

Bile Detection Device for Intestinal Obstruction and Methods of Use

Rotational abnormalities of the small bowel, known as Midgut volvulus, is a rare condition but left undiagnosed for over six hours may result in prolonged hospitalization, an intestinal transplant, or even fatal if undiagnosed. Biloccult is a reliable and rapid handheld device to detect the bile in vomit using an enclosed and encased testing strip. The first component of the device neutralizes the vomit and allows analytes to pass while the second component has antibodies that will bind to the analytes for detection.

What is the Problem?

Any form of intestinal obstruction must be immediately and accurately diagnosed, and any delay in the definitive management of the condition can lead to increased health complications. This is especially the case with midgut volvulus, a complete small bowel torsion that can occur at any age but is more frequent in children and infants. This condition is more likely to occur because of intestinal malrotation, or incomplete rotation, which is a rare congenital disability that may be missed if a physician is not explicitly looking for it. The reported incidence of rotational abnormalities is approximately 10 per 1 million children aged 1 to 2 years, where 1 in 500 live births have malrotation complications. Although it is a rare condition, if midgut volvulus is left undiagnosed for over six hours, all the small bowels will suffer necrosis which may lead to the patient's death due to sepsis or cause lifelong issues. Intestinal damage could result in prolonged hospitalization for total parenteral nutrition (TPN), costing around \$60,000 per year. An intestinal transplant may also be required, costing over a million dollars. Midgut volvulus is difficult to diagnose as the symptoms are often non-specific. This is because what occurs in the internal organs manifests externally as the presence of bile in vomit; a symptom that is easy to misdiagnose. Bilious vomiting in newborns is an urgent condition that requires the immediate involvement of a team of pediatric surgeons and neonatologists for perioperative management.

What is the Solution?

Biloccult is a point of care device which allows healthcare providers to reliably and rapidly detect the presence of bile in vomit. The device is a quantitative chemical test based on lateral flow assays. The Biloccult device uses lateral flow (LF) technology as the method of detection which includes a handheld enclosure encasing a testing strip. The first component of the test strip is the sample pad which neutralizes the vomit sample and only allows target analytes to pass. The second component is the conjugate pad and where the antibodies will be loaded to bind to the analytes that we are trying to detect. The membrane captures antibodies to signal a positive or negative presence of the target analytes.

Technology ID

BDP 8659

Category

Device/Other

Selection of Available Technologies

Diagnostic

Learn more



What Differentiates it from Solutions Available Today?

The only existing method to screen for bilious vomiting is the visual inspection of the color of vomit, and while observation of color is an easy method at no cost, confusion on the color of bile can still cause an inaccurate diagnosis, making it unreliable. This method also excludes 8% of the population who are affected by color blindness. This solution offers quantitative inspection of bilious vomiting, taking out the guesswork and inaccuracy of the current solutions.