



# OXIDATIVE STRESS SOURCES



Oxidative stress happens when there's an imbalance between free radicals and antioxidants in the body. While some oxidative stress is normal and even essential, excess can damage cells, accelerate aging, and contribute to chronic disease.

## Internal Sources

These arise from within the body, often silently and chronically:

- **Normal cellular respiration**  
Especially in high-energy organs like the brain and ovaries
- **Chronic inflammation**  
Even low-grade, persistent inflammation drives oxidative stress, and vice versa
- **Imbalanced blood sugar/insulin resistance**  
High blood sugar increases free radical production. (Fasting insulin ~5 mIU/L; HbA1c < 5.3% is ideal.)
- **Excess estrogen (without enough progesterone)**  
Can increase oxidative stress and affect detoxification
- **Nutrient deficiencies**  
Especially:
  - Glutathione
  - Selenium
  - Zinc
  - CoQ10
  - Vitamins C & E
- **Autoimmune conditions**  
Ongoing immune activation increases oxidative load
- **Chronic infections**  
Viral, bacterial, fungal, or parasitic all trigger ongoing immune responses
- **Poor methylation / detox capacity**  
Issues like MTHFR mutations or sluggish liver detox can lead to buildup of oxidative byproducts.
- **Overtraining**  
Excessive exercise without adequate rest increases ROS (reactive oxygen species)
- **Sleep deprivation**  
Inhibits cellular repair and detoxification processes



## External Sources

These come from your environment and daily habits:

- **Processed foods & seed oils**  
E.g., soybean, canola, corn, and sunflower oils high in omega-6
- **Cooking at high heat**  
Browning, frying, grilling = more AGEs (advanced glycation end products)  
→ Marinate meats & cook gently to reduce AGEs
- **Environmental toxins**
  - Pesticides & herbicides
  - Food additives
  - Heavy metals (e.g., mercury, arsenic)
  - Mold/mycotoxins
  - Plastics (e.g., BPA, phthalates)
  - Pollution & EMFs (from Wi-Fi, phones, etc.)
- **Smoking & alcohol**  
Major contributors to oxidative stress and liver burden
- **Medications**  
Especially NSAIDs, antibiotics, chemotherapy, and some chronic-use prescriptions
- **Radiation exposure**  
From X-rays, CT scans, air travel, and devices (phones, tablets)
- **Infections (e.g., UTIs, viral flares)**  
Can spike oxidative stress as the body mounts a defense
- **Chronic stress**  
Especially NSAIDs, antibiotics, chemotherapy, and some chronic-use prescriptions
- **Radiation exposure**  
Emotional stress can drive cortisol up and antioxidants down