

# Hemolytic Uremic Syndrome

**H**emolytic uremic syndrome (HUS) is a disease that usually affects infants and children. The most common form of HUS is caused by consuming food or water contaminated with strains of *Escherichia coli* bacteria called **enterohemorrhagic *E coli***. The first symptoms of infection include diarrhea, which may be bloody. Toxins released by the bacteria are thought to damage the intestines and then spread through the blood to the kidneys. Hemolytic uremic syndrome may develop within 1 week of the appearance of diarrhea and is considered the most common cause of sudden kidney failure in children. **Atypical HUS** is a less common form and is associated with improper function of the **complement system**, blood proteins involved in the natural immune response. This form of HUS is sometimes hereditary and recurrent. The March 14, 2012, issue of *JAMA* includes an article on enterohemorrhagic *E coli*.

## DIAGNOSIS

Hemolytic uremic syndrome is diagnosed when patients present with

- **thrombocytopenia** (low numbers of platelets).
- **microangiopathic hemolytic anemia** (anemia caused by damage to red blood cells). Patients may appear pale because of anemia.
- decreased kidney function, sometimes with decreased urine output (**oliguria**) or no urine production at all (**anuria**). Patients may develop hypertension and **edema** (swelling).

## TREATMENT

- Although patients with HUS may be dehydrated, fluids are given very carefully so that the kidneys, which may not be functioning at normal capacity, are not overwhelmed.
- Urine output, a marker for kidney function, is monitored very closely.
- Patients with HUS may require **dialysis** (blood filtering) to temporarily perform the functions of the kidney.
- Patients may receive blood transfusions if their blood counts are very low.
- Antibiotics are generally not used to treat HUS because of concerns that killing the bacteria would release more toxins and worsen symptoms.
- Patients with atypical HUS may be treated with plasma (fluid portion of blood) to replace complement proteins or **antibodies** (blood proteins that are part of the immune system) that block complement activation.

## PROGNOSIS

The course of HUS varies from patient to patient. Some may require hospitalization for a short time while others may require monitoring and care in the intensive care unit and even dialysis or **plasma exchange** (removal, treatment, and replacement of the blood plasma). In severe cases, other organ systems can be affected. Most patients with HUS require close follow-up after they are discharged from the hospital to ensure that their kidney function improves or remains normal. Patients with atypical HUS tend to have a recurrent course of disease that may lead to renal failure.

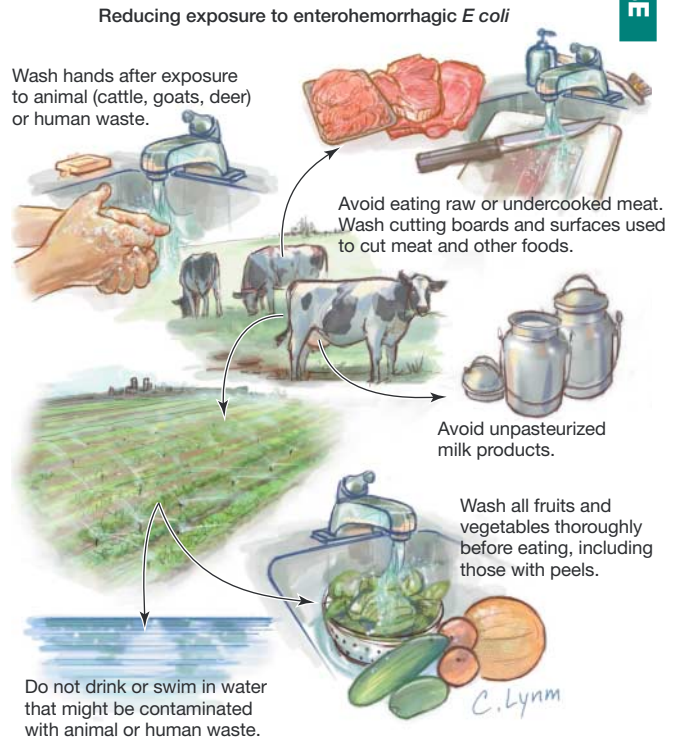
Sources: Centers for Disease Control and Prevention, Mayo Clinic, National Kidney and Urologic Diseases Information Clearinghouse

Ann R. Punnoose, MD, Writer

Cassio Lynn, MA, Illustrator

Robert M. Golub, MD, Editor

The JAMA Patient Page is a public service of JAMA. The information and recommendations appearing on this page are appropriate in most instances, but they are not a substitute for medical diagnosis. For specific information concerning your personal medical condition, JAMA suggests that you consult your physician. This page may be photocopied noncommercially by physicians and other health care professionals to share with patients. To purchase bulk reprints, call 312/464-0776.



## FOR MORE INFORMATION

- Centers for Disease Control and Prevention  
[www.cdc.gov/osels/ph\\_surveillance/nndss/casedef/hemolyticcurrent.htm](http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/hemolyticcurrent.htm)
- Mayo Clinic  
[www.mayoclinic.com/health/hemolytic-uremic-syndrome/DS00876](http://www.mayoclinic.com/health/hemolytic-uremic-syndrome/DS00876)
- National Kidney and Urologic Diseases Information Clearinghouse  
[kidney.niddk.nih.gov/kudiseases/pubs/childkidneydiseases/hemolytic\\_uremic\\_syndrome/](http://kidney.niddk.nih.gov/kudiseases/pubs/childkidneydiseases/hemolytic_uremic_syndrome/)

## INFORM YOURSELF

To find this and previous JAMA Patient Pages, go to the Patient Page link on JAMA's website at [www.jama.com](http://www.jama.com). Many are available in English and Spanish.

