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## ***Thin Obesity (Normal-Weight Obesity)***

### **Overview**

“Thin obesity” is a common informal term for having a normal or low BMI but an unhealthfully high body-fat percentage, especially visceral fat (fat around the internal organs). In medicine and research it is often referred to as:

- Normal-weight obesity (NWO)
- Metabolically obese normal weight (MONW)
- Sometimes overlaps with “skinny fat” (popular term)
- TOFI: Thin outside, fat inside

### **What It Means (Core Idea)**

BMI only reflects weight relative to height. It does not tell you:

- How much of your body is fat vs muscle
- Where fat is stored (subcutaneous under skin vs visceral deep abdominal fat)

So someone can look “thin,” have a BMI like 18.5–24.9, yet have:

- Low muscle mass
- Higher body fat percentage
- Higher visceral fat
- And therefore higher cardiometabolic risk

## Why It Matters: Visceral Fat Is the Key Risk

Visceral fat behaves like an active endocrine organ. Compared with subcutaneous fat, visceral fat releases more:

- Inflammatory cytokines (chronic low-grade inflammation)
- Free fatty acids into the portal vein (directly affects the liver)
- Hormones/signals that worsen insulin resistance

This is why a thin person with high visceral fat can develop:

- Prediabetes / type 2 diabetes
- High triglycerides
- Low HDL
- Fatty liver (NAFLD/MASLD)
- Hypertension
- Higher cardiovascular disease risk

## How It Happens (Common Causes)

Thin obesity is a mismatch between weight and body composition.

### 1) Low Lean Mass (“Sarcopenic” Pattern)

If muscle mass is low, body fat percentage can be high even at low weight.

Contributors:

- Sedentary lifestyle
- Not enough protein
- Aging
- Chronic dieting / under-eating
- Illness, stress, poor sleep

### 2) Diet High in Refined Carbs + Ultra-Processed Foods

You can maintain low weight but still accumulate visceral fat, especially with:

- Sugary drinks
- Sweets/snacks
- White flour products
- Low fiber intake
- Insufficient high-quality proteins and fats

### 3) Genetics / Ethnicity

Some populations develop visceral fat and metabolic risk at lower BMI (e.g., many South and East Asian groups).

#### 4) Stress and Sleep Disruption

High cortisol signaling and poor sleep can preferentially promote central/visceral fat storage.

#### 5) “Normal Weight” but Physically Inactive

This is a major driver. Fitness and muscle mass are protective even without weight loss.

### What It Looks Like Clinically

A person may have:

- Normal BMI
- “Thin arms/legs” but more abdominal fat
- Low strength / low muscle definition
- Fatigue, low exercise tolerance

But the bigger clue is metabolic markers:

- Elevated fasting insulin
- Elevated triglycerides
- High-normal glucose or A1c
- Fatty liver markers

### How It’s Measured (Better Than BMI)

To identify thin obesity, you need body composition and visceral fat indicators:

#### Body Fat Percentage

Often estimated by:

- DEXA scan (very good)
- Bioelectrical impedance (BIA devices such as InBody)
- Skinfold calipers (operator dependent)

Typical cutoffs used in research vary, but commonly:

- Women: body fat  $\geq$  ~30–35%
- Men: body fat  $\geq$  ~20–25%

#### Visceral Fat

Measured by:

- DEXA visceral fat estimate
- Bioelectrical impedance (BIA devices such as InBody)
- CT/MRI (gold standard, but not routine)

Useful proxies:

- Waist circumference
- Waist-to-height ratio (strong simple marker)

A widely used rule:

- Waist / height > 0.5 suggests increased cardiometabolic risk (even at normal BMI)

## Why BMI Fails Here

BMI can be “normal” in two very different bodies:

- Higher muscle + lower fat → low risk
- Lower muscle + higher visceral fat → higher risk

Same BMI, very different health implications.

## What Helps (Conceptually)

The goal usually isn't “lose weight” but recomposition:

- Increase muscle mass
- Reduce visceral fat
- Improve insulin sensitivity

Most effective levers:

- Progressive resistance training
- Adequate protein
- Daily movement / aerobic conditioning
- Higher fiber
- Eliminate ultra-processed carbs
- Sleep and stress management