

# SIBO Testing:

## Is it Time for a Change in Protocol?



**Probiotic Advisor**

*Unique evidence based  
information*

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# The Case...

- 35 yo male
- PC:
  - freq. belching
  - diarrhoea
    - type 6 stools; 4-8 bm's/day
      - often greasy & pale
      - often mucus
      - urgent & explosive at times
  - episodic bloating
  - episodic abdo cramps
  - smelly flatulence
- **GIT S&S worse white flour products, sweets & many fruits**

## Bristol Stool Chart

Type 1		Separate hard lumps, like nuts (hard to pass)
Type 2		Sausage-shaped but lumpy
Type 3		Like a sausage but with cracks on its surface
Type 4		Like a sausage or snake, smooth and soft
Type 5		Soft blobs with clear-cut edges (passed easily)
Type 6		Fluffy pieces with ragged edges, a mushy stool
Type 7		Watery, no solid pieces. <b>Entirely Liquid</b>



# Case Presentation

- HPC:
  - 13 year Hx gut issues
  - started with ↑ bm freq. and an abundance of foul-smelling flatulence and stools
    - no obvious initiating event could be recalled
- 1<sup>st</sup> Inx
  - Stool test for parasites done by local GP
    - +ve for Blastocystis
- saw a **naturopath** in 2005
  - Rx herbal anti-blasto protocol + probiotics for 6 wks
  - significant, but temporary, improvement in S&S



# Case Presentation

- Relevant family Hx
  - brother and daughter recently Dx as coeliac
  - father long Hx GERD
- Previous Inx
  - numerous stool tests showing presence of Blasto
  - coeliac serology
    - normal antibody levels
    - **but not eating gluten preceding test!!**
  - coeliac gene testing
    - +ve HLADQ2



# Case Presentation

- Previous Txts:
  - numerous courses of flagyl (metronidazole)
    - sometimes short-term relief of gut S&S
  - prescribed & self-prescribed herbal antimicrobials & probiotics
    - often provided short-term relief whilst taking
    - on and off for over 10 years!
  - 2012 did the Centre for Digestive Diseases triple AB Blasto protocol (oral)
    - felt horrible during
    - some beneficial short-term changes in S&S immediately post
  - currently following an “anti-candida” diet
    - S&S are better when he follows strictly
- **But nobody did much in the way of Inx**
  - **except more parasite stool tests!**



# Differential Diagnosis & Investigations

- My DDX

- SIBO
- coeliac disease
- gluten sensitivity
- fructose intolerance
- IBD
- Blastocystis infection
- D-IBS



- My Inx

- breath testing
  - glucose
  - lactulose
  - fructose
- intestinal permeability
  - lactulose:mannitol
- faecal calprotectin



# Results

- Breath tests:

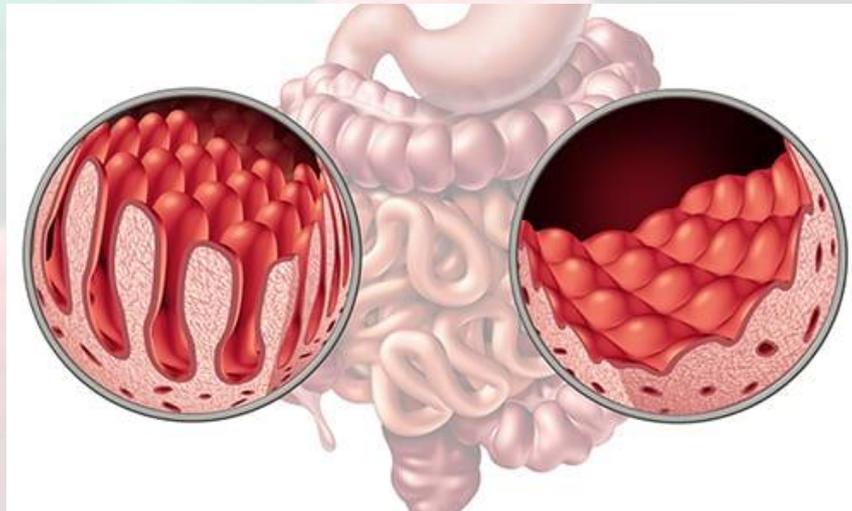
Test sugar	Date	Time (min)	0	20	40	60	80	100	120	140	160	180
Lactulose	25/02/2017	Hydrogen	8	10	9	4	11	15	3	3	3	4
		Methane	2	2	2	0	0	2	0	0	0	0
Fructose	22/02/2017	Hydrogen	19	49	118	87	93	78	61	61	66	61
		Methane	2	7	9	7	8	8	6	9	7	8
Lactose		Hydrogen										
		Methane										
Sorbitol		Hydrogen										
		Methane										
Test sugar	Date	Time (min)	0	15	30	45	60	75	90			
Glucose	3/03/2017	Hydrogen	1	2	22	14	0	3	1			
		Methane	0	0	4	3	0	2	0			

- IP:
  - normal lactulose and mannitol recovery
- Faecal calprotectin
  - 6 mg/kg (normal <50)



# Final Diagnosis

- PDx
  - **SIBO – H<sub>2</sub>**
  - **2° fructose intolerance**
  - possible coeliac disease
  - possible gluten-sensitivity
  - **probably coeliac & SIBO**



# SIBO Breath Testing Interpretation

(Rezaie et al, 2017)

- Since the inception of the LBT being used to Dx SIBO until relatively recently, there has been considerable **heterogeneity** between labs in how LBT is conducted and interpreted...
  - → in 2017 group of US-based academics & clinicians developed a set of **consensus** guidelines on breath testing **interpretation**
  - +ve SIBO - LBT and GBT
    - SIBO = rise in H<sub>2</sub> of ≥20 ppm from baseline by 90 mins
  - Methane +ve
    - ≥10 ppm at any time point
    - **Note – no considerations of small bowel vs colonic methanogenesis**
      - **after an overnight fast, where would the methane in the lungs be coming from at baseline – the small bowel or the colon?**

# UK Expert Views on SIBO Breath Testing

(British Society of Gastroenterology, 2019)

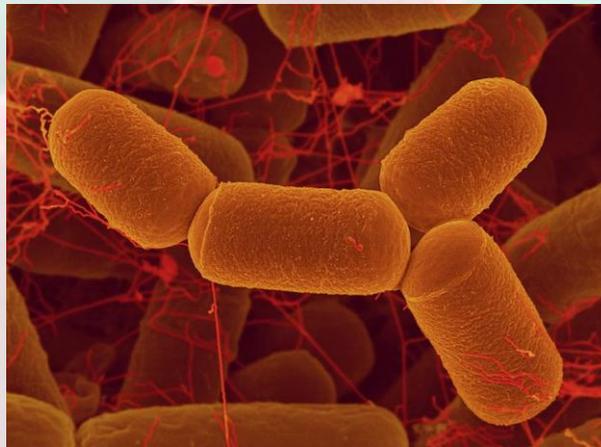
- British Society of Gastroenterology breath testing guidelines:
  - **+ve SIBO** = rise in H<sub>2</sub> of **≥10 ppm** from baseline by **60 mins** on **LBT**
    - **clinical judgement required if rise seen between 60-90 mins on LBT**
  - Recommend doing a follow-up GBT *if* the LBT result is equivocal
  - Methane level of **≥10 ppm** at baseline or **any** time point is +ve
    - state unclear whether methanogenesis is occurring in the small bowel or colon



# American College of Gastroenterology SIBO Guideline

(Pimentel et al, 2020)

- Rather than methane-SIBO, better termed:  
**IMO = Intestinal Methanogen Overgrowth**
- Why?
  - methanogens aren't bacteria
  - methanogens may also grow in the colon

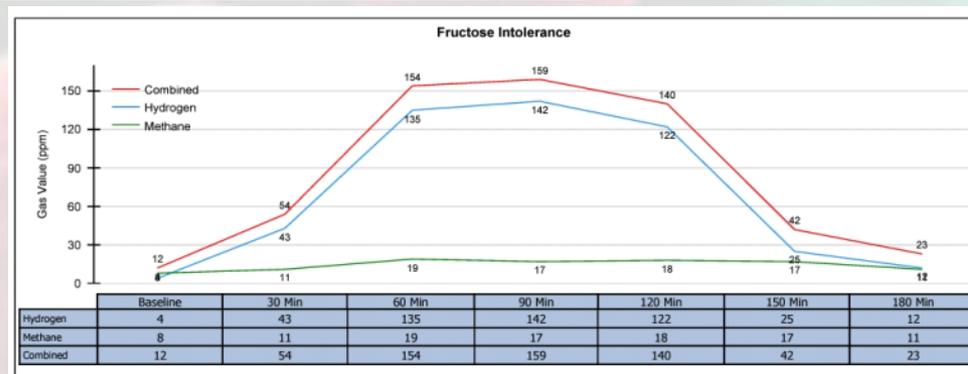
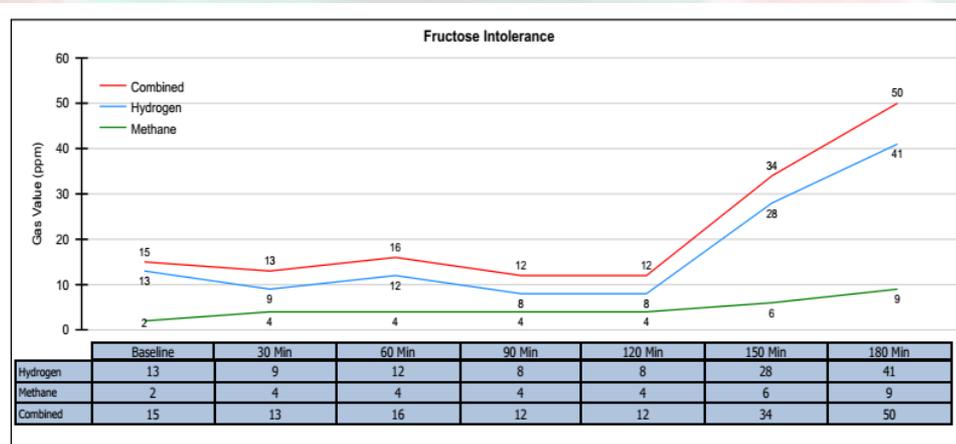


# My Approach to SIBO Breath Testing...

- Triple sugar testing
  - Lactulose
  - Glucose
  - Fructose



x 3



# Some Example Breath Test Results

*Time (min)*

<b>Lactulose 26.03.21</b>	<b>0</b>	<b>20</b>	<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>	<b>140</b>	<b>160</b>	<b>180</b>	<b>Symptoms</b>
<b>Hydrogen (ppm)</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>5</b>	<b>4</b>	<b>12</b>	<b>11</b>	<b>14</b>	<b>Flatulence Bloating</b>
<b>Methane (ppm)</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>7</b>	

*Time (min)*

<b>Fructose 24.03.21</b>	<b>0</b>	<b>20</b>	<b>40</b>	<b>60</b>	<b>80</b>	<b>100</b>	<b>120</b>	<b>140</b>	<b>160</b>	<b>180</b>	<b>Symptoms</b>
<b>Hydrogen (ppm)</b>	<b>6</b>	<b>20</b>	<b>119</b>	<b>102</b>	<b>83</b>	<b>102</b>	<b>36</b>	<b>33</b>	<b>28</b>	<b>17</b>	<b>Flatulence Bloating Borborygmi</b>
<b>Methane (ppm)</b>	<b>4</b>	<b>8</b>	<b>16</b>	<b>16</b>	<b>14</b>	<b>12</b>	<b>13</b>	<b>9</b>	<b>10</b>	<b>6</b>	

*Time (min)*

<b>Glucose 23.03.21</b>	<b>0</b>	<b>15</b>	<b>30</b>	<b>45</b>	<b>60</b>	<b>75</b>	<b>90</b>	<b>105</b>	<b>120</b>	<b>Symptoms</b>
<b>Hydrogen (ppm)</b>	<b>2</b>	<b>10</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>Flatulence Bloating Borborygmi</b>
<b>Methane (ppm)</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>2</b>	



# Some Example Breath Test Results

*Time (min)*

Lactulose 15.03.19	0	20	40	60	80	100	120	140	160	180	Symptoms
Hydrogen (ppm)	0	3	0	2	2	2	0	0	4	7	Borborygmi
Methane (ppm)	6	6	5	5	5	4	4	4	6	7	

*Time (min)*

Fructose 17.03.19	0	20	40	60	80	100	120	140	160	180	Symptoms
Hydrogen (ppm)	0	3	2	15	9	3	2	0	0	0	Diarrhoea (4hours post test) Stomach Ache (3hours post test)
Methane (ppm)	4	5	5	11	9	9	4	4	4	4	

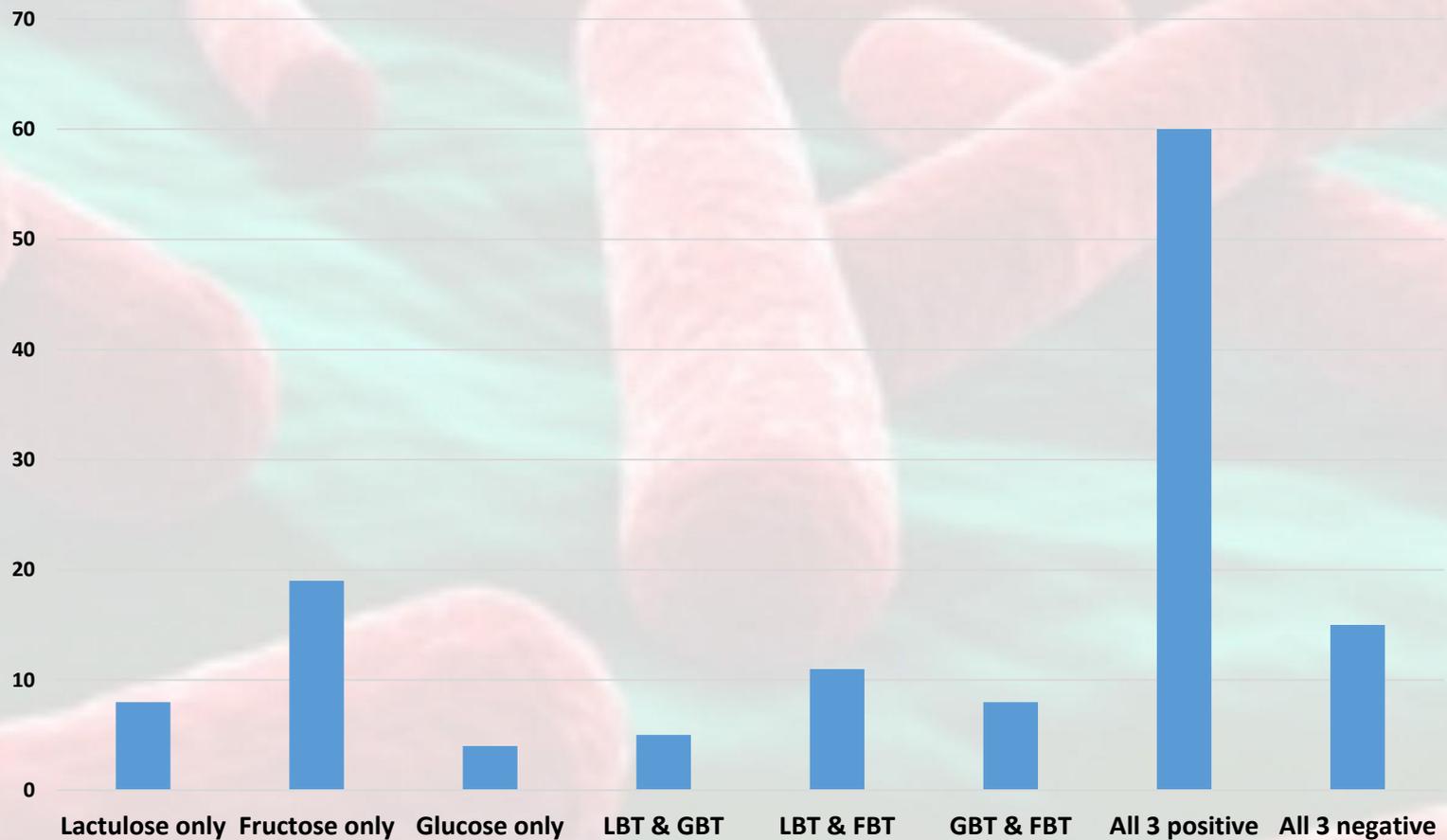
*Time (min)*

Glucose 19.03.19	0	15	30	45	60	75	90	105	120	Symptoms
Hydrogen (ppm)	2	2	2	2	6	5	5	2	2	None reported
Methane (ppm)	3	3	5	6	6	7	5	4	3	



# Results of 130 Consecutive Triple Sugar Breath Tests

Breath Test Results from 130 Consecutive Patients



# Results of 130 Consecutive Triple Sugar Breath Tests

Test	Accuracy in Picking up SIBO/IMO
LBT only	73.0% (84/115)
FBT only	85.2% (98/115)
GBT only	67.0% (77/115)
LBT & GBT	76.5% (88/115)
GBT & FBT	93.0% (107/115)
LBT & FBT	96.5% (111/115)
All 3 Tests	100% (115/115)



# Potential Consequences of Incorrect Diagnosis & Treatment

- What happens if we **misdiagnose** our patient?
  - inappropriate treatment
    - financial harm
    - inappropriate treatment itself may cause harm
    - not treating the actual issue!



# References

- British Society of Gastroenterology. Association of gastrointestinal physiologists (AGIP) proposed standardised testing protocol for hydrogen/methane breath testing (HMBT) to assess small intestinal bacterial overgrowth (SIBO) and carbohydrate malabsorption. *New Wave: Official e-Newsletter of the Association of GI Physiologists*. Feb, 2019:7-10.
- Pimentel, M., Saad, R. J., Long, M. D., & Rao, S. S. C. (2020). ACG Clinical Guideline: Small Intestinal Bacterial Overgrowth. *American Journal of Gastroenterology*, 115(2), 165-178. doi:10.14309/ajg.0000000000000501
- Rezaie, A., Buresi, M., Lembo, A., Lin, H., McCallum, R., Rao, S., . . . Pimentel, M. (2017). Hydrogen and Methane-Based Breath Testing in Gastrointestinal Disorders: The North American Consensus. *The American Journal Of Gastroenterology*, 112, 775. doi:10.1038/ajg.2017.46