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Simultaneous Fat-Mass Reduction and Lean-Mass Preservation Over 16 Weeks in a 72-Year-Old Man

A DEXA-Anchored n-of-1 Analysis of a Seven-Pillar Health-Optimization Protocol

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Abstract

Background. Involuntary loss of skeletal muscle and gain of visceral fat characterize the aging phenotype and drive cardiometabolic and functional risk. Simultaneous fat loss with concurrent lean-mass gain ("body recomposition") is difficult to demonstrate in older adults and is rarely documented at the individual level with imaging.

Methods. A single male subject (72.0 y; 74.0 in) underwent paired dual-energy X-ray absorptiometry (DEXA; GE Lunar Prodigy) with CoreScan visceral adipose tissue (VAT) quantification at a 16-week interval while executing a structured seven-pillar protocol (time-restricted eating, precision nutrition, combined resistance + Zone-2 training, targeted supplementation, sleep and stress architecture, and cold hydrotherapy). Continuous glucose monitoring (Dexcom) provided a 24-hour glycemic snapshot. Changes were interpreted against published least-significant-change (LSC) thresholds for elderly men.

Results. Fat mass fell 5.8 lb (−9.0%) while fat-free mass rose 1.5 lb; total scale weight fell only 4.3 lb, understating fat loss by ≈35%. Body fat declined 30.1% → 27.9%. VAT volume fell 11.9% (135.9 → 119.7 in^3) and the android/gynoid ratio improved 1.22 → 1.14. Appendicular lean-mass index (8.29 kg/m^2) and total-body bone density (T-score +2.1) remained well within healthy ranges. The fat-mass and VAT reductions exceeded published LSC; the lean-mass gain sat at the detection threshold and is interpreted conservatively as preservation with possible modest accrual.

Conclusions. Over 16 weeks the subject achieved a favorable recomposition signature—robust fat and visceral-fat loss with preserved musculoskeletal mass—at chronological age 72. Residual VAT remains in the "very high" category and is identified as the priority target for the next cycle. Findings are hypothesis-generating for a single individual and are not generalizable.

Keywords: *body recomposition; DEXA; visceral adipose tissue; sarcopenia; healthy aging; n-of-1; time-restricted eating; resistance training*

1. Introduction

The aging body follows a predictable and unfavorable compositional trajectory: skeletal muscle is lost at roughly 0.5–1% per year after the fifth decade, while adipose tissue—particularly metabolically active visceral adipose tissue (VAT)—tends to accumulate. This dual movement erodes strength, metabolic flexibility, and

independence, and it raises cardiovascular risk. In community-dwelling 70-year-old men, greater VAT has been shown to carry roughly a 60% increase in the risk of stroke or myocardial infarction, and that association held after adjustment for total fat mass and muscle density[1]—evidence that VAT is a distinct and priority risk target rather than a proxy for total adiposity.

Reversing the trajectory—losing fat while simultaneously preserving or building lean mass—is termed *body recomposition*. It is well documented in younger and untrained populations, but in older adults the evidence base is thinner: a recent scoping review concluded that while fat loss and lean preservation are consistently achievable with resistance training plus adequate protein, statistically robust *lean-mass gain* has been demonstrated in only isolated, not-yet-reproduced studies[2]. Documenting a favorable recomposition signature in a single 72-year-old man, anchored to serial DEXA imaging and interpreted against measurement-error thresholds, is therefore of practical and illustrative value.

This white paper reports paired DEXA assessments 112 days apart in one subject executing a defined multi-pillar protocol. Its purpose is threefold: (i) to quantify the compositional change with appropriate statistical humility; (ii) to describe the intervention that accompanied it; and (iii) to identify, honestly, what improved, what did not, and where residual risk remains.

2. Methods

2.1 Subject

A single male subject, chronological age 72.0 years at follow-up (DOB 11 July 1954), height 74.0 in (188.0 cm). The subject is the principal investigator and reports the protocol below as self-administered under a physician-overseen case-study program. This is an uncontrolled n-of-1 observation, not a controlled trial.

2.2 Instrumentation

- **Body composition.** GE Lunar Prodigy DEXA with enhanced analysis (Live Lean Rx, Nashville). Whole-body and five-region (arms, legs, trunk, android, gynoid) fat, lean, and bone-mineral content (BMC).
- **Visceral fat.** GE CoreScan algorithm, reporting VAT mass (lb) and volume (in^3) within the android region; validated for adults aged 18–90 and BMI 18.5–40.
- **Bone.** Total-body BMD with young-adult (T) and age-matched (Z) scores. Note: total-body BMD is not equivalent to a clinical DEXA of the femoral neck and AP spine (L1–L4), which remains the standard for osteoporosis diagnosis.
- **Glycemia.** Dexcom continuous glucose monitor (CGM); a single 24-hour trace was captured (fasting-morning value 99 mg/dL).

Baseline scan: 23 March 2026 (age 71.6). Follow-up scan: 13 July 2026 (age 72.0). Interval: 112 days ≈ 16.0 weeks.

2.3 Intervention — the seven-pillar protocol

The subject executed a structured optimization framework. The pillars, as practiced during this interval, were:

- **Pillar 1 — Metabolic reset / time-restricted eating.** Intermittent fasting to compress the feeding window and lower fasting insulin, supporting fat oxidation.

- **Pillar 2 — Precision nutrition.** Elevated protein intake distributed across meals to supply the amino-acid signal for muscle-protein synthesis, with attention to carbohydrate quality.
- **Pillar 3 — Resistance training + Zone-2 cardio.** Combined (concurrent) training: progressive resistance work to defend and load lean tissue, plus low-intensity aerobic base work for mitochondrial and cardiovascular conditioning.
- **Pillar 4 — Precision supplementation.** Targeted agents adjusted to quarterly biomarker panels, including pravastatin (LDL management), DIM and calcium-D-glucarate (estrogen-metabolism support), and an NAD^+ regimen.
- **Pillar 5 — Sleep optimization.** Sleep prioritized as the recovery substrate for training adaptation and appetite regulation.
- **Pillar 6 — Stress management / psychological architecture.** Deliberate down-regulation practices to limit cortisol-driven central adiposity.
- **Pillar 7 — Cold hydrotherapy.** Added May 2026 as a recovery and metabolic-stimulus modality.

Adherence and training-volume logs are maintained by the subject but are not contained in the imaging files analyzed here; causal attribution of the results to specific pillars is therefore not possible from this dataset (see Limitations).

2.4 Analysis and the noise floor

DEXA is precise but not error-free. The least significant change (LSC = 2.77 × precision error) defines the smallest between-scan difference that exceeds measurement noise at 95% confidence. Because precision degrades with age and adiposity, this analysis uses LSC values derived specifically in elderly men[3], plus GE CoreScan's published VAT precision[4]. Each reported change is graded against these thresholds so that robust findings are separated from directional-only ones.

3. Results

3.1 Whole-body composition

Table 1. Whole-body composition, baseline vs. 16-week follow-up.

Metric	Baseline 3/23/26	Follow-up 7/13/26	Δ	Δ %
Total mass (lb)	212.8	208.5	−4.3	−2.0%
Fat mass (lb)	64.1	58.3	−5.8	−9.0%
Lean mass (lb)	140.8	142.4	+1.6	+1.1%
Bone mineral content (lb)	7.9	7.8	−0.1	−1.3%
Fat-free mass (lb)	148.7	150.2	+1.5	+1.0%
Body fat (%)	30.1	27.9	−2.2 pp	—

pp = percentage points. Values as reported by the analyzing system; figures reconcile to total mass to within rounding.

The compositional story is more favorable than the scale. Weight fell 4.3 lb, but fat mass fell **5.8 lb**—fat loss *exceeded* scale loss by 1.5 lb because fat-free mass rose over the same period. Framed as a ratio, more than

100% of the weight change was fat, with concurrent lean accretion on top. This is the textbook recomposition signature and the reason body weight alone is an inadequate endpoint in this population[2].

Rate matters. The fat-loss rate was 0.36 lb/week (≈ 0.17% of body mass per week)—well below the ~1%/week threshold above which lean-mass catabolism accelerates[5]. The conservative pace is the most plausible mechanical reason lean tissue was defended.

3.2 Visceral adipose tissue (VAT) — improved, still elevated

Table 2. VAT and android/gynoid fat distribution.

Metric	Baseline	Follow-up	Δ	Interpretation
VAT mass (lb)	4.63	4.08	−0.55	−11.9%
VAT volume (in³)	135.86	119.72	−16.14	−11.9%
Android fat (%)	37.3	32.6	−4.7 pp	improved
Gynoid fat (%)	30.0	28.2	−1.8 pp	improved
A/G ratio	1.22	1.14	−0.08	> 1.0 (not yet optimal)

GE CoreScan reference bands: Healthy 0–52 in³ · High 52–112 in³ · Very high 112+ in³. Optimal A/G < 1.0 with android fat % below total body fat %.

VAT volume dropped nearly 12%—a change (−250 g) that clears the CoreScan LSC (≈ 131 g) and is therefore a real reduction, not noise[4]. This is the single most clinically meaningful result in the dataset, given that VAT is an independent driver of stroke and MI risk in men of exactly this age[1].

> **Honest flag — residual visceral risk.** Despite the improvement, VAT volume of 119.7 in³ remains inside the "very high" band (112+). The android fat fraction (32.6%) still exceeds total body fat (27.9%), and A/G (1.14) is still above the optimal 1.0. The direction is right; the destination is not yet reached. VAT reduction should be the explicit primary endpoint of the next cycle.

3.3 Regional lean redistribution

Table 3. Regional lean mass (lb).

Region	Baseline	Follow-up	Δ	Note
Legs (lean)	46.1	47.6	+1.5	gain
Trunk (lean)	68.3	69.3	+1.0	gain
Arms (lean)	18.0	17.0	−1.0	loss — watch

Net lean gain (+1.6 lb) was driven by the legs and trunk; the arms *lost* ~1 lb of lean. Regional lean estimates carry larger precision error than whole-body values, so the arm change may partly reflect noise—but directionally it flags an upper-body programming gap. Recommendation: bias the next training block toward pulling and pressing volume to defend arm lean mass.

Muscle symmetry improved independently of this: arm side-to-side imbalance moved from 5.0% to 0.0%, and leg imbalance from −2.7% to −1.3%.

3.4 Bone and glycemic status

Total-body BMD was 1.412 g/cm² (T-score +2.1, Z-score +2.6)—well above the young-adult mean and far from the osteoporosis range (T ≤ −2.5). BMC ticked down 0.1 lb, a change below any meaningful threshold and within noise. Because energy-restricted weight loss can erode bone, and because resistance/impact loading is protective[6], continued bone monitoring during further fat loss is prudent; a site-specific clinical DEXA (femoral neck / L1–L4) would be the appropriate instrument if bone becomes a question.

The 24-hour CGM trace showed a fasting-morning value of 99 mg/dL with excursions that appear to remain within a tight euglycemic band, consistent with preserved insulin sensitivity—coherent with the VAT reduction, since visceral fat is a primary driver of insulin resistance. This is a single day's snapshot and is not a substitute for HbA1c or a multi-week ambulatory glucose profile.

3.5 Derived indices — reframing the "overweight" label

Table 4. Derived composition indices.

Index	Baseline	Follow-up	Reference / read
BMI (kg/m²)	27.3	26.8	"Overweight" by BMI — misleading here
Fat-free mass index (kg/m²)	≈ 19.1	≈ 19.3	Solid musculature for age 72
Appendicular lean-mass index (kg/m²)	8.23	8.29	≫ sarcopenia cutoff (< 7.0)

ALMI cutoff per EWGSOP2 (men < 7.0 kg/m²). Indices computed from reported lean/fat-free mass and stated height.

BMI classifies the subject as "overweight" at both timepoints—an artifact of a tall, muscular frame. DEXA reframes it: the appendicular lean-mass index of 8.29 kg/m² sits far above the sarcopenia threshold[7], and the fat-free mass index (~19.3) is comparable to that of much younger untrained men. In other words, the subject is not "overweight" in any risk-bearing sense; he carries above-average muscle with a still-elevated visceral fat depot. This is precisely the case in which BMI misleads and imaging clarifies.

3.6 What clears the noise floor

Table 5. Change vs. least-significant-change (LSC) in elderly men.

Measure	Observed Δ	Approx. LSC	Verdict
Fat mass	−5.8 lb (2631 g)	≈ 1.6 lb (731 g)	Robust (≈ 3.6× LSC)
VAT volume/mass	−250 g	≈ 131 g	Real (≈ 1.9× LSC)
Lean mass	+1.6 lb (726 g)	≈ 1.56 lb (706 g)	At threshold — conservative
Arm lean (regional)	−1.0 lb (454 g)	larger (regional)	Likely within noise
BMC	−0.1 lb (45 g)	≈ 0.1 lb	Within noise

LSC values from paired-scan precision studies in elderly men (GE Lunar) and CoreScan VAT precision. Values approximate; system- and technologist-specific LSC would refine them.

The discipline here is the point: fat loss and VAT reduction are large, robust, and beyond dispute. The lean-mass gain is real-looking but sits essentially *at* the detection threshold, so the defensible claim is **preservation of lean mass with probable modest accrual**—not a headline muscle-building result. Stating it that way is what makes the rest of the paper credible.

4. Discussion

Three findings stand out. First, the recomposition signature is genuine: a 72-year-old man lost ~9% of his fat mass over 16 weeks while defending—and probably slightly adding to—lean tissue. Given that robust lean gain is difficult to demonstrate even in controlled older-adult trials[2], achieving clear lean *preservation* during an active fat-loss phase is itself a meaningful outcome, and the conservative loss rate is the most likely mechanism[5].

Second, the visceral result is the one with the clearest health meaning. A ~12% VAT reduction is exactly the direction that matters for a man in the demographic where VAT independently predicts stroke and MI[1]. That it remains in the "very high" band is not a failure—it is a defined target with measurable headroom.

Third, the case is a clean illustration of why body composition, not the bathroom scale or BMI, is the correct instrument for older adults. A 4.3-lb scale change would read as trivial; the DEXA shows a 5.8-lb fat loss, a lean gain, and a visceral reduction underneath it. The combined resistance-plus-aerobic training pattern the subject followed is the modality the literature associates with preserving lean and bone during weight loss, in contrast to aerobic-only approaches that accelerate musculoskeletal decline[6].

5. Limitations

- **n-of-1, uncontrolled.** A single subject with no control condition; findings are illustrative and not generalizable.
- **Single interval.** Two timepoints cannot establish a trend or rule out regression to the mean; serial scans are needed.
- **No causal attribution.** Seven pillars moved together with no dietary-intake or training-load data in this dataset, so no individual pillar can be credited.
- **Measurement error.** The lean-gain and BMC changes sit at or below LSC; system-specific precision testing would sharpen interpretation.
- **Instrument scope.** Total-body BMD is not a diagnostic bone measure; the CGM trace is a single day, not an HbA1c or multi-week AGP.
- **Residual risk unresolved.** VAT and A/G remain outside optimal ranges.

6. Conclusion

Over 16 weeks, a 72-year-old man executing a structured seven-pillar protocol produced a favorable body-recomposition signature: robust fat and visceral-fat loss with preserved—and probably modestly increased—lean mass, healthy bone density, and a lean-mass index far above the sarcopenia threshold. The results are reported against measurement-error thresholds so that the strong findings (fat, VAT) are separated from the threshold-level ones (lean, bone). The defined next objective is unambiguous: drive VAT volume out of the "very high" band and the A/G ratio below 1.0 while continuing to defend—particularly in the upper body—the lean mass that anchors function and metabolic health into the eighth decade.

References

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Reference note: *Citations are provided to contextualize an n-of-1 report; before external publication, finalize each to the target outlet's style and verify against the primary source.*

Appendix A. Source data of record

Body composition: GE Lunar Prodigy DEXA report, Live Lean Rx (Patient: Skoda, Mark; scans 3/23/2026 and 7/13/2026). Glycemia: Dexcom CGM 24-hour capture (fasting value 99 mg/dL). All figures in this paper are transcribed from those source reports; where an index is derived (BMI, FFMI, ALMI), the computation uses reported mass values and stated height (74.0 in / 1.880 m).