

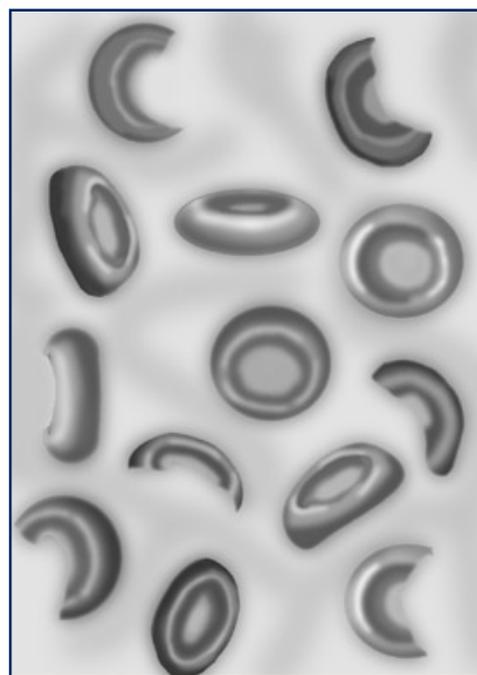
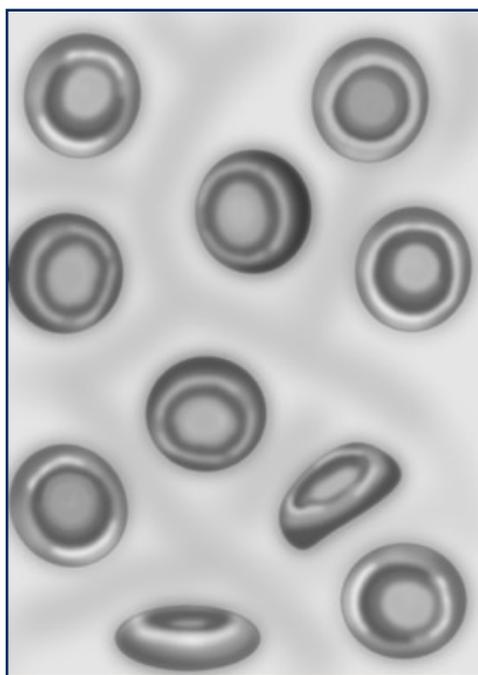
Hemolytic Uremic Syndrome in Children

What is hemolytic uremic syndrome (HUS)?

HUS, a disease that destroys red blood cells, is the most common cause of sudden, short-term—acute—kidney failure in children. Although HUS can cause serious complications and can even be life threatening, most children who develop HUS recover without permanent damage to their health.

What causes HUS?

HUS develops when *Escherichia coli* (*E. coli*) bacteria lodged in the digestive tract make toxins that enter the bloodstream and start to destroy red blood cells. Most cases of HUS occur after an infection of the digestive tract by the *E. coli* bacterium, which is found in foods like meat, dairy products, and juice when they are contaminated. Some people have contracted HUS after swimming in pools or lakes contaminated with feces.



Healthy red blood cells (left) are smooth and round. In hemolytic uremic syndrome, toxins destroy red blood cells (right). These misshapen cells may clog the tiny blood vessels in the kidneys.



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National Kidney and Urologic Diseases
Information Clearinghouse

Infection of the digestive tract is called gastroenteritis and may cause a child to vomit and have stomach cramps and bloody diarrhea. Most children who have gastroenteritis recover fully in 2 or 3 days and do not develop HUS.

What are the signs and symptoms of HUS and kidney failure?

With HUS, the child remains pale, tired, and irritable. Other signs include small, unexplained bruises or bleeding from the nose or mouth that may occur because the toxins also destroy the platelets, cells that normally help the blood to clot. Signs and symptoms of HUS may not become apparent until a week after the digestive problems have occurred.

More than half of children with HUS develop acute kidney failure. With kidney failure, the child's urine output decreases. The urine may also appear red. Urine formation slows because the damaged red blood cells clog the tiny blood vessels in the kidneys, making them work harder to remove wastes and extra fluid from the blood. The body's inability to rid itself of excess fluid and wastes may in turn cause high blood pressure or swelling of the face, hands, feet, or entire body.

Parents or guardians should call the child's doctor immediately if the child has unexplained bruises, unusual bleeding, swollen limbs or generalized swelling, extreme fatigue, or decreased urine output. A child who goes 12 hours without urinating should be taken to a doctor or an emergency room.

How is HUS diagnosed?

A doctor may suspect that a child has HUS after examining the child and learning the history of symptoms. The diagnosis is confirmed by microscopic examination of a blood sample to see if the red blood cells are misshapen.

How is HUS treated?

Treatments, which consist of maintaining normal salt and water levels in the body, are aimed at easing the immediate symptoms and preventing further problems. A child may need a transfusion of red blood cells delivered through an intravenous, or IV, tube. In severe cases, several sessions of dialysis, a blood-cleansing treatment, may be required to temporarily take over the kidneys' job of filtering wastes and extra fluid from the blood.

Some children may sustain significant kidney damage that slowly develops into permanent kidney failure and will then require long-term dialysis or a kidney transplant. Some studies suggest that limiting protein in the child's diet and treating high blood pressure with a medicine from a class of drugs called angiotensin-converting enzyme (ACE) inhibitors helps delay or prevent the onset of permanent kidney failure. Most children recover completely with no long-term consequences.

How can HUS be prevented?

Washing and cooking foods adequately, especially meats, and avoiding unclean swimming areas are the best ways to protect a child from this disease.

Points to Remember

- Hemolytic uremic syndrome (HUS), a disease that destroys red blood cells, is the most common cause of sudden, short-term—acute—kidney failure in children.
- Although HUS can cause serious complications and can even be life threatening, most children with HUS recover without permanent damage to their health.
- Most cases of HUS occur after an infection of the digestive tract by *Escherichia coli* (*E. coli*) bacterium, which is found in foods like meat, dairy products, and juice when they are contaminated.
- Treatments, which consist of maintaining normal salt and water levels in the body, are aimed at easing the immediate symptoms and preventing further problems.
- A child may need a transfusion of red blood cells delivered through an intravenous, or IV, tube.
- Only the most severe cases require dialysis.

Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducts and supports research to help people of all ages with kidney disease, including children. The NIDDK's Division of Kidney, Urologic, and Hematologic Diseases (KUH) maintains the Pediatric Nephrology Program, which supports research into the causes, treatment, and prevention of kidney diseases in children. The KUH division supports several researchers working to find ways to prevent HUS from developing after the initial infection of the digestive tract.

Participants in clinical trials can play a more active role in their own health care, gain access to new research treatments before they are widely available, and help others by contributing to medical research. For information about current studies, visit www.ClinicalTrials.gov.

For More Information

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Acknowledgments

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This publication was originally reviewed by the American Society of Pediatric Nephrology's (ASPN) Clinical Affairs Committee: Barbara Fivush, M.D.; Kathy Jabs, M.D.; Tej Mattoo, M.D.; William Primack, M.D.; Joseph Flynn, M.D.; Ira Davis, M.D.; Ann Guillott, M.D.; Steve Alexander, M.D.; Deborah Kees-Folts, M.D.; Alicia Neu, M.D.; Steve Wassner, M.D.; John Brandt, M.D.; and Manju Chandra, M.D. Frederick Kaskel, M.D., Ph.D., president, ASPN, and Sharon Andreoli, M.D., secretary-treasurer, ASPN, also provided comments and coordination.

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- searching the NIDDK Reference Collection at www.catalog.nidDK.nih.gov/resources
- visiting MedlinePlus at www.medlineplus.gov

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U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES
National Institutes of Health

NIH Publication No. 09-4570
January 2009

