
Number Dictionary

Every number in the book, as a short card. Look up the name you see on your screen; if your device calls it something else, the “On your device” line and the Brand Lookup will lead you here. A label applies only to the claim just before it.

At a glance, by verdict

Trust: Bedtime and wake time; ECG recording on a watch; Heart rate during steady exercise; High blood pressure alert; High or low heart rate alert; Irregular rhythm alert; Resting heart rate; Sleep apnea alert; Steps while walking or running.

Watch: AI assistant advice; Blood oxygen (SpO₂); Body fat and muscle (bioimpedance); Breathing rate at night; Cycle and ovulation predictions; Heart rate during weights or intervals; Heart rate zones; HRV, overnight; Skin temperature, overnight; Steps when your arm doesn’t swing; Steps, weekly average; Total sleep time; Training load, recovery time; VO₂ max.

Ignore: 10,000-step target; Active calories, total calories; Blood pressure without a cuff; CGM readings, without diabetes; Energy scores; Fitness age, heart age, biological age; Maximum heart rate (estimated); “No alert”; Non-invasive blood sugar on a watch or ring; Readiness and recovery scores; Sleep score; Sleep stages (deep, REM, light); Stress score; Time awake at night.

10,000-step target

Kind: A built-in goal, not a measurement

How the device gets it: Set by default on many devices

Typical error: Doesn’t come from research

(■■■ Moderate evidence)

Verdict: **Ignore.** Set a target from your age and your own baseline

When to see a doctor: If your joints hurt from chasing it

Chapter: 6

Active calories, total calories

Kind: Estimated

How the device gets it: A formula from heart rate, movement and the details you entered; nothing measures calories at the wrist

Typical error: Badly off for any one person or session; no device had an error under 20% in one study

(■■■ Moderate evidence); two devices on the same person disagree **(■■■ Moderate evidence)**

Verdict: **Ignore** for planning meals. **Watch** the weekly trend on the same device

When to see a doctor: If tracking food, weight or calories makes you anxious or guilty (safety flag, Chapter 7)

On your device: Apple: Activity rings (Move ring)

Chapter: 7

AI assistant advice

Kind: Not a number, but advice built from your numbers

How the device gets it: A language model reading your data

Typical error: No trial has shown that in-app AI coaches make users healthier **(■■■ Unproven)**

Verdict: Use it to **understand** numbers, not to make health decisions

When to see a doctor: If its advice differs from your doctor's, ask your doctor

On your device: Oura: Oura Advisor

Chapter: 14

Bedtime and wake time

Kind: Estimated, but the part devices estimate best

How the device gets it: When you start and stop lying still, plus heart rate

Typical error: Small; can be off if you read or scroll in bed for a long time. Regular sleep goes with lower risk of death (■■■ **Moderate evidence**)

Verdict: **Trust.** Look at how regular it is across days

When to see a doctor: Trouble sleeping several nights a week for several weeks, affecting your days

On your device: Part of the sleep data on every device

Chapter: 8

Blood oxygen (SpO₂)

Kind: Estimated

How the device gets it: Red and infrared light reflected from the skin

Typical error: Off by up to about 2 percentage points; may read higher than the truth in people with darker skin (■■■ **Moderate evidence**); not for diagnosis or for replacing a fingertip oximeter when ill (■■■ **Moderate evidence**)

Verdict: **Watch,** compared with yourself

When to see a doctor: Clearly below your usual for several nights with snoring or daytime sleepiness. **Emergency:** breathlessness, blue lips, confusion

On your device: Apple: Blood Oxygen app · Samsung: Vitals · Google: oxygen saturation (SpO₂) · Garmin: Pulse Ox

Chapter: 10

Blood pressure without a cuff

Kind: Estimated

How the device gets it: Light signals from the wrist, sometimes calibrated against a cuff

Typical error: Many features aren't authorized as medical monitors (■■■ **Strong evidence**)

Verdict: **Ignore** for diagnosis or treatment. Use a validated cuff monitor

When to see a doctor: A home cuff average of 130/80 or above. **Emergency:** very high readings with a severe headache, chest pain or weakness on one side

On your device: Samsung: Blood Pressure Trend ·

WHOOOP: Blood Pressure Insights

Chapter: 11

Body fat and muscle (bioimpedance)

Kind: Estimated

How the device gets it: A very weak electric current between your fingers

Typical error: Body fat off by about 14% compared with DXA; muscle mass worse (■■■ **Debated**)

Verdict: **Watch**, very loosely: same time, same position, trends over months

When to see a doctor: **Don't use** with a pacemaker, implanted defibrillator or other implant, or during pregnancy (safety flag, Chapter 11)

On your device: Samsung: Body Composition

Chapter: 11

Breathing rate at night

Kind: Estimated

How the device gets it: From the rise and fall of heart rate with each breath, and small chest movements

Typical error: Not enough studies to say how accurate it is; steady night to night in healthy people

Verdict: **Watch**, compared with yourself

When to see a doctor: Clearly higher than usual with fever or breathlessness

On your device: Apple: respiratory rate (Vitals app) · Samsung: Vitals · Google: breathing rate · Garmin: respiration · Oura: Respiratory Rate

Chapter: 10

CGM readings, without diabetes

Kind: Measured (a sensor under the skin)

How the device gets it: Sugar in tissue fluid every few minutes

Typical error: Readings are fairly real, but healthy people spike after meals too; no study has shown that wearing a CGM makes healthy people healthier (■■■ **Unproven**)

Verdict: **Ignore** (for healthy people). Don't worry about after-meal spikes

When to see a doctor: Often high, high when fasting, or low with symptoms; anxiety about food

On your device: Oura: Glucose Tracking (from a connected CGM)

Chapter: 12

Cycle and ovulation predictions

Kind: Estimated

How the device gets it: Past cycles plus overnight skin temperature

Typical error: Temperature shows ovulation after it has happened (■■■ **Debated**); only specifically authorized apps are contraception (■■■ **Strong evidence**)

Verdict: **Watch**, to understand your cycle. **Not contraception** unless the app is authorized for it

When to see a doctor: Marked changes in your cycle; choosing contraception (safety flag, Chapter 10)

On your device: Apple: Cycle Tracking · Samsung: Cycle Tracking · Garmin: Women's health tracking · Oura: Cycle Insights, Fertile Window · WHOOP: Natural Cycles Integration (an authorized app)

Chapter: 10

ECG recording on a watch

Kind: Measured (a single-lead heart tracing)

How the device gets it: Electrodes; you hold a finger on the crown or bezel for about 30 seconds

Typical error: Spots atrial fibrillation well (■■■ **Strong evidence**); can't see heart attacks, strokes or other heart problems (■■■ **Strong evidence**); "inconclusive" if you move or contact is poor

Verdict: **Trust**, for the question "was there atrial fibrillation during the recording?" Save it for your doctor

When to see a doctor: A result of atrial fibrillation; repeated "inconclusive" with symptoms. **Emergency:** chest pain, breathlessness, fainting, whatever the recording says

On your device: Apple: ECG app · Samsung: ECG · Google: ECG app · Garmin: ECG app · WHOOP: Heart Screener with ECG, On-demand AFib Detection

Chapter: 5

Energy scores

Kind: Scored

How the device gets it: The maker blends HRV, sleep, heart rate and activity

Typical error: Not checked against health outcomes
(■■■■ Unproven)

Verdict: **Ignore** the number. Ask your body first

When to see a doctor: If the score makes you anxious (Chapter 13)

On your device: Samsung: Energy Score · Garmin: Body Battery energy monitoring

Chapter: 9

Fitness age, heart age, biological age

Kind: Scored

How the device gets it: Usually an estimated VO₂ max or other estimates, compared with an age table the maker chose

Typical error: No independent validation found
(■■■■ Unproven)

Verdict: **Ignore** the number. Watch the VO₂ max trend instead

When to see a doctor: If early heart disease or diabetes runs in your family: ask for standard tests, not a score

On your device: Garmin: Fitness age · Oura: Cardiovascular Age · WHOOP: Healthspan, WHOOP Age · Samsung: Heart Health Score (closest)

Chapter: 12

Heart rate during steady exercise

Kind: Measured

How the device gets it: Green light and an optical sensor

Typical error: Small when worn correctly; under 5% during

cycling for most devices in one study

Verdict: **Trust**

When to see a doctor: Chest pain, breathlessness or fainting during exercise: stop and get help

On your device: Heart rate on every device

Chapter: 4

Heart rate during weights or intervals

Kind: Measured, but noisy

How the device gets it: Green light, disturbed by wrist bending and fast changes

Typical error: Wrist devices are less accurate; chest straps do better (■■■ **Moderate evidence**)

Verdict: **Watch.** Use a chest strap if you need accuracy

When to see a doctor: As above

On your device: Heart rate on every device

Chapter: 4

Heart rate zones

Kind: Estimated

How the device gets it: Percentages of an estimated maximum heart rate

Typical error: Inherits the error in maximum heart rate (■■■ **Moderate evidence**); can be off by a whole zone

Verdict: **Watch.** Check with the talk test

On your device: Apple: Heart Rate Zones · WHOOP: Heart Rate Zones

Chapter: 4

High blood pressure alert

Kind: Estimated

How the device gets it: Green-light signals analyzed over many days

Typical error: Usually right when it alerts; catches only about 4 in 10 people with blood pressure of 130/80 or above (■■■ **Moderate evidence**)

Verdict: **Trust an alert**, then recheck with a cuff. **No alert doesn't mean normal**

When to see a doctor: Any alert; a home cuff average of 130/80 or above (safety flag, Chapter 11)

On your device: Apple: Hypertension notifications

Chapter: 11

High or low heart rate alert

Kind: Estimated, against a threshold

How the device gets it: Resting heart rate compared with a threshold set by the maker or by you

Typical error: Depends on the threshold; a slow heart rate can be normal for some people

Verdict: Follow the safety flag in Chapter 4

When to see a doctor: With dizziness, breathlessness, chest pain or fainting: **emergency**. Repeated alerts without symptoms: book an appointment

On your device: Apple: Heart Rate app alerts

Chapter: 4

HRV, overnight

Kind: Measured

How the device gets it: Green light, measuring the gaps between beats during sleep

Typical error: Fairly close to ECG in healthy people, varying by device (■■■ **Debated**). Low HRV goes with higher heart risk (■■■ **Moderate evidence**), but raising the number hasn't been shown to help (■■■ **Unproven**)

Verdict: **Watch** your own trend over weeks. Don't compare between people or brands

When to see a doctor: A clear, unexplained drop for days with unusual tiredness, fever or breathlessness

On your device: Apple: Heart rate variability · Samsung: Vitals · Google: Heart-rate variability (HRV) · Garmin: HRV status · Oura: Heart Rate Variability

Chapter: 9

Irregular rhythm alert

Kind: Estimated

How the device gets it: Green light; the watch checks the

gaps between beats from time to time

Typical error: Rarely goes off; usually right when it does

(■ ■ ■ Moderate evidence)

Verdict: **Trust**, in the sense of booking an appointment within a few days

When to see a doctor: Every alert. **Emergency** if there are symptoms (safety flags, Chapter 5)

On your device: Apple: Irregular rhythm notifications ·

Samsung: Irregular Heart Rhythm Notification · Google:

Irregular Rhythm Notifications

Chapter: 5

Maximum heart rate (estimated)

Kind: Estimated

How the device gets it: An age formula such as 220 minus age

Typical error: Can be far off for individuals

(■ ■ ■ Moderate evidence)

Verdict: **Ignore** the number. Don't train to reach it

Chapter: 4

“No alert”

Kind: Not a number, but silence

Typical error: Watches don't look for heart attacks, strokes or most heart problems **(■ ■ ■ Strong evidence)**; high blood pressure alerts miss most people who have it

(■ ■ ■ Moderate evidence)

Verdict: **Ignore** as reassurance. Silence doesn't mean healthy

When to see a doctor: Symptoms always outrank the device

Chapters: 5, 11

Non-invasive blood sugar on a watch or ring

Kind: Estimated, if at all

How the device gets it: Light through the skin, with no sensor under it

Typical error: Not authorized for managing diabetes; the FDA warns against using it **(■ ■ ■ Strong evidence)**

Verdict: **Ignore. Dangerous** if used to decide medicines

When to see a doctor: Keep using a fingerstick meter or an authorized CGM (safety flag, Chapter 11)

Chapter: 11

Readiness and recovery scores

Kind: Scored

How the device gets it: The maker blends HRV, resting heart rate, sleep and more with an unpublished formula {L2}

Typical error: Not checked against health outcomes (■■■ **Unproven**)

Verdict: **Ignore** the number. Ask your body first

When to see a doctor: If the score makes you anxious or changes your plans against how you feel (Chapter 13)

On your device: Apple: Readiness app · Google: Readiness · Garmin: Training Readiness · Oura: Readiness Score · WHOOP: Recovery

Chapter: 9

Resting heart rate

Kind: Measured

How the device gets it: Green light and an optical sensor, usually during sleep

Typical error: About $\pm 3\%$ on average (■■■ **Strong evidence**); varies widely between people but is steady within each person (■■■ **Moderate evidence**)

Verdict: **Trust**, compared with your own usual level

When to see a doctor: A clear change from your usual for days, especially with dizziness, breathlessness, chest pain or fainting

On your device: Apple: Heart Rate · Samsung: Vitals · Google: Resting heart rate · Garmin: Resting Heart Rate · Oura: Resting Heart Rate

Chapters: 4, 15

Skin temperature, overnight

Kind: Measured (the change), not core temperature

How the device gets it: A temperature sensor against the skin during sleep

Typical error: The absolute number means little; a rise with resting heart rate can come days before an infection (■■■ **Debated**); it shifts with the menstrual cycle (■■■ **Debated**)

Verdict: **Watch** the change from your usual. If it rises with resting heart rate, rest

When to see a doctor: With fever, breathlessness or other symptoms

On your device: Apple: wrist temperature · Samsung: Vitals (skin temperature) · Google: skin temperature variation · Garmin: skin temperature · Oura: Body Temperature

Chapter: 10

Sleep apnea alert

Kind: Estimated

How the device gets it: Small breathing movements, over many nights

Typical error: Usually right when it alerts; misses about a third of moderate to severe cases (■■■ **Moderate evidence**)

Verdict: **Trust an alert.** No alert doesn't rule out sleep apnea

When to see a doctor: Any alert; loud snoring, pauses in breathing someone has seen, or daytime sleepiness, whatever the device says

On your device: Apple: Sleep apnoea notifications · Samsung: Sleep Apnea

Chapter: 10

Sleep score

Kind: Scored

How the device gets it: Total sleep, stages, wake-ups and heart rate blended by the maker

Typical error: Private formula that differs between brands (■■■ **Debated**); carries the errors of total sleep and stages

Verdict: **Ignore** the number. If you like, look only at trends

over weeks

When to see a doctor: If checking it keeps you awake (Chapter 13)

On your device: Apple: Sleep score · Samsung: Sleep Insight · Google: Sleep score · Garmin: Sleep Score · Oura: Sleep Score · WHOOP: Sleep

Chapter: 8

Sleep stages (deep, REM, light)

Kind: Estimated, and what devices guess worst

How the device gets it: Stillness and heart rate patterns, not brain waves

Typical error: Only moderate to poor agreement with polysomnography (■ ■ ■ **Moderate evidence**); worse in people with insomnia (■ ■ ■ **Debated**)

Verdict: **Ignore** single nights

When to see a doctor: Don't bring stage numbers as evidence; bring how you feel

On your device: Apple: Sleep stages · Google: sleep stages · Oura: Sleep Stages

Chapter: 8

Steps when your arm doesn't swing

Kind: Measured, but easily missed

How the device gets it: As above; pushing a cart, using a stick, cycling or walking very slowly

Typical error: Large undercounts; overcounts when your arm moves but your feet don't

Verdict: **Watch.** Expect low numbers on those days

Chapter: 6

Steps while walking or running

Kind: Measured

How the device gets it: An accelerometer counting the swing of your arm

Typical error: Usually a slight undercount, about -9% to $+12\%$ (■ ■ ■ **Moderate evidence**)

Verdict: **Trust**

On your device: Step count on every device

Chapter: 6

Steps, weekly average

Kind: Measured, added up

How the device gets it: Daily totals averaged over a week

Typical error: Daily errors tend to cancel out. More steps go with lower risk of death, leveling off at about 6,000–8,000 for people 60 and over (■ ■ ■ **Moderate evidence**); trackers help people walk about 1,800 more steps a day (■ ■ ■ **Strong evidence**)

Verdict: **Watch.** The movement number most worth looking at

When to see a doctor: Joint pain as you build up; a sharp drop for weeks for no clear reason

Chapter: 6

Stress score

Kind: Scored

How the device gets it: Rising heart rate and falling HRV, labeled as stress

Typical error: Can't tell stress from coffee, exercise or excitement

Verdict: **Ignore** the number. If it says high, ask: am I actually stressed?

When to see a doctor: If the score itself becomes a source of worry (Chapter 13)

On your device: Google: Stress (Stress & mindfulness) · Garmin: Stress tracking · Oura: Daytime Stress, Resilience, Cumulative Stress · WHOOP: Stress Monitor

Chapters: 9, 13

Time awake at night

Kind: Estimated

How the device gets it: Movement and heart rate

Typical error: Usually an underestimate: devices recognize only about 20% to 50% of the time you're awake (■ ■ ■ **Moderate evidence**)

Verdict: **Ignore** the number. You know better than the device

Chapter: 8

Total sleep time

Kind: Estimated

How the device gets it: Stillness and heart rate

Typical error: Usually an overestimate, because devices are poor at spotting when you lie still but awake

(■ ■ ■ Moderate evidence)

Verdict: **Watch** the weekly average; the true number may be lower

When to see a doctor: Enough hours but still tired for a long time

On your device: Part of the sleep data on every device

Chapter: 8

Training load, recovery time

Kind: Scored

How the device gets it: The maker's formula from recent workouts and heart rate

Typical error: Private, unpublished formula **(■ ■ ■ Debated)**

Verdict: **Watch**, as a reminder not to ramp up too fast. Ask your body first

On your device: Apple: Training load · Google: Target load · Garmin: Training Status, Recovery Time · WHOOP: Strain

Chapter: 12

VO₂ max

Kind: Estimated

How the device gets it: Heart rate, speed (GPS), age, sex and weight; no breath analysis

Typical error: Off by about 10–15% for any one person, in either direction **(■ ■ ■ Moderate evidence)**. Fitness measured in a laboratory strongly predicts health **(■ ■ ■ Strong evidence)**

Verdict: **Watch** the trend over months on the same device

When to see a doctor: Chest pain or breathlessness on exertion

On your device: Apple: Cardio fitness · Garmin: VO₂ max
· WHOOP: VO₂ Max

Chapter: 12