

### [Test Your Knowledge: Kidney Stones](#)

A recent Core Curriculum article by [Pfau and Knauf](#) covers recent literature on the epidemiology, pathophysiology, diagnosis, and management of nephrolithiasis. The following questions and true/false statements based on the article will test your knowledge on this topic.

1. Which of the following is **NOT** a recognized risk factor for kidney stone formation?
  - A. Low fluid intake
  - B. High calcium diet
  - C. Residence in certain parts of the United States, including the Carolinas, Georgia, and Alabama
  - D. High animal protein intake
  
2. Which of the following medications should **NOT** increase the risk of kidney stone formation?
  - A. Acetazolamide
  - B. Acyclovir
  - C. Furosemide
  - D. Hydrochlorothiazide
  
3. Which are the following strategies would **NOT** prevent nephrolithiasis recurrence in a patient with uric acid stones?
  - A. Potassium citrate supplementation
  - B. Low-sodium diet
  - C. Targeting a urine pH less than 5.5
  - D. Allopurinol use
  
4. Obesity is a known risk factor for nephrolithiasis. Therefore, weight loss/bariatric surgery reduces the risk of calcium oxalate stone formation.
  - A. True
  - B. False
  
5. JW has a medical history of long-standing Sjogren syndrome. She's currently experiencing her second episode of nephrolithiasis. Your metabolic evaluation revealed the possibility of calcium phosphate stones. Which of the following interventions would **NOT** reduce the risk of future stone recurrence?
  - A. Increase fluid intake to 2L per day
  - B. Start high calcium diet
  - C. Start potassium citrate and aim for urine pH above 7
  - D. Start thiazide diuretic

6. Percutaneous nephrolithotomy monotherapy is the treatment of choice for infected staghorn calculi.
- A. True
  - B. False

*Quiz prepared by Dr. Veeraiash Chauhan, AJKD Blog Contributor.*

## Solutions to AJKD Blog's [Test Your Knowledge: Kidney Stones](#)

Based on [Pfau & Knauf](#) AJKD review

### 1. B. High calcium diet

High dietary calcium intake is independently associated with lower risk of kidney stones. This is because calcium binds to intestinal oxalate, therefore reducing the amount of soluble oxalate available for absorption. Low fluid intake, high salt and protein diet, and geographic variations are known risk factors for kidney stones.

### 2. D. Hydrochlorothiazide

Hydrochlorothiazide, while a diuretic, also reduces hypercalciuria. This occurs as inhibition of the sodium chloride co-transporter in the distal tubule leads to volume depletion and increased calcium reabsorption in the proximal tubule. Therefore, the medication is frequently used for preventing development of most calcium-based stones.

### 3. C. Targeting a urine pH less than 5.5

All these strategies, including potassium citrate supplementation, low-sodium diet, and allopurinol use have potential roles in preventing uric acid stone recurrence. However, reducing the urine pH to less than 5.5 will actually promote uric acid precipitation. With uric acid stones, alkalinization of urine prevents crystallization.

### 4. B. False

While obesity is a known risk factor for nephrolithiasis, bariatric surgery also could increase risk of calcium oxalate stone formation. This is related to enteric hyperoxaluria. Increased free fatty acids in the intestinal lumen bind to calcium after such surgery, thereby increasing the amount of oxalate available for intestinal absorption. This will increase risk of calcium oxalate stone formation.

### 5. C. Start potassium citrate and aim for urine pH above 7

Distal renal tubular acidosis (dRTA) can often be seen in autoimmune conditions like Sjogren's syndrome. As we know, a high urine pH is typical in dRTA. This will also increase risk of calcium phosphate stone formation. Increasing the urine pH above 7 would further increase risk of calcium phosphate stone formation, and most recommendations advise not to let the pH rise above 6.5-7.

**6. A. True**

The [American Urological Association guideline](#) recommends percutaneous nephrolithotomy as the treatment of choice for staghorn calculi.