

# Frequently Asked Questions

**IMPROPER PREPARATION OF THE PATIENT:** The inappropriate choice or incomplete avoidance of food by the patient on the night before the test will provide a high, but gradually falling level of hydrogen ( $H_2$ ) on which the test will be superimposed. This is because the amount of fiber in the colon will be elevated at the beginning of the test, and will fall during the hours of the measurement. Even if  $H_2$  is produced from the challenge-dose of carbohydrate, it may not exceed the initial baseline level by enough to be classified as a positive test.

**SLEEPING:** Allowing the patient to sleep during the test will cause an increase in breath- $H_2$ . This probably has two causes. Hypoventilation, which is an inadequate rate of air turn-over in the lung, slows down the rate of  $H_2$ -removal from the blood. Sleep also decreases motility, which slows down the movement of carbohydrates through the colon and allows a longer time for  $H_2$ -production. Thus, intermittent sleeping during the test will interfere with its reliability and should not be allowed.

**HIGH BASELINES:** High fasting levels of trace gases at the beginning of the test may suggest that the patient did not follow instructions for complete avoidance of carbohydrate and fiber the night before; it also may suggest that the patient has small intestinal bacterial overgrowth (SIBO).

**NORMALIZING BREATH-GAS MEASUREMENTS:** One of the sources of error in trace-gas analyses is contamination of the alveolar sample with dead space air during its collection. The problem is minimized by properly using the QuinTron GaSampler system or the QuinTron Single-Patient AlveoSampler System to collect the alveolar sample. However, if they are not used according to instructions, or if the syringe is contaminated with room air during transfer of the sample to the BreathTracker or MicroLyzer, the  $H_2$  and/or  $CH_4$  in the sample may be diluted so that falsely low concentrations will be indicated. The BreathTracker SC, H2+ and MicroLyzer SC instruments can be used to correct the analysis of trace breath-gases for such contamination. It is based on the concept that carbon dioxide ( $CO_2$ ) is present in alveolar air at a virtually constant concentration, while it is essentially absent in room air. Therefore, if alveolar air is erroneously mixed with room air, the concentration of  $CO_2$  will be reduced, as will that of any trace gases present in the sample. By knowing the degree to which the  $CO_2$  was diluted, it is possible to apply a correction to the analysis of the trace-gases as well, thus being able to calculate the true “alveolar” concentration of the sample which was contaminated.

**SMALL INTESTINAL BACTERIAL OVERGROWTH (SIBO):** Bacterial overgrowth exposes the complex sugars and other soluble carbohydrates in the small intestine to bacterial fermentation instead of allowing them to be hydrolyzed enzymatically and absorbed in the relatively sterile intestine. If bacteria are introduced into the small intestine, they can survive and thrive in the nutritionally rich environment. As indicated above the harsh, acid environment of the stomach kills most bacteria, so there is a low bacterial count in the proximal part of the intestine (the duodenum and the jejunum). However, in achlorhydria (lack of acid production in the stomach) bacteria may pass into the small intestine and colonize there. Alternately, conditions of intestinal hypomotility (“blind-loop” syndrome or other causes of “stasis”) permit bacteria to invade the small intestine from the colon. These conditions permit an increase in bacterial count to over  $10^5$  (100,000) bacteria per milliliter (mL) of intestinal contents, which defines the condition called “bacterial overgrowth.” The condition leads to symptoms similar to those for carbohydrate malabsorption. It also destroys some vitamins, interferes with the absorption of fatty acids and competes for sugars and other foodstuff ordinarily absorbed in the jejunum. Thus, it is a serious digestive disturbance which can be treated effectively, but only if it is diagnosed.

