

# Hemolytic-Uremic Syndrome

Hemolytic-uremic syndrome (HUS) is one of the most common causes of sudden kidney failure in children. It most often results from gastrointestinal infection with a certain type of bacteria called *Escherichia coli* O157:H7. This is a serious condition that requires aggressive medical treatment. The chances of full recovery are good, but some children with HUS are at risk of kidney problems later in life.

## What is hemolytic-uremic syndrome?

Hemolytic-uremic syndrome is a serious kidney disease usually occurring in children under age 4. Most of the time it results from eating foods contaminated with a type of *Escherichia (E.) coli* bacteria. Other causes are also possible. The disease causes damage to the kidney and blood vessels, resulting in sudden kidney failure and blood abnormalities, including anemia (low blood hemoglobin levels).

Children with HUS need immediate and intensive medical care, often including dialysis to replace lost kidney function. With aggressive treatment, most children survive. Some of these children may be left with severe kidney damage (end-stage renal disease), which requires continued dialysis or even a kidney transplant. In the years after recovering from HUS, your child will need close medical follow-up, as the risk of kidney-related complications is high.

## What does it look like?

- Most cases of HUS begin with acute diarrhea, usually caused by eating contaminated food. The diarrhea is often bloody. Other symptoms may include fever, vomiting, and abdominal pain.
- Occasionally, the illness may start with an upper respiratory infection (a cold).
- Kidney and other problems develop within 5 to 10 days after the start of the infection, with symptoms including:
  - Pale skin (from anemia).
  - Fussiness.
  - Weakness, lack of energy.
  - Decreased urination, that is, not going to the bathroom or wetting diapers. This may be caused by dehydration or kidney damage. *If your child doesn't urinate for 12 hours, go to the emergency room immediately.*

- Dehydration: symptoms include dryness inside the mouth, decreased tears when crying, sunken eyes or “soft spot” (fontanelle) on the top of the head.
- Small red spots (called petechiae) on the limbs.

## What causes hemolytic-uremic syndrome?

Most often, HUS occurs as a complication of infection with a specific type of bacteria called *E. coli* O157:H7. The bacteria are usually spread from contaminated food.

- This specific *E. coli* bacteria can be found in the intestines of cattle and other domesticated animals. This is one reason to make sure meat is cooked well enough before eating it.
- Other bacteria and viruses can cause HUS, but these are less common.

Kidney problems aren't caused by the infection itself. Instead, they result from a toxic substance produced by the bacteria during the infection. This substance, called “Shiga toxin,” damages the blood vessels of the kidneys. The result is abnormal clotting and other types of damage to the blood cells.

## What are some possible complications of hemolytic-uremic syndrome?

HUS is a serious illness. In the past, most children with HUS died. Today, with aggressive medical care, 90% survive.

The main complication is kidney damage. Severe kidney damage (end-stage renal disease) occurs in about 9% of children who survive the initial illness. Later in life, other kidney-related complications can occur.

Children with HUS are at risk of a number of other complications, including problems with the heart, brain and nervous system, and gastrointestinal system.

## Can hemolytic-uremic syndrome be prevented?

- Make sure meat is cooked well enough before eating, especially beef.
- If your child develops bloody diarrhea, see your doctor. In general, your child should not be treated with antibiotics before the cause of this symptom is known for sure. If the cause is infection with *E. coli* O157:H7, antibiotics could increase the chance of developing HUS.



## How is hemolytic-uremic syndrome treated?

Children with HUS need immediate hospitalization and aggressive medical care. This phase of your child's care will probably be directed by a kidney specialist (pediatric nephrologist) and blood specialist (hematologist). Treatment may include:

- *Proper fluids and electrolytes* (sugars, salts, and other chemicals the body needs), often given through a vein (intravenously or IV).
- *Dialysis*. Your child will probably receive some type of dialysis treatment to make up for lost kidney function, including the ability to produce enough urine and filter wastes and toxins.
- Your child may undergo *hemodialysis*, in which waste products are removed by filtering your child's blood through a special dialysis machine.
- However, many children with kidney failure undergo a different procedure called *peritoneal dialysis*. Special fluids are placed in your child's abdomen to absorb waste products. The fluids are then removed from your child's body, taking the waste products with them.

- Treatments to reduce high blood pressure.
- Treatments to ensure proper nutrition.
- Treatments for less common complications, such as seizures and strokes.
- There are other potential treatments whose value is less clear or that are used in unusual circumstances. Your doctor will explain these treatments, if they are needed.

Although HUS is a serious illness, most children recover without lasting problems. It may take a while for your child to recover completely.

There is a chance that your child will be left with reduced kidney function or permanent kidney damage after HUS. Even if kidney function returns to normal, your child will need long-term medical follow-up because of an increased risk of kidney problems later in life.

## When should I call your office?

Call our office if you have any questions about treatment for HUS or about long-term follow-up after your child has recovered.