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## FPIN's Clinical Inquiries

### Effective Management of Flatulence

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#### Clinical Question

What is the most effective management of flatulence?

#### Evidence-Based Answer

Probiotics and rifaximin (Xifaxan) have been shown to reduce total number of flatus episodes and associated discomfort. (Strength of Recommendation [SOR]: B, based on small randomized controlled trials [RCTs]). Oral alpha-galactosidase (Beano) has been shown to reduce volume of flatus associated with fermentable carbohydrates and high-fiber diets. (SOR: B, based on small RCTs). Oral bismuth subsalicylate (Pepto-Bismol) and odor-reducing external devices containing activated charcoal have shown benefit in reducing flatus-associated odor. (SOR: C, based on disease-oriented evidence). Evidence for oral activated charcoal and simethicone has been inconsistent and does not support their use. (SOR: B, based on multiple small RCTs). See *Table 1* for a summary of the relative effectiveness of different methods for controlling flatus.<sup>1-10</sup>

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**Table 1. Relative Effectiveness of Different Methods for Controlling Flatus**

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<i>Treatment</i>	<i>Symptoms treated</i>	<i>Outcome variable</i>
<b>Antibiotics</b>		
Rifaximin (Xifaxan) <sup>1</sup>	Volume	+++
<b>Probiotics</b>		
VSL#3 <sup>2</sup>	Volume	+
Prescript-Assist <sup>3</sup>	Volume	+++
<i>Other Bifidobacterium and Lactobacillus species mixtures</i> <sup>4,5</sup>	Volume	+++
<b>Activated charcoal</b>		
Oral <sup>6</sup>	Odor	0

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Devices <sup>7</sup>		
Briefs	Odor	+++
Pads in underwear	Odor	++
Seat cushions	Odor	+
<b>Other</b>		
Bismuth subsalicylate (Pepto-Bismol) <sup>8</sup>	Odor	+++
Alpha-galactosidase (Beano) <sup>9</sup>	Volume	+ (300 GalU) ++ (1,200 GalU)
Simethicone/loperamide (Imodium Advanced) <sup>10</sup>	Volume associated with diarrhea	0

*0 = not effective; + = minimally effective, or effective only in certain situations; ++ = moderately effective; +++ = very effective.  
Information from references 1 through 10.*

## Evidence Summary

Flatus represents two distinct problems: (1) volume of flatus resulting in bloating and discomfort; and (2) odor possibly disturbing persons around the patient. Volume is caused by hydrogen, nitrogen, and methane, whereas odor is a result of sulfur gases in the flatus. Because flatus represents two different perceived problems, distinct treatments for either volume or odor may be required.

### ANTIBIOTICS

One double-blind study comparing rifaximin, a nonabsorbed antibiotic, 400 mg orally twice daily and placebo showed that more patients reported relief of symptoms of abdominal bloating, distension, and flatulence with rifaximin (41 versus 23 percent; number needed to treat [NNT] = 5.4).<sup>1</sup> This benefit diminished 10 days after the treatment course finished; however, it remained significant (29 versus 11 percent of patients reporting improvement; NNT = 5.8).

### PROBIOTICS

Multiple probiotics have been shown in RCTs to have significant short- and long-term reduction in flatulence and bloating. Because each probiotic is a different mixture of bacteria, they have to be treated as different medications. VSL#3 probiotic (a *Bifidobacterium* and *Lactobacillus* species mixture) demonstrated a 50 percent reduction in flatulence in more patients at four weeks compared with placebo (52 versus 33 percent; NNT = 6.4).<sup>2</sup> A proprietary agent, Prescript-Assist (30 soil-based organisms), showed a reduction in flatulence symptom scores at four weeks compared with placebo (reduction by 0.55 standard score units on a 0 to 1.2 unit scale;  $P < .001$ ). Follow-up of the treatment group at 60 weeks showed persistent reduction of symptoms.<sup>3</sup> Other formulations of *Bifidobacterium* and *Lactobacillus* species alone and in mixtures have had differing results, but most studies showed modest reduction in flatus-associated discomfort.<sup>4,5</sup>

### ACTIVATED CHARCOAL

Early studies (many uncontrolled) of oral activated charcoal looked promising; however, more recent trials have failed to demonstrate benefit.<sup>6</sup> Odor-reducing external devices containing activated charcoal are effective at binding sulfur gases, thus reducing odor. Activated charcoal briefs were most effective, and absorbed almost 100 percent of sulfur gases. Charcoal pads worn in underwear absorbed 55 to 77 percent of sulfur gases. Charcoal seat cushions absorbed about 20 percent of sulfur gases, whereas regular seat cushions absorbed one half that amount. Cushions were more effective when sat on, thus limiting situations in which the device could be used.<sup>7</sup> A major limitation with clinical application of

absorbed sulfur gases is that the minimum level to reduce social discomfort has never been established.

### **BISMUTH SUBSALICYLATE**

Bismuth subsalicylate (524 mg orally four times daily) has been shown to bind more than 95 percent of sulfide gases in the gut. Concern for salicylate toxicity inhibits its use as a chronic treatment; however, episodic use is safe and could be used strategically to prevent social unease.<sup>8</sup>

### **ALPHA-GALACTOSIDASE**

Alpha-galactosidase is effective for reducing symptoms of bloating and flatus associated with consumption of fermentable carbohydrates (e.g., those found in beans, bran, or fruit). In an RCT, all eight patients taking 300 or 1,200 galactosidase International Units showed significant improvement in symptom score compared with those receiving placebo.<sup>9</sup>

### **SIMETHICONE**

Simethicone has been recommended for treatment of flatulence and bloating; however, no benefit has been shown for common flatulence. A combination of simethicone and loperamide (Imodium Advanced) is effective in relieving abdominal bloating and gas associated with acute diarrhea (more than either treatment alone); however, it has not been studied in nondiarrhea-associated flatus.<sup>10</sup>

## **Recommendations from Others**

No consensus guidelines about effective management of flatulence were found. Recommendations in UpToDate include use of alpha-galactosidase for flatus associated with beans, avoidance of flatus-causing foods, and a trial of antibiotics. Oral bismuth subsalicylate and external odor-absorbing devices made of carbon fiber were recommended to help reduce odor. Use of simethicone or oral activated charcoal was not recommended.<sup>11</sup>

## **Clinical Commentary**

What is the cost of flatulence control? Pepto-Bismol is widely available and is the least expensive medication in this review (about \$6 for 16 fl oz).<sup>12</sup> Beano can be found in most grocery stores and pharmacies. It costs approximately \$17 for 100 tablets.<sup>12</sup> Activated charcoal underwear liners (the variety that can be washed and reused for several weeks) are approximately \$20 through a manufacturer's Web site. The probiotics discussed in this review range from \$40 (for 60 capsules of Prescript-Assist) and \$48 (for 60 capsules of VSL#3) to \$80 (for 30 packets of VSL#3 powder), depending on the Web site. At \$161 for 30 200-mg tablets, rifaximin is the most expensive option.<sup>12</sup> The International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code for flatulence is 787.3.

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