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Kidney Stones

Also called: Nephrolithiasis

A kidney stone is a solid piece of material that forms in the kidney from substances in the urine. It may be as small as a grain of sand or as large as a pearl. Most kidney stones pass out of the body without help from a doctor. But sometimes a stone will not go away. It may get stuck in the urinary tract, block the flow of urine and cause great pain.

The following may be signs of kidney stones that need a doctor's help:





- Extreme pain in your back or side that will not go away
- Blood in your urine
- Fever and chills
- Vomiting
- Urine that smells bad or looks cloudy
- A burning feeling when you urinate

Your doctor will diagnose a kidney stone with urine, blood, and imaging tests [<https://medlineplus.gov/kidneytests.html>] .



If you have a stone that won't pass on its own, you may need treatment. It can be done with shock waves; with a scope inserted through the tube that carries urine out of the body, called the urethra; or with surgery.

NIH: National Institute of Diabetes and Digestive and Kidney Diseases




Start Here

- Definition and Facts for Kidney Stones [<https://www.niddk.nih.gov/health-information/urologic-diseases/kidney-stones/definition-facts>]  (National Institute of Diabetes and Digestive and Kidney Diseases)
- Kidney Stones [<https://www.kidney.org/kidney-topics/kidney-stones>]  (National Kidney Foundation)
- Kidney Stones [<https://www.niddk.nih.gov/health-information/urologic-diseases/kidney-stones>]  **Easy-to-Read** (National Institute of Diabetes and Digestive and Kidney Diseases)
Also in Spanish [<https://www.niddk.nih.gov/health-information/informacion-de-la-salud/enfermedades-urologicas/piedras-rinones>]
- Pebbles in Your Plumbing: Flushing Kidney Stones [<https://newsinhealth.nih.gov/2017/06/pebbles-your-plumbing>]  (National Institutes of Health)
Also in Spanish [<https://salud.nih.gov/recursos-de-salud/nih-noticias-de-salud/guijarros-en-la-caneria>]

Diagnosis and Tests

- Abdominal Pain (Stomach Pain), Short-Term [<https://familydoctor.org/symptom/abdominal-pain-stomach-pain-short-term/?adfree=true>] (American Academy of Family Physicians)
Also in Spanish [<https://es.familydoctor.org/sintoma/dolor-en-el-abdomen-de-corta-duracion/?adfree=true>]
- Crystals in Urine [<https://medlineplus.gov/lab-tests/crystals-in-urine/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/prueba-de-cristales-en-la-orina/>]
- Kidney Stone Analysis [<https://medlineplus.gov/lab-tests/kidney-stone-analysis/>]  (National Library of Medicine)

Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/analisis-de-calculos-renales/>]

- **Kidney Tests: MedlinePlus Health Topic** [<https://medlineplus.gov/kidneytests.html>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/kidneytests.html>]
- **Phosphate in Urine** [<https://medlineplus.gov/lab-tests/phosphate-in-urine/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/prueba-de-fosfato-en-la-orina/>]
- **Uric Acid Test** [<https://medlineplus.gov/lab-tests/uric-acid-test/>]  (National Library of Medicine)
Also in Spanish [<https://medlineplus.gov/spanish/pruebas-de-laboratorio/prueba-de-acido-urico/>]
- **Urography** [<https://www.radiologyinfo.org/en/info/urography>] (American College of Radiology; Radiological Society of North America)
Also in Spanish [<https://www.radiologyinfo.org/es/info/urography>]



Prevention and Risk Factors

- **New!** Preventing Kidney Stones [<https://www.veteranshealthlibrary.va.gov/diseasesconditions/Kidney/3,84729>]
(Department of Veterans Affairs)

Treatments and Therapies

- **New!** Kidney Stone Treatment [<https://www.kidney.org/kidney-topics/kidney-stone-treatment>] (National Kidney Foundation)





Living With

- **Eating, Diet, and Nutrition for Kidney Stones** [<https://www.niddk.nih.gov/health-information/urologic-diseases/kidney-stones/eating-diet-nutrition>]  (National Institute of Diabetes and Digestive and Kidney Diseases)
Also in Spanish [<https://www.niddk.nih.gov/health-information/informacion-de-la-salud/enfermedades-urologicas/piedras-rinones/alimentos-dietas-nutricion>]
- **Kidney Stone Diet Plan and Prevention** [<https://www.kidney.org/kidney-topics/kidney-stone-diet-plan-and-prevention>]
 (National Kidney Foundation)



Specifics

- **Understanding Hyperoxaluria** [<https://ohf.org/understanding-hyperoxaluria/>] (Oxalosis and Hyperoxaluria Foundation)

Genetics

- **Cystinuria: MedlinePlus Genetics** [<https://medlineplus.gov/genetics/condition/cystinuria/>]  (National Library of Medicine)
- **Hereditary xanthinuria: MedlinePlus Genetics** [<https://medlineplus.gov/genetics/condition/hereditary-xanthinuria/>]
 (National Library of Medicine)
- **Kidney stones: MedlinePlus Genetics** [<https://medlineplus.gov/genetics/condition/kidney-stones/>]
 (National Library of Medicine)
- **Primary hyperoxaluria: MedlinePlus Genetics** [<https://medlineplus.gov/genetics/condition/primary-hyperoxaluria/>]
 (National Library of Medicine)


Videos and Tutorials

- **Kidney stones** [<https://medlineplus.gov/ency/anatomyvideos/000075.htm>]  (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/anatomyvideos/000075.htm>]
- **New!** Kidney Stones in Younger People: What to Know and How to Prevent Them [<https://www.youtube.com/watch?v=wTtm8yydtxo>]  (University of Washington, School of Medicine)

Statistics and Research

- **New!** Kidney Stones: Learn More -- Preventing Kidney Stones [<https://www.ncbi.nlm.nih.gov/books/NBK348941/>]
 (National Center for Biotechnology Information)

Clinical Trials


- ClinicalTrials.gov: Nephrolithiasis [<https://clinicaltrials.gov/search?cond=%22Nephrolithiasis%22&aggFilters=status:not%20rec>]  (National Institutes of Health)

Journal Articles


References and abstracts from MEDLINE/PubMed (National Library of Medicine)

- Article: Leveraging the integration of bioinformatics and machine learning to uncover common... [<https://www.ncbi.nlm.nih.gov/pubmed/40718484>]
- Article: Unraveling the role of gut microbiota on the formation of nephrolithiasis:... [<https://www.ncbi.nlm.nih.gov/pubmed/40664942>]
- Article: Effects of calcium oxalate crystals on neutrophil cellular proteome and functions:... [<https://www.ncbi.nlm.nih.gov/pubmed/40646566>]
- Kidney Stones -- see more articles [<https://pubmed.ncbi.nlm.nih.gov/?term=%22Nephrolithiasis%22%5Bmajr%3Anoexp%5D+AND+humans%5Bmh%5D+AND+english%5Bla%5D+AND+%22last+1+Year%22+%5Bedat%5D+NOT+%28letter%5Bpt%5D+OR+case+reports%5Bpt%5D+OR+editorial%5Bpt%5D+OR+comment%5Bpt%5D%29+AND+free+full+text%5Bsb%5D+>]


Reference Desk

- Kidneys and Urinary Tract (For Parents) [<https://kidshealth.org/en/parents/kidneys-urinary.html>] (Nemours Foundation)
Also in Spanish [<https://kidshealth.org/es/parents/kidneys-urinary.html>]
- Your Kidneys and How They Work [<https://www.niddk.nih.gov/health-information/kidney-disease/kidneys-how-they-work>]  (National Institute of Diabetes and Digestive and Kidney Diseases)
Also in Spanish [<https://www.niddk.nih.gov/health-information/informacion-de-la-salud/enfermedades-rinones/rinones-funcionamiento>]

Find an Expert

- National Institute of Diabetes and Digestive and Kidney Diseases [<https://www.niddk.nih.gov>] 
- National Kidney Foundation [<https://www.kidney.org/>]

Children

- Blood in the Urine (Hematuria) (For Parents) [<https://kidshealth.org/en/parents/hematuria.html>] (Nemours Foundation)
Also in Spanish [<https://kidshealth.org/es/parents/hematuria.html>]
- Kidney Stones (For Parents) [<https://kidshealth.org/en/parents/kidney-stones.html>] (Nemours Foundation)
- Kidney Stones in Children [<https://www.niddk.nih.gov/health-information/urologic-diseases/kidney-stones-children>]  (National Kidney and Urologic Diseases Information Clearinghouse)
- Kidney Stones in Children and Teens [<https://www.healthychildren.org/English/health-issues/conditions/genitourinary-tract/Pages/Kidney-Stones-in-Children-and-Teens.aspx>] (American Academy of Pediatrics)
Also in Spanish [<https://www.healthychildren.org/spanish/health-issues/conditions/genitourinary-tract/paginas/kidney-stones-in-children-and-teens.aspx>]
- Ultrasound: Renal (Kidneys, Ureters, Bladder) (For Parents) [<https://kidshealth.org/en/parents/renal-ultrasound.html>] (Nemours Foundation)

Patient Handouts

- Kidney stones [<https://medlineplus.gov/ency/article/000458.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/000458.htm>]
- Kidney stones - self-care [<https://medlineplus.gov/ency/patientinstructions/000135.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/patientinstructions/000135.htm>]

Kidney stones and lithotripsy - discharge [<https://medlineplus.gov/ency/patientinstructions/000136.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/patientinstructions/000136.htm>]

- Lithotripsy [<https://medlineplus.gov/ency/article/007113.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/007113.htm>]
- Ureteroscopy [<https://medlineplus.gov/ency/article/007593.htm>] (Medical Encyclopedia)
Also in Spanish [<https://medlineplus.gov/spanish/ency/article/007593.htm>]



MEDICAL ENCYCLOPEDIA

Abdominal CT scan [<https://medlineplus.gov/ency/article/003789.htm>]

Abdominal ultrasound [<https://medlineplus.gov/ency/article/003777.htm>]

Citric acid urine test [<https://medlineplus.gov/ency/article/003618.htm>]

Cystinuria [<https://medlineplus.gov/ency/article/000346.htm>]

Intravenous pyelogram [<https://medlineplus.gov/ency/article/003782.htm>]

Kidney stones [<https://medlineplus.gov/ency/anatomyvideos/000075.htm>]

Kidney stones [<https://medlineplus.gov/ency/article/000458.htm>]

Kidney stones - self-care [<https://medlineplus.gov/ency/patientinstructions/000135.htm>]

Kidney stones - what to ask your doctor [<https://medlineplus.gov/ency/patientinstructions/000186.htm>]

Kidney stones and lithotripsy - discharge [<https://medlineplus.gov/ency/patientinstructions/000136.htm>]

Lithotripsy [<https://medlineplus.gov/ency/article/007113.htm>]

Percutaneous kidney procedures [<https://medlineplus.gov/ency/article/007375.htm>]

Percutaneous urinary procedures - discharge [<https://medlineplus.gov/ency/patientinstructions/000137.htm>]

RBC urine test [<https://medlineplus.gov/ency/article/003582.htm>]

Ureteroscopy [<https://medlineplus.gov/ency/article/007593.htm>]

Uric acid - blood [<https://medlineplus.gov/ency/article/003476.htm>]

Uric acid urine test [<https://medlineplus.gov/ency/article/003616.htm>]

Urine - bloody [<https://medlineplus.gov/ency/article/003138.htm>]

Urine pH test [<https://medlineplus.gov/ency/article/003583.htm>]

Related Health Topics

Kidney Diseases [<https://medlineplus.gov/kidneydiseases.html>]

National Institutes of Health

The primary NIH organization for research on *Kidney Stones* is the National Institute of Diabetes and Digestive and Kidney Diseases [<https://www.niddk.nih.gov>]

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