

# AI-03499 Treadmill Fitness Test vs Indoor Cycling

👤 Owner	© Rigel Arcayan
🏷️ Tags	SwimBikeSleep
🕒 Created time	@February 22, 2026 11:01 AM

Design a treadmill test to measure fitness

Here's a structured treadmill test design you can use to measure fitness. It's modeled after standardized protocols like the **Bruce Treadmill Test**, but I'll outline a clear, adaptable version:

---

## Treadmill Fitness Test Design

### 1. Purpose

- Assess cardiovascular endurance and aerobic capacity.
- Estimate **VO<sub>2</sub> max** (maximum oxygen uptake).
- Gauge overall fitness level for training or health monitoring.

---

### 2. Preparation

- Ensure the participant is healthy enough for exercise (medical clearance if needed).
- Wear comfortable athletic clothing and shoes.
- Warm up for 5 minutes at a slow walking pace.

---

### 3. Test Protocol

This is a **progressive stage test** where treadmill speed and incline increase every 3 minutes until exhaustion.

Stage	Duration	Speed (mph)	Incline (%)	Equivalent Activity
1	3 min	1.7	10	Slow uphill walk
2	3 min	2.5	12	Brisk uphill walk
3	3 min	3.4	14	Fast walk/jog
4	3 min	4.2	16	Jog uphill
5	3 min	5.0	18	Faster jog
6	3 min	5.5	20	Run uphill
7+	3 min	6.0+	22+	Sustained run

- Continue until **voluntary exhaustion** or medical stop criteria (e.g., chest pain, dizziness, abnormal heart rate).
- Record **total time completed**.

#### 4. Measurements

- **Heart rate** (each stage).
- **Perceived exertion** (Borg scale 6–20).
- **Blood pressure** (optional, if supervised).
- **Test duration** → used to estimate VO<sub>2</sub> max.

#### 5. VO<sub>2</sub> Max Estimation

A common formula (for Bruce Protocol):

$$VO_{2\{max\}} = 14.76 - (1.379 \cdot T) + (0.451 \cdot T^2) - (0.012 \cdot T^3)$$

Where (T) = total time on treadmill (minutes).

#### 6. Safety Notes

- Always have supervision if testing clinical populations.
- Stop immediately if participant experiences pain, dizziness, or abnormal symptoms.

- Cool down with 5 minutes of slow walking.

👉 This test is widely used in sports science and clinical settings, but it can be adapted (lower starting speeds, smaller increments) for beginners or non-athletes.

Would you like me to design a **simplified version** of this treadmill test that's more practical for everyday gym-goers without medical supervision?

Got it — let's reframe the treadmill test using **kilometers per hour (km/h)** instead of miles per hour:

## Treadmill Fitness Test (Bruce Protocol in km/h)

### 1. Purpose

- Assess cardiovascular endurance and aerobic capacity.
- Estimate **VO<sub>2</sub> max** based on test duration.

### 2. Preparation

- Medical clearance if needed.
- Comfortable clothing and shoes.
- 5-minute warm-up at 3 km/h, 0% incline.

### 3. Test Protocol

Each stage lasts **3 minutes**, with speed and incline increasing progressively until exhaustion.

Stage	Duration	Speed (km/h)	Incline (%)	Equivalent Activity
1	3 min	2.7	10	Slow uphill walk
2	3 min	4.0	12	Brisk uphill walk
3	3 min	5.5	14	Fast walk/jog
4	3 min	6.8	16	Jog uphill
5	3 min	8.0	18	Faster jog

Stage	Duration	Speed (km/h)	Incline (%)	Equivalent Activity
6	3 min	8.9	20	Run uphill
7+	3 min	9.7+	22+	Sustained run

- Continue until **voluntary exhaustion** or medical stop criteria.
- Record **total time completed**.

#### 4. Measurements

- **Heart rate** at each stage.
- **Perceived exertion** (Borg scale).
- **Blood pressure** (optional).
- **Test duration** → used to estimate VO<sub>2</sub> max.

#### 5. VO<sub>2</sub> Max Estimation

Formula (Bruce Protocol):

$$[ \text{VO}_{2\{\text{max}\}} = 14.76 - (1.379 \cdot T) + (0.451 \cdot T^2) - (0.012 \cdot T^3) ]$$

Where (T) = total time on treadmill (minutes).

#### 6. Safety Notes

- Stop immediately if chest pain, dizziness, or abnormal symptoms occur.
- Supervision recommended for clinical populations.
- Cool down with 5 minutes at 3 km/h, 0% incline.

👉 This version is now fully in **km/h**, making it easier to apply in countries that use metric units.

Would you like me to also design a **simplified everyday gym version** (lower speeds and inclines, easier to self-administer) alongside this clinical-style protocol?

Here's a **dual treadmill fitness test design**: one is the **clinical-style Bruce Protocol** (structured, progressive, medically supervised), and the other is a **simplified everyday gym version** (lower speeds/inclines, easier to self-administer).

## Clinical-Style Treadmill Test (Bruce Protocol, km/h)

Stage	Duration	Speed (km/h)	Incline (%)	Equivalent Activity
1	3 min	2.7	10	Slow uphill walk
2	3 min	4.0	12	Brisk uphill walk
3	3 min	5.5	14	Fast walk/jog
4	3 min	6.8	16	Jog uphill
5	3 min	8.0	18	Faster jog
6	3 min	8.9	20	Run uphill
7+	3 min	9.7+	22+	Sustained run

- Continue until exhaustion or medical stop criteria.
- Record **total time completed** → estimate VO<sub>2</sub> max.

## Simplified Everyday Gym Version (Self-Administered)

This version is designed for **general gym-goers** without medical supervision. Lower speeds and inclines make it safer and more practical.

Stage	Duration	Speed (km/h)	Incline (%)	Equivalent Activity
1	2 min	3.0	0	Easy walk
2	2 min	4.0	2	Brisk walk
3	2 min	5.0	4	Fast walk/jog
4	2 min	6.0	6	Jog uphill
5	2 min	7.0	8	Faster jog

Stage	Duration	Speed (km/h)	Incline (%)	Equivalent Activity
6+	2 min	+1 km/h each stage	+2% incline	Progressively harder

- Stop when you can't maintain pace or cadence.
- Record **stage reached** and **heart rate** at the end.
- Use results to track progress over time (e.g., reaching Stage 5 comfortably = good endurance).

## Key Differences

- **Clinical Bruce Protocol** → steeper inclines, longer stages, medically supervised, VO<sub>2</sub> max estimation.
- **Simplified Gym Version** → shorter stages, gentler progression, self-administered, practical for everyday fitness tracking.

Would you like me to also create a **scoring chart** for the simplified gym version (e.g., "Stage 4 = Good fitness, Stage 6+ = Excellent") so you can easily interpret results without VO<sub>2</sub> max calculations?

**Design an Indoor cycling fitness test using Saris Indoor trainer with power meter and cadence. Use miles.**

Here's a structured **Indoor Cycling Fitness Test** you can run on a **Saris Indoor Trainer** using its **power meter and cadence sensor**, with all values expressed in **miles per hour (mph)**:

## Indoor Cycling Fitness Test (Saris Trainer, mph)

### 1. Purpose

- Assess aerobic endurance and cycling-specific fitness.
- Estimate **Functional Threshold Power (FTP)** and VO<sub>2</sub> max.
- Track progress over time using power (watts), cadence (rpm), and speed (mph).

## 2. Preparation

- Calibrate the Saris trainer before starting.
  - Warm up: 10 minutes at 12–14 mph, cadence 80–90 rpm, low resistance.
  - Ensure hydration and proper ventilation indoors.
- 

## 3. Test Protocol

This is a **progressive ramp test** leading to exhaustion. Speed is used as a reference, but **power output (watts)** is the key metric.

Stage	Duration	Speed (mph)	Cadence (rpm)	Target Effort
1	2 min	12	80–90	Easy spin
2	2 min	14	85–95	Moderate
3	2 min	16	90–95	Tempo effort
4	2 min	18	90–100	Hard effort
5	2 min	20	95–100	Very hard
6+	2 min	+2 mph each stage	95–105	Max effort until failure

- Continue until cadence drops below 80 rpm or you cannot sustain the target speed/power.
  - Record **maximum power (watts)** and **total test duration**.
- 

## 4. Measurements

- **Power output (watts):** primary fitness metric.
  - **Cadence (rpm):** consistency and efficiency.
  - **Heart rate** (optional, if monitored).
  - **Test duration:** used to estimate VO<sub>2</sub> max.
- 

## 5. FTP Estimation

After the ramp test, calculate **Functional Threshold Power (FTP):**

$$\text{FTP} \approx 0.75 \cdot P_{\text{max}}$$

Where ( $P_{\text{max}}$ ) = highest sustained power (watts) during the test.

---

## 6. VO<sub>2</sub> Max Estimation (Cycling)

A simplified formula using power and body weight:

$$\text{VO}_2\{\text{max}\} = \frac{(P_{\text{max}} \cdot 10.8)}{\text{Weight, (kg)}} + 7$$

Convert weight to kilograms if needed (1 lb = 0.454 kg).

---

## 7. Cool Down

- 5–10 minutes at 12 mph, cadence 80 rpm, low resistance.
- 

✔ This test gives you both **FTP** (cycling-specific training benchmark) and an estimate of **VO<sub>2</sub> max**. It's repeatable, safe indoors, and tailored to your Saris trainer setup.

---

Would you like me to also design a **shorter 20-minute FTP test protocol** (commonly used by cyclists) that's less exhausting than a full ramp test but still accurate?