

**Recommended Reading:**

**"No More Kidney Stones"**

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**ACKNOWLEDGEMENTS**

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Important telephone numbers

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# Diet and Kidney Stones

## Stone Prevention Clinic

*A guide to healthy  
eating for people with  
kidney stones*

University of Toronto



The Kidney Stone Centre

A provincial program at  
St. Michael's Hospital  
in conjunction with  
The University of Toronto

[www.kidneystone.org](http://www.kidneystone.org)



**K**idney stones can be prevented or controlled by dietary intervention or medication. The intent of this booklet is to provide information to people who have kidney stones.

The risk of forming kidney stones is related to factors such as inheritance, gender, age, occupation, metabolic disturbances within the body, urinary tract infections, eating habits, and fluid intake.

The most common stones are those composed of calcium and oxalate crystals. Foods in the diet, along with chemical reactions within the body, result in the release of chemical "salts" in the urine. The following risk factors increase one's chances of forming calcium oxalate stones:

LOW urine output (less than 2L per day)  
LOW urine magnesium citrate  
HIGH urine calcium  
          oxalate  
          sodium  
          uric acid

The 24-hour urine collection gives an indication of the risk factors present. The diet can be modified to change the chemical composition of the urine with the aim of reducing the risk of kidney stone formation.

Instructions might need to be modified by your physician or dietitian depending upon your individual requirements.

The following diet modifications are suggested:

- ↑ FLUIDINTAKE
- ↓ CALCIUM (only if excessive)
- ↓ OXALATE
- ↓ SODIUM / SALT
- ↓ ANIMAL PROTEIN

## Fluids

- Drink at least 10 to 12 cups (2.5 to 3 L) per day. Half of all fluids taken should preferably be water.
- Drinking enough fluid each day will help to wash chemical salts or crystals through the kidneys before stones have a chance to form.
- In hot, humid weather conditions, it is important to increase fluid intakes to make up for losses due to perspiration from the skin.
- Limit alcohol and caffeine beverages, avoid tea, Coke, Pepsi, Root Beer, Dr. Pepper.
- Add ½ cup concentrated (Real Lemon) lemon juice to 2 litre (8 cups) water and drink over the day to increase urine citrates. Citrates help to prevent stones from forming naturally.



## CALCIUM

- Calcium and Vitamin D are needed for healthy bones. Therefore, it is important to include calcium in your diet.
- Too little calcium in the diet might result in too much oxalate being absorbed and released into the urine.

### Foods High in Calcium

#### Dairy Products

Milk  
Milk Puddings/Custard  
Yogurt  
Ice Cream  
Cheese (low salt)

#### Other Products:

Orange juice with added calcium (limit to max. one 8oz. glass a day)

**Have three (3) servings per day of dairy foods from the above list, with the main meals, and when you eat fruits and vegetables.**

Over-the-counter calcium preparations should only be taken on the advice of your physician (e.g., Tums®, Rolaid®).

#### Avoid

Nuts & Soya Milk; these are very high in oxalate.

## OXALATE

- Oxalate comes from eating foods rich in this substance, from Vitamin C supplements, and from chemical reactions within the body.
- Oxalate in the urine can be decreased by decreasing oxalate in the diet, while taking enough calcium to maintain a proper balance of these two elements.

#### • Avoid using the following foods high in oxalate content:

##### Avoid:

Dark green leafy vegetables e.g. spinach, swiss chard, beet greens, kale, escarole, watercress, etc.  
Rhubarb, beets  
Nuts  
Tea - (black, green, mint)  
Vitamin C supplements  
Coke, Pepsi, Root Beer, Dr. Pepper

##### Limit:

Chocolate  
Strawberries and other berries  
Soya products:  
- tofu, veggie burgers, meat substitutes  
Beans - String, baked, kidney, soy  
Fruit juice (max. 2 cups/day)  
Parsley

##### Choose:

Herbal teas - chamomile, ginger, rosehip, peach, etc.  
Sprite, Ginger Ale, 7-Up  
All other fruits and vegetables not listed above.

## SODIUM / SALT

#### • A high amount of salt in your diet tends to increase the amount of calcium in the urine.

- To control amount of salt in your diet, try to limit the use of the following foods which are rich in sodium/salt:

#### 1. SALT PRESERVED FOODS

- ♦ smoked, pickled, canned or
- ♦ seasoned meats, fish, and
- ♦ poultry e.g., bologna, bacon,
- ♦ ham, salami, sausage, pastrami,
- ♦ anchovies, caviar, herring

#### 2. HIGHLY SALTED FOODS

- ♦ canned vegetables / vegetable juices e.g., tomato juice
- ♦ canned / powder soups
- ♦ bouillon cubes
- ♦ **processed cheese products**
- ♦ salted crackers / salted snack foods, such as, chips, nuts, pretzels
- ♦ **most cheeses**

#### 3. SPICES / CONDIMENTS

- ♦ table salt
- ♦ garlic / onion salts, Accent® (MSG)
- ♦ soy sauce, steak and worcestershire sauces, chili sauce, ketchup
- ♦ sauerkraut, olives, dill pickles
- ♦ Avoid using salt substitutes e.g., sea salt, “No Salt”, “Half-salt”, “Nu-salt”, MSG, brine.

- When preparing food REDUCE the amount of salt.
- Try using herbs, spices, fresh or powdered onion and garlic, “Mrs. Dash” or McCormick’s “No salt added”, and lemon juice as flavour enhancer instead of salt.

## ANIMAL PROTEIN

- Most North Americans consume very generous portions of animal protein products, such as meat, fish, poultry, & eggs.
- Eating large amounts of animal protein can increase the amount of uric acid, calcium and possibly oxalate in the urine.

- ♦ REDUCE portion sizes of animal protein products. **(Daily serving of 4-6 oz. or 100-150 gm. cooked is ideal).**

- ♦ Limit the use of the following foods, which readily produce uric acid:

Organ Meats - liver, kidneys, heart  
- tongue  
- brain  
- sweetbreads

Goose / Game Meats / Rabbit

Anchovies / Fish Roe

Sardines / Herring

Mussels / Scallops

	Your Test Nos.		Your risk
	Date	Date	
Normal 24hour Urine			↑ = high risk ✓ = low risk
Volume more than 2000 ml			
Calcium less than 7.5 mmol			
Oxalate less than 440 µmol			
Uric Acid less than 4.0 mmol			
Sodium 100-150 mmol			
Citrate more than 1.6 mmol/24hr.			
Magnesium more than 3 mmol/L.			