

## **New Test for Enterohemorrhagic *E. coli* Shiga toxin 1 and 2** By Jessica Dodge, M.D.

All stool cultures are routinely evaluated for *Salmonella*, *Shigella*, *Campylobacter*, *Yersinia*, *Aeromonas*, *Plesiomonas*, *Vibrio* and Shiga toxin-producing *Escherichia coli*. In August, 2009, the Microbiology section of the Laboratory changed the test used to detect Shiga toxin in stool cultures. The new test, the ImmunoCard STAT EHEC, is an immunochromatographic rapid test for the qualitative detection of Shiga toxins 1 and 2 (also called Verotoxins) produced by *E. coli* in cultures derived from clinical stool specimens. ImmunoCard STAT EHEC is used in conjunction with the patient's clinical symptoms and other laboratory tests to aid in the diagnosis of diseases caused by enterohemorrhagic *E. coli* (EHEC) infections. In contrast to the old test, the ImmunoCard STAT EHEC differentiates between Shiga toxin 1 and 2. Shiga toxin 2 is a risk factor for the progression of the infection to microangiopathic sequelae such as hemolytic-uremic syndrome.

Among the *E. coli* human pathogens, Shiga toxin-producing strains of *E. coli* have gained in importance in recent years. The group of EHEC, with their highly pathogenic serovars O157:H7, O26, O103, O111, O145, and other strains are of particular concern. Production of Shiga toxins is the most common criteria for the detection of this group of bacteria. Shiga toxins can be classified into two main categories: Shiga toxin 1 (ST1) and Shiga toxin 2 (ST2). EHEC strains may produce ST1 or ST2 only or both ST1 and ST2 simultaneously. EHEC are capable of initiating life-threatening illnesses, particularly in young children, the elderly or patients with immune deficiency. The main sources of infection are contaminated, raw or insufficiently heated foods of animal origin, e.g., meat and dairy products. The reservoirs for EHEC are cattle, sheep and goats and it is spread through their feces. These microorganisms can enter food during the processing of meat and dairy products if hygienic conditions are inadequate. The incidence of food infection caused by Shiga toxin-producing *E. coli* demands reliable and rapid methods of detection. In addition to traditional culture methods, immunological techniques are becoming more useful due to their improved specificity and sensitivity. ImmunoCard STAT EHEC is an immunological diagnostic test based on the immunochromatographic lateral flow principle.

The performance of ImmunoCard STAT EHEC has not been evaluated with direct stool samples. It has only been evaluated using actual bacterial growth from stool culture media. If stool cultures do not exhibit sufficient growth, Shiga toxin testing will not be performed, as false negative results may occur.

Questions may be directed to Dr. Jessica Dodge at 203-739-7034.