

CLIA CERTIFICATION: 38D0624258

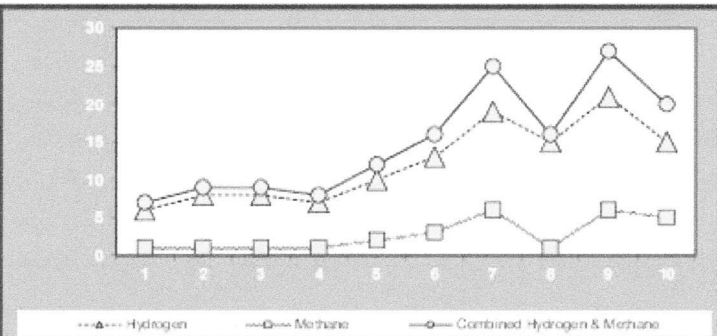
Patient Name: Wimminger, Riley

Date Collected: 5/17/2015 Date Received in Lab: 5/19/2015 Date Tested: 5/28/2015 Tech: CM

Data

H₂ = Hydrogen CH₄ = Methane CO₂ = Measured

	Sample	ppm H ₂	ppm CH ₄	Total H ₂ + CH ₄	CO ₂ %*
1	Baseline	6	1	7	OK
2	20 min	8	1	9	OK
3	40 min	8	1	9	OK
4	60 min	7	1	8	OK
5	80 min	10	2	12	OK
6	100 min	13	3	16	OK
7	120 min	19	6	25	OK
8	140 min	15	1	16	OK
9	160 min	21	6	27	OK
10	180 min	15	5	20	OK



*Dilutions of the sample may occur during the sampling procedure which may decrease the CO₂ concentration of the sample and render the sample invalid. If the concentration falls below 14%, the entry for CO₂ will be marked as Quantity Not Sufficient (QNS) and the entries for H₂ and CH₄ will be highlighted. If the sample is otherwise unusable the entry for CO₂ will be marked as Not Available (N/A) and the entries for H₂ and CH₄ will be highlighted. See notes section for details if cells are highlighted and blank or highlighted and contain N/A or QNS.

Analysis

Combined baseline total =	7	-	≤20ppm
Greatest H ₂ increase over the lowest preceding value within first 120 minutes =	13	-	≤20ppm
Greatest CH ₄ increase over the lowest preceding value within first 120 minutes =	5	-	≤12ppm
Greatest combined H ₂ & CH ₄ increase over the lowest preceding value within first 120 minutes =	18	H	≤15ppm

Interpretation

SIBO Suspected - Elevated Hydrogen	Increases of hydrogen greater than 20ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	NEGATIVE
SIBO Suspected - Elevated Methane	Increases of methane greater than 12ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	NEGATIVE
SIBO Suspected - Elevated Combined Hydrogen & Methane Gasses	Increases in combined hydrogen and methane gas values greater than 15ppm over the lowest preceding value are indicative of bacterial overgrowth.	POSITIVE

Notes

The following symptoms were reported during collection:
None reported.

Additional Information

High Baseline: Some doctors interpret a baseline gas above normal value as positive. This is particularly true for methane since a high baseline and an early rise is a standard methane pattern.^{1,2,3} Gas levels that fall after an elevated baseline and continue to reduce or remain low during the first two hours, may indicate an improper preparation diet.⁴

Methane > 3ppm: Some doctors interpret methane > 3ppm at any point in the test as positive.⁵ Levels of methane that are greater than or equal to 3ppm at any time during the test are indicative of methanogen overgrowth which has been correlated in studies to IBS constipation type and chronic constipation.⁶

Level vs. increase: The standard interpretation of results for SIBO uses the difference between the peak level compared to the lowest previous level in the first 120 minutes (+/- 5 min deviation). If this increase is equal or greater than 20 PPM for H₂, or equal or greater than 12 PPM for CH₄, SIBO is diagnosed. At the NCCM SIBO center, we have also used an absolute value (rather than an increase) of 20 PPM (H₂) or 12 PPM (CH₄) to indicate SIBO. Also note that methane values may not increase, the baseline and all levels often remain high for the whole test.^{7,8}

References: 1. Perman JA, Modler S, Barr RG, Rosenthal P. Fasting breath hydrogen concentration: normal values and clinical application. *Gastroenterology*. 1984;87(5):1358-63. Pub Med ID# 6489700. 2. Cugley EM, Quer A R. Small intestinal bacterial overgrowth: roles of antibiotics, prebiotics, and probiotics. *Gastroenterology*. 2005 Feb; 128(2 Suppl 1):S78-S90. Pub Med ID# 16473077. 3. Pimentel M, Lin HC, Enayati F, van den Burg B, Lee HR, Chen JH, Park S, Kong Y, Corleto J. Methane, a gas produced by enteric bacteria, slows intestinal transit and augments small intestinal contractile activity. *Am J Physiol Gastrointest Liver Physiol*. 2006 Jun;290(6):G1089-95. Pub Med ID# 16293652. 4. Siebeker A, Sandberg Lewis S. The Finer Points of Diagnosis, Test Interpretation, and Treatment. *Naturopathic Doctor News and Review*. January 2014; 10:46. <http://ndnr.com/gastrointestinal/sibo/>. 5. Pimentel M. SIBO Symposium: Current Perspectives and Management in IBS. National College of Natural Medicine. January 18-19, 2014. Webinar recording: <http://www.nccm.edu/ce/modulo/course/category.php?id=130>. 6. Uae studies already listed. 7. Pimentel M. An evidence based treatment algorithm for IBS based on a bacterial/SIBO hypothesis. Part 2. *Am J Gastroenterol*. 2010 Jun; 105(6):1227-30. PMID 20525306. 8. Siebeker A, Sandberg Lewis S. The Finer Points of Diagnosis, Test Interpretation, and Treatment. *Naturopathic Doctor National Review*. January 2014; 10:46. <http://ndnr.com/gastrointestinal/sibo/>.