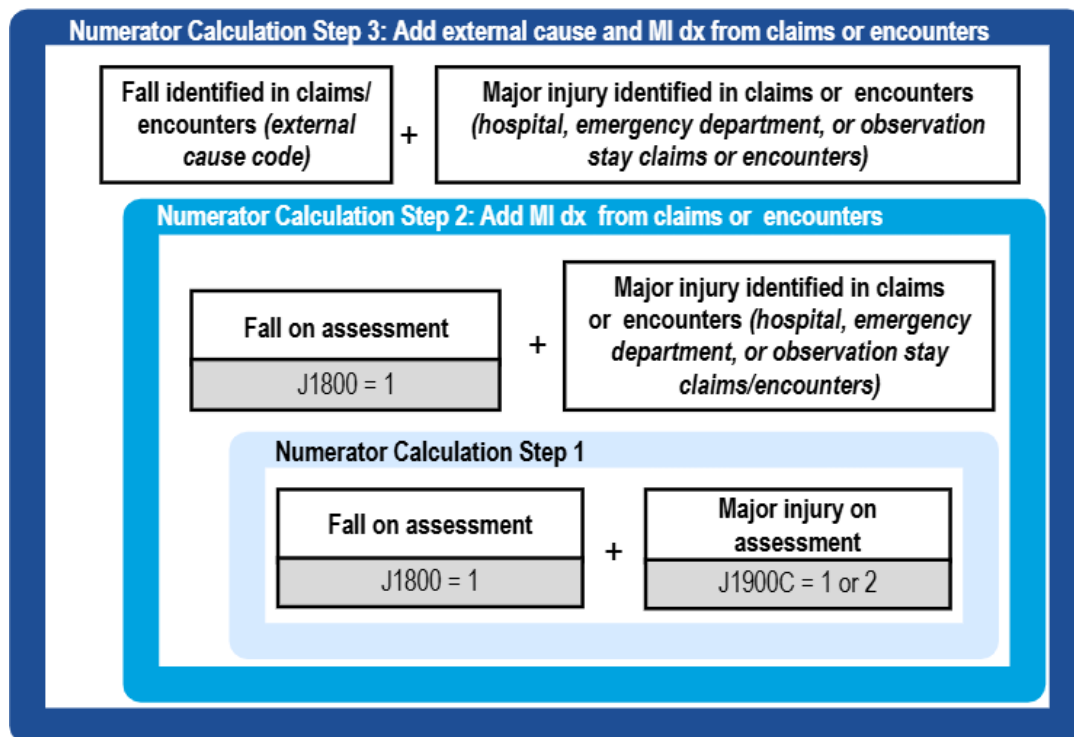
The measure also uses claims and encounter data to identify FMI events. As shown in *Numerator Calculation Step 2 (Exhibit 1)*, the measure uses diagnosis codes to identify a major injury that likely resulted from a fall identified in the MDS data (using J1800) during the target period or look-back period.

As shown in *Numerator Calculation Step 3 (Exhibit 1)*, the measure also uses claims and encounter data to determine whether a fall occurred during the target period or look-back period using external cause of injury codes and whether the fall resulted in a major injury using claims diagnosis codes.

Numerator Calculation Steps 2 and 3 use International Classification of Diseases, Version 10, (ICD-10) diagnosis codes in Medicare FFS, Medicare Advantage, and Medicaid claims and encounter data to identify major injuries. *Numerator Calculation Step 4 (Exhibit 1)* uses ICD-10

external cause of injury codes in Medicare FFS and Medicare Advantage claims and encounter data to identify falls. Every eligible NH episode is evaluated for an FMI using the three numerator calculation steps.

Exhibit 1. Graphical Depiction of Steps for Calculating Respecified FMI Measure



3. Measure Specifications

This section of the report describes the FMI measure following respecification to address potential underreporting of FMI events, as described in the introduction.

3.1 Measure Time Period

This measure is calculated based on episodes⁷ for LS⁸ NH residents with a qualifying assessment in the target data period. The measure applies a look-back scan to identify FMI events occurring for up to approximately 1 year prior to the last day of the episode. For FMI events identified based on MDS assessments, this look-back scan is performed by reviewing all qualifying assessments within the episode with target dates up to 275 days prior to the last day of the episode, with a more-detailed description of methodology presented in **Exhibit 2**.⁹ For FMI events purely identified in claims, the look-back scan period is 365 days. All episodes for LS NH residents with a qualifying assessment in the target period, except those meeting denominator exclusion criteria, are included in the measure.

3.2 Data Sources

3.2.1 MDS Assessment Data

This measure uses data from the MDS. The MDS data are currently collected for all LS NH residents, regardless of payer source.

MDS data are used to identify LS NH episodes. Detailed methodology for identifying LS NH episodes using MDS assessment data and look-back scans can be found in the NHQI MDS 3.0 QM User's Manual (available for download at [Quality Measures | CMS](#)). MDS data also provide information on FMI events, as described in greater detail below.

3.2.2 Claims and Encounter Data

This respecified measure, in addition to assessment data, relies on data from Medicare FFS claims, Medicare Advantage encounters, and Medicaid Transformed Medicaid Statistical Information System (T-MSIS) data from the inpatient and outpatient settings. The Medicare and Medicaid claims and encounters files provide information about each inpatient hospital stay, emergency department (ED) visit, and observation stay, including dates of admission, diagnoses, and external cause of injury. For each LS NH resident, we identify any claims or encounters that person may have had during the claims scan period, in the hospital, in the ED, or during an observation stay, which is used to assess an injury via diagnosis codes and a fall via external cause of injury codes. The claims scan period is different for Numerator Steps 2

⁷ For more detailed information on the construction of episodes, please consult the MDS 3.0 Quality Measure User's Manual v17.0.

⁸ Episodes of more than 100 days are considered long-stay.

⁹ The lookback scan as applied to the MDS assessment is defined as a 275-day period. This period "is used to include up to three quarterly OBRA [Omnibus Budget Reconciliation Act] assessments. The earliest of these assessments would have a look-back period of up to 93 days, which would cover a total of about one year. All qualifying RFAs with target dates in this time period are examined to determine whether the event or condition of interest occurred at any time during the time interval". (From the MDS 3.0 Quality Measure User's Manual v17.0).

and 3 (described in **Section 3.7**). An overview of the definition of the LS NH claims scan period is provided in **Exhibit 2** below.

Exhibit 2. NH LS Claims Scan Period

Numerator Calculation Step	Claims Scan Period
Numerator Calculation Step 2: Identifying Major Injury on Claim or Encounter Data for Assessment-Identified Falls	<p>The following steps are completed for all assessments with a fall indicated (J1800 = 1) with a target date in the target period.</p> <ol style="list-style-type: none"> Determine which of the following occurred most recently: <ol style="list-style-type: none"> The target date of the assessment immediately preceding the assessment that reports the fall 120 days before the target date of the most-recent assessment with a fall (J1800 = 1) 365 days before the final target date of the episode The start date of the episode Include claims with <i>From date</i> between (and inclusive of) the following: <ol style="list-style-type: none"> The most-recent date selected in Step 1 The target date of the assessment with a fall (J1800 = 1) indicated <p>After Steps 1 and 2 are completed for all assessments in an episode with a fall, an episode qualifies for inclusion in Numerator Step 2 if at least one qualifying claim/encounter identifies major injury.</p>
Numerator Calculation Step 3: Identifying Major Injury and Fall on Claims or Encounter Data	<ol style="list-style-type: none"> Limit claims to those with a <i>From date</i> between (and inclusive of) the episode start date and episode end date. Further limit claims to those with a <i>From date</i> 365 days before episode final target date through the episode final target date. <p>After Steps 1 and 2 are completed for the episode, an episode qualifies for inclusion in Numerator Step 3 if at least one qualifying claim or encounter identifies a fall and major injury.</p>

We note that we are unable to obtain claims or encounters that are not submitted through public insurance. Below, we link to documentation for the files used in the LS NH measure.

- Documentation for the Medicare claims data is provided online by the Research Data Assistance Center. Data dictionaries for all standard analytical files (Inpatient and Outpatient Research Identifiable Files) are available at <https://resdac.org/cms-data?tid=1&tid%5B4931%5D=4931>.
- Documentation for the Medicare Advantage encounter data is provided online by ResDAC, available at: <https://resdac.org/cms-data?tid%5B6056%5D=6056>.
- Information about the Medicaid T-MSIS data is available at: <https://www.medicaid.gov/medicaid/data-systems/macbis/transformed-medicaid-statistical-information-system-t-msis>.

3.3 Risk Adjustment

This measure is not risk-adjusted or stratified.

3.4 Measure Window

The measure window for this measure is the target period, look-back period, and claims scan period in a resident's most-recent LS NH episode, as determined by the MDS assessment data. Detailed methodology for identifying LS NH episodes and look-back scans using MDS assessment data can be found in the NHQI User's Manual ([Quality Measures | CMS](#)) .

3.5 Measure Calculation

3.5.1 Measure Calculation Overview

The following steps are used to calculate the measure. Because this measure is not risk-adjusted or stratified, only the provider observed score is computed.

Step 1. Calculate the denominator count:

- Calculate the number of LS NH residents (LS NH episodes identified using assessment data), not including those that meet the exclusion criteria.

Step 2. Calculate the numerator count:

- Calculate the number of LS NH residents during the selected time window who experienced one or more falls that resulted in major injury during the target period or look-back period identified in assessment, claims, or encounter data.

Step 3. Calculate the provider's observed score:

- Divide the provider's numerator count (Step 2) by its denominator count (Step 1), multiply by 100, and round to two decimal places to obtain the provider's observed score.

3.6 Denominator Calculation

3.6.1 Denominator Definition

The respecified FMI measure is considered a "hybrid" measure, incorporating both claims/encounters and assessment data. Although FMI incorporates claims/encounters and assessment data in the numerator, the denominator is constructed using a process typical of assessment-based measures. Detailed methodology for identifying LS NH episodes and look-back scans using MDS assessment data can be found in the NHQI MDS 3.0 QM User's Manual ([Quality Measures | CMS](#)). Claims and encounter data are only used to improve the accuracy of capturing numerator events of FMI.

The FMI denominator includes all LS NH residents included in the target period other than those covered by generic and measure-specific denominator exclusions.

3.6.2 Denominator Exclusions

The only current exclusions for the respecified FMI measure are standard LS NH exclusions. Standard LS NH exclusions can be found in the NHQI User's Manual ([Quality Measures | CMS](#)).

3.7 Numerator Calculation

3.7.1 Numerator Statement

The numerator for this quality measure is the number of LS NH residents who experienced one or more FMIs in the target period or look-back period, as determined from review of the

assessment data (J1800 and J1900), claims data, and encounter data (hospital, ED, and observation stay). We calculate the numerator in three steps.

3.7.2 Numerator Calculation Step 1: FMI from the Assessment

The MDS assessment items used for this measure (**Appendix A**) indicate whether a fall took place (J1800) and, if so, the number of falls in each of the following categories (J1900):

- **Injury Related to Fall:** Any documented injury that occurred because of, or was recognized within, a short period of time (e.g., hours to a few days) after the fall and attributed to the fall.
- **Injury (Except Major):** Includes, but not limited to, skin tears, abrasions, lacerations, superficial bruises, hematomas, and sprains or any fall-related injury that causes the patient to complain of pain.
- **Major Injury:** Including, but not limited to, traumatic bone fractures, joint dislocation/subluxations, internal organ injuries, amputations, spinal cord injuries, head injuries, and crush injuries.

FMI events identified in Numerator Step 1 must include an indication of a major injury, as indicated by item J1900C, which assesses whether a patient had one or more falls that resulted in major injury since the time of admission/entry, reentry, or prior assessment, whichever is most recent. A resident is counted in the numerator of the measure if any assessments included in the target period or look-back scan indicate an FMI. As mentioned in **Section 3.4**, the look-back scan is defined in the NHQI MDS 3.0 QM User's Manual.

3.7.3 Numerator Calculation Step 2: Identifying Major Injury on Claims or Encounter Data for Falls Identified on Assessment

CMS is respecifying the FMI measure to include claims and encounter data. To improve the accuracy of the FMI measure, we include Numerator Calculation Step 2, which uses diagnosis codes found on hospital, ED, or observation stay claims or encounters that occurred during the claims scan period to determine whether a resident with a documented fall in assessment data **but no documented major injury on the assessment** had diagnosis codes consistent with major injury after the documented fall. For the LS NH FMI measure, we first identify all instances in the target period or look-back period where the resident fell (J1800). We then look for claims and encounters during the claims scan period, described in **Exhibit 2**. This refinement requires the identification of sets of ICD-10 diagnosis codes that identify falls in claims and encounters in a logic analogous to that of the existing assessment-based measure.

CMS organized a clinical workgroup to assess feedback from a cross-setting PAC TEP and patient/caregiver stakeholders on clinical diagnosis groups that would clinically meet the definition of a major injury.¹⁰ This workgroup adopted a comprehensive set of diagnoses that include the following:

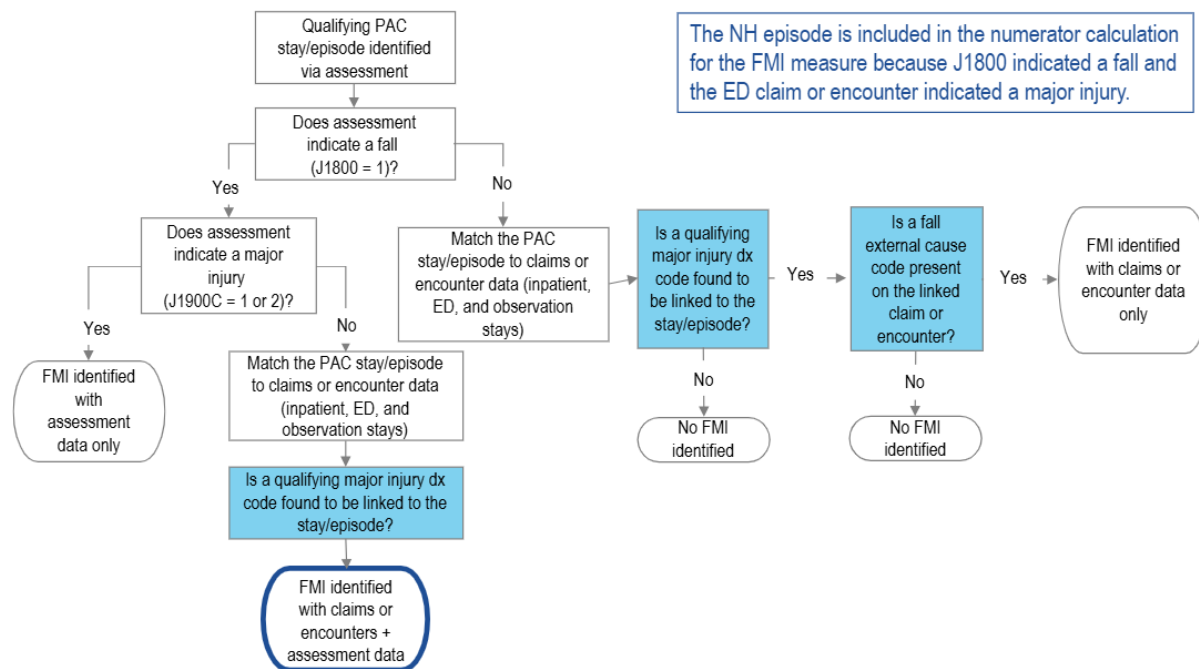
- *Fracture (Traumatic)*
- *Joint Dislocation/Subluxation (Traumatic)*

¹⁰ RTI International and Abt Global LLC. (2025, July). *Standing technical expert panel (TEP) for the Falls with Major Injury (FMI) quality measure*. Report prepared for CMS. <https://www.cms.gov/files/document/may-2025-cross-setting-falls-major-injury-tep-summary-report.pdf>

- *Injury to the Head (with and without Loss of Consciousness)*¹¹
- *Other Non-Fracture Bony Injury*
- *Organ Trauma*
- *Crush Injury*
- *Spine (Cord/Disc)*
- *Traumatic Amputation*
- *Complications of Surgical and Medical Care*

Exhibit 3 outlines an example scenario that demonstrates how using claims and encounter data to determine a major injury diagnosis contributes to the numerator calculation. In this scenario, the LS NH resident would be included in the FMI numerator calculation because a fall is identified via the MDS item J1800 and a diagnosis code from the patient's ED claim or encounter corresponded to a major injury diagnosis group. The ICD-10 diagnosis codes for major injury must co-occur with a fall on assessment data. Although the MDS J1900 did not indicate a major injury, the major injury identified via the ICD-10 code on the claim or encounter is sufficient to trigger the numerator. For a full listing of diagnoses that meet the comprehensive criteria of major injury, see **Appendix B**.

Exhibit 3. Numerator Calculation Step 2 Scenario



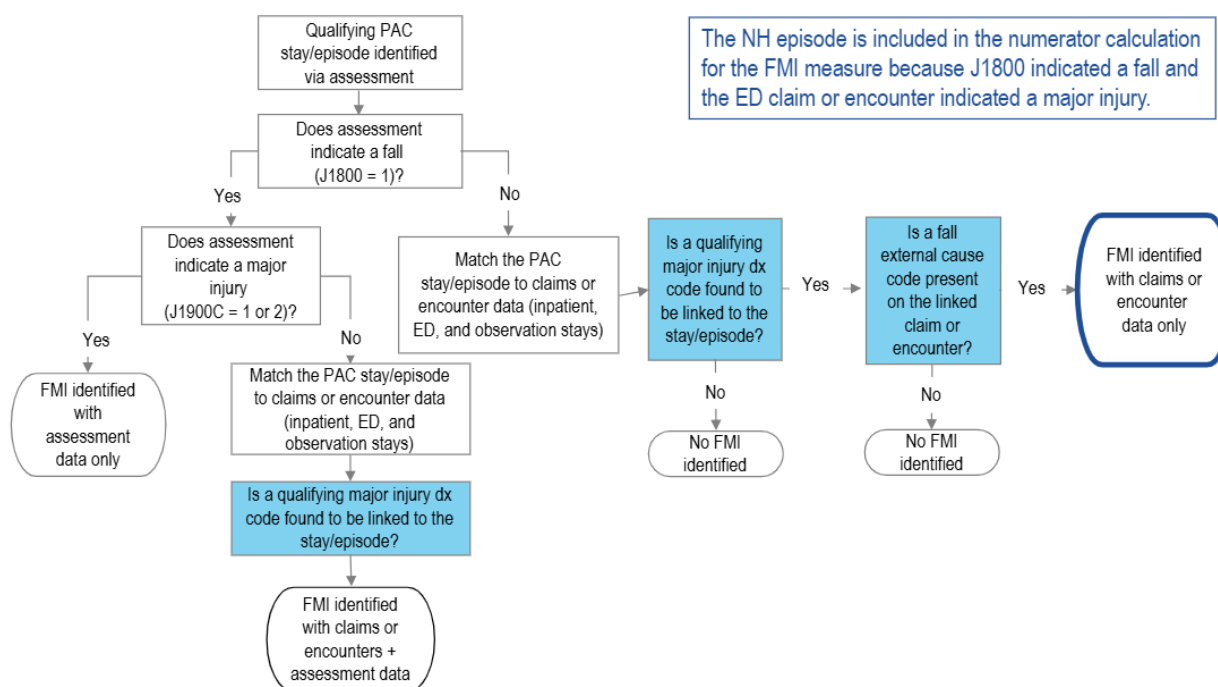
¹¹ Formerly *Brain Injury*; renamed to match ICD-10 terminology for codes beginning with the same four characters in this section.

3.7.4 Numerator Calculation Step 3: Major Injury Identified via Claims or Encounter Diagnosis Codes, Fall Identified via Claims or Encounter External Cause of Injury Code

Numerator Calculation Step 3 uses claims and encounter data to identify an FMI event (both a fall and major injury occurring on the same claim/encounter). Falls are identified on claims or encounters using external cause of injury codes that co-occur with a major injury diagnosis code on an inpatient hospital, ED, or observation stay claim or encounter during the claims scan period, described in **Exhibit 2** above. External cause of injury codes are used to classify environmental events and circumstances as the cause of injury and other adverse effects. They should only be coded when there is an injury coded on the claim or encounter. External cause of injury codes are voluntary, and they are used secondary to the codes that represent the injury or adverse effect.

Exhibit 4 below outlines an example scenario that shows how an FMI event can be identified using only claims or encounter data. In this scenario, the LS NH resident would be included in the FMI numerator calculation because the resident had an ED claim/encounter that began during the target period or look-back period, which indicated a fall via the external cause of injury code and a major injury via the diagnosis code. Numerator Calculation Step 3 only identifies FMI events when a hospital, ED, or observation stay claim/encounter occurring during the target period or look-back period indicates both a fall and a major injury. For the full listing of FMI external cause of injury codes, please see **Appendix C**.

Exhibit 4. Numerator Calculation Step 3 Scenario



3.7.5 Numerator Exclusions

The exclusions listed in **Exhibit 5** will be applied to numerator calculations using claims or encounter data.

Exhibit 5. Numerator Exclusions

Concern	Numerator Exclusion
Fall or major injury occurred before the episode, and patient is receiving continuing care.	Exclude diagnosis codes (for fall or major injury) with a <i>sequela</i> or <i>subsequent encounter</i> suffix; include only initial encounters.
FMI event occurred before the episode.	Exclude claims or encounters where: <ul style="list-style-type: none"> Claim from date ≤ start of look-back period
FMI event occurred in the hospital (inpatient claims/encounters only).	Exclude diagnosis codes without a corresponding Present on Admission flag.
FMI event occurred after discharge from episode.	Exclude claim or encounter where: <ul style="list-style-type: none"> From date > NH episode end date From date = NH episode end date AND NH episode ends with a discharge to home

3.8 Measure Results

Exhibit 6 shows average FMI rates across and the proportion of providers without any FMI events across Numerator Calculation Steps 1, 2, and 3. Including FMI events from claims and encounters results in an increase in the rate of FMI events at the provider level, from 3.67% (Numerator Calculation Step 1, using only MDS data) to 9.36% (Numerator Calculation Step 3). The percentage of providers with no FMI events decreases from 11.61% (Numerator Calculation Step 1) to 1.48% (Numerator Calculation Step 3).

Exhibit 6. NH FMI Rate by Numerator Calculation Step

Numerator Calculation Step	Data Source	Mean FMI Score, %	Providers with No FMI Events, %
Numerator Calculation Step 1	Assessment	3.67	11.61
Numerator Calculation Step 2	Assessment, Claims/Encounters	4.17	8.72
Numerator Calculation Step 3	Assessment, Claims/Encounters	9.36	1.48

Note: FMI scores calculated using FY 2024 data from providers with at least 20 eligible residents

4 Measure Testing

4.1 Reportability

Reportability testing examines the total number and proportion of NH providers that would have at least 20 eligible LS NH residents for the FMI measure in the reporting period.

Exhibit 7. Publicly Reportable NHs, FY 2024

Total Number of NHs with ≥ 20 Episodes	Percentage of NHs with ≥ 20 Episodes
14,297	96.88%

Note: FMI scores calculated using FY 2024 data

4.2 Variability

Variability testing summarizes the distribution of the provider-level final FMI.

Exhibit 8. NH-Level Distribution of FMI

N	Mean Score	Standard Deviation	Minimum	25th Percentile	50th Percentile	75th Percentile	Maximum
14,297	9.36	4.78	0.00	6.03	8.82	12.09	37.14

Note: FMI scores calculated using FY 2024 data from providers with at least 20 eligible residents

4.3 Reliability

The split-half reliability test examined agreement between two FMI measure scores for each NH based on randomly split, independent subsets of observations for each NH in the same measurement period. Good agreement between pairs of performance measure scores calculated in this manner provides evidence that the measure is capturing an attribute of the NH rather than the effect of random chance.

For NHs with at least 20 eligible residents in FY 2024, each NH's residents were randomly divided into halves. We calculated a provider-level FMI score for each split-half sample. We used the Shrout-Fleiss intraclass correlation coefficient (ICC [2, 1]) with the Spearman-Brown correction to calculate agreement between the split-half scores. The overall intraclass correlation coefficient for NHs with more than 20 eligible residents was 0.46, which indicates moderate reliability. This finding represents an increase in reliability as compared to the previous specification for which the overall intraclass correlation coefficient was 0.34.

4.4 Validity

4.4.1 Measure Scores

To evaluate the validity of measure scores, we examined both convergent validity and face validity. The following subsections illustrate our findings for convergent validity, using correlation of provider's FMI scores with their score on other NHQI measures, and for face validity of the

measure, which was assessed by convening TEP meetings to gather expert, patient, and caregiver perspectives.

4.4.1.1 Convergent Validity

To evaluate convergent validity, we examined the relationships between provider FMI scores and related NHQI measures. Using Spearman's rank correlation, we compared providers' FMI scores to the claims-based measures Number of hospitalizations per 1000 long-stay resident days and to Number of outpatient emergency department visits per 1000 long-stay resident days as well as total nurse staffing hours per resident day. We hypothesized that the NHs that have a higher (worse) score on number of hospitalizations per 1000 long-stay resident days and number of outpatient emergency department visits per 1000 long-stay resident days measures are likely to have a higher (worse) score on the FMI measure as well, and conversely that NHs that have a lower (better) score on these measures are likely to have a lower (better) score on the FMI measure. Therefore, we are looking for a positive correlation between these measures and the FMI measure as support for these measures having convergent validity. For the staffing measure, however, a higher score indicates better performance thus a negative correlation between this measure and the FMI score would indicate convergent validity. We do not expect a strong relationship given the low occurrence of FMI and the wider range of clinical outcomes that result in hospital and ED use. The analysis used FMI scores calculated using FY 2024 data from providers with at least 20 LS NH residents.

Exhibit 9. Correlations Between FMI and Other Publicly Reported Measures

Measure	Spearman's Correlation	p-value
Number of hospitalizations per 1,000 LS resident days	-0.08	<0.001
Number of outpatient ED visits per 1,000 LS resident days	0.15	<0.001
Adjusted total nurse staffing hours per resident per day	0.15	<0.001

Source: RTI analysis of MDS, Medicare FFS claims data, Medicare Advantage encounter data and Medicaid claims data (FMI scores calculated using FY 2024 data from providers with at least 20 eligible residents), and publicly reported NHQI quality measures (available for download at <https://data.cms.gov/provider-data>). Data collection periods for publicly reported NHQI claims-based measures used in this analysis are the most recent available.

4.4.1.2 Face Validity

To assess face validity, two TEP meetings (July 2024 and May 2025) and a Patient and Family Engagement Listening Session were convened.^{12,13} TEP members showed strong support for

¹² RTI International and Abt Global, LLC. (2025, July). *Standing technical expert panel (TEP) for the Falls with Major Injury (FMI) quality measure*. Report prepared for CMS. <https://www.cms.gov/files/document/may-2025-cross-setting-falls-major-injury-tep-summary-report.pdf>

¹³ Acumen, LLC and Abt Global, LLC (2024, September). *Standing Technical Expert Panel (TEP) for the Development, Evaluation, and Maintenance of Post-Acute Care (PAC) and Hospice Quality Reporting Program (QRP) Measurement Sets*. <https://mmshub.cms.gov/sites/default/files/PAC-Home-Health-QRP-Cross-setting-TEP-Summary-Report-July-2024.pdf>

the face validity of this measure. Votes taken during the meeting showed support for key components of the respecified measure, including the conceptual and operational definition updates to the measure.

Appendix A. MDS Items Used in FMI Calculation

Section J - Health Conditions

J1800. Any Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

Enter Code

☐

Has the resident had any falls since admission/entry or reentry or the prior assessment (OBRA or Scheduled PPS), whichever is more recent?

0. No → Skip to K0200, Height and Weight

1. Yes → Continue to J1900, Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS)

J1900. Number of Falls Since Admission/Entry or Reentry or Prior Assessment (OBRA or Scheduled PPS), whichever is more recent

Coding:	↓	Enter Codes in Boxes
0. None	<input type="checkbox"/>	A. No injury - no evidence of any injury is noted on physical assessment by the nurse or primary care clinician; no complaints of pain or injury by the resident; no change in the resident's behavior is noted after the fall
1. One	<input type="checkbox"/>	B. Injury (except major) - as described in the CMS LTCF RAI User's Manual
2. Two or more	<input type="checkbox"/>	C. Major injury - as described in the CMS LTCF RAI User's Manual

Source: [Minimum Data Set \(MDS\) 3.0 Resident Assessment Instrument \(RAI\) Manual | CMS](#)

Appendix B. Major Injury Diagnostic Codes

Fracture (Traumatic)	
<i>Pelvis/Hip</i>	
S321	Fracture of sacrum
S322	Fracture of coccyx
S323	Fracture of ilium
S324	Fracture of acetabulum
S325	Fracture of pubis
S326	Fracture of ischium
S328	Fracture of other parts of pelvis
S329	Fracture of unspecified parts of lumbosacral spine and pelvis
S720	Fracture of head and neck of femur
S721	Pertrochanteric fracture
<i>Lower Extremity / Ankle / Foot</i>	
S722	Subtrochanteric fracture of femur
S723	Fracture of shaft of femur
S724	Fracture of lower end of femur
S728	Other fracture of femur
S729	Unspecified fracture of femur
S820	Fracture of patella
S821	Fracture of upper end of tibia
S822	Fracture of shaft of tibia
S823	Fracture of lower end of tibia
S824	Fracture of shaft of fibula
S825	Fracture of medial malleolus
S826	Fracture of lateral malleolus
S828	Other fractures of lower leg
S829	Unspecified fracture of lower leg
S890	Physeal fracture of upper end of tibia
S891	Physeal fracture of lower end of tibia
S892	Physeal fracture of upper end of fibula
S893	Physeal fracture of lower end of fibula
S920	Fracture of calcaneus
S921	Fracture of talus
S922	Fracture of other and unspecified tarsal bone(s)
S923	Fracture of metatarsal bone(s)

S924	Fracture of great toe
S925	Fracture of lesser toe(s)
S928	Other fracture of foot, except ankle
S929	Unspecified fracture of foot and toe
<i>Axial Skeleton</i>	
S120	Fracture of first cervical vertebra
S121	Fracture of second cervical vertebra
S122	Fracture of third cervical vertebra
S123	Fracture of fourth cervical vertebra
S124	Fracture of fifth cervical vertebra
S125	Fracture of sixth cervical vertebra
S126	Fracture of seventh cervical vertebra
S128	Fracture of other parts of neck
S129	Fracture of neck, unspecified
S220	Fracture of thoracic vertebra
S222	Fracture of sternum
S223	Fracture of one rib
S224	Multiple fractures of ribs
S225	Flail chest
S229	Fracture of bony thorax, part unspecified
S320	Fracture of lumbar vertebra
<i>Shoulder Girdle</i>	
S420	Fracture of clavicle
S421	Fracture of scapula
S429	Fracture of shoulder girdle, part unspecified
<i>Upper Extremity / Wrist / Hand</i>	
S422	Fracture of upper end of humerus
S423	Fracture of shaft of humerus
S424	Fracture of lower end of humerus
S490	Physeal fracture of upper end of humerus
S491	Physeal fracture of lower end of humerus
S498	Other specified injuries of shoulder and upper arm
S499	Unspecified injury of shoulder and upper arm
S520	Fracture of upper end of ulna
S521	Fracture of upper end of radius
S522	Fracture of shaft of ulna
S523	Fracture of shaft of radius
S525	Fracture of lower end of radius

S526	Fracture of lower end of ulna
S529	Unspecified fracture of forearm
S590	Physeal fracture of lower end of ulna
S591	Physeal fracture of upper end of radius
S592	Physeal fracture of lower end of radius
S620	Fracture of navicular [scaphoid] bone of wrist
S621	Fracture of other and unspecified carpal bone(s)
S622	Fracture of first metacarpal bone
S623	Fracture of other and unspecified metacarpal bone
S625	Fracture of thumb
S626	Fracture of other and unspecified finger(s)
S629	Unspecified fracture of hand
<i>Skull/Face</i>	
S020	Fracture of vault of skull
S021	Fracture of base of skull
S022	Fracture of nasal bones
S023	Fracture of orbital floor
S024	Fracture of malar, maxillary and zygoma bones
S025	Fracture of tooth (traumatic)
S026	Fracture of mandible
S028	Fractures of other specified skull and facial bones
S029	Fracture of unspecified skull and facial bones
Joint Dislocation / Subluxation (Traumatic)	
<i>Pelvis/Hip</i>	
S334	Traumatic rupture of symphysis pubis
S730	Subluxation and dislocation of hip
<i>Lower Extremity / Ankle / Foot</i>	
S830	Subluxation and dislocation of patella
S831	Subluxation and dislocation of knee
S930	Subluxation and dislocation of ankle joint
S931	Subluxation and dislocation of toe
S933	Subluxation and dislocation of foot
<i>Axial Skeleton</i>	
S131	Subluxation and dislocation of cervical vertebrae
S132	Dislocation of other and unspecified parts of neck
S231	Subluxation and dislocation of thoracic vertebra
S232	Dislocation of other and unspecified parts of thorax

S331	Subluxation and dislocation of lumbar vertebra
S332	Dislocation of sacroiliac and sacrococcygeal joint
S333	Dislocation of other and unspecified parts of lumbar spine and pelvis
<i>Shoulder Girdle</i>	
S430	Subluxation and dislocation of shoulder joint
S431	Subluxation and dislocation of acromioclavicular joint
S432	Subluxation and dislocation of sternoclavicular joint
S433	Subluxation and dislocation of other and unspecified parts of shoulder girdle
<i>Upper Extremity / Wrist / Hand</i>	
S530	Subluxation and dislocation of radial head
S531	Subluxation and dislocation of ulnohumeral joint
S630	Subluxation and dislocation of wrist and hand joints
S631	Subluxation and dislocation of thumb
S632	Subluxation and dislocation of other finger(s)
S633	Traumatic rupture of ligament of wrist
S634	Traumatic rupture of ligament of finger at metacarpophalangeal and interphalangeal joint(s)
<i>Skull/Face</i>	
S030	Dislocation of jaw
S031	Dislocation of septal cartilage of nose
S032	Dislocation of tooth
Injury to the Head	
<i>Intracranial (with Loss of Consciousness)</i>	
S060	Concussion
S061	Traumatic cerebral edema
S062	Diffuse traumatic brain injury
S063	Focal traumatic brain injury
S064	Epidural hemorrhage
S065	Traumatic subdural hemorrhage
S066	Traumatic subarachnoid hemorrhage
S068	Other specified intracranial injuries
S069	Unspecified intracranial injury
S06A	Traumatic brain compression and herniation
Traumatic Amputation	
S081	Traumatic amputation of ear
S088	Traumatic amputation of other parts of head
S282	Traumatic amputation of breast

S480	Traumatic amputation at shoulder joint
S580	Traumatic amputation at elbow level
S589	Traumatic amputation of forearm, level unspecified
S680	Traumatic metacarpophalangeal amputation of thumb
S681	Traumatic metacarpophalangeal amputation of and unsp finger
S685	Traumatic transphalangeal amputation of thumb
S686	Traumatic transphalangeal amputation of oth and unsp finger
S687	Traumatic transmetacarpal amputation of hand
S780	Traumatic amputation at hip joint
S880	Traumatic amputation at knee level
S889	Traumatic amputation of lower leg, level unspecified
S981	Traumatic amputation of one toe
S983	Traumatic amputation of midfoot
S989	Traumatic amputation of foot, level unspecified
Complications of Surgical and Medical Care	
T840	Mechanical complication of internal joint prosthesis
Other Non-Fracture Bony Injury	
<i>Axial Skeleton</i>	
M483	Traumatic spondylopathy
Organ Trauma	
<i>Lung</i>	
S270	Traumatic pneumothorax
S271	Traumatic hemothorax
S272	Traumatic hemopneumothorax
<i>Abdomen</i>	
S360	Injury of spleen
S361	Injury of liver and gallbladder and bile duct
S362	Injury of pancreas
S363	Injury of stomach
S364	Injury of small intestine
S365	Injury of colon
S366	Injury of rectum
S368	Injury of other intra-abdominal organs
S369	Injury of unspecified intra-abdominal organ
S370	Injury of kidney
S371	Injury of ureter

S372	Injury of bladder
S373	Injury of urethra
S374	Injury of ovary
S375	Injury of fallopian tube
S376	Injury of uterus
S378	Injury of other urinary and pelvic organs
S379	Injury of unspecified urinary and pelvic organ
<i>Eye</i>	
S050	Injury of conjunctiva and corneal abrasion w/o foreign body
S052	Ocular laceration and rupture with prolapse or loss of intraocular tissue
S053	Ocular laceration without prolapse or loss of intraocular tissue
S054	Penetrating wound of orbit with or without foreign body
S055	Penetrating wound with foreign body of eyeball
S056	Penetrating wound without foreign body of eyeball
S057	Avulsion of eye
S058	Other injuries of eye and orbit
S059	Unspecified injury of eye and orbit
<i>Heart</i>	
S260	Unspecified injury of heart with hemopericardium
S261	Injury of heart without hemopericardium
S269	Injury of heart, unspecified with or without hemopericardium
<i>Intrathoracic Organs</i>	
S273	Other and unspecified injuries of lung
S274	Injury of bronchus
S275	Injury of thoracic trachea
S276	Injury of pleura
S278	Injury of other specified intrathoracic organs
S279	Injury of unspecified intrathoracic organ
Injury to the Head	
<i>Intracranial (Without Loss of Consciousness)</i>	
S060	Concussion
S061	Traumatic cerebral edema
S062	Diffuse traumatic brain injury
S063	Focal traumatic brain injury
S064	Epidural hemorrhage
S065	Traumatic subdural hemorrhage
S066	Traumatic subarachnoid hemorrhage

S068	Other specified intracranial injuries
S069	Unspecified intracranial injury
S080	Avulsion of scalp
Crush Injury	
<i>Pelvis/Hip</i>	
S770	Crushing injury of hip
S772	Crushing injury of hip with thigh
<i>Lower Extremity / Ankle / Foot</i>	
S771	Crushing injury of thigh
S870	Crushing injury of knee
S878	Crushing injury of lower leg
S970	Crushing injury of ankle
S971	Crushing injury of toe
S978	Crushing injury of foot
<i>Shoulder Girdle</i>	
S471	Crushing injury of right shoulder and upper arm
S472	Crushing injury of left shoulder and upper arm
S479	Crushing injury of shoulder and upper arm, unspecified arm
<i>Upper Extremity / Wrist / Hand</i>	
S570	Crushing injury of elbow
S578	Crushing injury of forearm
S670	Crushing injury of thumb
S671	Crushing injury of other and unspecified finger(s)
S672	Crushing injury of hand
S673	Crushing injury of wrist
S674	Crushing injury of wrist and hand
S679	Crushing injury of unspecified part(s) of wrist, hand and fingers
<i>Skull/Face</i>	
S070	Crushing injury of face
S071	Crushing injury of skull
S078	Crushing injury of other parts of head
S079	Crushing injury of head, part unspecified
<i>Cervical</i>	
S170	Crushing injury of larynx and trachea
S178	Crushing injury of other specified parts of neck
S179	Crushing injury of neck, part unspecified

<i>Abdomen</i>	
S380	Crushing injury of external genital organs
S380	Crushing injury of external genital organs
S381	Crushing injury of abdomen, lower back, and pelvis
S280	Crushed chest
Spine (Cord / Disc)	
<i>Axial Skeleton</i>	
S130	Traumatic rupture of cervical intervertebral disc
S140	Concussion and edema of cervical spinal cord
S141	Other and unspecified injuries of cervical spinal cord
S230	Traumatic rupture of thoracic intervertebral disc
S240	Concussion and edema of thoracic spinal cord
S241	Other and unspecified injuries of thoracic spinal cord
S330	Traumatic rupture of lumbar intervertebral disc
S340	Concussion and edema of lumbar and sacral spinal cord
S341	Other and unsp injury of lumbar and sacral spinal cord

Appendix C. External Cause of Injury Code List

Diagnosis	Description
V00181A	Fall from other rolling-type pedestrian conveyance, initial encounter
V00281A	Fall from other gliding-type pedestrian conveyance, initial encounter
V00381A	Fall from other flat-bottomed pedestrian conveyance, initial encounter
V00811A	Fall from moving wheelchair (powered), initial encounter
V00831A	Fall from motorized mobility scooter, initial encounter
V00841A	Fall from standing electric scooter, initial encounter
V00891A	Fall from other pedestrian conveyance, initial encounter
W000XXA	Fall on same level due to ice and snow, initial encounter
W001XXA	Fall from stairs and steps due to ice and snow, initial encounter
W002XXA	Other fall from one level to another due to ice and snow, initial encounter
W009XXA	Unspecified fall due to ice and snow, initial encounter
W010XXA	Fall on same level from slipping, tripping and stumbling without subsequent striking against object, initial encounter
W0110XA	Fall on same level from slipping, tripping and stumbling with subsequent striking against unspecified object, initial encounter
W01110A	Fall on same level from slipping, tripping and stumbling with subsequent striking against sharp glass, initial encounter
W01111A	Fall on same level from slipping, tripping and stumbling with subsequent striking against power tool or machine, initial encounter
W01118A	Fall on same level from slipping, tripping and stumbling with subsequent striking against other sharp object, initial encounter
W01119A	Fall on same level from slipping, tripping and stumbling with subsequent striking against unspecified sharp object, initial encounter
W01190A	Fall on same level from slipping, tripping and stumbling with subsequent striking against furniture, initial encounter
W01198A	Fall on same level from slipping, tripping and stumbling with subsequent striking against other object, initial encounter
W04XXXA	Fall while being carried or supported by other persons, initial encounter
W050XXA	Fall from non-moving wheelchair, initial encounter
W051XXA	Fall from non-moving nonmotorized scooter, initial encounter
W052XXA	Fall from non-moving motorized mobility scooter, initial encounter
W06XXXA	Fall from bed, initial encounter
W07XXXA	Fall from chair, initial encounter
W08XXXA	Fall from other furniture, initial encounter
W090XXA	Fall on or from playground slide, initial encounter
W091XXA	Fall from playground swing, initial encounter
W092XXA	Fall on or from jungle gym, initial encounter

Diagnosis	Description
W098XXA	Fall on or from other playground equipment, initial encounter
W100XXA	Fall (on)(from) escalator, initial encounter
W101XXA	Fall (on)(from) sidewalk curb, initial encounter
W102XXA	Fall (on)(from) incline, initial encounter
W108XXA	Fall (on) (from) other stairs and steps, initial encounter
W109XXA	Fall (on) (from) unspecified stairs and steps, initial encounter
W11XXA	Fall on and from ladder, initial encounter
W12XXA	Fall on and from scaffolding, initial encounter
W130XXA	Fall from, out of or through balcony, initial encounter
W131XXA	Fall from, out of or through bridge, initial encounter
W132XXA	Fall from, out of or through roof, initial encounter
W133XXA	Fall through floor, initial encounter
W134XXA	Fall from, out of or through window, initial encounter
W138XXA	Fall from, out of or through other building or structure, initial encounter
W139XXA	Fall from, out of or through building, not otherwise specified, initial encounter
W14XXA	Fall from tree, initial encounter
W15XXA	Fall from cliff, initial encounter
W16011A	Fall into swimming pool striking water surface causing drowning and submersion, initial encounter
W16012A	Fall into swimming pool striking water surface causing other injury, initial encounter
W16021A	Fall into swimming pool striking bottom causing drowning and submersion, initial encounter
W16022A	Fall into swimming pool striking bottom causing other injury, initial encounter
W16031A	Fall into swimming pool striking wall causing drowning and submersion, initial encounter
W16032A	Fall into swimming pool striking wall causing other injury, initial encounter
W16111A	Fall into natural body of water striking water surface causing drowning and submersion, initial encounter
W16112A	Fall into natural body of water striking water surface causing other injury , initial encounter
W16121A	Fall into natural body of water striking bottom causing drowning and submersion, initial encounter
W16122A	Fall into natural body of water striking bottom causing other injury, initial encounter
W16131A	Fall into natural body of water striking side causing drowning and submersion, initial encounter
W16132A	Fall into natural body of water striking side causing other injury, initial encounter
W16211A	Fall in (into) filled bathtub causing drowning and submersion, initial encounter
W16212A	Fall in (into) filled bathtub causing other injury, initial encounter
W16221A	Fall in (into) bucket of water causing drowning and submersion, initial encounter
W16222A	Fall in (into) bucket of water causing other injury, initial encounter
W16311A	Fall into other water striking water surface causing drowning and submersion, initial encounter
W16312A	Fall into other water striking water surface causing other injury, initial encounter

Diagnosis	Description
W16321A	Fall into other water striking bottom causing drowning and submersion, initial encounter
W16322A	Fall into other water striking bottom causing other injury , initial encounter
W16331A	Fall into other water striking wall causing drowning and submersion, initial encounter
W16332A	Fall into other water striking wall causing other injury , initial encounter
W1641XA	Fall into unspecified water causing other drowning and submersion, initial encounter
W1642XA	Fall into unspecified water causing other injury, initial encounter
W170XXA	Fall into well, initial encounter
W171XXA	Fall into storm drain or manhole, initial encounter
W172XXA	Fall into hole, initial encounter
W173XXA	Fall into empty swimming pool, initial encounter
W174XXA	Fall from dock, initial encounter
W1781XA	Fall down embankment (hill), initial encounter
W1782XA	Fall from (out of) grocery cart, initial encounter
W1789XA	Other fall from one level to another, initial encounter
W1800XA	Striking against unspecified object with subsequent fall, initial encounter
W1801XA	Striking against sports equipment with subsequent fall, initial encounter
W1802XA	Striking against glass with subsequent fall, initial encounter
W1809XA	Striking against other object with subsequent fall, initial encounter
W1811XA	Fall from or off toilet without subsequent striking against object, initial encounter
W1812XA	Fall from or off toilet with subsequent striking against object, initial encounter
W182XXA	Fall in (into) shower or empty bathtub, initial encounter
W1830XA	Fall on same level, unspecified, initial encounter
W1831XA	Fall on same level due to stepping on an object, initial encounter
W1839XA	Other fall on same level, initial encounter
W1840XA	Slipping, tripping and stumbling without falling, unspecified, initial encounter
W1841XA	Slipping, tripping and stumbling without falling due to stepping on object, initial encounter
W1842XA	Slipping, tripping and stumbling without falling due to stepping into hole or opening, initial encounter
W1843XA	Slipping, tripping and stumbling without falling due to stepping from one level to another, initial encounter
W1849XA	Other slipping, tripping and stumbling without falling, initial encounter
W19XXXA	Unspecified fall, initial encounter