

Please review the following case studies and evaluate them to the best of your ability. You should treat these case studies as if they were your own patients and practice interpreting each lab. Don't worry, you won't have to turn in your answers for a grade. These assignments should be treated as more of a self-study tool to help you measure your progress throughout the course. We have also provided an answer key in a separate document, detailing the lab interpretation by Chris and his staff for your comparison.

You may also want to discuss the cases with others in the ADAPT Discussion Group.

SIBO Case Assignments

Of note, all presented test results are from lactulose breath tests rather than glucose.

CASE 1:

A 65-year-old female has Hashimoto's disease, hyperlipidemia, rosacea, heart palpitations, and occasional abdominal bloating/distention.

| Data | H ₂ = Hydro | gen CH4 | = Methane | CO ₂ = Meas | ured | | | | | |
|---------------------------|--|--------------------|-------------|------------------------|-----------|---|------------|--------------|--------------------|--|
| | Sample | ppm H ₂ | ppm CH₄ | Total H2 + CH4 | CO2 %* | 160 140 | ۵ | 0 | | |
| 1 | Baseline | 1 | 4 | 5 | OK | 120 - | A. 0 | | 2 | |
| 2 | 20 min | 8 | 9 | 17 | OK | 100 - | | / A~ | A Q | |
| 3 | 40 min | 86 | 23 | 109 | OK | 80 - /🕰 | | / | | |
| 4 | 60 min | 114 | 21 | 135 | OK | 60 - // | | | | |
| 5 | 80 min | 94 | 20 | 114 | OK | 40 // | | | | |
| 6 | 100 min | 67 | 21 | 88 | OK | 20 - | | | | |
| 7 | 120 min | 109 | 24 | 133 | OK | o Larrenter | | | | |
| 8 | 140 min | 92 | 23 | 115 | OK | 1 2 3 | | | 8 9 10 | |
| 9 | 160 min | 76 | 20 | 96 | OK | | | | | |
| 10 | 180 min | 50 | 18 | 68 | OK | Hydrogen O | Methane —• | - Combined H | lydrogen & Methane | |
| Analysis | and the entries to | | | baseline total = | | or details if cells are highlighted and blan | 5 | - | ≤20ppm | |
| Gre | atest H ₂ increa | ase over t | he lowest | preceding valu | e withi | n first 120 minutes = | 113 | н | ≤20ppm | |
| | - | | | | | n first 120 minutes = | 20 | Н | ≤12ppm | |
| Greatest co | mbined H ₂ & C | H₄ increa | se over the | e lowest preced | ding va | ue within first 120 minutes = | 130 | н | ≤15ppm | |
| Interpretati | on | | | | | | | | | |
| SIBO Suspect | SIBO Suspected - Elevated Hydrogen first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth. | | | | | | | POSITIVE | | |
| SIBO Suspect | ed - Elevated M | Nethane | | | | in 12ppm over the lowest precedin eviation) are indicative of bacteria | | POSITIVE | | |
| SIBO Suspecte Hydrogen | ed - Elevated C & Methane Ga | | Increase | | | and methane gas values greater alue are indicative of bacterial over | | POSITIVE | | |



CASE 2:

A 20-year-old male has food sensitivities, diarrhea, gas, and anxiety.

| | | | CO2 QC | Check | Pass | | | | |
|-------------------------------|-----------------------|-------------------------------|-----------------|-----------|-------------|--|---|------------------|---|
| | Gases | Expe | cted | Obse | erved | Norm | al/Abnorm | al | |
| | H2 † | <20 | ppm | 2.: | 25 | | Normai | | |
| | CH4 | <10.00 | ppm | 0.6 | D6 | | Normai | | |
| | H ₂ S | <5.00 | ppm | 9.3 | 24 | Abnormal | | | |
| Indicative of Exce | ess Hydrog | en Sulfide | | Interpi | retation | | | | |
| Indicative of Exce | ess Hydrog | en Sulfide | | | | | | | |
| | | | 13 | Re | sults | Th | 7 | 18 | 19 |
| andicative of Exce Samples | ess Hydrog 11 0 | en Sulfide <u>T2</u> 17 | 13 33 | | | 16 80 | <u>17</u> 96 | 18 111 | 19 127 |
| amples Interval (hr:min) | 11 | 12 | | Re: 14 | sults 15 | Card and a second s | 2412-2412-2412-2412-2412-2412-2412-2412 | | and the second se |
| Samples | 11 | 12 | | Re: 14 | sults 15 | Card and a second s | 2412-2412-2412-2412-2412-2412-2412-2412 | | and the second se |

Suboptimal Sample-Bag Deflated (T1, T6)

9.24

6.21

5.81

6.61

6.97

5.43

7.07

8.08

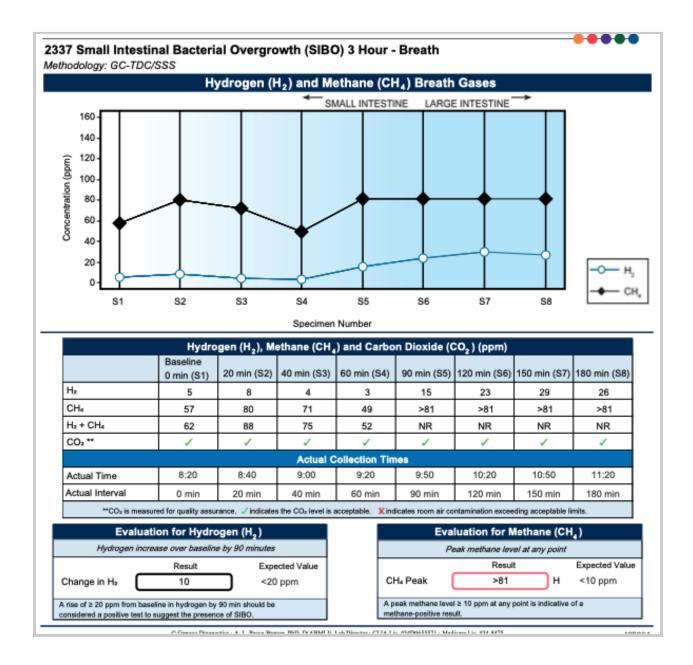
7.25

H₂S (ppm)



CASE 3:

A 68-year-old female has Parkinson's disease and associated mild hand tremor. She reports otherwise being in good health and has no digestive complaints. Small intestinal bacterial overgrowth (SIBO) is associated with Parkinson's disease in the scientific literature, so the positive finding is not surprising.





CASE 4:

A 42-year-old male has high cholesterol, impaired fasting glucose, mild reflux, and diarrhea that comes and goes.

| | CO ₂ QC Check Pass | | | | | | |
|------------------|---|-----|-------|----------|--|--|--|
| Gase | Gases Expected Observed Normal/Abnormal | | | | | | |
| H ₂ † | <20 | ppm | 7.99 | Normal | | | |
| CH4 | <10.00 | ppm | 24.90 | Abnormal | | | |
| H ₂ S | <5.00 | ppm | 10.00 | Abnormal | | | |

[†]Note: The "observed" peak for H₂ is within the first 90 minutes.

Interpretation

Indicative of Intestinal Methanogenic Overgrowth and Excess Hydrogen Sulfide

| | | | | Re | sults | | | | |
|------------------------|---------------------|---|------------------|--------------------|---|---------|--|--|---|
| Samples | 7999 1 99999 | | T3 | | T5 | <u></u> | 77 | | |
| Interval (hr:min) | 0 | 15 | 30 | 45 | 60 | 75 | 90 | 105 | 120 |
| Gases | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | **************** | ****************** | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, |
| H ₂ (ppm) | 0.00 | 0.08 | 0.00 | 7.99 | 4.54 | 1.65 | 0.50 | 3.03 | 1.36 |
| CH₄ (ppm) | 3.99 | 4.70 | 9.53 | 5.37 | 16.33 | 10.50 | 24.90 | 11.91 | 13.16 |
| H ₂ S (ppm) | 10,00 | 10,00 | 10.00 | 10,00 | 10.00 | 10,00 | 10,00 | 10,00 | 10.00 |



CASE 5:

A 52-year-old female has complaints of "silent reflux," upper gastrointestinal discomfort after meals, irritable bowel syndrome mixed type, fatigue, and depressed mood. Gut symptoms started after a trip to Mexico 5 years ago and again worsened 1 year ago after another food illness episode.

| | $\mathbb{C}(\mathbb{Q}_{2},\mathbb{Q})$ | Pass | |
|------------------|---|----------|-----------------|
| Gases | Expected | Observed | Normal/Abnormal |
| H ₂ † | <20.09 ppm | 44.23 | Abnormal |
| CH₄ | <10.00 ppm | 23.13 | Abnormal |
| H ₂ S | <5.00 ppm | 10.00 | Abnormal |

*Note: The "observed" peak for H₂ is within the first 90 minutes.

Interpretation

Indicative of Small Intestinal Bacterial Overgrowth, Intestinal Methanogenic Overgrowth, and Excess Hydrogen Sulfide

| Samples | T1 | T2 | T3 | T4 | T5 | T6 | 17 | T8 | T9 |
|-----------------------|---------------|-------------------|---------------|-----------------------|---------------|----------------|--|----------------------|-------|
| Interva! (hr:min) | 0 | 17 | 32 | 47 | 62 | 77 | 92 | 107 | 122 |
| Gases | | ***************** | | ********************* | ****** | ***** | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | ******************** | ***** |
| | | | | 0.01 | 0.43 | 11.00 | E/ 4E | 50.05 | 45.00 |
| H ₂ (ppm) | 0.09 | 1.81 | 1.77 | 2.21 | 8.61 | 44.23 | 56.45 | 59.95 | 45.22 |
| H₂ (ppm) CH₄ (ppm) | 0.09 23.13 | 1.81 22.78 | 1.77 22.45 | 2.21 20.52 | 8.61 21.47 | 44.23 21.87 | 21.31 | 20.23 | 45.22 |

Suboptimal Sample-Bag Deflated (T1-T3)

| | RESULTS | |
|-------------------|--------------------|-----------------|
| Antibody Detected | Patient Value (OD) | Antibody Levels |
| Anti-CdtB Ab | 0.35 | Not Elevated |
| Anti-Vinculin Ab | 2.81 | Elevated |

ABOUT THE ASSAY

Diarrhea-predominant irritable bowel syndrome (IBS-D) is a gastrointestinal disorder affecting 10-15% of the population. Host antibodies to CdtB cross-react with vinculin, a protein in the intestinal lining, leading to a small intestinal bacterial overgrowth (SIBO) and IBS-like phenotype. Elevated levels of anti-CdtB and anti-vinculin antibodies have been identified in IBS-D and IBS-M patients compared to patients with inflammatory bowel disease (IBD).^{1,2}

Results were achieved using ELISA test methodology. An elevated result supports the diagnosis of diarrheapredominant or mixed-typed IBS. A normal result does not preclude the diagnosis of IBS-D or IBS-M due to the low negative predictive value. The ibs.smart[™] assay has a specificity of 94% for anti-CdtB and 91% for antivinculin and a positive predictive value of 96% for anti-CdtB and 91% for anti-vinculin. An indeterminate result is denoted as (*) and indicates a level beyond the measurable range of the assay.

| Anti-CdtB Ab Anti-Vinculin Ab | Reference Interval 0.00 – 1.56 0.00 – 1.60 | Reportable Range 0.00 – 4.00 0.00 – 4.00 | |
|----------------------------------|--|--|--|
|----------------------------------|--|--|--|