

# Urea Breath Test



The urea breath test is a non-invasive and non-radioactive procedure for diagnosing the presence of a bacterium, *Helicobacter pylori* (*H.pylori*), a spiral, urease producing organism that causes inflammation, duodenal and gastric ulcers and atrophy of the stomach.

With over 90% of duodenal ulcers and 70% of gastric ulcers associated with *H.pylori* infection, the urea breath test procedure provides a sensitive (approaching 100%) and specific (approaching 98%) measure of *H.pylori* infection. The urea breath test is performed in the Chemistry department at the Diagnostic Scientific Center and will detect *H.pylori* infection in adults and children greater than 6 years of age. Testing for children less than 6 years old is done by stool antigen analysis.



*Demonstrating how the Urea Breath Test sample is collected*

Patient preparation for the collection of the breath sample is crucial since certain medications would inhibit the organism and cause a false negative result. The patient must be fasting a minimum of 4 hours including no water. The collection takes about 30 minutes. The patient blows through a straw into a collection tube (baseline sample). Immediately following the collection of the baseline sample, the patient ingests a reconstituted  $^{13}\text{C}$  powdered drink, which contains  $^{13}\text{C}$  urea (a stable naturally occurring non-radioactive isotope of carbon). After 30 minutes, the patient then blows into a second collection tube (T30 tube). If *H.pylori* are present in the stomach, the urea is broken down into carbon dioxide, which is absorbed across the lining of the stomach and into the blood. It then is excreted from the lungs in the breath. Samples of exhaled breath are collected and the exhaled carbon dioxide is measured.

Measurement of the  $\text{CO}_2$  labelled gas is achieved using the gas isotope Mass Spectrometer.  $^{13}\text{C}/^{12}\text{C}$  ratio in the 2 samples is calculated to determine whether the patient is positive or negative for *H.pylori*. A difference between these two ratios of greater than 3.5 would indicate the presence of *H.pylori* and the patient is deemed positive for *H.pylori* infection.