

Diets higher in calcium and potassium may help prevent recurrent symptomatic kidney stones, study finds

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Kidney stones can cause not only excruciating pain but also are associated with chronic kidney disease, osteoporosis and cardiovascular

disease. If you've experienced a kidney stone once, you have a 30% chance of having another kidney stone within five years.

Changes in diet are often prescribed to prevent recurrent symptomatic [kidney stones](#). However, little research is available regarding [dietary changes](#) for those who have one incident of [kidney stone](#) formation versus those who have recurrent incidents.

Mayo Clinic researchers designed a prospective study to investigate the impact of dietary changes. Their findings show that enriching diets with foods high in calcium and potassium may prevent recurrent symptomatic kidney stones.

Dietary factors were based on a questionnaire administered to 411 patients who had experienced first-time symptomatic kidney stones and a [control group](#) of 384 people—all of whom were seen at Mayo Clinic in Rochester and Mayo Clinic in Florida between 2009 and 2018. The findings, which were published in *Mayo Clinic Proceedings*, show that lower dietary calcium and potassium, as well as lower intake of fluids, caffeine and phytate, are associated with higher odds of experiencing a first-time symptomatic kidney stone.

Of the patients who had first-time stone formation, 73 experienced recurrent stones within a median of 4.1 years of follow-up. Further analysis found that lower levels of dietary calcium and potassium predicted recurrence.

"These dietary findings may have particular importance because recommendations for preventing kidney stones have been based primarily on dietary factors associated with first-time rather than recurrent stone formation," says Andrew Rule, M.D., a Mayo Clinic nephrologist and senior author of the study. "Patients may not be likely to adjust their diet to prevent an incidence of kidney stones, but they are

more likely to do so if it can help prevent recurrence."

Fluid intake of less than 3,400 milliliters per day, or about nine 12-ounce glasses, is associated with first-time stone formation, along with caffeine intake and phytate, the study finds. Daily [fluid intake](#) includes intake from foods such as fruits and vegetables.

Low fluid and [caffeine intake](#) can result in low urine volume and increased urine concentration, contributing to stone formation. Phytate is an antioxidant compound found in whole grains, nuts and other foods that can lead to increased calcium absorption and urinary calcium excretion.

"Changing your diet to prevent kidney stones can be very difficult," says Dr. Rule. "Thus, knowing the [dietary factors](#) that are most important for preventing kidney stone recurrence can help patients and providers know what to prioritize."

Low dietary calcium and potassium was a more important predictor than fluid intake of recurrent kidney stone formation, says Api Chewcharat, M.D., the article's first author and a postdoctoral research fellow at Mayo Clinic at the time of the study. "This is not to say high fluid intake is not important. We just did not find benefits of increasing fluid intake among those patients with a history of kidney stone formation."

The study concludes that diets with daily intake of 1,200 milligrams of calcium may help prevent first-time and recurrent kidney stones. That daily intake is in line with the Department of Agriculture's daily recommended nutrition.

While higher potassium intake also is recommended, the USDA does not make a recommendation for daily potassium intake. The study also doesn't recommend an intake level.

Dr. Chewcharat says the takeaway is that patients should add more fruits and vegetables that are high in calcium and potassium to their diets. Fruits that are high in potassium include bananas, oranges, grapefruits, cantaloupes, honeydew melons and apricots. Vegetables include potatoes, mushrooms, peas, cucumbers and zucchini.

More information: Api Chewcharat et al, Dietary Risk Factors for Incident and Recurrent Symptomatic Kidney Stones, *Mayo Clinic Proceedings* (2022). [DOI: 10.1016/j.mayocp.2022.04.016](https://doi.org/10.1016/j.mayocp.2022.04.016)

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