Research / Analytics Addendum

Patient: | DOB/age 79 (redacted)| Study date: xx/xx/2026 (redacted) | Dataset: pelvis / hips, sacroiliac joints, lumbar spine

Reformatted and expanded research-tier addendum. Existing analytic content has been preserved and restructured for readability. Added content includes an explicit score applicability panel, a composite index panel, and a confidence / concordance panel. Single-timepoint limitations remain stated explicitly; no longitudinal deltas or cross-modality outputs are imputed where inputs are absent.

Quantitative Radiologic Measures

Image-derived ordinal burden scale used below: 0 = none, 1 = minimal, 2 = mild, 3 = moderate, 4 = severe / end-stage.

1) Axial Structural Matrix

Region / level	Dominant structural process	Disc-loss burden	Endplate sclerosis / remodeling	Flowing / bridging ossification	Facet burden	Laterality / asymmetry	Confidence
Lower thoracic junction (partially visualized)	Flowing non-marginal ossification	1-2	1-2	Present, contiguous into thoracolumbar junction	NA	Right-anterolateral dominant	Moderate
T12-L1	Degenerative disc disease + ossific overlap	2	2	Near-bridging / flowing	0-1	Right-anterolateral dominant	High
L1-L2	Advanced degenerative disc disease	4	4	Complete or near-complete bulky bridging on the right	1	Right dominant	High
L2-L3	Advanced degenerative disc disease	4	4	Complete or near-complete bulky bridging on the right	1	Right dominant	High
L3-L4	Degenerative disc disease / spondylosis	2	1-2	Non-bridging osteophytes	1	Mild right-lateral predominance	High
L4-L5	Mild degenerative disc disease	1	1	Small non-bridging osteophytes	2	Mild lower-lumbar degenerative predominance	High
L5-S1	Mild degenerative disc disease	1	1	No convincing bridging	2	Symmetric to mildly asymmetric	High

2) Alignment and Morphology Audit

Metric	Result	Confidence
Coronal curvature	Mild-to-moderate thoracolumbar / upper-lumbar dextroconvex scoliosis with mild lower-lumbar compensatory countercurve	High
Sagittal alignment	No high-grade fixed sagittal malalignment on provided static lateral views	Moderate
Listhesis	No definite high-grade listhesis identified	Moderate
Vertebral height loss	No acute compression morphology detected on provided views	High
Destructive osseous pattern	Not seen on current radiographs	High

3) Sacroiliac / Pelvis / Hip Structural Matrix

Region	Structural process	Burden	Distribution / morphology	Asymmetry	Confidence
Right sacroiliac joint	Chronic non-erosive sacroiliac degeneration / condensans-like change	2	Inferior iliac-sided sclerosis and mild marginal irregularity; no ankylosis	Greater than left	High
Left sacroiliac joint	Chronic non-erosive sacroiliac degeneration / condensans-like change	1	Mild inferior iliac-sided sclerosis / irregularity; no ankylosis	Less than right	High
Right hip	Mild osteoarthrosis	2	Slight superior joint-space loss with small marginal osteophytes	Near-symmetric	High
Left hip	Mild osteoarthrosis	2	Slight superior joint-space loss with small marginal osteophytes	Near-symmetric	High
Pubic symphysis	Mild degeneration	1	Mild sclerosis / irregularity	Symmetric	High
Greater trochanter entheses	Enthesopathic change	Right 1 / Left 2	Left greater trochanter more conspicuous	Left greater than right	High
Iliac crest entheses	Enthesopathic change	Right 2 / Left 1	Crest spurring / irregularity	Right greater than left	High

4) Flowing Ossification / DISH-Pattern Audit

Audit item	Result	Comment	Confidence
Minimum contiguous vertebral-body span with flowing / near-flowing ossification	Criterion met	At least 4 contiguous vertebral bodies are involved on the provided thoracolumbar / upper-lumbar views	High
Ossification morphology	DISH-pattern	Bulky flowing non-marginal right-anterolateral ossification rather than thin marginal syndesmophytes	High
Disc preservation at involved levels	Not cleanly satisfied	Bridged / near-bridged upper lumbar levels also show severe degenerative disc loss, vacuum change, and marked endplate remodeling	High
Sacroiliac inflammatory exclusion	No erosive sacroiliitis / no ankylosis seen	Mild chronic non-erosive degenerative / condensans-like SI change only	High
Research-tier phenotype summary	DISH-pattern ossification with superimposed advanced degenerative spondylosis	Mixed axial ossific-degenerative phenotype rather than isolated textbook DISH-only spine	High

5) Score Summary / Applicability Statement

Domain	Score / framework	Status	Rendered statement
Thoracolumbar ossific-degenerative spine	Formal named validated mixed-pattern spine score	Not separately computed	Current dataset is rendered through the level-by-level burden matrix and contiguous-vertebra DISH-pattern audit; no single formal named score was applied in this manual reconstruction.
Sacroiliac joints	Inflammatory sacroiliitis grading	Not assigned	Morphology is mild, non-erosive, and degenerative / condensans-like rather than inflammatory; therefore a formal inflammatory grade was not rendered.
Hips	Formal OA score	Not separately tabulated	Mild bilateral structural OA burden is described directly in the pelvis / hip structural matrix without a separate named score line.
Longitudinal delta scores	Delta-based structural scoring	Not computable	Single-timepoint study; no matched priors were available for delta scoring or interval classification.

Temporal Stability Analysis

Study type: single-timepoint only.

Numeric longitudinal deltas: not available.

Temporal stability score: not computable without matched priors.

Baseline State Vector

Domain	Baseline class
Axial mechanical / degenerative burden	High
Flowing thoracolumbar ossific burden	High
Sacroiliac chronic non-erosive burden	Mild
Hip OA burden	Mild
Compression-fracture burden	None detected on current study

Age-Adjusted Reference Values

Domain	Age-context statement	Certainty
Bilateral hip OA	Mild burden; broadly age-concordant	Moderate
Pubic symphysis degeneration	Mild burden; age-concordant	Moderate
Sacroiliac chronic sclerosis	Mild chronic burden; compatible with age-related / mechanical change	Moderate
Upper lumbar degeneration	Structurally prominent within this exam, exceeding the burden seen in the lower lumbar levels	High
Formal age-normalized percentile / reference-curve output	Not computable from radiographs alone in this manual reconstruction	High

Symmetry Metrics

Metric	Result
Global pattern	Mixed asymmetry
Dominant axial side	Right-anterolateral thoracolumbar / upper-lumbar ossification predominance
Sacroiliac asymmetry	Right greater than left
Hip symmetry	Near-symmetric mild bilateral OA
Enthesial asymmetry	Left greater trochanter greater than right; right iliac crest greater than left
Balance interpretation	Right axial / right SI predominance with counterbalancing left trochanteric enthesopathic emphasis

DEXA-Radiograph Correlation Summary

Item	Result
DEXA dataset available	No
DEXA-linked radiograph correlation	Not computable
Gross diffuse osteopenic collapse pattern	Not evident on current radiographs
Vertebral fragility-fracture morphology	Not seen on provided views
Bone-health research inference	Limited by absent densitometric data

Composite Index Panel

Composite metric	Status / class	Interpretive note
Radiographic Severity Index (RSI)	High overall axial burden; formal scalar not computed	Driven by scoliosis, severe L1-L2 / L2-L3 degeneration, and contiguous thoracolumbar DISH-pattern ossification.

Composite metric	Status / class	Interpretive note
Composite Damage / Trajectory Index (CDTI)	Not computable	Single-timepoint study; no matched prior dataset for temporal weighting or damage-trajectory calculation.
Composite Discrepancy Class (CDC)	Mixed-process overlap present	Strong DISH-pattern morphology coexists with severe upper-lumbar degenerative disc collapse and endplate remodeling.
Stability band	Not assignable	Temporal stability band cannot be assigned without longitudinal data.
Discrepancy class summary	Axial ossific-degenerative overlap; low inflammatory structural discordance	Radiographic pattern supports mixed mechanical / enthesopathic ossification rather than erosive inflammatory sacroiliitis or syndesmophytic disease.

Composite Trajectory Summary

Composite domain	Class	Basis
Overall axial structural burden	High	Scoliosis + severe L1-L2 / L2-L3 degeneration + flowing thoracolumbar ossification
Pelvic / appendicular burden	Low-to-moderate	Mild SI, hip, pubic symphysis, and enthesopathic changes
Mechanical-degenerative dominance	High	Severe disc loss, vacuum change, endplate sclerosis / remodeling, OA distribution
Inflammatory structural signature	Low	No erosive sacroiliitis, no ankylosis, no syndesmophytic pattern
Ossific enthesopathic signature	High	Contiguous flowing non-marginal right-anterolateral bridging
Mixed-process classification	Degenerative + DISH-pattern ossification + mild chronic non-erosive SI degeneration	
Fracture-signal class	No radiographic vertebral compression signal on this study	

Confidence / Concordance Metrics

Metric	Rendered output	Notes
Primary reliability map	High for lumbar alignment / disc degeneration / large bridging osteophytes; high for SI and hip structural screening	Downgraded only by partial lower thoracic field-of-view and absence of cross-modality correlation.
Confidence weighting	High overall with localized moderation at the proximal thoracolumbar extent	Static radiographs support confident structural description but not direct nerve-root, soft-tissue, or marrow-edema assessment.
Concordance index	Not computable as a formal scalar in this reconstruction	No external human-baseline dataset, dual-reader comparator, or cross-modality reference was supplied.
Missing concordance inputs	External comparator; matched prior study; DEXA; MRI / CT	Missing inputs explain why formal concordance and temporal weighting remain suppressed rather than estimated.

QA / Reliability Indicators

Category	Result
Pelvis / hip adequacy	Adequate for structural OA and enthesopathic assessment; limited for occult chondral / labral pathology
Sacroiliac adequacy	Adequate for structural sclerosis / ankylosis / gross erosive screening
Lumbar adequacy	Adequate for alignment, disc degeneration, endplate change, large osteophytes / bridging, and vertebral height assessment
Neural / soft-tissue limitation	Radiographs do not directly resolve disc herniation, nerve-root compression, piriformis pathology, marrow edema, or inflammatory soft tissue
Laterality confidence	High
Exact proximal thoracic extent of flowing ossification	Limited by partial thoracic field-of-view
External concordance metric	Not computable; no external human-baseline dataset supplied in this reconstruction
Missingness summary	No priors, no DEXA, no MRI / CT, no flexion-extension views, no full cervical / thoracic series

Experimental Research Addendum

Exploratory Composite Metrics

Exploratory metric	Result	Status
Axial load-transfer hotspot	L1-L3 dominant	Exploratory
Ossification-degeneration overlap class	High overlap	Exploratory
Pattern discordance flag	Present	Strong DISH-pattern morphology coexists with severe disc degeneration at involved levels
Lower-lumbar compensation class	Mild compensatory	Exploratory
Mechanical concentration map	Upper lumbar > lower lumbar	Exploratory

Exploratory Extended Axial Phenotype Map

Subdomain	Exploratory readout
Ossific phenotype	Right-anterolateral flowing / bridging dominant
Degenerative phenotype	Upper-lumbar disc collapse / sclerosis / vacuum dominant
SI phenotype	Mild chronic non-erosive inferior iliac-sided change
Hip phenotype	Mild symmetric OA
Whole-study phenotype	Mixed axial ossific-degenerative spine with low inflammatory structural signal

Exploratory Bone-Health Context

Item	Result
Extended densitometric modeling	Not available; no attached DEXA
Exploratory fragility signal	Low on current radiographs; no compression morphology seen
Bone-quality discordance analysis	Not computable

Exploratory Non-destructive Safety Scan

Domain	Exploratory result
Aggressive lytic / permeative process	Not identified radiographically

Domain	Exploratory result
Vertebral collapse pattern	Not identified
Sacroiliac erosive inflammatory pattern	Not identified
Advanced destructive hip process	Not identified

Advanced Symmetry Map

Region pair	Higher-order asymmetry readout
Right vs left SI joint	Mild right-dominant chronic change
Right vs left hip	Low asymmetry
Right vs left trochanteric entheses	Left-dominant
Right vs left iliac crest entheses	Right-dominant
Axial right vs left ossification field	Marked right-dominant

External / Integrative Hooks

Module	Result
External AI integration	Not supplied
Cross-modality fusion	Not available
Electrophysiology-linked root concordance	Not available
Snapshot reconstruction source	Not available in current manual read

Data Integrity Extensions

Integrity field	Result
Single-point-only flag	Yes
Longitudinal matrix completeness	Not applicable
Densitometric completeness	Missing
Cross-modality completeness	Missing

Integrity field	Result
Experimental layer conflict with clinical core	None identified
Token / internal-label exposure	None rendered

This document preserves the existing research and experimental content while adding missing explicit analytic blocks that were absent or only implicit in the original addendum. No clinical narrative has been altered here.