

# KIDNEY STONES

The urinary tract system consists of two kidneys, two ureters, one urinary bladder, and one urethra.

Urine is produced by our two kidneys. Urine then drains into the bladder through the ureters. It is then stored in the urinary bladder until it is passed out through the urethra.

## ? What is a kidney stone?

A kidney stone is a solid mass which forms in the urinary tract due to crystallization of substances present in the urine. It can be found along any part of the urinary tract. Kidney stones may stay in the kidneys or break loose and travel down the urinary tract. A small stone may pass out of the body spontaneously. On the other hand, a larger stone may become lodged in the ureter, bladder or urethra. Stones may also obstruct the flow of urine and cause pain although many can exist without symptoms. Stones that obstruct or cause repeated or severe infections may lead to kidney failure.

### How do kidney stones form?

Many risk factors lead to stone formation. Some of these include:

DRINKING TOO LITTLE FLUID

FAMILY HISTORY OF STONES

PREVIOUS HISTORY OF URINARY TRACT INFECTIONS OR STONES

CERTAIN METABOLIC CONDITIONS

### Types of stones

There are 4 main types

#### Calcium Containing Stones (most commonly calcium oxalate)

These may form for a variety of reasons including low fluid intake, high excretion of calcium, uric acid and/or oxalate in the urine. A high amount of dietary salt also leads to increased calcium in the urine.

#### Infection Stones

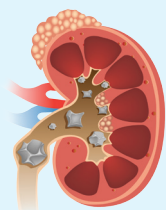
These are of a mixed nature containing magnesium ammonium phosphate (also called struvite) and calcium carbonate. They are associated with infection by certain bacteria only.

#### Uric Acid Stones

Too much acid in the urine assists in the formation of uric acid stones. Uric acid stones may also occur with high quantities of uric acid passed in the urine.

#### Cystine Stones

These are very rare and usually an inherited disorder.

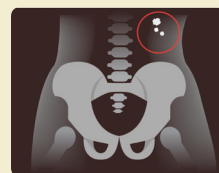


### What are the signs and symptoms?

There may not be any symptoms at all. However, some symptoms include the following:

- ▶ Pain at the side or back
- ▶ Blood in urine
- ▶ Painful urination, cloudy urine or urine that smells bad associated with fever suggesting urine infection

### What tests are usually done to confirm that stones are present?



A plain X ray of the urine tract called the KUB X-ray (Kidney – Ureter – Bladder) can pick up about 85% of stones. These will be stones that contain calcium. Stones that do not contain calcium cannot be seen on a routine X-ray. Your doctor may order an IVU (intravenous urogram) instead, which involves a dye being injected into the blood stream to “light up” the whole urine tract as the dye gets excreted. This can also detect obstruction to urine flow, if present. A less informative but easier alternative is an ultrasound scan.

### How to find out what type of stone do I have?

The best way to find out what type of stone you have is to test the stone. If you know you are passing out a stone, you may catch it with a strainer and show it to your doctor. Other methods include urine collection to look for abnormally high levels in the urine for the common constituents of stones. Blood tests may also be needed.

### What needs to be done when a kidney stone has been diagnosed?

- Your kidney function needs to be assessed by your doctor to check if there has been any kidney damage
- Your doctor needs to decide on what to do with the stone that has already formed

Small stones which are causing no symptoms may be left alone. If they are not obstructing and appear to be passing down the urine tract, they may be left alone to give it an opportunity to pass out on its own. However, if your doctor judges that it needs to be removed, he can choose one of the following options depending on the size, type and location of the stone. Each treatment has its advantages and disadvantages.

- ▶ Extracorporeal Shock Wave Lithotripsy (ESWL) is a non invasive method using shock waves
  - ▶ Percutaneous lithotripsy with an endoscope inserted into the kidney with energy applied directly to the stone
  - ▶ Endoscopic lithotripsy for ureteral or bladder stones
  - ▶ Open surgery is now seldom done though it may still be necessary for larger stones
- c) Your doctor will discuss with you measures to prevent new stones from forming

These measures should be taken once a stone has been detected. They include:


#### KEEPING A HIGH FLUID INTAKE

- ▶ This will prevent saturation of urine with substances which can form stones leading to crystallization and eventual stone formation.

#### DIETARY RESTRICTIONS

- ▶ Limiting sodium in the diet (to 2-3 g per day) to reduce urine calcium excretion
- ▶ Reduce a high calcium intake to a moderate calcium intake. Low calcium intake is not advisable because of the risk of osteoporosis (thin bones)

- ▶ Limiting the intake of coffee, tea and cola because they are rich in oxalate which can combine with calcium to ‘crystallize’ and form stones
- ▶ You may be advised to eat less meat if you have uric acid stones

 The assistance of a dietician is useful in assessing what is considered optimal for a patient.

### Points to remember

- Untreated kidney stones can lead to kidney failure
- See a doctor if you have:
  - ▶ severe pain in your back or side that will not go away
  - ▶ blood in the urine
- Talk to your doctor about how to avoid the formation of kidney stones.
- Keep yourself well hydrated to prevent stone formation

### You may visit these websites for more information:

<http://www.kdf.org.sg>

<http://www.davita.com>

<http://www.uptodate.com/patients/index.html>

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# 肾结石

泌尿系统是由两颗肾脏、两条输尿管、一个膀胱和一条尿道组成。

在泌尿的过程中，两颗肾脏所生产的尿液会由输尿管导入膀胱，然后蓄积在内直到通过尿道被排出体外。

## 什么是肾结石？

肾结石是个固体硬块，由存在尿液中的物质晶化而成，可出现在泌尿系统的任何一处。肾结石可能会宿居在肾脏内或碎裂成小块顺着尿路往下移动。体型小的结石可能会自然地排出体外，而较大的结石则会停留在输尿管、膀胱或尿道内。肾结石也可能导致尿流梗塞，引起疼痛，然而许多时候它的存在是毫无症状的。结石若重复形成或造成阻塞或感染，可能导致肾衰竭。

## 肾结石如何形成？

导致结石形成的风险因素有许多，其中包括：

饮水量过少

家族病史

曾有泌尿系统感染或结石的病历

一些新陈代谢异常的状况

## 肾结石的类型

肾结石主要有四种类型：

### 含钙结石

这种结石含有钙质，最常见的是草酸钙。导致这种结石的形成有几种原因，如：低水份摄入、尿液中有高含量的钙质、尿酸或草酸，以及摄取大量的食盐也会导致尿液的含钙量增加。

### 感染性结石

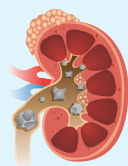
这是由磷酸镁铵（也称为鸟粪石）和碳酸钙混合而成的结石。这类感染性结石由某些细菌的感染引起。

### 尿酸结石

尿液里的酸性及尿酸过高都可能形成尿酸结石。

### 胱氨酸结石

这是非常罕见的类型，通常是遗传性的。

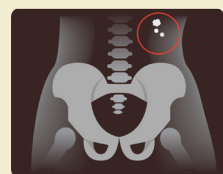


## 肾结石有那些临床症状？

一般肾结石不会有任何症状，但可能会出现以下症状：

- ▶ 身体侧面或背部感到疼痛
- ▶ 血尿
- ▶ 排尿疼痛、混浊的尿液或带有异味的尿液
- ▶ 因泌尿系统感染引起的发烧

## 需要做那些检查以确定结石是否存在？



通常透过泌尿系统 X 光线片，简称为 KUB X-光线片（K即为肾，U即为输尿管，B即为膀胱），能捕捉约85%的结石，尤其是含钙的结石。不含钙的结石则不能在常规的X-光线片中显现，但是你可进行静脉尿路造影检验（IVU）以检查结石的踪影。医生将色素注入静脉后，身体将色素排出，它就能‘照亮’整个泌尿系统来鉴查结石的踪影。此外，这项检查也能鉴查尿流是否有阻塞的问题。超声波扫描则是另一项较简单的检查，但其能提供的信息有限。

## 如何知道我患的是哪类型的结石？

要确定结石是属于哪类型的最好方法是进行结石检验。如果你的排泄物中有结石，可以用过滤器来收取它们，交给医师检验。其他方法包括收集尿液，以检验使结石形成的物质在尿液里是否含量过高。你也可能需要进行血液检验。

## 被诊断患有肾结石后该如何处理？

- 接受检查以确认你的肾功能是否有受到损坏
- 你的医生会决定如何处理已形成的肾结石

无症状又细小的结石可以不必理会。因为细小的结石不会造成任何的阻塞，且会自行顺着尿道排出体外，所以可以不用担心。但假如你的医生认为必须将它取出，他会根据结石形状的大小、类型和位置选择以下其中的一种治疗方法。每个疗法都各有优缺点：

- ▶ 体外震波碎石术（ESWL），是一种利用震波击碎结石的无侵害性治疗。
- ▶ 敲打松开法，将内窥镜插入肾脏再以能量直接打松结石。
- ▶ 内窥镜碎石法，适用于尿道或膀胱结石的治疗。
- ▶ 肾结石切割手术，虽然现在已不普遍，但适用于处理大颗的结石。

c) 你的医生会与你讨论如何预防新结石的形成

一旦发现有结石，就必须采取以下的预防措施：

### 需摄入大量的水分

- ▶ 这能减低尿液的浓度，预防物质的沉积，进而降低沉积物质晶化而逐渐形成结石的可能性。

### 限制饮食的摄入

- ▶ 限制钠的摄入（每天约2-3克），以减少钙在尿液中排出
- ▶ 摄入适量的钙质，减少含高钙的食物，但不鼓励过度减低摄入量，因它会导致骨质疏松症。

- ▶ 少喝咖啡、茶和可乐，因它们含有大量的氧化物。氧化物与钙质结合可能会晶化形成肾结石。
- ▶ 若患有尿酸结石，最好减少肉类的摄入。



营养师的食物评估和饮食建议对于患者是有很大的帮助的。

## 切记

- 肾结石若不处理或治疗治疗，可导致肾衰竭
- 如有以下症状，请务必求诊：
  - ▶ 身侧或背部有久久未撤的剧烈疼痛
  - ▶ 血尿
- 要向医生了解如何避免结石的重复形成
- 摄入足够的水份以预防结石形成

## 欲知更多，可浏览以下网页：

<http://www.kdf.org.sg>  
<http://www.davita.com>  
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