

Obesity During Adolescence Increases the Risk of Severe Infections in Adulthood

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STORY AT-A-GLANCE

- › Adolescent obesity is rapidly turning into a worldwide health emergency. The World Health Organization (WHO) reports that over 160 million children and teenagers ages 5 to 19 are now overweight or obese
- › A new study from the University of Gothenburg collected data from nearly one million Swedish men and found that obese teenagers are more likely to experience severe infections later in life
- › Obesity is a chronic medical condition characterized by excess body fat that impairs health and leads to symptoms such as fatigue, shortness of breath, joint pain, and metabolic issues that tend to worsen over time
- › Body mass index (BMI) has traditionally been the standard for assessing weight and health, but it has come under scrutiny because it frequently misclassifies risk
- › You can tackle obesity at its root by eliminating metabolic health hazards like seed oils and ultraprocessed foods and instead, choosing healthy carbs and walking more

Adolescent obesity is quietly becoming one of the most urgent health crises of our time. In the U.S., nearly one in five teenagers¹ aged 12 to 19 years old are now classified as obese. Globally, obesity rates among the youth have quadrupled since the 1990s, and today more than 160 million young people aged 5 to 19 are living with obesity.²

While lifestyle changes are often recommended, reversing obesity trends is far from simple. Many families encounter barriers such as limited access to healthy foods, time constraints, and deeply ingrained habits, making effective interventions difficult.³

This puts adolescents on a dangerous path where excess weight can evolve into severe conditions like heart disease, diabetes,⁴ and even severe infections as they carry this literal and metaphorical burden into adulthood.⁵

Can High BMI and Poor Fitness in Teens Predict Severe Infections Later?

A new study from the University of Gothenburg, published in the *Journal of Internal Medicine*,⁶ examined whether body weight and physical fitness during late adolescence influence the risk of severe bacterial infections decades later.

The objective was to examine whether body mass index (BMI) and cardiorespiratory fitness (CRF)⁷ in late adolescence can predict severe bacterial infections in adulthood. Study lead and Associate Professor of Infectious Diseases, University of Gothenburg, Josefina Robertson, explained:⁸

"It has long been known that high BMI and poor physical fitness in youth are risk factors for cardiovascular disease and cancer later in life. However, whether these factors are linked to severe bacterial infections in adulthood had not been previously studied."

- **Massive numbers make for impactful results** – The register-based cohort study⁹ included nearly 1 million Swedish men, using data from the Swedish Military Conscription Register, the National Patient Register, and the National Cause of Death Register. This allowed researchers to track participants for more than 30 years.¹⁰

- **How was the study conducted?** When participants enlisted for military service in late adolescence, their BMI and physical fitness were measured and categorized. Researchers then compared infection outcomes – such as bacterial pneumonia, sepsis, and heart valve infections across these groups. To ensure accuracy, the analysis adjusted for muscle strength, socioeconomic status, and asthma.¹¹
- **Key findings in the current study** – More than 44,000 cases of severe bacterial infections were identified during the follow-up period, with pneumonia being the most common, followed by sepsis. The researchers also noted that:^{12,13}
 - Risk increased progressively with BMI, even starting at high-normal weight.
 - Men who were obese had three times higher prevalence of sepsis and four times higher risk of dying from it compared to those with low-normal weight.
 - High CRF lowered the risk of contracting bacterial infections and dying from them.

One of the study's authors, Birger Sourander, a doctoral student at the University of Gothenburg and resident physician at Sahlgrenska University Hospital, emphasized the importance of fostering healthy habits:¹⁴

"Our findings underline the importance of early interventions to promote a healthy weight and physical activity already in adolescence, for the future health of both the individual and society as a whole."

The Basics of Obesity

Obesity is a chronic health condition defined by having excess fat that disrupts how the body works and raises the risk of serious disease. Research from the World Health Organization (WHO) shows that obesity can profoundly affect health and development, influencing metabolism, hormones, heart health, and even immune function.¹⁵

- **Obesity wasn't always common** – For most of human history, food was scarce, meals were simple, and daily life demanded physical labor. In fact, carrying extra weight often signaled that someone had reliable access to food. Things began to change in the late 1800s as industrialization spread. Jobs became less physically demanding, people moved less, and cheap, calorie-dense foods became widely available.¹⁶

Over time, these shifts made weight gain far more common. By 1997, the WHO declared obesity a global epidemic,¹⁷ and in 2013, the American Medical Association officially classified it as a disease.¹⁸

- **Fat is more than just stored energy** – Scientists now know that body fat acts as a complex metabolic and endocrine organ, sending out hormones and chemical signals that affect metabolism, blood sugar, inflammation, and heart health. When fat builds up beyond what the body can safely manage, these signals go out of balance, raising the risk for serious conditions like diabetes, heart disease, and fatty liver – even in people who don't look visibly overweight.¹⁹

That's why two people with the same BMI can have very different health outcomes: It depends on how much fat they have, where it's stored, and how their body responds to it.²⁰

- **Obesity warning signs** – Common **symptoms** include fatigue, shortness of breath, joint pain, and metabolic problems that tend to worsen over time. If left untreated, obesity can significantly reduce life expectancy and diminish overall quality of life.
- **The most common causes** – Obesity occurs when your calorie intake is higher than what your body burns; however, there are many other factors involved beyond just eating habits. Here are five common reasons why this happens:²¹
 - **Poor diet choices** – Consuming high-calorie ultraprocessed foods rich in refined sugar and unhealthy fat creates an energy imbalance, leading to fat storage over time.

- **Lack of physical activity** — Sedentary routines reduce calorie burn, making it easier for excess energy to turn into body fat.
- **Insufficient sleep** — Poor sleep disrupts hunger hormones, increasing appetite and cravings for calorie-dense foods.
- **Chronic stress** — Stress hormones like cortisol trigger overeating and promote fat storage, especially around the abdomen.
- **Genetics and medical conditions** — Certain genes and health issues, such as polycystic ovary syndrome (PCOS) or hypothyroidism, predispose individuals to weight gain despite healthy habits.
- **Adults and children get evaluated differently** — Because kids and teens are still growing, doctors use BMI percentiles instead of adult cutoffs. Overweight means a BMI between the 85th and 94th percentile for age and sex, and obesity means a BMI at or above the 95th percentile. This approach accounts for growth spurts, puberty, and differences between boys and girls, thereby improving the accuracy of weight assessment.²²

Where BMI Misses the Mark

For years, BMI has been the go-to number for evaluating weight and health. But here's the thing: BMI can be misleading and there are far better ways to measure obesity:

- **BMI's simplicity is its biggest flaw** — BMI is a quick math formula: Your weight is divided by your height squared. In U.S. units, it looks like this:²³

$$\text{weight (lb)} \div [\text{height (in)}]^2 \times 703$$

The U.S. Centers for Disease Control and Prevention (CDC) calls BMI a "screening tool," not a diagnostic measure.²⁴

It is categorized as underweight (<18.5), overweight (25 to 29.9), or obese (≥ 30). But here's the catch: BMI doesn't reveal how much of your weight is fat versus muscle – or where that fat sits in your body. As a result, athletes often get labeled "obese," while people with hidden fat around the organs (visceral fat) – linked to diabetes and heart disease – slip through the cracks.²⁵ BMI also ignores differences in sex, race, ethnicity, age, and activity level.²⁶

The WHO has adjusted BMI cutoffs for Asians, who face higher metabolic risks at lower BMIs. Still, similar guidance does not exist for Black or Latino populations.

- **There's a big chance of getting misdiagnosed** – People incorrectly labeled as obese might undergo unnecessary diets, medications, or surgeries. Meanwhile, individuals with a normal BMI but high visceral fat often remain untreated until they develop chronic health issues. These mistakes impact both physical health and emotional well-being.
- **Other ways to measure obesity** – Doctors frequently incorporate additional assessments to gain a more accurate picture of obesity and health risks. Here are the main alternatives to BMI, explained:^{27,28}
 - **Waist-to-hip ratio** – Measure your waist at its narrowest point, usually just above your belly button, and your hips at their widest point, around your buttocks. Use a flexible tape measure and keep both measurements in the same unit – either inches or centimeters. Then divide your waist measurement by your hip measurement.

An ideal ratio is about 0.8 for men and 0.7 for women, while a ratio above 1.0 for men or 0.85 for women indicates high risk.
 - **Waist-to-height ratio** – Measure your waist at its narrowest point, usually just above your belly button, and measure your height in the same unit. Divide your waist measurement by your height measurement.

An ideal ratio falls between 0.40 and 0.49, while a ratio of 0.50 to 0.59 suggests increased health risk, and 0.60 or higher signals a high risk of obesity-related conditions.

Obesity Is Not a Moral Failure – It's a Cellular One

When your cells lean too heavily on fat for fuel – especially during stress – it can backfire. Breaking down fat requires vitamin B2 (riboflavin), which powers Complex II, a key part of your mitochondria's energy machinery. When riboflavin runs low, electrons start flowing backward in a process scientists call "reverse electron flow." Instead of producing clean energy, this backflow floods your cells with reactive oxygen species (ROS).²⁹

Your body interprets this surge of ROS as a stress signal. To protect itself, it slows your metabolism and shifts into fat-storing mode. In short, burning fat excessively doesn't always help you slim down – sometimes it primes your body to gain weight.

In a podcast hosted by David Gornoski, mitochondrial biochemistry expert Georgi Dinkov, and Danny Roddy Marshall, a Temple University Genomic Medicine major researching mitochondrial biology in Alzheimer's disease, discuss why **obesity** is less about overeating and more about broken energy metabolism.³⁰ Their view challenges the old "calories in, calories out" mantra that dominates mainstream advice.

- **Personal experience shaped their perspective** – Marshall shared that his own struggles with weight led him deep into mitochondrial science – the study of how cells turn fuel into energy. Dinkov, with a background in computer science and bioinformatics, became fascinated by metabolic biochemistry through independent research. Together, they aim to help people understand why popular strategies like calorie restriction and **keto diets** often fail over time.
- **Polyunsaturated fats (PUFs) disrupt energy burning** – Marshall explained that when you consume PUFs – such as **linoleic acid (LA)** found in **vegetable oils** – your cells burn less oxygen. That might sound good, but it's not, as it traps excess energy

inside cells, which your body then stores as fat.

- **Reductive stress: the hidden energy backlog** – When cells have too much stored energy and not enough oxygen to process it, they enter a state called reductive stress. Key enzymes shut down, blocking carbohydrate burning, while fats remain partially oxidized. This low-energy state signals your body to store fat rather than burn it. Marshall described this as a metabolic "switch" that flips when your system senses an energy overload.
- **PUFs mimic hibernation signals in animals** – Dinkov noted that squirrels and bears gorge on PUFs before winter because these fats lower body temperature, slow brain and reproductive function, and push the body into a semi-hibernation mode. "You will actually **gain weight** because your metabolic rate will drop," Dinkov explained.
- **Hormonal effects amplify the problem** – PUFs don't just slow metabolism – they mimic estrogen inside your cells. **Estrogen**, often thought of as a female hormone, acts as a stress signal that swells cells with water and shuts down energy production. "The polyunsaturated fats mimic those effects of estrogen quite well," Dinkov said, adding another layer to the fat-storage puzzle.

For a more in-depth analysis of their discussion, read my article "[Obesity Causes and Solutions](#)."

5 Ways to Target the Root Cause of Weight Gain

If you're battling weight gain, cravings, or constant fatigue, it's not about laziness or lack of willpower. Your body isn't broken – it's just stuck in energy-saving mode. Research shows the biggest driver of obesity isn't skipping workouts, but what you eat and how it impacts your metabolism.

When your mitochondria get bogged down by modern food and environmental toxins, your body flips into fat-storage mode instead of burning energy. Here's how to reset your metabolism and finally feel in control again:

- 1. Cut out vegetable oils to stop LA overload** – Poor food choices, **not lack of exercise, fuels obesity**. Start by getting rid of seed oils like canola, soybean, sunflower, safflower, corn, and grapeseed oil. Swap them with grass fed butter, ghee, or tallow. Avoid chicken and pork, as they're loaded with linoleic acid (LA), and choose grass fed beef or lamb instead.
- 2. Enjoy the right carbs to fuel your cells** – Carbs aren't the enemy, as your body actually runs best on glucose. The real issue? Eating the wrong carbs, especially when your gut is inflamed. A damaged gut pumps out endotoxins that choke off mitochondrial function. If you're bloated, fatigued, or have loose stools after meals, your gut needs a reset.

Stick with easy carbs like fruit and white rice, then slowly reintroduce root veggies, legumes, and whole grains. Aim for about 250 grams of healthy carbs daily to support metabolism. Skip ultraprocessed foods, junk foods, and fast foods, as these not only add inches to your waist, but also **drive chronic disease**.

- 3. Lower estrogen and endocrine disruptors** – If you're noticing stubborn belly fat or feeling drained, excess estrogen could be part of the problem. Estrogen dominance throws your metabolism off balance, and it's often made worse by endocrine disruptors – chemicals that mimic hormones and confuse your system. These disruptors hide in everyday items like plastic containers, receipts, and even personal care products.

Reduce exposure by using glass for food storage, skipping receipts, choosing fragrance-free products, ventilating your home, and filtering your water.

- 4. Reduce your electromagnetic fields (EMF) exposure** – Sleeping next to your phone or leaving Wi-Fi on overnight can put your mitochondria under constant stress. EMFs raise calcium inside cells, slowing energy production. Putting your phone on airplane mode at night, turning off Wi-Fi, and keeping devices out of your bedroom are simple ways to minimize your EMF exposure. Swap Bluetooth earbuds for wired headphones and use wired internet when possible.

5. Move your body regularly – When you sit too much, your body gets worse at using energy from food. Simple activities like **walking** every day, doing light strength exercises, or using resistance bands help your body burn fuel better. You don't need hard workouts. Just moving your muscles regularly helps your body do what it's meant to do.

For years, weight loss advice has focused on quick fixes – crash diets, pills, and endless workouts. But real change starts with understanding what's driving the problem and making small, steady shifts that support your body. You don't have to overhaul everything overnight. Begin with one choice today and let progress build from there. Every step you take toward restoring your metabolism moves you closer to feeling better, stronger, and more in control.

Frequently Asked Questions (FAQs) about Obesity

Q: What did the Swedish study reveal about obesity in adolescence?

A: The University of Gothenburg study followed nearly one million Swedish men for more than 30 years and found that obesity in late adolescence was linked to a much higher risk of severe bacterial infections later in life, including pneumonia and sepsis. The risk increased steadily with higher BMI and was lowest in those with good physical fitness.

Q: Why do many people regain weight after dieting?

A: Most diets emphasize calorie restriction but overlook how the body generates energy. Under stress, cells slow down metabolism and store more fat, leading to frequent weight regain, especially after ending restrictive diets.

Q: Does physical fitness in youth really make a difference?

A: Yes. The study found that high cardiorespiratory fitness in adolescence significantly lowered the risk of severe infections and infection-related death in adulthood – even among those with higher body weight. This suggests fitness can partially offset some obesity-related risks.

Q: Why isn't Body Mass Index (BMI) alone enough to assess long-term health risk?

A: BMI does not indicate the amount of body fat or its distribution. The study found that risk rises even at high-normal BMI levels, emphasizing that metrics like waist circumference, fitness, and metabolic health offer more meaningful insights than BMI alone.

Q: What's the most effective way to lower obesity-related health risks?

A: The most effective approach focuses on supporting metabolic health rather than extreme dieting. This includes improving food quality, reducing ultraprocessed foods and seed oils, choosing nourishing carbohydrates, and staying physically active.

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