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Daily Sugary Drinks Linked to Higher Gastric Cancer Risk

Analysis by Dr. Joseph Mercola | November 19, 2026

STORY AT-A-GLANCE

- Consuming at least one sugar-sweetened beverage per day was associated with 2.45 times the gastric cancer risk compared with consuming less than one per month
- The association appeared in both sexes, with women consuming more than one sugary drink daily having 3.04 times the gastric cancer risk and men having 1.99 times the risk
- Artificially sweetened soft drinks weren't linked to gastrointestinal cancer overall, but a liver-specific analysis found consumption was associated with a 28% higher liver cancer risk
- Soda delivers more than sugar: high-fructose corn syrup delivers a concentrated fructose load your liver has to process rapidly, while phosphoric acid in cola supplies highly absorbable inorganic phosphate that research suggests may burden your kidneys and disrupt mineral balance
- Replacing soda and other sweetened drinks with options such as sparkling mineral water with citrus, whole fruit, and coconut water helps you avoid HFCS and phosphate additives without eliminating carbohydrates from your diet

Gastric cancer remains a major global health problem, ranking among the top causes of cancer death worldwide. Established risk factors include Helicobacter pylori infection, older age, male sex, alcohol intake and tobacco use. Those exposures receive ongoing attention in cancer research. A far more ordinary exposure gets less attention — what you drink each day.

Two large prospective studies connect daily beverage choices with digestive cancer risk in ways that go beyond the familiar sugar-and-calories narrative. The findings implicate sugar-sweetened and artificially sweetened drinks through distinct pathways, and neither category gets a clean bill of health.

Yet the deeper concern isn't sweetness itself. It's what soda actually delivers to your body — concentrated fructose from high-fructose corn syrup (HFCS) and highly absorbable inorganic phosphate — and how those two ingredients place repeated stress on your liver, your kidneys, your arteries and your cellular energy systems.

Gastric Cancer Risk Climbed with Daily Sugary Drinks

A study published in Gastro Hep Advances examined long-term beverage consumption in 112,284 participants from the Nurses' Health Study and Health Professionals Follow-up Study.[1] Compared with people who consumed less than one **sugar-sweetened beverage** per month, those consuming at least one serving per day had 2.45 times the risk of developing gastric cancer.

The association appeared in both sexes. Women consuming more than one serving per day had 3.04 times the risk, while men had 1.99 times the risk. That makes the central finding hard to dismiss — a single daily sugary drink was associated with more than double the gastric cancer risk.

- **Researchers tracked beverage habits repeatedly over decades —** Participants completed validated food-frequency questionnaires every four years, while lifestyle, medical history and disease information was updated every two years. Repeated assessment captures how habits actually change over decades, rather than freezing them at a single snapshot.

  The two cohorts also provided extensive follow-up data. The Nurses' Health Study originally enrolled female registered nurses ages 30 to 55, while the Health Professionals Follow-up Study enrolled male health professionals ages 40 to 75.

- **The higher risk persisted after accounting for numerous other factors —** Researchers adjusted their analysis for characteristics that could influence gastric cancer risk, including body mass index, calorie intake, smoking, alcohol use, diabetes, physical activity and overall diet quality.

  They also accounted for medication use and additional health and lifestyle factors. That matters because sugary drink consumers could differ from nonconsumers in ways that independently affect cancer risk. The association nevertheless remained after these variables were taken into account.

- **H. pylori didn't explain the association —** Researchers also examined H. pylori antibodies in a smaller subgroup of 616 women and 324 men. Infection was present in 36.7% of the women and 34.0% of the men tested.

  Yet sugar-sweetened beverage intake wasn't associated with H. pylori infection in either group. Because H. pylori is an established gastric cancer risk factor, this finding suggests that greater H. pylori prevalence among sugary drink consumers didn't account for the beverage-cancer association.

- **Total fructose intake was also associated with gastric cancer —** The researchers found a positive association between total fructose intake and gastric cancer incidence in the overall study population and among women. This finding is particularly relevant because sugar-sweetened beverages commonly contain HFCS.

  The researchers identified several pathways that could help explain the broader association between sugary beverages and cancer, including weight gain, insulin resistance, steroid hormone imbalance, inflammation, DNA damage and gut dysbiosis, meaning an unhealthy imbalance in your gut microbes. The study didn't establish which mechanism was responsible for the increased gastric cancer risk.

- **The findings have important limitations —** Researchers had limited information about H. pylori status, tumor location within the stomach, family history of gastric cancer and previous upper endoscopy. Most participants were also White and

entered the original cohorts between ages 30 and 75. Because this was an observational study, it establishes an association rather than proving that sugary drinks directly caused gastric cancer.

Artificially Sweetened Drinks Were Tied to Higher Liver Cancer Risk

Sugar-sweetened drinks aren't the only beverages that deserve scrutiny. While the first study linked daily sugary drink consumption with higher gastric cancer risk, replacing regular soda with an artificially sweetened version doesn't necessarily eliminate the concerns. A second analysis broadened the picture by examining how **artificially sweetened soft drinks** relate to cancers throughout the digestive system.

A systematic review and meta-analysis published in Public Health Nutrition examined artificially sweetened soft drinks and five major gastrointestinal cancers: esophageal, gastric, pancreatic, liver and colorectal cancer.[2] Researchers searched PubMed and EMBASE through May 2020 and included observational studies that compared higher consumption with little or no consumption.

When researchers separated the results by cancer type, liver cancer was the exception. Artificially sweetened soft drink consumption was associated with a modest, borderline-significant 28% higher risk of liver cancer. Importantly, no significant association emerged for any of the other gastrointestinal cancer types examined.

- **The liver cancer association appeared across two different types of studies —** Only three studies contributed to the liver cancer analysis, so this finding rests on considerably less evidence than the overall analysis. Still, the direction of the association remained consistent when researchers separated cohort studies, which follow people over time, from case-control studies, which compare people with a disease against those without it.

In the two cohort studies, artificially sweetened soft drink consumption was associated with a 50% higher risk of liver cancer. The single case-control study found an 18% higher risk. Seeing the association in both study designs adds context to the finding, but the small number of liver cancer studies means it deserves further investigation rather than being treated as proof of causation.

- **Aspartame breakdown offers one proposed biological explanation —** The researchers explored how ingredients in artificially sweetened drinks could affect the body over long periods. **Aspartame**, for example, is broken down in the digestive tract into aspartic acid, phenylalanine and methanol. The body then converts methanol into formaldehyde.

  Formaldehyde is genotoxic, meaning it damages genetic material. The researchers described how formaldehyde forms attachments to DNA and promotes DNA-protein cross-links, where DNA becomes abnormally bound to proteins. This damage increases the likelihood of chromosomal mutations. The researchers discussed this pathway as one possible explanation for the liver cancer association, drawing on laboratory and animal research rather than direct proof in humans.

- **Artificial sweeteners aren't the only ingredients under scrutiny —** Diet soft drinks contain more than high-intensity sweeteners. The researchers noted that these beverages also contain acidifying agents, artificial flavors and coloring agents, including caramel coloring containing 4-methylimidazole.

  That distinction matters when you evaluate a beverage. Studying "diet soda" doesn't isolate a single chemical exposure because you're consuming a mixture of ingredients. The researchers noted that some **artificial flavoring agents** are chemically synthesized, although their role in cancer development remains unclear.

- **Changes in appetite, blood sugar regulation and inflammation offer another possible pathway —** The researchers discussed evidence that intense artificial sweetness could weaken the normal relationship between sweet taste and the

body's physiological response to incoming energy. Your body registers intense sweetness but receives no corresponding energy — a mismatch that may recalibrate how it responds to future meals.

The researchers proposed that this disrupted signaling could promote greater food intake, higher-glycemic eating patterns and hyperinsulinemia, meaning abnormally high insulin levels. They also discussed systemic inflammation as part of this pathway. These mechanisms remain proposed explanations rather than demonstrated causes of gastrointestinal cancer in the human studies included in the analysis.

- **Diet measurements make long-term risk difficult to pin down —** Most observational studies in the analysis measured artificially sweetened drink intake only once, at the beginning of the study. Your drinking habits can change substantially over years, so a single questionnaire doesn't necessarily represent your long-term exposure. Other differences also complicated the evidence.

  Some studies didn't adjust for fruit, fruit juice or vegetable intake, and dietary questionnaires don't measure beverage consumption perfectly. Researchers also found substantial variation among the study results, known as heterogeneity, although removing individual studies one at a time didn't substantially change the overall estimate. These limitations help explain why the liver-specific finding warrants attention without establishing that artificially sweetened drinks directly cause liver cancer.

Soda Delivers a Double Hit from Fructose and Phosphate

Taken together, the first two sources point to a broader problem than sugar content alone. Sugar-sweetened beverages were linked to higher gastric cancer risk, while artificially sweetened drinks showed their own concerns, including a higher liver cancer risk in subgroup analysis.[3,4] That raises an important question: What is it about soda itself that places so much stress on your metabolism? Two ingredients deserve closer attention — HFCS and inorganic phosphate.

- **High-fructose corn syrup concentrates fructose in a form your liver has to process quickly —** The sugar in soda matters, but its form matters just as much. HFCS-55, a common soda sweetener, contains about 55% fructose and 45% glucose. Unlike glucose, which cells throughout your body use for energy, fructose is handled primarily by your liver. A typical HFCS-sweetened soda contains about 22 grams of fructose, delivered without the fiber and other components found in whole fruit.

  When fructose arrives faster than your liver can comfortably process it, more may be directed toward fat production. Research suggests fat can begin accumulating inside liver cells, with triglycerides rising in the blood. With repeated exposure, this pattern has been linked to fatty liver disease and insulin resistance, potentially making it harder for the body to regulate fuel efficiently.

- **Fructose also raises uric acid and increases cellular stress —** Fructose metabolism generates uric acid as a byproduct. Research indicates excess uric acid may promote oxidative stress, reduce nitric oxide availability in blood vessels, and interfere with normal vascular relaxation. That combination places added strain on your blood vessels, kidneys and cellular energy systems.

  Your mitochondria, the structures inside your cells that produce energy, may also be affected. Some research suggests repeated fructose overload can reduce cellular ATP (adenosine triphosphate) availability, the energy currency your cells depend on, while uric acid adds another layer of oxidative stress. This helps explain why the harm from soda may extend beyond a temporary rise in blood sugar.

- **Whole fruit doesn't deliver fructose in the same way —** Context changes the metabolic effect. Whole fruit packages fructose with water, fiber and nutrients that slow how quickly the sugar reaches your system. Soda strips away that natural buffer and delivers a concentrated liquid dose that reaches your liver rapidly.

  That distinction is important because the problem isn't carbohydrates or fruit themselves. It's repeated exposure to concentrated fructose in a highly processed drink. Soda makes it easy to consume a large fructose load in minutes without the

physical fullness that normally accompanies whole food.

- **Phosphoric acid adds a separate burden that sugar alone doesn't explain —** Cola commonly contains phosphoric acid, which delivers **inorganic phosphate**. Unlike phosphate naturally bound to proteins or plant compounds in whole foods, inorganic phosphate is absorbed extremely efficiently. Phosphate from whole foods is absorbed at roughly 40% to 60%, while the inorganic phosphate in soda approaches complete absorption.

  Within 30 to 60 minutes, blood phosphate rises and triggers fibroblast growth factor 23, or FGF23 — the same hormone known to rise in chronic kidney disease, where research has linked it to elevated cardiovascular risk in that population.

  FGF23 helps your body remove excess phosphate, but research suggests it may also suppress activation of vitamin D and disrupt calcium metabolism. Your kidneys then work harder to excrete phosphate, while your body draws on additional hormonal responses to keep calcium and phosphate in balance.

- **Repeated phosphate exposure stresses your kidneys, bones and arteries —** Every phosphate surge gives your kidneys more work. Some research suggests repeated exposure could promote oxidative stress and affect the nephrons, the microscopic filters that clean your blood. At the same time, altered calcium-phosphate balance may place additional pressure on bone metabolism.

  Your arteries may respond to excess phosphate as well. Research suggests persistently high phosphate may push smooth muscle cells in arterial walls toward characteristics normally seen in bone-forming cells, a process associated with vascular calcification and stiffness.

  Taken together, the metabolic stress from concentrated fructose and the burden of highly absorbable phosphate suggest soda may deliver more than empty calories, though further research is needed to confirm the full extent of these combined

effects. Proposed mechanisms include a rapid fructose load that may stress your liver and mitochondria, plus highly absorbable phosphate that may disrupt mineral and hormone balance.

How to Cut Soda and Replace It with Healthier Drinks

If soda and other sugar-sweetened beverages are part of your routine, focus first on replacing them rather than simply drinking less. Many of these drinks deliver concentrated fructose from HFCS, while colas and some other processed beverages also contain highly absorbable inorganic phosphate. Regular cola gives you both. The easiest way to break the habit is to match each drink you rely on with an alternative that still gives you the flavor, carbonation, hydration or exercise fuel you want.

1. **Swap cola for sparkling mineral water with fresh citrus —** If you reach for regular cola, you're getting HFCS along with phosphoric acid, a source of inorganic phosphate. Diet cola removes the HFCS, but it still exposes you to phosphoric acid. Replace either one with sparkling mineral water and fresh lemon or lime for carbonation and flavor without either ingredient.

   This is especially important for phosphate because its form determines how readily your body absorbs it. Unlike phosphate naturally bound within whole foods, the inorganic phosphate in soda approaches complete absorption.

2. **Replace sweetened fruit drinks with whole fruit —** If lemonade, fruit punch or other sweetened fruit-flavored beverages are your weakness, check the ingredient list for HFCS rather than assuming the fruit flavor makes them a better choice. The Gastro Hep Advances study specifically included punch and lemonade among the sugar-sweetened beverages studied.[5]

   Choose whole fruit instead. Whole fruit packages fructose with water, fiber and nutrients that slow its delivery, rather than giving your liver the concentrated fructose load found in HFCS-sweetened beverages.

3. **Trade sports and energy drinks for simpler hydration —** If you're an athlete or rely on sports and energy drinks during demanding days, read the ingredient list for HFCS, phosphoric acid and other phosphate additives. Some processed exercise drinks expose you to concentrated fructose, inorganic phosphate or both when what you primarily need is fluid, electrolytes and, during prolonged activity, carbohydrates.

   Unsweetened coconut water with a small amount of sea salt gives you fluid, carbohydrates and electrolytes without relying on HFCS or phosphoric acid. For shorter or less demanding activity, choose water or mineral water instead.

4. **Use homemade carbohydrate fuel instead of processed exercise products —** If you need extra fuel for prolonged exercise, skip commercial sports drinks, energy drinks and other sweetened exercise products that contain HFCS, phosphate additives or both. You don't have to get your carbohydrates and electrolytes from a bottle or commercial gel.

   Make simple rice bars with cooked white rice, a small amount of maple syrup and sea salt, then press and chill them. I don't recommend cutting carbohydrates to solve the problem. Most adults do best with about 250 grams per day, with more if you're highly active. The goal is to choose better carbohydrate sources rather than relying on highly processed sweetened products.

5. **Make HFCS- and phosphate-free drinks your default choices —** If soda is always in your refrigerator, office or car, you're making yourself repeatedly decide whether to drink it. Remove that decision. Stop routinely buying soda and other beverages with HFCS or phosphate additives, and stock the replacements you enjoy instead.

   Keep mineral water, lemons and limes, coconut water, tea and other simple options readily available. When you buy a packaged beverage, scan the ingredient list for HFCS and phosphoric acid or phosphate additives before putting it in your cart. That small habit helps you address the exposure at its source instead of trying to compensate for it later.

FAQs About Sugary Drinks and Gastric Cancer

Q: How much did daily sugary drink consumption affect gastric cancer risk?

A: People who consumed at least one sugar-sweetened beverage per day had 2.45 times the gastric cancer risk of those consuming less than one per month. The association was even stronger among women consuming more than one serving daily, whose risk was 3.04 times higher.[6]

Q: What makes regular soda especially concerning?

A: Two major ingredients are HFCS and inorganic phosphate from phosphoric acid. Concentrated fructose places a heavy metabolic load on your liver and contributes to insulin resistance, while inorganic phosphate is rapidly absorbed and disrupts vitamin D, calcium and phosphate regulation.

Q: Is the fructose in whole fruit as concerning as HFCS in soda?

A: No. Whole fruit provides fructose along with water, fiber and nutrients that slow its delivery. HFCS-sweetened soda delivers concentrated fructose rapidly, making it easy to consume a large amount without the natural food matrix found in fruit.

Q: Is diet soda a better choice than regular soda?

A: Diet soda eliminates HFCS, but it doesn't eliminate every concern. A meta-analysis found artificially sweetened soft drinks were associated with a 28% higher liver cancer risk in the liver-specific analysis, although only three studies contributed to that finding and no significant association was found for the other gastrointestinal cancers examined.[7]

Q: What are good replacements for soda and other sweetened beverages?

A: Choose replacements based on what you're looking for. Sparkling mineral water with lemon or lime provides carbonation, whole fruit replaces sweetened fruit drinks, and coconut water with a little sea salt provides an alternative to many sports and energy drinks. Checking packaged drinks for HFCS, phosphoric acid and other phosphate additives helps you avoid the ingredients you're trying to eliminate.

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.

Sources and References

- [1, 3, 5, 6] Gastro Hep Advances August 17, 2026
- [2, 4, 7] Public Health Nutrition 2021 Mar 11;24(18):6122–6136