

## Overview

### Useful For

Determining whether *Escherichia coli* O157:H7 may be the cause of diarrhea

Reflexive testing for Shiga toxin and/or *E coli* O157:H7 nucleic acid amplification test-positive feces

This test is generally **not useful for** patients hospitalized more than 3 days because the yield from specimens from these patients is very low, as is the likelihood of identifying a pathogen that has not been detected previously.

### Testing Algorithm

When this test is ordered, the reflex tests may be performed and charged separately.

See [Laboratory Testing for Infectious Causes of Diarrhea](#) in Special Instructions.

### Special Instructions

- [Laboratory Testing for Infectious Causes of Diarrhea](#)

### Highlights

This test provides evidence of the presence of the bacterium, *Escherichia coli* O157:H7, in feces, in a viable state, and provides an isolate for submission to a health department, if needed. Minnesota healthcare providers are required to report all confirmed or suspected cases of *E coli* O157:H7 and other Shiga toxin-producing *E coli* to the Minnesota Department of Health. Mayo Clinic Laboratories clients should refer to their local health departments regarding public health submission of *E coli* O157:H7 and other Shiga toxin-producing *E coli* isolates.

### Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
GID	Bacteria Identification	No	No
ISAE	Aerobe Ident by Sequencing	No	No
REFID	Additional Identification Procedure	No	No
EC	Serologic Agglut Method 2 Ident	No	No
RMALD	Ident by MALDI-TOF mass spec	No	No

### Method Name

Conventional Culture

### NY State Available

Yes

## Specimen

### Specimen Type

Fecal

**Additional Testing Requirements**

In some cases, local public health requirements may impact Mayo Clinic Laboratories clients, requiring, for example, submission of isolates to public health laboratories. Clients should familiarize themselves with local requirements and are responsible for submitting isolates to appropriate public health laboratories. Clients can obtain isolates of *Escherichia coli* O157:H7 species recovered from specimens submitted to Mayo Clinic Laboratories by calling 800-533-1710 as soon as possible after reporting (to ensure viability of the bacterium).

**Shipping Instructions**

**Specimen must arrive within 96 hours of collection.**

**Necessary Information**

**Specimen source is required.**

**Specimen Required**

**Patient Preparation:** Medications: Do not use barium or bismuth before collection of specimen.

**Supplies:** C and S Vial (T058)

**Specimen Type:** Preserved Feces

**Container/Tube:** Commercially available transport system specific for recovery of enteric pathogens from fecal specimens (15 mL of non-nutritive transport medium containing phenol red as a pH indicator, either Cary-Blair or Para-Pak C and S)

**Specimen Volume:** Representative portion of fecal specimen

**Collection Instructions:**

1. Collect fresh feces and submit 1 gram or 5 mL in container with transport medium.
2. Place feces in preservative within 2 hours of collection.
3. Place vial in a sealed plastic bag.

**Reject Due To**

Unpreserved feces ECOFIX preservative Formalin or PVA fixative    Reject

**Specimen Minimum Volume**

1 mL

**Specimen Stability Information**

Specimen Type	Temperature	Time	Special Container
Fecal	Ambient (preferred)	4 days	
	Refrigerated	4 days	

**Clinical & Interpretive****Clinical Information**

Diarrhea may be caused by a number of agents, including bacteria, viruses, parasites, and chemicals; these agents may result in similar symptoms. A thorough patient history covering symptoms, severity and duration of illness, age, travel history, food consumption, history of recent antibiotic use, and illnesses in the family or other contacts will help the healthcare provider determine the appropriate testing to be performed.

Shiga toxin-producing *Escherichia coli* (STEC) are *E coli* strains capable of producing Shiga toxin, which can result in diarrhea that can be bloody. The incubation period between exposure and symptom onset is 1 to 9 days.

Hemolytic-uremic syndrome (HUS) is a systemic complication of STEC infection and is characterized by renal failure,

microangiopathic hemolytic anemia, and nonimmune thrombocytopenia. HUS complicates approximately 15% of STEC infections in children younger than 10 years and 6% to 9% overall.

Treatment of STEC infection consists of supportive care. Antibiotic therapy is generally not beneficial in patients with STEC infection and has been associated with development of HUS in some studies. Thus, when STEC is clinically suspected, antibiotics should be withheld. Antiperistaltic agents also increase the risk of systemic complications and should be avoided.

### Reference Values

No growth of pathogen

### Interpretation

The growth of *Escherichia coli* O157:H7 identifies a potential cause of diarrhea.

### Cautions

The yield of *Escherichia coli* O157:H7 is reduced when specimens are delayed in transit to the laboratory (>2 hours from collection for unpreserved specimens).

Check local public health requirements, which may require submission of isolates to a public health laboratory.

Primary testing for Shiga toxin-producing *E coli* using Shiga toxin PCR and not specifically just for *E coli* O157:H7 is recommended because roughly half of Shiga toxin-producing *E coli* are not O157:H7.

Susceptibilities should **not** be performed on *E coli* O157:H7 since antibiotics are not used for treatment. Any healthcare provider contemplating a request for susceptibility testing on *E coli* O157:H7 should consult with the Laboratory Section Director for guidance.

### Clinical Reference

1. Pillai DR: Fecal culture for *Campylobacter* and related organisms. [In](#) Clinical Microbiology Procedures Handbook, Fourth edition. Washington, DC, ASM Press, 2016, Section 3.8.2
2. DuPont HL: Persistent diarrhea: A clinical review. JAMA, 2016;315(24):2712-2723 doi:10.1001/jama.2016.7833
3. Page AV, Liles WC: Enterohemorrhagic *Escherichia coli* infections and the hemolytic-uremic syndrome. Med Clin North Am 2013;97:681
4. Nelson JM, Griffin PM, Jones TF, et al: Antimicrobial and antimotility agent use in persons with shiga toxin-producing *Escherichia coli* O157 infection in FoodNet Sites. Clin Infect Dis 2011;52:1130

## Performance

### Method Description

The fecal specimen is inoculated onto sorbitol MacConkey agar. After incubation, suspect colonies are identified using one or a combination of the following techniques: matrix-assisted laser desorption/ionization time of flight (MALDI-TOF) mass spectrometry, conventional biochemical tests, carbon source utilization, serologic methods, or nucleic acid sequencing of the 16S ribosomal RNA (rRNA) gene. Isolates are reported as *Escherichia coli* O157:H7 or *Escherichia coli* O157, unable to detect H7 antigen.(Pillai DR: Fecal culture for aerobic pathogens of gastroenteritis. [In](#) Clinical Microbiology Procedures Handbook, Fourth edition. Washington, DC, ASM Press, 2016, Section 3.8.2)

### PDF Report

No

**Specimen Retention Time**

7 days

**Performing Laboratory Location**

Rochester

**Fees & Codes****Test Classification**

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

**CPT Code Information**

87046-Escherichia coli O157:H7 Culture, Stool-with isolation and preliminary examination

87077-Bacteria Identification (if appropriate)

87153-Aerobe Ident by Sequencing (if appropriate)

87077-Additional Identification Procedure (if appropriate)

87147-Serologic Agglut Method 2 Ident (if appropriate)

87077-Ident by MALDI-TOF mass spec (if appropriate)