

## PATIENT INFORMATION

# Purines, urine pH and citrate



### Your guide to purines, urine pH and citrate

Review these frequently asked questions to learn more about purines, urine pH, citrate and kidney stone prevention.

#### **“My doctor said that I have to cut down on my purines.**

##### **What is a purine?”**

In order to reduce the level of uric acid in your urine, you must lower your consumption of purines. Purine is a compound that is mainly found in meat (beef, poultry, pork, fish) and breaks down into uric acid when metabolized.

When you eat a diet that is high in protein, you have higher uric acid levels. This may increase your risk of forming kidney stones.

#### **“I make calcium oxalate stones. I would think that since I have excess uric acid I would be making uric acid stones. Please explain.”**

Some patients who have high levels of uric acid in their urine do make uric acid stones. Other patients that have high levels of uric acid in their urine make calcium oxalate stones. High levels of uric acid in the urine appear to promote crystallization of calcium oxalate. This will increase your risk of forming calcium oxalate stones. If your uric acid level is lowered, new stones (uric acid and calcium oxalate) are less frequent.

#### **“How much protein am I allowed to eat?”**

Most people can reduce their uric acid levels by diet alone. Avoid eating organ meats, (i.e., liver and brain). Reduce your daily intake of meats to 6 to 8 ounces per day. This includes beef, poultry, pork and fish. Many patients have been told to limit their red meat intake or cut down on saturated fats (for other medical reasons) and have overcompensated by eating higher levels of poultry, pork and seafood; it is important to understand that these food items are high in protein as well.

In practical terms, this means cutting back on portion sizes: a smaller steak, one less chicken leg, etc. It is not realistic to be too exact in this area. There is no need to know the protein composition of every food. High protein foods include all meat, poultry, pork, fish and eggs.

#### **“I don’t eat that much protein. Why are my levels so high?”**

There are some patients who simply produce more uric acid than others, regardless of their protein intake. If you are one of these patients, then your doctor may prescribe you a medication called allopurinol. This drug has been proven successful in lowering urine uric acid levels. Allopurinol has been used in treating patients with gout, a painful metabolic disease that is caused by excessive uric acid buildup.

#### **“My doctor said I have a low urine pH and low citrate level. What does that mean?”**

A normal urine pH is about 6.0. pH is the unit of measure used to describe acid-base balance. If your urine pH falls under 5.8, it is considered to be low which means your urine is more acidic. When your urine pH is low, uric acid crystals will form (the crystals are more prone to form in an acidic environment) and this will lead to uric acid stones or mixed calcium oxalate/uric acid stones. Citrate is a molecule in blood and urine that binds to calcium. When citrate binds to calcium in the urine, it acts like a shield by preventing calcium from binding with oxalate or phosphate.

This shield will protect you from making more kidney stones. Having low citrate levels in your urine means you do not have this natural shield and you are more likely to form new kidney stones.

**“I was prescribed potassium citrate to increase my citrate level, but I’m concerned I’m not absorbing the pills.”**

The pills have an outer coating that is not absorbed by the body, so you may notice some of the outer coating in your stool. Do not worry, this is a normal occurrence. The medication has been dissolved and you have received the full therapeutic dose.

## Very high purine foods

Below is a list of foods that have very high purine levels (100 to 1,000 mg of purine per 3 oz serving of food). You should try to avoid these products. If one of your favorites is on this list, cut back on how many times you eat the product and always drink a glass of water before and after your favorite treat.

- Anchovies
- Bacon
- Bouillon
- Brains
- Broth
- Codfish
- Consomme
- Goose
- Gravy
- Haddock
- Heart
- Herring
- Kidney
- Liver
- Mackerel
- Meat extracts
- Mincemeat
- Mussels
- Partridge
- Roe
- Sardines
- Scallops
- Shrimp
- Sweetbreads
- Veal
- Venison
- Yeast
- Yeast extract

## Moderate purine foods

Below is a list of foods that have moderate purine levels (9 to 100 mg per 3 oz of food). Again, if one of your favorites is on this list, cut back on how many times you eat the product and always drink a glass of water before and after your favorite treat.

- Asparagus
- Beans, dried
- Fish
- Ham
- Lentils
- Mushrooms
- Peas, dried
- Pork
- Poultry
- Meat (red)
- Spinach

**Source:** M.V. and L.K. Mahan, Food, Nutrition, and Diet Therapy, 8th ed. (Philadelphia: W.B. Saunders Company, 1992) p. 696.

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