Dietary and Pharmacologic Management to prevent Recurrent Nephrolithiasis in Adults

A Clinical Practice Guideline From the American College of Physicians

Introduction

Approximately 80% of adults with kidney stones have stones consisting primarily of calcium oxalate, calcium phosphate, or both. Other stones consist of struvite, uric acid or cystine.


Stones are caused by interaction between genetics and environmental exposure. [Attanasio and al. Pediatr Nephron 2011; 26: 337]
Introduction

Effort to prevent the recurrence of nephrolithiasis target **decreasing concentration of lithogenic factors** (for example, calcium and oxalate) and **increasing the concentration of inhibitors of stone formation** (for example, citrate). This is achieved by both **dietary change** and **appropriate pharmacologic approaches** for preventing recurrent kidney stones. Dietary changes include **increasing water intake**, reducing oxalate, reducing dietary animal protein and other purines, and maintaining normal dietary calcium.

Questions Guiding the Evidence Review (1/2)

1. Do results of baseline stone composition and blood and urine chemistries predict the effectiveness of diet and/or pharmacologic treatment on final health outcomes and intermediate stone outcomes, as well as reduce adverse effects?  
   Insufficient evidence to make a recommendation

2. Do results of follow-up blood and urine biochemistry measurements predict final health outcomes and intermediate stone outcomes in adults being treated to prevent recurrence?  
   Insufficient evidence to make a recommendation

3. What is the effectiveness and comparative effectiveness of different dietary therapies on final health outcomes and intermediate stone outcomes?  
   recommendation 1

4. What is the evidence that dietary therapies to reduce risk for recurrent stone episodes are associated with adverse effects?

Multicomponent diet: hypertension, gout, and stroke

5. What is the effectiveness and comparative effectiveness of different pharmacologic therapies on final health outcomes and intermediate stone outcomes?

**Recommendation 2**

6. What is the evidence that pharmacologic therapies to reduce risk for recurrent stone episode are associated with adverse effects?

**Thiazide:** orthostasis, gastrointestinal upset, erectile dysfunction, fatigue and muscle symptoms; **Citrate:** gastrointestinal symptoms; **Allopurinol:** rash, acute gout, and leukopenia

Recommendation 1

ACP recommends management with increased fluid intake spread throughout the day to achieve at least 2 L of urine per day to prevent recurrent nephrolithiasis

[Grade: weak recommendation, low-quality evidence]
Recommendation 2

ACP recommends pharmacologic monotherapy with a thiazide, citrate or allopurinol to prevent recurrent nephrolithiasis in patients with active disease in which increased fluid intake fails to reduce the formation of stones.

[Grade: weak recommendation, moderate-quality evidence]

Clinical consideration

Evidence is applicable primarily to calcium stones.

Evidence showed that patients who decreased intake of soda that was acidified by phosphoric acid had reduced kidney stone recurrence. Clinicians should encourage patients to avoid colas as opposed to fruit-flavored soft drinks, which are often acidified by citric acid.