

Decode Your Labs

The blood work reference for South Asian women. Standard lab ranges were established from Western European study populations. This guide presents the narrower thresholds associated with better metabolic outcomes in South Asian women, based on published clinical research.

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The Twelve Markers

Most standard panels include three or four of these. The remainder require a specific request. This section explains what each test measures and why it matters for South Asian women in particular.

Fasting Insulin

Not the same as fasting glucose

Detects insulin resistance years before glucose rises. South Asian women develop insulin resistance at lower body weights. This is the earliest signal.

HOMA-IR

Calculated from insulin + glucose

The gold standard for quantifying insulin resistance. Most labs do not calculate it automatically. Ask your doctor to derive it: $(\text{fasting insulin} \times \text{fasting glucose}) \div 405$.

HbA1c

Glycated haemoglobin

A three-month average of blood sugar. South Asian metabolic risk is associated with lower HbA1c values than the conventional prediabetes threshold.

TSH

Thyroid-stimulating hormone

Governs metabolism, energy, hair growth, and weight regulation. Values above 2.5 are associated with subclinical symptoms in South Asian women, though many labs flag only above 4.5.

Free T4 and Free T3

Active thyroid hormones

TSH alone misses thyroid hormone conversion problems. Free T4 and Free T3 together reveal whether the thyroid is producing adequately and whether the body is converting T4 into its active form.

Ferritin

Stored iron — not serum iron

The primary driver of hair loss, dark circles, and unexplained fatigue in South Asian women. Lab reference ranges begin at 12, but research links hair shedding and fatigue to levels below 40.

Vitamin D

25-hydroxy vitamin D

Higher melanin concentration reduces cutaneous vitamin D synthesis. Deficiency prevalence in South Asian women exceeds 70 per cent across most published studies, even in sunny climates.

Vitamin B12

Cobalamin

Vegetarian and plant-forward dietary patterns common in South Asian households gradually deplete B12 stores over years. Low B12 presents as fatigue, dark circles, tingling, and cognitive fog.

DHEA-S

Adrenal androgen

Often elevated in South Asian women with PCOS. Unlike ovarian androgens, DHEA-S originates from the adrenal glands and drives acne, facial hair growth, and scalp hair thinning through a separate hormonal pathway.

Free Testosterone

Not total testosterone

Free testosterone is the biologically active fraction. Elevated levels drive the visible symptoms of PCOS — acne, hirsutism, androgenic alopecia. Total testosterone often appears normal while free testosterone is elevated.

AMH

Anti-Müllerian hormone

Reflects ovarian reserve and can support a PCOS diagnosis when elevated. Interpretation is age-dependent. Relevant for fertility planning and for confirming a polycystic ovarian pattern.

hs-CRP

High-sensitivity C-reactive protein

A systemic inflammation marker. South Asians carry a disproportionately higher cardiovascular risk, and hs-CRP helps quantify the inflammatory component of that risk.

Reference Ranges

Standard range is the interval printed on your laboratory report, typically representing the central 95th percentile of a reference population. **Optimal** is the narrower interval associated with better metabolic outcomes in published research on South Asian populations. These are discussion points for your clinician — not diagnostic cutoffs.

In nearly every row below, the standard range is substantially wider than the optimal range. A result marked “normal” on your report may fall outside the range where South Asian women tend to thrive.

MARKER	STANDARD	OPTIMAL	CLINICAL NOTE
Fasting Insulin	2.6 – 24.9 µIU/mL	< 8 µIU/mL	Above 8 suggests developing insulin resistance even when glucose is normal. Correlates with visceral fat storage and fatigue.
HOMA-IR	< 2.5	< 1.5	South Asian insulin resistance risk increases above 1.5, not 2.5. Calculated: (insulin × glucose) ÷ 405.
HbA1c	< 5.7%	< 5.3%	Prediabetes risk in South Asians may begin around 5.3%. A “normal” 5.5% warrants monitoring.
Fasting Glucose	70 – 99 mg/dL	72 – 90 mg/dL	A “normal” 95+ is a metabolic warning for South Asian biology. Pair with fasting insulin.
TSH	0.45 – 4.5 mIU/L	0.5 – 2.5 mIU/L	Above 2.5, symptoms often begin — fatigue, hair loss, weight gain, cold intolerance, brain fog.
Free T4	0.82 – 1.77 ng/dL	1.0 – 1.5 ng/dL	Low-normal Free T4 with symptoms suggests thyroid underperformance even when TSH appears within range.
Ferritin	12 – 150 ng/mL	40 – 100 ng/mL	Below 40: expect hair shedding, dark circles, fatigue. A “normal” ferritin of 15 is functionally depleted.
Vitamin D	30 – 100 ng/mL	50 – 70 ng/mL	Below 40 is common in South Asian women regardless of sun exposure. Linked to fatigue, low mood, and bone loss.
Vitamin B12	200 – 900 pg/mL	500 – 800 pg/mL	Below 400 is associated with fatigue, dark circles, and nerve symptoms. Depletes slowly on plant-forward diets.
DHEA-S	35 – 430 µg/dL	Age-dependent	Elevated DHEA-S in younger women suggests adrenal-driven androgen excess. Interpret alongside free testosterone.
Free Testosterone	0.2 – 5.0 pg/mL	< 2.0 pg/mL	Above 2.0 with symptoms (acne, facial hair, thinning hair) is clinically significant even if within standard range.
hs-CRP	< 3.0 mg/L	< 1.0 mg/L	South Asians carry elevated cardiovascular risk. Values above 1.0 warrant attention alongside other metabolic markers.

* Optimal ranges are drawn from published research including the MASALA Study, Lancet Diabetes & Endocrinology South Asian cardiometabolic analyses, ADA position statements on ethnic-specific thresholds, and JCEM subclinical thyroid studies. They are not diagnostic criteria. Individual clinical context always applies.

Symptom Cross-Reference

Begin from what you are experiencing. Each entry lists the markers most frequently implicated in South Asian women, along with the clinical reasoning. This is a starting point for conversation with your doctor — not a diagnostic tool.

Hair loss or thinning

Ferritin · TSH · Free T4 · Vitamin D · DHEA-S

Hair follicles are among the last tissues to receive nutrients when the body is depleted. Ferritin below 40, subclinical thyroid dysfunction, and adrenal androgen excess are the most common drivers. External treatments (oils, supplements applied topically) address conditioning but cannot compensate for internal deficiency.

Persistent dark circles

Ferritin · B12 · TSH

South Asian periorbital skin is thinner and contains more melanin than most other populations. Deficiencies in iron storage and B12 manifest in this area before they become clinically apparent elsewhere. Dark circles that do not respond to sleep improvement or topical treatment warrant blood work.

Abdominal fat at normal weight

Fasting Insulin · HOMA-IR · HbA1c · hs-CRP

South Asian women store more visceral fat at lower body mass indices. This is a well-documented metabolic pattern, not a behavioural issue. Insulin resistance is typically the mechanism, and it precedes glucose elevation by years. Waist-to-hip ratio is often more informative than BMI.

Chronic fatigue

TSH · Free T4 · B12 · Ferritin · Vitamin D

Fatigue that persists despite adequate sleep is not a personality trait. These five markers explain the majority of cases in clinical practice. Subclinical thyroid dysfunction and iron depletion are disproportionately prevalent in South Asian women and frequently coexist.

Irregular menstrual cycles

Free Testosterone · DHEA-S · AMH · Fasting Insulin · TSH

PCOS, thyroid dysfunction, and insulin resistance all independently disrupt ovulatory cycles, and in South Asian women they frequently overlap. A comprehensive workup distinguishes which pathway is driving the irregularity and allows targeted intervention.

Premature skin ageing and dullness

HbA1c · Fasting Insulin · hs-CRP · Vitamin D

Glycation — the process by which circulating sugar binds to collagen and degrades it — accelerates skin ageing from within. Chronic low-grade inflammation compounds the effect. These markers capture what no skincare product can address.

Acne and unwanted facial hair

Free Testosterone · DHEA-S · Fasting Insulin

Androgen excess drives both symptoms. Insulin resistance amplifies androgen production, creating a self-reinforcing cycle. Addressing insulin resistance often reduces androgen-driven symptoms more effectively than treating them in isolation.

Unexplained weight gain

TSH · Fasting Insulin · HOMA-IR · Free T4

When dietary and exercise interventions fail to produce results, the cause is usually hormonal or metabolic rather than behavioural. Subclinical hypothyroidism and insulin resistance are the two most common culprits in this population.

Appointment Scripts

Clinicians respond to specificity. These scripts are designed to communicate what you need clearly and to provide clinical rationale when needed. Adapt the language to your own voice.

REQUESTING THE FULL PANEL

“I would like to order a comprehensive metabolic panel that includes fasting insulin with a HOMA-IR calculation, HbA1c, a full thyroid panel — TSH, free T4, and free T3 — along with ferritin, vitamin D, B12, and hs-CRP. I am South Asian and aware that standard reference ranges may not reflect optimal thresholds for my population.”

WHEN RESULTS ARE REPORTED AS “NORMAL”

“Could I see the actual numerical values rather than just a normal or abnormal flag? I would like to compare them against thresholds that have been studied in South Asian populations, where metabolic risk tends to emerge at lower values.”

IF THE CLINICIAN QUESTIONS THE SCOPE OF TESTING

“I understand this is broader than a standard panel. South Asian women have a significantly higher prevalence of insulin resistance and metabolic syndrome at lower BMIs. These tests help establish a baseline before issues become clinically apparent and harder to address.”

FOR A PCOS-SPECIFIC EVALUATION

“In addition to the standard PCOS workup, I would like fasting insulin, DHEA-S, free testosterone, and AMH included. Published research shows that South Asian women with PCOS experience more severe metabolic complications. A broader panel supports earlier and more targeted intervention.”

Preparing for your appointment

Fast for 10–12 hours before blood draw (water is fine). Schedule the appointment for morning, when fasting insulin and glucose values are most accurate. Bring this document. Write your symptoms and their duration on a separate sheet — specificity helps. If a test is declined, ask that the refusal be documented in your medical record; this often changes the decision.

Want your results interpreted by someone who understands your biology?

Merah Health is a telehealth platform built for South Asian women.
Book a metabolic panel review and have your numbers assessed against
ranges that reflect your population — not a generic reference.

merahhealth.com

This document is for educational purposes only and does not constitute medical advice, diagnosis, or treatment. The “optimal” ranges presented are based on published research on South Asian populations and are intended as discussion points with your healthcare provider, not as diagnostic criteria. Always consult a qualified healthcare professional before making decisions about your health. Individual needs vary. — Merah Health provides telehealth consultations, not diagnostic services. Free to share. Not for resale. © Merah Health.