

Citric Acid and Kidney Stones

What is citric acid?

Citric acid (citrate) is a natural part of many fruits. It is not a vitamin or mineral. Eating fruit that has citric acid may help prevent calcium kidney stones.

How does citric acid protect against kidney stones?

Citrate keeps tiny crystals from joining together to form bigger ones. Citric acid from food helps prevent calcium-containing stones. It does not help prevent other stone types such as uric acid stones.

The more citrate you have in your urine, the more protected you are from calcium kidney stones. If the citrate in your urine is very low, you may need a prescription for a stronger form of citrate. Treatment may be costly and require as many as 12 tablets daily. On the other hand, if your urine citrate is low, there is no need to try and increase it.

What can I do to decrease my risk of calcium stones?

Two things you can do to decrease your risk of new calcium stones are:

- Increase your citric acid,
- Drink plenty of fluids (at least ten 8 oz glasses per day).

What are the best food sources of citric acid?

Lemons and limes have the most citric acid. A half cup (4 ounces) of pure lemon or lime juice per day provides about the same amount of citric acid as the prescription form. Lemon or lime juice can be squeezed fresh from the fruit or used from a bottle. Oranges, grapefruits, and berries also contain large amounts. Many other fruits and vegetables contain a small amount of citrate, too.

Tips to Increase Citric Acid in Your Diet

- While citrus fruits are the best source of citric acid, all fruits and vegetables will increase the citric acid in your urine. Eating a balanced diet that includes fruits and vegetables has many health benefits. For example, potassium and magnesium protect against forming new stones and may prevent cancer and other chronic diseases. **Try for 5 or more servings per day.**
- Make lemon-lime ice cubes. Fill ice cube trays with water. Then squeeze at least half of a lemon and/or lime over the ice cube trays before freezing. Juice concentrate can also be used. Use these ice cubes to spruce up plain tap water and other drinks.
- Squeeze some fresh lemon or lime directly into your soda, fruit juice, tea or water.
- Chug it! Dilute 2 ounces lemon juice with 6 ounces water and drink twice a day – once in the morning and once in the evening – to reach the goal of 4 ounces lemon juice per day.
- Lemonade isn't just for summer! Try homemade lemonade. Squeeze a ½ cup (4 ounces) of fresh or bottled lemon juice into a pitcher of cold water. Add sugar or sugar substitute, if desired. If you are watching calories or sugar, there are non-caloric lemonade products (such as Crystal Light or Minute Maid Light). These brands are high in citric acid but have much less sugar and few or no calories. Check the labels before buying to be sure citric acid appears near the top of the ingredient list.

- Make a lemon spritzer. Pour 2 cups fresh lemon juice (from about 9 medium size lemons; or use lemon juice concentrate) into a large pitcher. Add 1 cup Splenda[®], a non-calorie sweetener made from sugar. When Splenda[®] is fully dissolved, add 1-liter chilled club soda, thin slices from 2 limes, and a few ice cubes. Stir and serve.
- Use fresh lemon on lettuce or spinach salads. You may find yourself using less of those high-fat salad dressings.
- Use freshly squeezed lemon or lime on fruit salads. Besides adding a zesty taste, the acid in the juice will prevent cut fruits, such as apples, from browning. You'll have better-looking and healthier fruit salads.
- Use lemon or lime juice on fish and in marinades for any type of meat. Let the label be your guide. Choose products that are high in citric acid.
- Some lemon-lime sodas can be high in citric acid. If you drink soda, consider switching to a brand that is high in citric acid.
- **Here's a quick tip to get more juice from lemons & limes - Roll them on a hard surface while pressing down with your palm. Or, heat them for about 30 seconds in the microwave before squeezing.**

Teach Back

What is the most important thing you learned from this handout?

What changes will you make in your diet/lifestyle, based on what you learned today?

If you are a UW Health patient and have more questions, please call UW Health at one of the phone numbers below. You can also visit our website at www.uwhealth.org/nutrition.

Nutrition clinics for UW Hospital and Clinics (UWHC) and American Family Children's Hospital (AFCH) can be reached at **(608) 890-5500**.

Nutrition clinics for UW Medical Foundation (UWMF) can be reached at **(608) 287-2770**.

If you are a patient receiving care at UnityPoint – Meriter, Swedish American or a health system outside of UW Health, please use the phone numbers provided in your discharge instructions for any questions or concerns.

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright 2/2019 University of Wisconsin Hospital and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#353.