

REGIONAL PATHOLOGY SERVICES

DEPARTMENT OF PATHOLOGY AND MICROBIOLOGY

Shiga Toxin EIA / Stool Culture

Test Overview: Stool specimens submitted for a routine enteric pathogen culture (detects Salmonella, Shigella, and Campylobacter.) will also be tested for Enterohemorrhagic *E. Coli* (EHEC) by the Shiga Toxin EIA test.

Clinical Significance: This recommendation from the CDC was in response outbreaks of gastroenteritis cause by toxin-producing *e coli*. Shiga Toxin assay provides better sensitivity than culture for 0157:H7 serotype and provides a more complete picture of *E. coli* infection by detecting Shiga toxin production which may result from *E. coli* organisms other than the 0157:H7 serotype

Enterohemorrhagic *E. coli* (EHEC) is recognized as an important cause of epidemic and endemic diarrhea, hemorrhagic colitis, and hemolytic-uremic syndrome (HUS). The most commonly reported serotype associated with outbreaks in the United States to date has been 0157:H7, but more than 50 other non-0157:H7 EHEC serotypes have been reported to be associated with human disease, including HUS.

The traditional laboratory diagnosis of EHEC infection has been dependant on the recovery of *E. coli* 0157:H7 in culture on sorbitol-MacConkey agar (SMAC) followed by immunologic confirmation. SMAC culture has a demonstrated sensitivity of 50%-80% for detection of *E. coli* 0157:H7 and will miss the non-0157 EHEC serotypes. One virulence trait of all EHEC stains is the ability to produce two potent cytotoxins called Shiga-like toxins (SLT). **Studies have shown that an EIA for EHEC Shiga toxin detects approximately 40% more EHEC 0157:H7 than the conventional SMAC culture, and is also able to detect an additional 20% more Shiga toxin-producing *E. coli* that are non-0157-H7 depending on the prevalence.** Dr. Paul Fey, UNMC, has shown that non 0157 serotypes account for about 50% of the EHEC strains recovered from patients with diarrhea in Nebraska (Emerg Infect Dis 2000, 6:530).

Method: Standard reference procedures for Salmonella, Shigella and Campylobacter culture and identification and EIA for Shiga Toxin.

Availability: Daily; positive results reported as soon as detected, negative results at 2 days.

Specimen: Stool; loose or diarrheal stools are recommended for routine bacterial culture only,

Collect: Stool container

Volume: 1.0-5.0 mL fresh stool; 10 mL stool in Para-Pak enteric plus or Cary-Blair media is specimen > 2 hours old.

Transport: Room Temperature

Unacceptable: Nonsterile or leaking container, multiple specimens (>1 in a 24 hour period), dry specimen, delayed transport to lab without use of appropriate preservative. Specimen in diapers.

Reference Range: Negative for all organisms

CPT Code: 87065; 87047; 87427

Additional Information: Indicate suspected organisms and available patient history, especially travel. Submit 2-3 stools collected at least 24 hours apart for culture. Routine stool cultures are not recommended from patients hospitalized for greater than 3 days, unless the patient is known to be HIV positive or approved by Microbiology Medical Director.

Test performed by The Nebraska Medical Center Clinical Laboratory.