SYNTHETIC / RESEARCH ONLY

Unified Health & Device Report - Executive summary

GROUND MEDICAL ATTESTATION PENDING: 13 of 13 included records

Attested 0 · not attested 13 · revoked 0 · earlier record version 0.
Records awaiting attestation: E001-E013 (see Section 5).
Intake acceptance is a data-entry confirmation, not a Ground Medical attestation.

SCIENTIFIC INTERPRETATION: PENDING INDEPENDENT REVIEW

0 interpretations are scientifically validated (PENDING_NIKOLAS_REVIEW). Handbook statements in Section 3 are hypotheses for qualified review.

Mission	SYNTHETIC SAMPLE - research only - not clinically validated (ID synthetic-sample-mission)
Astronaut	Synthetic Crew 01 (fictional) (ID synthetic-crew-01)
Provenance	SYNTHETIC
Generated (UTC)	2026-11-06T00:00:00.000Z
Reporting filter	earliest record to latest record
Observed date range	2026-09-01T07:30:00.000Z to 2026-10-13T07:30:00.000Z
Sources selected	Bone, Immune, Cardiovascular, Behavioral, Wearable, Device

Record counts

Included (active) records	13
Pending human review	0
Excluded records	0 (superseded by correction 0, marked erroneous 0, duplicate projections 0)
Domains with data	Bone 2, Immune 2, Cardiovascular 7, Behavioral 2
Missing domains	Wearable, Device (absence is not a negative finding)

At a glance (descriptive only)

- 5 metric(s) observed; 5 show a descriptive first-to-last recorded difference across different days; 0 have fewer than two comparable time points.

Research-use-only assessment. Not clinically validated. Not a medical diagnosis or treatment recommendation.

Not a diagnosis, readiness or fitness-for-duty assessment. No clinical thresholds, causal claims or scientific approval are implied. Not endorsed by NASA.

Generated locally by MITOCHONDRIA - https://mitochondria.edocinfo.com

1. Descriptive findings

Metric	n	First -> last	Difference	Evidence
cv-001	4	58 -> 72 bpm	14 bpm	E001, E006, E011, E013 - E013: DEMONSTRATION ANNOTATION (DEMO-cv-001 v0.0-demo) - not an approved medical decision
cv-027	3	62 -> 48 ms	-14 ms	E002, E007, E012 - E012: DEMONSTRATION ANNOTATION (DEMO-cv-027 v0.0-demo) - not an approved medical decision
bone-001	2	300 -> 360 pg/mL	60 pg/mL	E003, E008
IMM-001	2	6.1 -> 5.4 10^9/L	-0.7 10^9/L	E004, E009
BSC-002	2	88 -> 81 %	-7 %	E005, E010

Adverse-value assessment: rows marked DEMONSTRATION ANNOTATION are illustrative synthetic examples printed in dark red with a text marker; they are not approved medical decisions. All other values: Not assessed / scientific review pending.

Values and units are shown exactly as recorded; no unit conversion or display equivalence is applied. First/last differences are descriptive at the recorded precision; they are not trends, thresholds or clinical changes.

Governed cross-domain research context (no association inferred)

Context	Observed signals	Missing signals	Time coverage (UTC)	Evidence
immune / behavioral	none	salivary cortisol, sleep duration, immune cell function	none	none
immune / bone	CTX: 2 observation(s)	IL-6, 25(OH) vitamin D	2026-09-01T07:32:00Z to 2026-09-15T07:32:00Z	E003, E008
behavioral / cardiovascular	HRV RMSSD: 3 observation(s)	sleep duration, workload	2026-09-01T07:31:00Z to 2026-09-29T07:31:00Z	E002, E007, E012

No cross-domain association, temporal alignment, causality or clinical significance is inferred from partial coverage or co-observation.

Evidence coverage and comparability

Domain	Included records	Distinct metrics	Recorded UTC coverage
Bone	2	1	2026-09-01T07:32:00.000Z to 2026-09-15T07:32:00.000Z
Immune	2	1	2026-09-01T07:33:00.000Z to 2026-09-15T07:33:00.000Z
Cardiovascular	7	2	2026-09-01T07:30:00.000Z to 2026-10-13T07:30:00.000Z
Behavioral	2	1	2026-09-01T07:34:00.000Z to 2026-09-15T07:34:00.000Z
Wearable	0	0	not observed

Domain	Included records	Distinct metrics	Recorded UTC coverage
Device	0	0	not observed

Coverage counts describe available evidence, not overall astronaut health. Uneven sampling, different observation times, unrecorded measurement methods and missing domains limit comparisons. A first-to-last difference is not a validated trend; no normal/abnormal classification, diagnosis or fitness-for-duty conclusion is made.

2. Limitations, missing data and uncertainty

- Research-use-only. Not clinically validated. Not a medical diagnosis, risk classification, readiness score or treatment recommendation.
- Values and units are shown exactly as recorded; no unit conversion, reference range, threshold or trend inference is applied.
- A missing domain, metric or date is not a negative clinical finding. Records are not a complete medical history.
- Device and wearable rows appear only when a persisted scalar observation declares a canonical metric, value, unit, time, source, quality and explicit synthetic/real provenance.
- Human verification of a row is a data-entry confirmation, not scientific or clinical approval. Catalog review states are unchanged.
- Report contents stay in this browser; nothing is uploaded or synchronized by generating, printing or exporting the report.
- Descriptive first/last comparisons do not establish statistical significance, clinical relevance, causality or a sustained trend.
- Cross-domain links require relevant co-observed signals and are context hypotheses, not calculated correlations.
- Interpretation is limited to authorized, included rows within the selected mission, crew, provenance and date filters.
- A qualified medical professional must independently review evidence before issuing any clinical opinion.
- Two-point differences carry no statistical significance; measurement method, timing, specimen handling and device quality are not evaluated by this summary.
- Missing domains: Wearable, Device. Missing data is not a negative finding.

Handbook-listed related measures (possible confounding context)

Metric	Related measures (documented)
cv-001	Association with BP, SV, posture, ECG
cv-027	Rest/posture

Researcher module physiological evidence interpretation (research only)

This section separates recorded changes from possible biological context. A measured difference is not an abnormality, clinical trend, diagnosis or fitness-for-duty finding. Ground Medical attestation verifies evidence provenance, not scientific interpretation.

Intake acceptance	13 - Rows accepted one by one in Unified Intake; confirms data entry, not scientific validity.
Ground Medical attestation	0 - Verifies evidence provenance for the exact record version; not a scientific interpretation or clinical opinion.
Scientific interpretation approval	0 - None approved. All handbook context and catalog mappings remain PENDING_NIKOLAS_REVIEW.

Bone Health

2 included observation(s) across 1 metric/unit series; 1 with two or more comparable time points on different recorded days, 0 same-UTC-day only, 0 with insufficient comparable time points.

Governance: Astronaut Bone Health Handbook v7 (Nikolas). Exact catalog-ID handbook text, machine-assisted English, PENDING_NIKOLAS_REVIEW; shown only as pending hypotheses.

Metric / unit (as recorded)	Recorded observation	Coverage / review	Evidence
bone-001 | pg/mL	Last reading higher than first by 60 pg/mL (300 → 360 pg/mL, 2026-09-01T07:32:00.000Z to 2026-09-15T07:32:00.000Z). Descriptive first-to-last difference only.	2 reading(s), 2 UTC day(s). SYNTHETIC · CSV: synthetic-sample-kit.csv. Quality: No quality recorded; quality is not inferred. Ground Medical: 0 attested · 2 not attested · 0 revoked · 0 earlier record version.	E003, E008

- bone-001 [pg/mL] biological context: Handbook context for an increase: Possibly more intense osteoclastic resorption. Pending hypothesis for the recorded direction; not validated and not a finding about this crew member. Source: Astronaut Bone Health Handbook v7 (Nikolas); status: pending_independent_review; approval: PENDING_NIKOLAS_REVIEW.

Limitations: Only two readings; no trend is established. Individual baseline, method, timing, specimen handling and confounders are not evaluated. Descriptive observations only; physiological significance requires qualified review of baseline, method, quality, timing and confounders.

Cardiovascular Health

7 included observation(s) across 2 metric/unit series; 2 with two or more comparable time points on different recorded days, 0 same-UTC-day only, 0 with insufficient comparable time points.

Governance: NASA Cardiovascular Handbook (Nikolas). Exact catalog-ID handbook text, machine-assisted English, PENDING_NIKOLAS_REVIEW; shown only as pending hypotheses.

Metric / unit (as recorded)	Recorded observation	Coverage / review	Evidence
cv-001 | bpm	Last reading higher than first by 14 bpm (58 → 72 bpm, 2026-09-01T07:30:00.000Z to 2026-10-13T07:30:00.000Z). Descriptive first-to-last difference only.	4 reading(s), 4 UTC day(s). SYNTHETIC · CSV: synthetic-sample-kit.csv. Quality: No quality recorded; quality is not inferred. Ground Medical: 0 attested · 4 not attested · 0 revoked · 0 earlier record version.	E001, E006, E011, E013
cv-027 | ms	Last reading lower than first by 14 ms (62 → 48 ms, 2026-09-01T07:31:00.000Z to 2026-09-29T07:31:00.000Z). Descriptive first-to-last difference only.	3 reading(s), 3 UTC day(s). SYNTHETIC · CSV: synthetic-sample-kit.csv. Quality: No quality recorded; quality is not inferred. Ground Medical: 0 attested · 3 not attested · 0 revoked · 0 earlier record version.	E002, E007, E012

- cv-001 [bpm] biological context: Handbook context: HR↑ may compensate for SV↓ or reflect exercise; HR↓ may be physiological at rest. Pending hypothesis; the handbook gives general context rather than direction-specific text. Source: NASA Cardiovascular Handbook (Nikolas); status: pending_independent_review; approval: PENDING_NIKOLAS_REVIEW.
- cv-027 [ms] biological context: Handbook context: Influenced by breathing/artefacts. Pending hypothesis; the

handbook gives general context rather than direction-specific text. Source: NASA Cardiovascular Handbook (Nikolas); status: pending_independent_review; approval: PENDING_NIKOLAS_REVIEW.

Limitations: Individual baseline, method, timing, specimen handling and confounders are not evaluated. Descriptive observations only; physiological significance requires qualified review of baseline, method, quality, timing and confounders.

Immune Health

2 included observation(s) across 1 metric/unit series; 1 with two or more comparable time points on different recorded days, 0 same-UTC-day only, 0 with insufficient comparable time points.

Governance: No governed exact-ID handbook mapping; interpretation PENDING_NIKOLAS_REVIEW and none is generated.

Metric / unit (as recorded)	Recorded observation	Coverage / review	Evidence
IMM-001 | 10^9/L	Last reading lower than first by 0.7 10^9/L (6.1 → 5.4 10^9/L, 2026-09-01T07:33:00.000Z to 2026-09-15T07:33:00.000Z). Descriptive first-to-last difference only.	2 reading(s), 2 UTC day(s). SYNTHETIC · CSV: synthetic-sample-kit.csv. Quality: No quality recorded; quality is not inferred. Ground Medical: 0 attested · 2 not attested · 0 revoked · 0 earlier record version.	E004, E009

- IMM-001 [10^9/L] biological context: No governed exact-ID handbook mapping exists for Immune Health; interpretation is pending scientific review and none is generated.

Limitations: Only two readings; no trend is established. Individual baseline, method, timing, specimen handling and confounders are not evaluated. Descriptive observations only; physiological significance requires qualified review of baseline, method, quality, timing and confounders.

Behavioral Health

2 included observation(s) across 1 metric/unit series; 1 with two or more comparable time points on different recorded days, 0 same-UTC-day only, 0 with insufficient comparable time points.

Governance: No governed exact-ID handbook mapping; interpretation PENDING_NIKOLAS_REVIEW and none is generated.

Metric / unit (as recorded)	Recorded observation	Coverage / review	Evidence
BSC-002 | %	Last reading lower than first by 7 % (88 → 81 %, 2026-09-01T07:34:00.000Z to 2026-09-15T07:34:00.000Z). Descriptive first-to-last difference only.	2 reading(s), 2 UTC day(s). SYNTHETIC · CSV: synthetic-sample-kit.csv. Quality: No quality recorded; quality is not inferred. Ground Medical: 0 attested · 2 not attested · 0 revoked · 0 earlier record version.	E005, E010

- BSC-002 [%] biological context: No governed exact-ID handbook mapping exists for Behavioral Health; interpretation is pending scientific review and none is generated.

Limitations: Only two readings; no trend is established. Individual baseline, method, timing, specimen handling and confounders are not evaluated. Descriptive observations only; physiological significance requires qualified review of baseline, method, quality, timing and confounders.

Cross-domain comparability

- Immune Health + Behavioral Health: missing salivary cortisol, sleep duration, immune cell function. No comparison is made; missing signals are not evidence of normal status. Evidence: none.
- Immune Health + Bone Health: missing IL-6, 25(OH) vitamin D. No comparison is made; missing signals are not evidence of normal status. Evidence: E003, E008.
- Behavioral Health + Cardiovascular Health: missing sleep duration, workload. No comparison is made; missing signals are not evidence of normal status. Evidence: E002, E007, E012.

Cross-domain hypotheses require co-observed, temporally comparable evidence and independent scientific review. No automatic risk classification, abnormality label, causal claim, treatment or medical recommendation is generated.

3. Handbook hypotheses (pending independent scientific review)

Statements quoted from the governed handbooks for observed directions of change. They are hypotheses for qualified review, not validated interpretations.

- cv-001 - recorded increase: Sinoatrial (sinus node) rate and autonomic regulation Handbook context: HR↑ may compensate for SV↓ or reflect exercise; HR↓ may be physiological at rest. Evidence E001, E006, E011, E013. [NASA Cardiovascular Handbook (Nikolas); pending_independent_review]
- cv-027 - recorded decrease: Short-term NN variability Handbook context: Influenced by breathing/artefacts. Evidence E002, E007, E012. [NASA Cardiovascular Handbook (Nikolas); pending_independent_review]
- bone-001 - recorded increase: Type I collagen fragment; indicates the rate of resorption. Handbook context for an increase: Possibly more intense osteoclastic resorption. Evidence E003, E008. [Astronaut Bone Health Handbook v7 (Nikolas); pending_independent_review]
- Gap: IMM-001 (IMM-001): no English handbook interpretation is documented for this catalog ID; no biological implication stated.
- Gap: BSC-002 (BSC-002): no English handbook interpretation is documented for this catalog ID; no biological implication stated.

4. Reviewer decisions (data-entry acceptance)

Intake acceptance confirms that a row was transcribed and reviewed; it is not scientific or clinical approval and not a Ground Medical attestation.

- Stored module observations (Health module entries): 0. Recorded in a Health module; a data-entry record, not a scientific approval.
- Reviewer-accepted intake observations (Unified Intake): 13. Accepted row by row in Unified Intake; reviewer confirmation is not scientific validation.
- Persisted device / wearable observations: 0. Scalar device rows with declared provenance; device quality is shown as recorded.
- Scientifically validated interpretations: 0. None. All handbook interpretations and catalog mappings remain pending independent scientific review (PENDING_NIKOLAS_REVIEW).
- Bone: 2 included (0 module, 2 intake); Medical Intake accepted 2. Counts are consistent.
- Immune: 2 included (0 module, 2 intake); Medical Intake accepted 2. Counts are consistent.
- Cardiovascular: 7 included (0 module, 7 intake); Medical Intake accepted 7. Counts are consistent.
- Behavioral: 2 included (0 module, 2 intake); Medical Intake accepted 2. Counts are consistent.

5. Ground Medical evidence attestation (optional second stage)

Attested 0 · not attested 13 · revoked 0 · stale (earlier record version) 0 · 0 audit event(s). Attestation confirms an evidence record only; it never changes catalog or scientific review status and is not a legal signature.

Awaiting Ground Medical attestation (13): E001-E013.

6. Chronological records (active versions only)

Observed (UTC)	Source	Metric	Value	Unit	GM	Ref
2026-09-01T07:30:00Z	Cardiovascular	cv-001	58	bpm	Pending	E001
2026-09-01T07:31:00Z	Cardiovascular	cv-027	62	ms	Pending	E002
2026-09-01T07:32:00Z	Bone	bone-001	300	pg/mL	Pending	E003
2026-09-01T07:33:00Z	Immune	IMM-001	6.1	10^9/L	Pending	E004
2026-09-01T07:34:00Z	Behavioral	BSC-002	88	%	Pending	E005
2026-09-15T07:30:00Z	Cardiovascular	cv-001	61	bpm	Pending	E006
2026-09-15T07:31:00Z	Cardiovascular	cv-027	55	ms	Pending	E007
2026-09-15T07:32:00Z	Bone	bone-001	360	pg/mL	Pending	E008
2026-09-15T07:33:00Z	Immune	IMM-001	5.4	10^9/L	Pending	E009
2026-09-15T07:34:00Z	Behavioral	BSC-002	81	%	Pending	E010
2026-09-29T07:30:00Z	Cardiovascular	cv-001	64	bpm	Pending	E011
2026-09-29T07:31:00Z	Cardiovascular	cv-027	48	ms	Pending	E012
2026-10-13T07:30:00Z	Cardiovascular	cv-001	72	bpm	Pending	E013

7. Corrected, superseded and erroneous records

Append-only history: originals are never rewritten or deleted. Only the latest corrected version appears in the active records and findings above.

No corrected or erroneous records in this scope.

8. Qualified Ground Medical follow-up considerations

- A qualified Ground Medical reviewer may consider whether the recorded differences in cv-001, cv-027, bone-001, IMM-001, BSC-002 are relevant in the crew member's full clinical context.
- These are considerations for qualified human review only — not recommendations, diagnoses, treatment or fitness-for-duty judgments.

Appendix A. Evidence index (full identifiers)

Every reference used above resolves here to the full immutable record ID, observation time, metric and source trace.

Ref	Record ID	Observed (UTC) / metric	Source and evidence trace
E001	synthetic-sample-cv-001-1	2026-09-01T07:30:00Z cv-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E002	synthetic-sample-cv-027-1	2026-09-01T07:31:00Z cv-027	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E003	synthetic-sample-bone-001-1	2026-09-01T07:32:00Z bone-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E004	synthetic-sample-IMM-001-1	2026-09-01T07:33:00Z IMM-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E005	synthetic-sample-BSC-002-1	2026-09-01T07:34:00Z BSC-002	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E006	synthetic-sample-cv-001-2	2026-09-15T07:30:00Z cv-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E007	synthetic-sample-cv-027-2	2026-09-15T07:31:00Z cv-027	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E008	synthetic-sample-bone-001-2	2026-09-15T07:32:00Z bone-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E009	synthetic-sample-IMM-001-2	2026-09-15T07:33:00Z IMM-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E010	synthetic-sample-BSC-002-2	2026-09-15T07:34:00Z BSC-002	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E011	synthetic-sample-cv-001-3	2026-09-29T07:30:00Z cv-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000…
E012	synthetic-sample-cv-027-3	2026-09-29T07:31:00Z cv-027	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000… · DEMONSTRATION ANNOTATION (DEMO-cv-027 v0.0-demo) - not an approved medical decision
E013	synthetic-sample-cv-001-4	2026-10-13T07:30:00Z cv-001	CSV: synthetic-sample-kit.csv · unified-intake · csv · sha256 0000000000000000… · DEMONSTRATION ANNOTATION (DEMO-cv-001 v0.0-demo) - not an approved medical decision

Appendix B. Excluded and pending records

None.

Appendix C. Ground Medical attestation audit history

No attestation events.

Appendix D. Medical Intake history narrative

- bone (fact): 2 reviewer-confirmed bone health observation(s) are available. Reviewer confirmation does not establish scientific validity. [E003, E008]
- immune (fact): 2 reviewer-confirmed immune changes observation(s) are available. Reviewer confirmation does not establish scientific validity. [E004, E009]

- cardiovascular (fact): 7 reviewer-confirmed cardiovascular health observation(s) are available. Reviewer confirmation does not establish scientific validity. [E001, E002, E006, E007, E011, E012, E013]
- behavioral (fact): 2 reviewer-confirmed behavioral health observation(s) are available. Reviewer confirmation does not establish scientific validity. [E005, E010]
- bone (limitation): Available records do not constitute a complete medical history. Absence of recorded findings must not be interpreted as absence of disease. Scientific review and measurement-method context may be pending.

Excluded from narrative: 0 unreviewed, 0 erroneous, 0 other provenance. 5 descriptive first/last comparison(s) with the same evidence are shown in Section 1 and not repeated.

Appendix E. Interpretation review status and boundaries

- Bone (data present): Astronaut Bone Health Handbook v7 (Nikolas). Handbook text quoted by exact catalog ID; machine-assisted English pending independent scientific review.
- Immune (data present): No governed handbook interpretation is available; interpretation is pending scientific review and none is stated.
- Cardiovascular (data present): NASA Cardiovascular Handbook (Nikolas). Handbook text quoted by exact catalog ID; machine-assisted English pending independent scientific review.
- Behavioral (data present): No governed handbook interpretation is available; interpretation is pending scientific review and none is stated.
- Bone: 2 observation(s) across 1 metric(s), 2026-09-01T07:32:00.000Z to 2026-09-15T07:32:00.000Z; 1 metric(s) show a first-to-last recorded difference.
- Immune: 2 observation(s) across 1 metric(s), 2026-09-01T07:33:00.000Z to 2026-09-15T07:33:00.000Z; 1 metric(s) show a first-to-last recorded difference.
- Cardiovascular: 7 observation(s) across 2 metric(s), 2026-09-01T07:30:00.000Z to 2026-10-13T07:30:00.000Z; 2 metric(s) show a first-to-last recorded difference.
- Behavioral: 2 observation(s) across 1 metric(s), 2026-09-01T07:34:00.000Z to 2026-09-15T07:34:00.000Z; 1 metric(s) show a first-to-last recorded difference.
- Biological implications are quoted from Nikolas's handbooks (machine-assisted English, pending independent scientific review) and describe the measure, not this crew member's condition.
- AI-assisted drafts are unverified, are kept separate from these findings and are excluded from PDF and TXT exports.