## CLAIMS

1. Use of a system in determining a likelihood of the presence of small intestine bacterial overgrowth (SIBO) in patients, the use comprising:

determining a first concentration of hydrogen gas based on a first set of hydrogen data detected by a hydrogen detector of the system, and determining a first methane gas concentration based on a first set of methane data detected by a methane detector of the system in exhaled breath collected from a patient at a first time before ingestion of a substance;

determining a second concentration of hydrogen gas based on a second set of hydrogen data detected by the hydrogen detector, and determining a second methane gas concentration based on a second set of methane data detected by the methane detector in exhaled breath collected from the patient at a second time after ingestion of the substance;

comparing the first and second hydrogen gas concentrations to determine a change in hydrogen gas concentration after ingesting the substance;

determining a methane calibrated change in hydrogen gas concentrations based on at least one of the first and second methane concentrations;

determining whether the methane calibrated change in hydrogen gas concentration crosses a threshold; and

outputting onto a display of the system an indication of whether the patient has SIBO based on the determination of whether the methane calibrated change in hydrogen gas concentration crosses the threshold.

2. The use of claim 1, wherein the step of determining a methane calibrated change in hydrogen gas concentration based on at least one of the first and second methane concentrations comprises increasing the change in hydrogen gas concentration by a factor proportional to at least one of the first and second methane gas concentrations.

3. The use of claim 1, wherein the step of determining a methane calibrated change in hydrogen gas concentration based on at least one of the first and second methane concentrations comprises determining whether the patient is a methane producer by determining whether at least one of the first and second methane concentrations crosses a threshold and increasing the change

in hydrogen gas concentration by a predetermine factor if the patient is determined to be a methane producer.

4. The use of claim 1, wherein the step of determining a methane calibrated change in hydrogen gas concentration based on at least one of the first and second methane concentrations comprises accessing a database of patient data correlated to known SIBO status and recorded hydrogen and methane levels.

5. The use of claim 4, wherein the database includes the ages of each subject.

6. A system for determining a likelihood of small intestine bacterial overgrowth (SIBO) in patients, the system comprising:

a breath collector;

a testing chamber comprising a flow control device and a flow meter;

a display;

a hydrogen detector connected to the testing chamber suitable for outputting hydrogen data representing a concentration of hydrogen in exhaled breath;

a methane detector connected to the testing chamber suitable for outputting methane data representing a concentration of methane in exhaled breath;

a memory containing machine readable medium comprising machine executable code having stored thereon instructions for performing a method of a likelihood of the presence of SIBO in patients;

at least one processor coupled to the memory, the at least one processor configured to execute the machine executable code to cause the at least one processor to:

control a flow rate through the testing chamber using the flow control deice based on feedback from the flow meter;

determine, by the at least one processor, a first concentration of hydrogen gas based on a first set of hydrogen data detected by the hydrogen detector and a first level of methane gas concentration based on a first set of methane data detected by the methane detector at a first time in exhaled breath collected from a patient before ingestion of a substance;

determine, by the at least one processor, a second concentration of hydrogen gas based on a second set of hydrogen data detected by the hydrogen detector and a second methane gas concentration based on a second set of methane data detected by the methane detector at a second time in exhaled breath collected from the patient after ingestion of the substance;

compare the first and second hydrogen gas concentrations to determine a change in hydrogen gas concentration after ingesting the substance;

determine a methane calibrated change in hydrogen gas concentrations based on at least one of the first and second methane concentrations;

determine whether the methane calibrated change in hydrogen gas concentration crosses a threshold; and

output onto the display an indication of whether the patient has SIBO based on the determination of whether the methane calibrated change in hydrogen gas concentration crosses the threshold.

7. The system of claim 6, wherein the at least one processor is further suitable for sending a notification to a clinician computing device to indicate whether the patient has SIBO.

8. The system of claim 6, wherein determining the methane calibrated change further comprises reducing the change in hydrogen gas concentration by a predetermined amount if the patient is a methane producer.

9. The system of claim 8, wherein determining the methane calibrated change further comprises keeping the change in hydrogen gas concentration the same if the patient is not a methane producer.

10. The system of claim 6, wherein determining the methane calibrated change further comprises reducing the change in hydrogen gas concentration by a ratio correlated to at least one of the first and second methane concentrations.