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Type 2 Diabetes Found to Double the Risk of Sepsis

Analysis by Dr. Joseph Mercola | November 17, 2026

STORY AT-A-GLANCE

- Sepsis is a life-threatening overreaction of your immune system to infection, causing widespread inflammation and organ failure when not treated quickly
- A large Australian study found people with Type 2 diabetes were twice as likely to develop sepsis, with the highest risk seen in men, smokers, and younger adults aged 41 to 50
- Chronic high blood sugar and insulin resistance weaken immune defenses, impairing white blood cell function, slowing wound healing, and allowing common infections like urinary or skin infections to escalate into sepsis
- Managing diabetes through blood sugar control, physical activity, sunlight exposure, and eliminating seed oils and refined sugar can help improve insulin sensitivity and may lower the likelihood of severe infection
- Maintaining wound hygiene, treating infections promptly, eating nutrient-rich foods, managing chronic conditions, and avoiding habits like nail-biting may further help lower your risk of infection and sepsis

Sepsis is one of the most dangerous medical emergencies you can face. Physicians define it as a "life-threatening organ dysfunction caused by a dysregulated host response to infection."[1] In the United States, more than 1.7 million people develop sepsis each year, and about 350,000 die from it, making it a leading cause of hospital deaths.[2] Globally, it accounts for one in every five deaths, reflecting its scale as a public health crisis.[3]

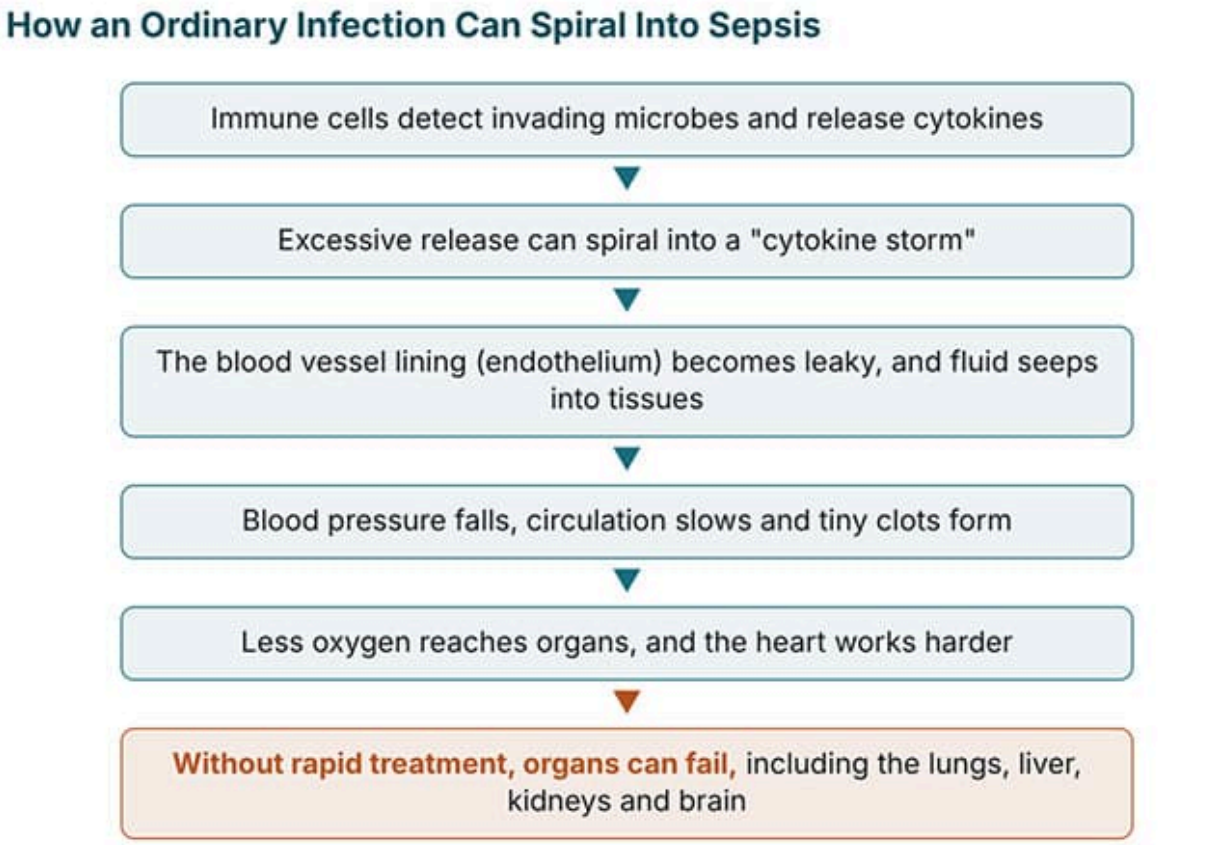
A study presented at the 2025 Annual Meeting of The European Association for the Study of Diabetes is now drawing renewed attention to the connection between sepsis and one of the most common chronic conditions in the country — Type 2 diabetes. With more than 38 million Americans living with diabetes, understanding how this condition may sharply increase the already staggering risk of sepsis has never been more urgent.[4]

What Is Sepsis?

Sepsis develops when an ordinary infection sets off an uncontrolled inflammatory response that spreads throughout your body. Instead of containing the threat, your immune system overreacts, damaging blood vessels, lowering blood pressure, and starving vital organs of oxygen. Without immediate medical intervention, this runaway process can lead to multi-organ failure and death.[5,6]

- **How the inflammatory cascade unfolds —** When immune cells detect invading microbes, they release cytokines, which are chemical messengers that help coordinate the body's defense. If this release becomes excessive, it can spiral into a "cytokine storm," which causes the inner lining of your blood vessels (endothelium) to become leaky, allowing fluid to seep into surrounding tissues.

  As fluid leaks from blood vessels and pressure falls, circulation becomes sluggish. Tiny clots begin to form, and the supply of oxygen to organs diminishes, forcing the heart to work harder to maintain blood flow. Without rapid medical intervention, this imbalance can lead to cascading organ failure, affecting organs such as the lungs, liver, kidneys, and brain.[7,8]



Sepsis cascade. Sources: NIGMS, Sepsis and Heliyon Volume 10, Issue 13, 15 July 2024, e33340

Figure 1. *In sepsis, an excessive immune response to infection can make blood vessels leaky, lower blood pressure, and cut oxygen to organs, which can lead to organ failure without rapid treatment.*

- **Sepsis unfolds along a spectrum —** Severe sepsis describes the point at which organ damage becomes evident, such as reduced urine output or difficulty breathing. Septic shock is the next stage, marked by a dangerous drop in blood pressure that requires intensive care to restore circulation.[9]

- **Many cases begin with common infections —** Urinary tract infections (UTIs), pneumonia, skin wounds, and mild intestinal infections are among the most common sources of sepsis. The Sepsis Alliance notes that roughly 80% of cases begin in the community rather than in hospitals, meaning the process often starts well before medical care is received.[10]

- **Recognizing the signs early is vital —** Because many symptoms of sepsis resemble those of a cold or the flu, they're often overlooked until the condition worsens. The key difference is how quickly they progress. If you suspect sepsis, seek medical attention immediately, as timely treatment is crucial to prevent severe complications. Common warning signs include:[11,12,13]
    - Fever with chills or shivering
    - Rapid heartbeat (tachycardia)
    - Rapid breathing (tachypnea)
    - Excessive sweating (diaphoresis)
    - Dizziness or lightheadedness
    - Confusion or disorientation
    - Slurred speech
    - Nausea, vomiting, or diarrhea
    - Difficulty breathing or shortness of breath
    - Severe muscle pain
    - Low urine output
    - Cold and clammy skin and/or skin rash
- **Remembering the warning signs —** The Sepsis Alliance recommends using the acronym TIME to help you remember the main warning signs:[14]
    - **T — Temperature —** Is it higher or lower than normal?
    - **I — Infection —** Signs of an infection now or recently
    - **M — Mental decline —** Mental changes such as confusion or unusual sleepiness
    - **E — Extremely ill —** Extreme pain or feeling severely unwell

Another easy way to remember the signs is the SEPSIS acronym:[15]

- **S —** Shivering, fever, or chills
- **E —** Extreme pain or discomfort
- **P —** Pale, clammy skin
- **S —** Sleepiness, confusion, or disorientation
- **I —** "I feel like I might die"
- **S —** Shortness of breath

Certain conditions weaken your immune defenses and make infections harder to control. Older age, recent surgery, hospitalization, immune-suppressing medications, and chronic illnesses all heighten the risk of sepsis.[16] Among these risk factors, Type 2 diabetes has emerged as a particularly important factor.

Large-Scale Australian Study Finds Sepsis Twice as Common in Type 2 Diabetes

In the featured study, researchers from the University of Western Australia drew from the Fremantle Diabetes Study Phase II, a large community-based project conducted in a multi-ethnic urban region of 157,000 residents. It followed 1,430 adults with Type 2 diabetes and 5,720 matched individuals without diabetes, enrolled between 2008 and 2011.[17]

Each participant was tracked through linked health records until a first episode of sepsis, death, or the end of 2021 (an average of 10 years). The goal was to provide data on sepsis incidence among people with Type 2 diabetes — a link that earlier research had suggested but not defined precisely.[18,19]

- **Sepsis occurred twice as often in those with diabetes —** During an average of 10 years of follow-up, new sepsis cases emerged in 11.8% of participants with Type 2 diabetes versus 5% of those without. Even after adjusting for age, gender, prior sepsis hospitalization, and other chronic conditions, Type 2 diabetes remained associated with a twofold higher risk of sepsis. At baseline, 2% of diabetic participants had already been hospitalized for sepsis compared with 0.8% of controls.

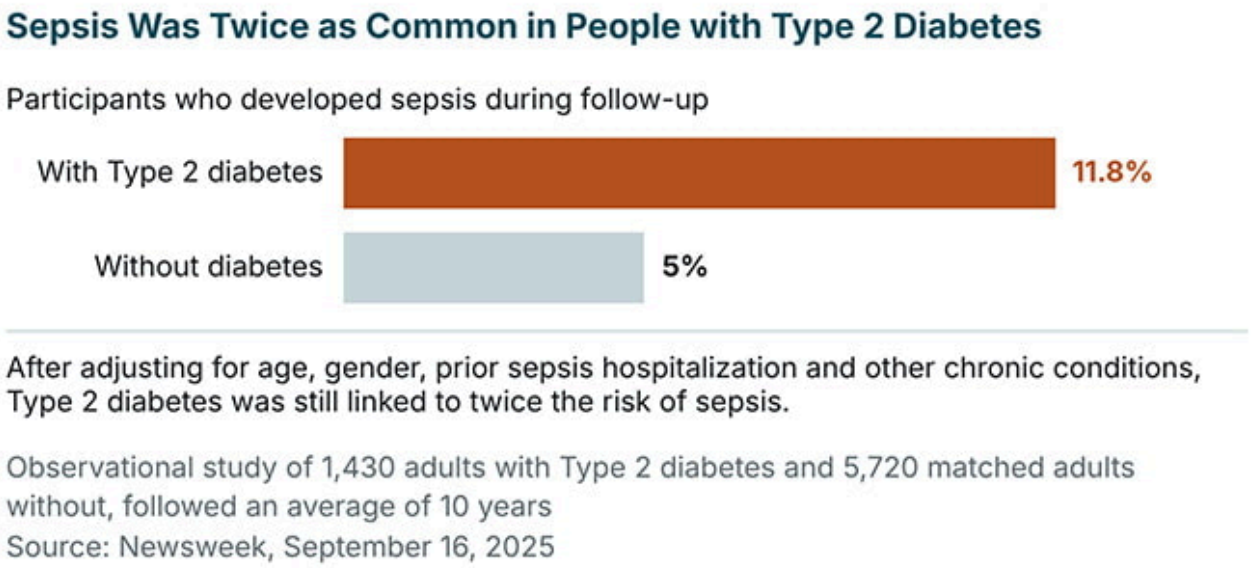


Figure 2. *Over about 10 years, 11.8% of people with Type 2 diabetes developed sepsis, compared with 5% of those without diabetes.*

- **The risk was even greater in certain groups —** Adults aged 41 to 50 with diabetes were 14.5 times more likely to develop sepsis compared with non-diabetic counterparts. Men and those of Aboriginal ancestry were also disproportionately affected, with Indigenous Australians showing a threefold higher risk of sepsis.

- **Smoking and poor metabolic health amplified vulnerability —** Among those with diabetes, several factors independently raised sepsis risk, including current smoking, insulin use, elevated fasting glucose, higher heart rate, neuropathy,

cerebrovascular disease, and elevated NT-proBNP, a marker of cardiac dysfunction. Smoking alone was linked to an 83% higher risk, underscoring the role of modifiable lifestyle choices.

- **Multiple biological pathways heighten the risk —** Persistent hyperglycemia (high blood sugar) weakens the immune system, increasing the risk of infections of the skin, urinary tract, and lungs, which are all leading causes of sepsis hospitalizations.

  At the same time, insulin resistance and chronic inflammation can damage the endothelium, the inner lining of blood vessels, making tissues more vulnerable to infection-related injury. Poor circulation and neuropathy also delay recognition of infections, allowing localized problems to progress into systemic illness.

- **Prevention depends on early detection and control —** The authors emphasized the importance of close infection monitoring and timely intervention in diabetic patients. According to Professor Wendy Davis, an epidemiologist from the University of Western Australia and the study's lead author:

  > *"Our study identifies several modifiable risk factors, including smoking, high blood sugar, and complications of diabetes, underscoring that there are steps individuals can take to potentially lower their risk of sepsis."*[20]

This observational research adds to evidence that Type 2 diabetes is linked to a significantly higher risk of sepsis and related hospitalizations. The findings reinforce that infection management and preventive care are essential components of diabetes treatment because sepsis, once triggered, progresses too quickly to wait.

Earlier Research on the Link Between Diabetes and Sepsis

The relationship between diabetes and infection has been recognized for centuries. The Persian physician Avicenna was among the first to note that people with diabetes frequently developed tuberculosis, establishing an early link between metabolic disease

and infection. In the early 1900s, Dr. Elliott Joslin, a pioneer in diabetes care, reported that diabetic coma was usually triggered by infection, in an era before insulin therapy was available.[21]

- **People with diabetes make up a large share of sepsis cases —** Modern population studies estimate that people with diabetes make up 20.1% to 22.7% of all sepsis patients. In one Canadian study, diabetes was found to significantly increase the risk of cystitis, pneumonia, cellulitis, and tuberculosis. Similarly, a Dutch study reported higher odds of lower-respiratory, urinary, and skin or mucosal infections.

- **Hyperglycemia undermines immune defense at multiple levels —** Early theories blamed high glucose for feeding bacteria, but experiments in 1911 disproved this, redirecting attention to immune dysfunction. Subsequent research revealed that chronic hyperglycemia reduces chemotaxis (the directed movement of immune cells toward sites of infection) and intracellular killing.

  High blood sugar also impairs the function of neutrophils (the white blood cells responsible for engulfing and destroying pathogens), making them stick too tightly to vessel walls and slowing their travel to infection sites. These effects diminish the body's ability to contain infections.

- **Blood-based immunity also loses strength —** In diabetes, the blood becomes less effective at recognizing and neutralizing harmful microbes. High glucose levels interfere with the process of opsonization, in which immune proteins tag bacteria so white blood cells can destroy them. Antibody responses also tend to be weaker, and levels of IgG, a major infection-fighting antibody, are often lower in poorly controlled diabetes.

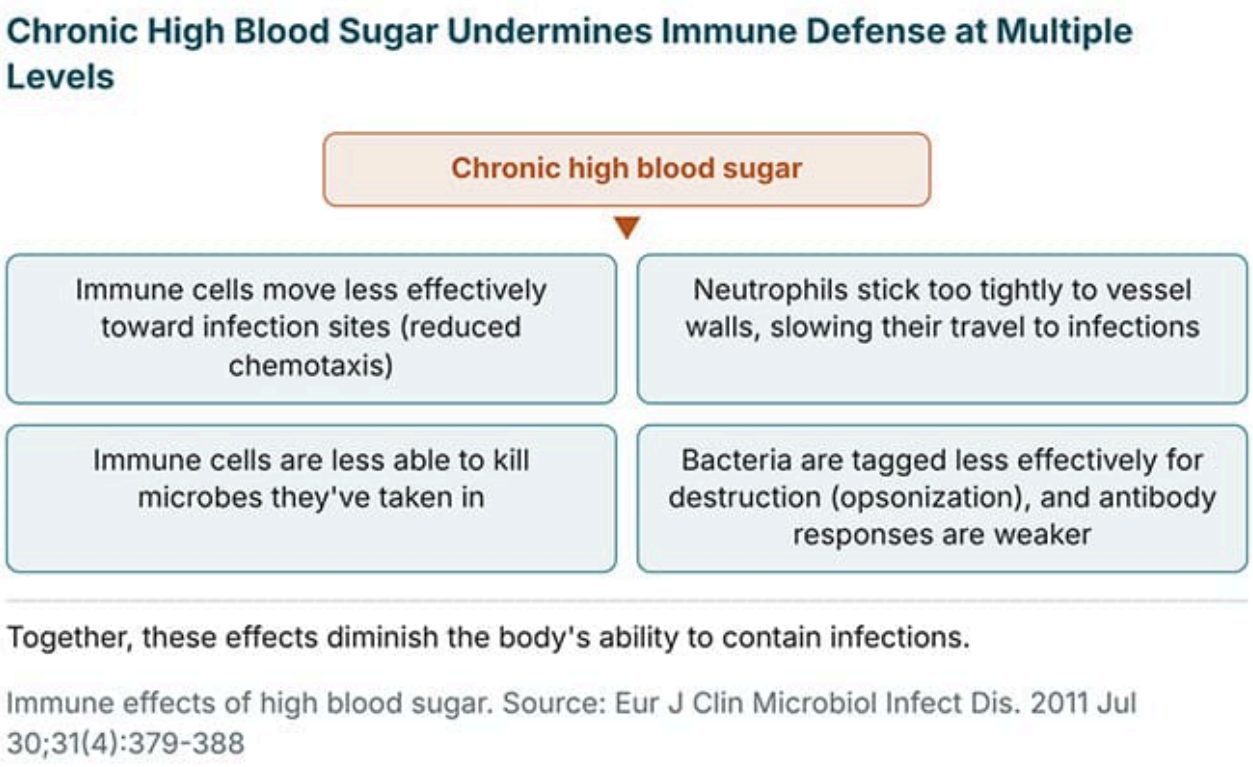


Figure 3. *Chronic high blood sugar can impair immune cell movement, killing ability, and antibody responses, making infections harder to contain.*

- **Stable blood sugar may help lower infection risk —** In one large study of people with diabetes, the risk of infection after surgery rose when blood glucose went above about 8.3 mmol/L (150 mg/dL). Results in community studies are less clear, but since high blood sugar has been linked to a higher risk of sepsis, keeping your blood sugar steady may help protect against infection and sepsis.

Many of the biological problems described here improve when glucose levels are brought under control. Managing diabetes, then, isn't only about preventing long-term damage; it's also about rebuilding your body's capacity to fight off serious infections.

Practical Strategies to Manage Type 2 Diabetes

Type 2 diabetes develops gradually, beginning with insulin resistance, wherein your cells stop responding properly to insulin. The body compensates by producing more, but over time, this excess insulin and chronically elevated glucose wear down your metabolic

machinery. Recognizing and addressing insulin resistance early is important, since improving insulin sensitivity may help lower your risk for diabetes and the infections that often accompany it, including sepsis.

1. **Clear refined sugars and seed oils from your diet —** Replacing sweets and processed snacks with whole fruits gives your body fiber, antioxidants, and minerals that help slow sugar absorption. This steadier digestion helps prevent the sharp insulin spikes that overwork your pancreas and drive insulin resistance.

   Equally important is cutting out **seed oils** like canola, soybean, and sunflower oil, found in fries, chips, packaged foods, and most restaurant meals. These oils are high in **linoleic acid (LA)**, which can disrupt mitochondrial energy production and worsen insulin resistance. Replace them with foods prepared using healthy fats like grass fed butter, ghee, or tallow.

2. **Reintroduce carbohydrates in a smart way —** Your body and brain rely on a steady supply of glucose to function properly. When you cut carbohydrates too severely, your body compensates by releasing stress hormones such as cortisol, adrenaline, and glucagon to create glucose from within. This survival mechanism, called gluconeogenesis, keeps blood sugar from falling too low but does so at a cost.

   The hormone that signals the most strain is cortisol. It works by breaking down muscle tissue to release amino acids, which are then converted into glucose. This process helps you maintain blood sugar but gradually erodes muscle mass, which is essential for metabolic health and insulin sensitivity.

   Over time, this cycle can contribute to slower metabolism and increased insulin resistance — the very pattern that leads to Type 2 diabetes. Providing your body with healthy, whole-food carbohydrates such as fruit and white rice helps provide a steady fuel source without triggering this stress response. These foods give your system the glucose it needs to stay balanced while protecting muscle tissue.

3. **Reduce exposure to everyday metabolic stressors —** Insulin resistance doesn't just stem from diet. Environmental stress from **plastics**, personal care products, and **electromagnetic fields (EMFs)** can also interfere with your body's ability to convert fuel into energy, worsening insulin resistance over time.

   Reducing this load starts with small, practical steps. Choose glass or stainless steel containers, avoid heating food in plastic, and keep your phone away from your body while sleeping. Each of these actions helps lower background stress on your cells, allowing your mitochondria to recover and support healthier insulin function.

4. **Incorporate regular physical activity into your routine —** Movement is one of the most reliable ways to enhance insulin sensitivity and support your metabolism. When your muscles contract, they draw glucose directly from your bloodstream, which helps lower blood sugar and eases the strain on your pancreas. You don't need intense workouts to see results — consistent **moderate physical activity**, such as brisk walking, cycling, or swimming, can help. Aim for about an hour of walking a day.

5. **Get daily sunlight exposure —** Sunlight may improve insulin sensitivity and support energy production inside your mitochondria, in part through melatonin, which is mainly made in your mitochondria in response to the near-infrared light in sunlight. Melatonin acts as an antioxidant within cells, protecting mitochondria from oxidative stress and helping them sustain efficient energy metabolism, which supports healthy insulin function.

   Make sunlight exposure a part of everyday life — spend time outdoors walking, biking, or sitting in natural light whenever possible. If your diet has been high in seed oils, avoid high-intensity midday sun until you've been off them for four to six months, as LA increases your vulnerability to sunburn. Learn more in "**Beyond Vitamin D Production — How Sensible Sun Exposure Supports Overall Health**."

6. **Use the HOMA-IR test as a tracking tool —** Recognizing insulin resistance early gives you an advantage, since it often develops years before Type 2 diabetes is diagnosed. The Homeostatic Model Assessment of Insulin Resistance (HOMA-IR) test provides a straightforward way to measure how efficiently your body uses insulin through a single fasting blood draw.

   Developed in 1985, the HOMA-IR model calculates the relationship between fasting glucose and fasting insulin to estimate insulin resistance. Unlike more complex procedures such as the glucose clamp test, it requires only one sample, making it practical for routine use. With it, you can identify metabolic issues early and track how dietary and lifestyle changes are affecting your insulin sensitivity. The standard formula is:

   HOMA-IR = (Fasting Glucose × Fasting Insulin) ÷ 405, where:

   - Fasting glucose is measured in mg/dL
   - Fasting insulin is measured in μIU/mL (microinternational units per milliliter)
   - 405 is a constant that normalizes the values

   If your glucose is reported in mmol/L, use this version instead:

   HOMA-IR = (Fasting Glucose × Fasting Insulin) ÷ 22.5, where:

   - Fasting glucose is measured in mmol/L
   - Fasting insulin is measured in μIU/mL
   - 22.5 is the normalizing factor for this unit of measurement

   A HOMA-IR score below 1.0 reflects healthy insulin sensitivity. Scores above 1.0 indicate varying degrees of resistance — the higher the value, the more impaired your insulin function. (These ranges apply to individuals who still produce insulin;

they do not apply to Type 1 diabetics.) Talk to your healthcare provider about whether this testing is appropriate for you.

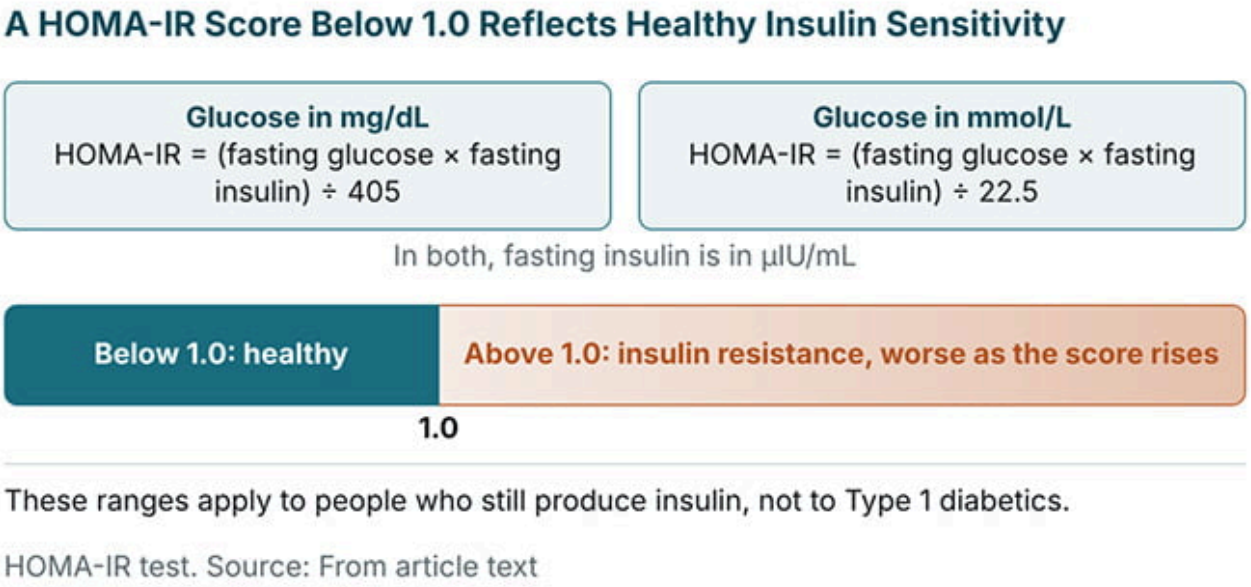


Figure 4. *HOMA-IR estimates insulin resistance from fasting glucose and insulin; a score below 1.0 reflects healthy insulin sensitivity.*

Interestingly, my personal HOMA-IR score stands at a low 0.2. I attribute this low score to my body's improved efficiency in burning fuel, which I believe comes from increased glucose availability. By incorporating additional carbohydrates into my diet, I provided my cells with the necessary energy to operate more effectively.

This improved cellular function has significantly boosted my metabolic health, suggesting how strategic dietary adjustments can lead to better insulin sensitivity and overall metabolic performance.

How to Reduce Your Risk of Developing Sepsis

Preventing sepsis starts with strengthening your body’s resistance to infection and ensuring that warning signs are never ignored. The following steps help lower your risk and improve your chances of recovery if infection does occur:

- **Manage chronic conditions carefully —** Since conditions such as Type 2 diabetes, heart disease, and kidney problems make it harder for your immune system to fight infection, keeping blood sugar, blood pressure, and other markers within healthy ranges reduces the stress on your organs and gives your body a stronger baseline defense against severe infections that could progress to sepsis.

- **Promptly treat UTIs —** UTIs are a common starting point for sepsis, so see your doctor promptly if you have symptoms, especially if you have diabetes. Conventional treatment usually involves antibiotics. Because E. coli causes about 90% of all UTIs,[22] researchers have also studied D-mannose, a naturally occurring sugar closely related to glucose that may help keep E. coli from sticking to the bladder wall. Some studies suggest it can lower the chance of UTIs coming back.[23]

  Another option is methylene blue, which is excreted through the kidneys and concentrates in the bladder, where it may help neutralize pathogens. In one clinical trial, symptoms improved within three days with a urinary antiseptic combining methylene blue and methenamine, although the trial compared it with another antiseptic rather than a placebo.

  If you're considering methylene blue, use only pharmaceutical-grade in capsule or tablet form, prescribed by your healthcare provider and filled through a compounding pharmacy. Avoid it if you have G6PD deficiency or take SSRIs or other serotonergic drugs, since that combination can cause a dangerous reaction called serotonin syndrome.[24]

- **Support your immune health —** A balanced immune system depends on good nutrition, regular sleep, and steady energy metabolism. Prioritize whole foods rich in vitamins A, C, D, zinc, and selenium, which help your body recognize and destroy pathogens efficiently.[25] Maintain a consistent sleep schedule and manage stress, since both affect immune regulation and inflammatory balance.

- **Keep skin wounds clean and protected —** Cuts, burns, and ulcers, especially in people with diabetes, are common entry points for bacteria. Clean all wounds promptly with a mild antiseptic, keep them covered, and monitor for redness, swelling, or discharge. Avoid habits that create small skin breaks as well, such as nail-biting.[26] If a wound isn't healing properly or shows spreading redness, seek medical care immediately.

- **Practice hospital and home hygiene —** If you or a family member has been hospitalized or recently undergone surgery, pay close attention to hand hygiene and sterile wound care. In the home setting, wash your hands regularly — before eating, after bathroom use, and after handling raw meat or pet waste. Keeping shared surfaces and medical equipment clean helps limit exposure to harmful microbes.

- **Ask your doctor about vitamin C-based therapy if sepsis develops —** Dr. Paul Marik, a critical care physician, created a sepsis treatment protocol using an intravenous mixture of vitamin C and thiamine (vitamin B1), in combination with hydrocortisone.

  These compounds are thought to work synergistically — in laboratory studies, vitamin C and hydrocortisone together helped restore the barrier function of blood vessel cells, while thiamine supports vitamin C metabolism and corrects B1 deficiencies common in critically ill patients.[27,28]

  In Marik's retrospective clinical study, giving this three-part therapy was linked to a hospital death rate of 8.5% among patients with severe sepsis or septic shock, compared with 40% in a similar group treated before the protocol was introduced.[29,30,31]

  Randomized trials since then have produced mixed results. Reviews of these trials found better organ function scores and shorter use of blood pressure medications, though no clear survival benefit, and it's unclear how much vitamin C and thiamine added beyond hydrocortisone.*[32,33]

Because this treatment needs to be administered under medical supervision, discuss it with your physician if you or a loved one develops sepsis. Learn more about this protocol in "Vitamin C Lowers Mortality in Severe Sepsis."

**These findings are from research conducted in clinical settings. Results may not apply to all individuals.*

Frequently Asked Questions (FAQs) About Sepsis

Q: How serious is sepsis, and how common is it?

A: Sepsis is one of the most dangerous medical emergencies you can face. It develops when your body's response to infection spirals out of control, damaging organs and leading to failure if untreated. In the United States, more than 1.7 million people develop sepsis each year, and about 350,000 die from it. Globally, it accounts for one in every five deaths.

Q: What are the early warning signs I should watch for?

A: Sepsis often looks like the flu or a bad cold at first, but symptoms progress quickly. Watch for fever or chills, rapid heartbeat, fast breathing, confusion, dizziness, or extreme pain. Low urine output, clammy skin, or difficulty breathing are also red flags. If you notice several of these signs together, seek medical care immediately.

Q: Why are people with Type 2 diabetes more likely to get sepsis?

A: If you have Type 2 diabetes, your body's ability to fight infection is weakened by high blood sugar and insulin resistance. These factors impair immune cells, slow blood flow, and reduce your ability to heal from minor wounds. In the featured

Australian study, people with Type 2 diabetes were twice as likely to develop sepsis compared with those without diabetes.

Q: What can I do to lower my risk of sepsis if I have diabetes?

A: Start by managing your blood sugar consistently and addressing infections early. The study emphasized the importance of infection monitoring, smoking cessation, and good metabolic control. Removing refined sugars and seed oils, eating whole-food carbohydrates, staying active, and supporting mitochondrial health may also help keep insulin resistance in check.

Q: How can I reduce my general risk of infection and sepsis?

A: Keep chronic conditions under control, practice good wound care, and stay on top of hygiene at home and in medical settings. Eat nutrient-rich foods, get enough sleep, and manage stress to support immune balance. Avoid habits like nail-biting, which create tiny breaks in the skin that allow bacteria to enter.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified healthcare provider before making changes to your health regimen.

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