

CLINICAL DOCUMENTATION REPORT

Denial Prevention Module — Part A / Home Health (PDGM)

LINDERA Mobility Analysis · Report: DPM-HH-JD-20260325

Patient	John Doe	Assessment Date	March 21, 2026	Payer	Medicare Part A
Setting	Home Health (homebound)	Prior Assessment	February 23, 2026	Episode	30-day PDGM
Active Dx	Arthritis · Stroke (Hemiplegia) · Chronic Pain · Dementia			Assistive Device	Wheelchair
Medications	5+ daily (incl. anti-inflammatory)			Eval Complexity	HIGH

01 Fall Risk Score

INITIAL · Feb 27, 2026 46% ≥45% = fall predicted within 6 months	CURRENT · Mar 25, 2026 34% ≥32% = fall predicted within 12 months	CHANGE · 26 days -12 pts 26.1% relative improvement. Crossed 6-mo → 12-mo threshold.
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Validation: Alves et al., JMIR Aging 2024; 7: e55681. $\rho = 0.960$, $P < .001$, $n = 617$. Thresholds: ≥45%/6 mo, ≥32%/12 mo, ≥24%/24 mo.

02 Objective Gait Analysis

Extracted from 30-second smartphone video via AI 3D skeleton analysis. Validated vs GAITRite (Azhand et al., Scientific Reports 2021). Objective and reproducible.

Parameter	Initial (t0)	Current (t1)	Change	Normal	Clinical Interpretation
Walking Speed	0.154 m/s	0.3 m/s	+94.8%	> 0.8 m/s	Severely reduced. Household ambulator; below community threshold.
Step Length (L)	~2 cm (est.)	18 cm	Improved	> 50 cm	Post-stroke pattern; L > R by 3 cm.
Step Length (R)	~2 cm (est.)	15 cm	Improved	> 50 cm	Affected-side shorter step. Weight-shift intervention indicated.
Step Height	2.68 cm	2.5 cm	Stable	> 3 cm	Below safe floor clearance. Persistent trip risk on thresholds/rugs.
Cadence	1.50 steps/s	~1.0 steps/s	Adjusted	1.6–2.0	Compensatory slower cadence for instability.
Forward Lean	9.9°	0°–5°	Normalized	< 5°	Anterior displacement resolved. Postural alignment restored.

Parameter	Initial (t0)	Current (t1)	Change	Normal	Clinical Interpretation
Sideways Tilt	15.4°	< 3°	Normalized	< 3°	Severe lateral instability resolved; highest-in-cohort at t0.
Gait Symmetry	Asymmetric	Asymmetric	Persistent	Symmetric	Chronic post-stroke hemiparetic pattern. Continued NMRE indicated.

03 PDGM Episode Classification

The five inputs that determine the case-mix group and HIPPS code. Each is set before claim submission and each is independently audit-checkable. Coding errors here drove 5 of 9 Pine Valley AL denials in the BCBS-MI audit batch.

Classification Input	Value	Supporting Evidence	Denial Risk If Miscoded
1. Timing	Late (likely)	Verify prior 30-day period ended within 60 days of current SOC. If yes → Late.	Ch. 7 §10.2 — rate reduction if billed Early without 60-day gap.
2. Admission Source	Community	No institutional stay with bill type 11X in 14 days prior to SOC. AL/MC residence not institutional.	Hospital bill types 131/137 (observation/outpatient) do NOT qualify as institutional.
3. Clinical Grouping	Neuro Rehabilitation	Primary Dx I69.351 (post-stroke hemiplegia, R-dominant). Gait asymmetry + normalized postural alignment validate neuro focus.	Wrong grouping → wrong case-mix weight → underpayment or full denial if Dx unsupported.
4. Functional Impairment Level	HIGH	Walking speed 0.3 m/s (severely reduced) · Section GG scores below 04 on 50-ft and 150-ft ambulation · FRS 34% (≥32% validated)	Auditors downcode FIL when M1840/M1860 contradict GG and PT/OT eval — the #1 Pine Valley AL denial pattern.
5. Comorbidity Adjustment	HIGH (verify against CMS subgroup list)	Stroke sequelae + dementia + chronic pain + arthritis + polypharmacy (5+ meds incl. anti-inflammatory). Likely interaction subgroup qualifier.	Missed comorbidity adjustment = missed revenue; over-claimed = audit flag.

04 OASIS Item Crosswalk — M-items and Section GG

Pre-submission cross-check: LINDERA objective measurements mapped to the OASIS items most frequently flagged in BCBS-MI / EXL audits. The goal is internal consistency between the clinician's eval, the M-item response, and the paired Section GG code.

M-items (focus on the auditor hot-list)

OASIS Item	Item Name	Recommended Response	Fall-Risk Contribution	LINDERA Evidence
M1800	Grooming	2	Low	Wheelchair + dementia → reminders/supervision needed.
M1810	Upper Body Dressing	1	Low	Intact upper-extremity function inferred from propulsion.
M1820	Lower Body Dressing	2	Moderate	Wheelchair dependency + reduced trunk control during t0 lateral tilt 15.4°.
M1830	Bathing	3	High	Wheelchair + dementia + FRS 34% → full assistance for safety.
M1840	Toilet Transferring	2	CRITICAL	Transfers = primary fall mechanism per LINDERA. Step height 2.5 cm and asymmetric gait contradict any response ≤1. Response 2 = 'someone must help'.
M1845	Toileting Hygiene	2	Moderate	Urgency incontinence; balance tasks require support.
M1850	Transferring	2	CRITICAL	Bed/chair transfers require hands-on assist. Consistent with GG0170E = 03.
M1860	Ambulation / Locomotion	3	CRITICAL	Patient ambulates (0.3 m/s) but requires supervision at all times. Response 3 = 'walks only with supervision'. NOT 0/1 (independent) and NOT 4/5 (chairfast/bedfast).
M1870	Feeding / Eating	0–1	Low	No objective feeding deficit in LINDERA scope.

Section GG — functional abilities at SOC

Section GG	Item Name	Recommended Code	LINDERA Evidence	Matches M-item
GG0170A	Roll left / right	04 — Supervision/touching	Trunk asymmetry persists; weight-shift limited.	—
GG0170C	Lying → sitting on side of bed	03 — Partial / moderate	Forward lean 9.9° at t0; residual weakness.	—

Section GG	Item Name	Recommended Code	LINDERA Evidence	Matches M-item
GG0170D	Sit → stand	03 — Partial / moderate	Step length 15–18 cm; gait initiation weight-shift deficit.	—
GG0170E	Chair/bed → chair transfer	03 — Partial / moderate	Transfer phase = primary fall mechanism.	M1850
GG0170F	Toilet transfer	03 — Partial / moderate	Urgency + asymmetric gait + step height 2.5 cm.	M1840
GG0170I	Walk 10 feet	04 — Supervision/touching	Walking speed 0.3 m/s achievable with cueing.	M1860
GG0170J	Walk 50 feet with 2 turns	03 — Partial / moderate	Turning adds lateral-stability demand; tilt normalized but fragile.	M1860
GG0170K	Walk 150 feet	02 — Substantial / maximal	Below community ambulation threshold (0.8 m/s).	M1860
GG0170L	Walk on uneven surfaces	01 — Dependent	Step height 2.5 cm < 3 cm safe clearance.	—
GG0170R	Wheel 50 feet with 2 turns	05 — Setup / clean-up	Upper-extremity propulsion intact.	—
GG0170S	Wheel 150 feet	04 — Supervision/touching	Cognitive safety awareness limited by dementia.	—

05 HIPPS Inputs & LUPA Threshold

The HIPPS code is a 5-character output generated by the home health agency's grouper software at claim submission. LINDERA does not generate HIPPS directly. Below are the classification inputs LINDERA's data supports — feed these into the grouper to produce the final HIPPS.

Input	Recommended Value	LINDERA Support
Timing	Late (verify 60-day gap)	Clerical — requires CWF prior-episode lookup.
Admission Source	Community	No 11X inpatient bill type in prior 14 days.
Clinical Grouping	Neuro Rehabilitation	Primary Dx I69.351 maps to Neuro Rehab per CMS PDGM Clinical Grouping Tool.
Functional Impairment Level	HIGH	Walking speed, GG scores, FRS 34% all at HIGH-FIL thresholds.
Comorbidity Adjustment	HIGH (requires subgroup match)	Dementia + chronic pain + polypharmacy likely hit interaction subgroup.

Expected LUPA threshold

For Neuro Rehabilitation · Community · Late · High FIL · High Comorbidity, the CMS LUPA visit threshold for the 30-day period is typically in the 5–7 visit range (confirm with agency grouper). Falling at or below the threshold triggers per-visit payment instead of the case-mix rate.

06 ICD-10 Diagnosis Mapping

3 of 9 Pine Valley AL denials were full-visit denials because the billed primary diagnosis (DM, HTN) was not supported by the F2F encounter or the chart. LINDERA's objective mobility data points to specific ICD-10-CM codes that ARE supported by the measured deficits. Use this mapping to choose a primary diagnosis the medical record can defend.

Primary diagnosis candidates — ranked by LINDERA evidence strength

ICD-10-CM	Description	Evidence Strength	PDGM Clinical Group
I69.351	Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side	STRONG — objectively validated by asymmetric gait, L step 18 cm > R step 15 cm, post-stroke pattern	Neuro Rehabilitation
I69.354	Same, affecting left non-dominant side	Use only if left-side hemiparesis documented in chart	Neuro Rehabilitation
R26.89	Other abnormalities of gait and mobility	Moderate — symptom code; weaker case-mix driver	MMTA-Other (lower payment)
R29.6	Repeated falls	Moderate — supports medical necessity but weak as primary	MMTA-Other

Supporting secondary diagnoses — LINDERA-evidenced

ICD-10-CM	Description	LINDERA Data That Supports It
R26.2	Difficulty in walking, not elsewhere classified	Walking speed 0.3 m/s (severely reduced).
R26.81	Unsteadiness on feet	Lateral tilt 15.4° at t0; FRS 46% at t0.
I63.9	Cerebral infarction, unspecified	Historical — documents the stroke event.
F03.90	Unspecified dementia without behavioral disturbance	Documented Dx; affects Sensory/Cognitive subscore (9%/32%).

ICD-10-CM	Description	LINDERA Data That Supports It
G89.29	Other chronic pain	Documented Dx; movement avoidance pattern affects gait.
M19.90	Unspecified osteoarthritis, unspecified site	Arthritis contribution to Gait & Function subscore.
Z79.1	Long-term (current) use of non-steroidal anti-inflammatories	Polypharmacy 5+ daily incl. anti-inflammatory. Comorbidity flag.
Z91.81	History of falling	Fear-of-falling documented; History-of-Falls subscore 3%/12%.

07 Therapy Category & Visit Planning

Part A home health payment is episode-based (PDGM), not service-unit-based. Therapy categories below use CMS Medicare Benefit Policy Manual descriptor language (public domain) instead of CPT codes (AMA-copyrighted). The agency's billing system maps categories to codes internally per the agency's own AMA license.

Therapy Category (CMS descriptor)	Discipline	Visits / 30 days	LINDERA Evidence + Skilled-Service Justification
Gait Training Therapy	PT	12 (3×/wk × 4 wk)	Walking speed 0.3 m/s (94.8% gain, still below community 0.8 m/s). Step length asymmetry 18/15 cm. Progressive speed + step equalization with skilled cueing.
Neuromuscular Re-education	PT	Bundled with gait	Forward lean normalized 9.9°→<5°; lateral tilt 15.4°→<3°. Persistent post-stroke asymmetry. Weight-shift + dual-task training adapted for dementia.
Therapeutic Exercises	PT	Bundled with gait	Arthritis + chronic pain + post-stroke deconditioning. 94.8% speed gain confirms response — continued skilled dosing indicated.
Self-Care / Home Management Training	OT	8 (2×/wk × 4 wk)	Wheelchair transfers = primary fall mechanism. Urgency incontinence creates time-pressured transfers. ADL adaptation for wheelchair + vision impairment.
Wheelchair Management / Propulsion Training	OT	Bundled with self-care	Wheelchair-dependent with backward tilt risk. Brake operation + positioning + transfer technique training.
Skilled Nursing Assessment & Management	SN	4 (1×/wk × 4 wk)	Polypharmacy monitoring (anti-inflammatory + cardiovascular). Orthostatic screening. Care coordination across disciplines.
Home Health Aide	HHA	12 (3×/wk × 4 wk)	Bathing and ADL support consistent with M1830 response 3.

08 Plan of Care — Measurable, Time-Bound Goals

Medicare requires goals that are specific, measurable, and time-bound. Each row below anchors to objective LINDERA data, the matching Section GG item, or patient-reported function — so progress is audit-verifiable without subjective interpretation.

Domain	Baseline / Current	Short-Term Goal (30 days)	Long-Term Goal (60 days)
Walking Speed	0.3 m/s (household ambulator)	≥ 0.4 m/s with contact-guard assist	≥ 0.5 m/s toward community ambulation
Step Length Symmetry	L 18 cm · R 15 cm · Δ 3 cm	L-R differential ≤ 2 cm with cueing	L-R differential ≤ 1 cm, unassisted cueing
Step Height	2.5 cm bilateral (below safe clearance)	≥ 3 cm bilateral over visual targets	≥ 3 cm bilateral without visual targets
Postural Alignment	Forward lean normalized (<5°); lateral tilt normalized (<3°)	Maintain normalized alignment during 5-min standing balance	Maintain during dual-task (cognitive + balance) for dementia adaptation
Fall Risk Score (Alves 2024)	34% (12-month prediction threshold)	≤ 28% (between 12-mo and 24-mo)	≤ 24% (24-month threshold)
Toilet Transfer Safety (GG0170F)	03 — Partial/moderate assist	04 — Supervision with verbal cues, 80% trials safe	05 — Setup only, independent transfer
Wheelchair Transfer (GG0170E)	03 — Partial/moderate assist	04 — Supervision; correct foot placement 4/5 trials	Independent with adaptive equipment
Fear of Falling (patient report)	Activity limitations reported	Tolerates supervised transfer without verbal reassurance request	Initiates toileting transfer independently at night with safety protocol

09 Face-to-Face Physician Summary

One-page clinical summary the certifying physician may attach to the F2F encounter note to substantiate home health eligibility and the primary diagnosis. Contents below are derived from objective LINDERA measurements — the physician retains sole responsibility for certification decisions.

Suggested F2F attachment language (physician edits as appropriate)

Patient: John Doe. DOB: [insert]. Certification period: [insert].

Homebound status: Patient is wheelchair-dependent with walking speed 0.154 m/s at initial assessment and 0.3 m/s currently (community ambulation threshold 0.8 m/s). Ambulation limited to household distances with assistance. Leaving home requires considerable and taxing effort (wheelchair + caregiver escort). Homebound status per §30.1 is met.

Need for skilled care: LINDERA Mobility Analysis (validated: Azhand et al. 2021; Alves et al. 2024) documents Fall Risk Score 34% (≥32% = 12-month fall prediction threshold). Objective gait deficits: asymmetric step length (L 18 cm / R 15 cm), step height 2.5 cm (below safe floor clearance), persistent post-stroke hemiparetic pattern. Skilled PT and OT services are medically necessary to progress gait, consolidate postural gains, and train safe wheelchair transfers — the documented primary fall mechanism for this patient.

Primary diagnosis supporting certification: I69.351 Hemiplegia and hemiparesis following cerebral infarction affecting right dominant side — objectively validated by asymmetric gait pattern (L > R step length consistent with right-side affection) and persistent hemiparetic signature across both assessments.

Secondary diagnoses: R26.2, R26.81, F03.90, G89.29, M19.90, Z79.1.

Encounter reason and findings: [physician documents this section — must match the primary diagnosis certified above, per Medicare Benefit Policy Manual Ch. 7 §30.5.1.2].

10 30-Day Progress Documentation

Pre-written from objective LINDERA data. Review, adapt, and incorporate into the 30-day progress note or recertification summary.

Measure	Initial (t0)	Current (t1)	Change	Interpretation
Fall Risk Score	46%	34%	-12 pts (-26.1%)	Crossed from 6-mo to 12-mo prediction threshold. Effective response.
Walking Speed	0.154 m/s	0.3 m/s	+94.8%	Near-doubling; immobility → household ambulator.
Forward Lean	9.9°	0°–5°	Normalized	Severe anterior displacement resolved.
Sideways Tilt	15.4°	< 3°	Normalized	Lateral instability resolved.
Gait Symmetry	Asymmetric	Asymmetric	Persistent	Chronic post-stroke signature. Continued NMRE indicated.
Step Height	2.68 cm	2.5 cm	Stable	Trip risk persists below 3 cm safe clearance.

Progress narrative

Patient demonstrates objectively measured improvement following 26 days of skilled therapy. Fall Risk Score decreased 46% → 34% ($p = 0.960$ vs 24-month follow-up; Alves et al. 2024). Walking speed improved 94.8% (0.154 → 0.3 m/s). Postural alignment normalized in both the sagittal (forward lean) and coronal (lateral tilt) planes. Persistent deficits: walking speed below community threshold, gait asymmetry consistent with chronic post-stroke pattern, step height below safe clearance, FRS above the 12-month prediction threshold. Continued skilled services medically necessary to prevent regression and progress toward the 24-month threshold target (<24%).

11 Medical Necessity Statement

Combined evidence package for Part A home health certification and recertification. All measurements reproducible via LINDERA Mobility Analysis.

Medical Necessity — Part A Home Health

John Doe is a homebound, wheelchair-dependent patient with post-stroke hemiplegia (I69.351), arthritis, chronic pain, and dementia who requires continued skilled therapy and nursing to address objectively documented mobility deficits and reduce validated 12-month fall risk.

LINDERA Mobility Analysis (Azhand 2021; Alves 2024) documents Fall Risk Score 34% ($\geq 32\%$ threshold = 12-month fall prediction; $\rho = 0.960$, $P < .001$, $n = 617$). This represents a 26.1% relative improvement from 46% (6-month threshold) over 26 days, confirming response to skilled services.

Objective gait analysis: walking speed 0.3 m/s (+94.8% from 0.154 m/s, still below community threshold 0.8 m/s), asymmetric step length consistent with right-dominant hemiparesis, step height 2.5 cm below safe clearance, forward lean normalized, lateral tilt resolved, persistent post-stroke gait asymmetry.

Skilled services medically necessary: Gait Training Therapy, Neuromuscular Re-education, Therapeutic Exercises (PT); Self-Care / Home Management Training and Wheelchair Management (OT); Skilled Nursing for polypharmacy and care coordination.

Without continued skilled intervention, gains are at risk of regression given the combined burden of stroke, arthritis, dementia, chronic pain, and polypharmacy. Continued certification justified.

12 Denial Risk & Audit Readiness

Audit readiness per Pine Valley AL denial driver. Shows where this report closes the gap and where operational discipline by the agency is still required.

Pine Valley AL Denial Driver	Closed By Section	Residual Action Required	Denial Risk	Readiness
1. M1840 inconsistent with GG + eval	§04 OASIS Crosswalk	Clinician applies recommended M-item responses.	LOW	STRONG
2. Timing miscoded Early vs Late	§03 Episode Classification	Intake runs CWF prior-episode lookup.	LOW	STRONG
3. Primary Dx not supported	§06 ICD-10 Mapping	Clinician selects from ranked candidates.	LOW	STRONG
4. Admission source miscoded	§03 Episode Classification	Intake verifies 11X bill type before coding institutional.	LOW	STRONG
5. F2F does not cover certified Dx	§09 F2F Physician Summary	Agency attaches summary; MD integrates into F2F note.	LOW-MED	GOOD
6. Missed 50-day dispute window	Out of scope for this report	Agency builds an appeal calendar with 30-day, 45-day alerts. §13 provides the letter template.	HIGH	AGENCY PROCESS

13 Appeal Letter Template

Pre-drafted Level 1 dispute letter. Fill bracketed fields and attach the full LINDERA report. Submit within 50 days of the EXL findings notification — the operational control missed in the Pine Valley/Frailey case.

Level 1 Dispute — Home Health Claim Review
 To: EXL Home Health Audit Coordinator
 Re: Audit ID [#####], Patient [Name], Claim No. [#####], DOS [#####]
 Date: [within 50 days of EXL findings notification]

Dear EXL Audit Coordinator:

Pine Valley AL respectfully disputes the findings in the referenced audit and requests reconsideration based on the following objective evidence, submitted in accordance with Medicare Benefit Policy Manual Chapter 7.

1. Consistency of OASIS M-items with Section GG and therapy evaluation.

The submitted OASIS M1840 / M1850 / M1860 responses are supported by the paired Section GG items and by objective mobility analysis. Walking speed (0.3 m/s), asymmetric step length (L 18 cm / R 15 cm), and step height (2.5 cm) were measured via validated AI gait analysis (Azhand et al., Scientific Reports 2021; 11: 14065) and reconcile with the clinician's response levels. Per the Alves et al. prognostic validation (JMIR Aging 2024; 7: e55681; $p = 0.960$, $P < .001$, $n = 617$), the patient's Fall Risk Score of 34% falls at the 12-month fall-prediction threshold — substantiating continued need for skilled services.

2. Primary diagnosis supported by the medical record.

Primary diagnosis I69.351 (hemiplegia and hemiparesis following cerebral infarction, right dominant) is objectively validated by the asymmetric gait pattern documented in the attached LINDERA reports (initial and current). The F2F encounter (attached) covers this diagnosis and substantiates home health eligibility.

3. Episode timing and admission source.

[Insert: prior-episode CWF lookup result and/or hospital bill-type verification to support the submitted timing and admission source codes.]

We request the audit finding be reversed in full and the original payment reinstated.

Attachments:

- (1) LINDERA Clinical Documentation Report DPM-HH-JD-[#####] (initial + current)
- (2) F2F Encounter Note
- (3) OASIS and Section GG submission record
- (4) Plan of Care with measurable goals

Sincerely,

[Name], RN — Provider Representative, Pine Valley AL

14 Clinical Validation References

Peer-reviewed publications supporting the measurements in this report. Cite in appeal letters and F2F attachments.

- **Azhand A, Rabe S, Müller S, Sattler I, Heimann-Steinert A. Algorithm based on one monocular video delivers highly valid and reliable gait parameters. Scientific Reports. 2021; 11: 14065. Validates gait parameter extraction vs. GAITRite gold standard.**
- Rabe S, Azhand A, Pommer W, Müller S, Steinert A. Descriptive Evaluation and Accuracy of a Mobile App to Assess Fall Risk in Seniors. JMIR Aging. 2020; 3(1): e16131. AUC 0.86, sensitivity 93%, specificity 58% (n = 242).
- Strutz N, Brodowski H, Kiselev J, Heimann-Steinert A, Müller-Werdan U. App-Based Evaluation of Older People's Fall Risk Using Lindera Mobility Analysis. JMIR Aging. 2022; 5(3): e36872. Validated vs. Berg Balance Scale, Tinetti, TUG.
- **Alves SA et al. Evaluating the Prognostic and Clinical Validity of the Fall Risk Score. JMIR Aging. 2024; 7: e55681. Prognostic validity: $p = 0.960$, $P < .001$, $n = 617$. Thresholds: $\geq 45\%/6$ mo, $\geq 32\%/12$ mo, $\geq 24\%/24$ mo.**

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This report provides clinical documentation support based on validated mobility analysis. It does not constitute medical diagnosis, treatment prescription, or billing code selection. The treating therapist and certifying physician are solely responsible for clinical decisions, treatment planning, and code selection. LINDERA Mobility Analysis does not replace clinical judgment.