



What about the Queasy Teen?



A common presentation of
gastrointestinal dysmotility in
adolescence

**By Robert Issenman, MD, FRCPC;
and Rabin Persad, MBBS, FRCPC**

Annette's nausea

Annette, a 15-year-old Grade 10 student, was seen in March, complaining of recurring nausea that started six months earlier. The nausea comes 15 minutes after eating.

Annette weighs 55 Kg (50%ile), and measures a height of 156 (15%) with a normal physical examination. She has a past history of treatment with metronidazole for a mild parasitic infection towards the end of the summer, and before the start of the school year.

Functional inquiry indicates normal eating without acknowledgement of vomiting or purging. Her body image is realistic and she says school is "OK." She describes herself as an A student, but has missed many days. Morning fatigue makes her feel ill, and she does not believe she should go to school if she feels ill. She describes herself as "the Gravol® Queen" (Gravol® doesn't help.) The family is very concerned, convinced their daughter has a serious stomach problem.

In this article:

1. What is gastroparesis?
2. Could it be an eating disorder?
3. What is the significance?
4. What degree of investigation is necessary?
5. How do I treat the queasy teen?

It is not uncommon for family practitioners, internists, and pediatricians to encounter the problem described as "the queasy teen." These individuals, more commonly females than males, present with a variety of complaints ranging from an overt complaint of nausea, to abdominal pain or just feeling unwell in a vague way. Parents may be concerned about the somatic complaint, but school absence is a major component of the patient's situation.

GI Dysmotility

Table 1

Recognized organic causes of chronic nausea/vomiting

- Brain tumour
- Diabetic gastroparesis
- Hypothyroidism
- Chronic gastritis/peptic ulcer disease
- Intestinal pseudo-obstruction

Adapted from: Reid B, DiLorenzo C, Travis L, et al: Diabetic gastroparesis due to postprandial antral hypomotility in childhood. *Pediatrics* 1992; 90:43-46.

Table 2

Lesser known, but more common causes of chronic nausea/vomiting

- Cyclic vomiting and chronic vomiting
- Chronic adolescent anxiety
- Post-viral gastroparesis
- Adult rumination syndrome

“Is it in my head?”

There is a natural defensiveness by teenagers presenting with nausea that the problem “is not in my head.” The approach to the problem is aided by an understanding of recent revelations about causes of nausea and vomiting, which suggest the problem originates in the body’s response to stress. In many teenagers, their head (*i.e.*, their consciousness) is not participating, although their mid-brain may be involved.¹

Work done in the field of chronic vomiting has been brought together in a supplement published in *Digestive Disease and Science* by the Cyclic Vomiting Syndrome Association in 1999.² The thrust of this work is that vomiting (and its precedent nausea) is part of the body’s natural defense mechanism against poisoning and infection. Confronted

with the possible ingestion of a noxious substance, sympathetic outflow from the hypothalamus induces a paralysis of the stomach, known as gastroparesis.³ This sympathetic surge is expressed in the small intestine and large bowel by an increase in both secretion and peristalsis, experienced by most individuals as intestinal cramping and diarrhea. These profound effects on the intestinal tract are recognized in common linguistic expressions describing the phenomenology of stress: “I was nervous and had a lump in my throat...I felt sick to my stomach...I felt so stressed, I could just puke.”

Secretion of antidiuretic hormone (ADH) is another expression of the physiologic stress reaction. ADH secretion is a potent stimulus to gastroparesis, as well as profound nausea. Chemically mediated nausea has been shown to act through the area postrema of the posterior nucleus in the hypothalamus.⁴ This system is activated by both physiologic (disease induced) and psychological (environmental) stimuli. The body’s survival mechanism incorporates nausea at the thought of a threat to diminish the chance that the organism will ingest a poison.



Dr. Issenman is a professor of pediatrics at McMaster University, and chief of pediatric gastroenterology and nutrition at McMaster Children's Hospital, Hamilton, Ontario.



Dr. Persad is an assistant professor of pediatrics at McMaster University, and pediatric gastroenterologist at McMaster Children's Hospital, Hamilton, Ontario.

GI Dysmotility

This entraining is well recognized in the anticipatory nausea associated with chemotherapy.⁵ There is no reason to think that performance anxiety or similar stress works by a distinct mechanism.

What is gastroparesis?

As gastroparesis is a final common pathway for the body's stress response, it is important to conduct a thorough history and physical examination to exclude the many organic causes of nausea and vomiting (Table 1). However, given the excellent health of most teens, it is more probable that chronic nausea and vomiting are expressions of the problems outlined in Table 2.

Is it an eating disorder?

It is important to exclude anorexia nervosa and bulimia in the differential diagnosis, as a teenager with an eating disorder usually presents to physicians with a somatic complaint (Table 3). This may include unexplained weight loss, vomiting, nausea, belly pain, constipation, or diarrhea.

The common denominator in these complaints is distorted body image. Dr. Sheri Findlay, an adolescent medicine physician, suggests the eating disorder should be based on specific criteria rather than made as a diagnosis of exclusion. Some degree of gastroparesis and starvation-induced diarrhea can accompany the malnutrition resulting from an eating disorder.

Table 3

Diagnosis: Anorexia Nervosa DSM IV criteria

- Intense fear of becoming obese
- Disturbance in perception of body weight, size and shape
- Refusal to maintain acceptable body weight for age and height (more than 15% below ideal body weight)
- Females: Absence of at least three consecutive menstrual cycles

What about post-viral gastroparesis and adult rumination syndrome?

The condition described as post-viral gastroparesis presents with nausea and feeding intolerance.⁶ This transient gastric neuropathy can occur at any age and may require tube-feeding, although symptoms usually resolve over a period of months. Post-viral gastroparesis must be distinguished from the adult rumination syndrome, recently described in a series of publications from the Mayo Clinic.^{7,8} In adult rumination syndrome, there is relaxation of the lower esophageal sphincter accompanied by a contraction of the smooth muscle in the gastric antrum, forcing the gastric contents up the esophagus and into the mouth. The regurgitation lacks the force of vomiting and patients reswallow the gastric contents back to the stomach, much as ruminant animals, hence the name.

The diagnosis is largely clinical. These patients regurgitate hundreds of times daily and are not par-



GI Dysmotility

Table 4

Sexual activity among teens

Most teens over 16 are sexually active. Statistics of high school students reported to be having sex are as follows:

- 60.5% of Grade 12 students
- 51.9% of Grade 11 students
- 40.8% of Grade 10 students
- 34.4% of Grade 9 students
- 6.6% of students reported initiating intercourse before age 13
- 7.7% of students reported having been forced to have sexual intercourse

Adapted from: United States National Institute of Health, Centre for Disease Control 2001.

ticularly bothered by nausea despite the presenting complaint of vomiting. The history should also focus on the quantity of emesis, the number of times, and the force of the emesis. This can be confirmed on 24-hour pH studies, through demonstration of hundreds of episodes of regurgitation of very short duration. Motility studies are also helpful, but these are not routinely available, and probably not as accurate as is a careful history. Gastric emptying studies may be similarly confusing. Treatment is largely behavioural, relying largely on positive behavioural reinforcement. The use of surface active antacids, such as alginate, may be helpful. Intestinal prokinetics, however, only increase the forcefulness of emesis, as coordination of gastric propulsion causes most of the problem.

What degree of investigation is necessary?

A variable degree of investigation is required in the evaluation of the queasy teen, including upper gastrointestinal (UGI), small bowel follow through, an ultrasound to look for biliary stones or pancreatitis,

UGI endoscopy for esophagitis or helicobacter infection, a urine culture and a pregnancy test. The single most useful test is a solid phase gastric emptying study. This is usually performed by administration of a radionucleotide marker and is reported as the time to empty the stomach contents. Nevertheless, there is some variability, as symptoms related to stress may be more or less present on the day of the investigation. Adolescent pregnancy remains an important consideration because of the high prevalence of adolescent sexual activity (Table 4).

How do I treat the queasy teen?

Treatment for the queasy teen is linked to the bio-behavioural origins of the problem. The problem may, in fact, have started out with an episode of identifiable illness. Patients are frequently high achievers with relatively little insight into their own level of stress. However, the school absence, resulting from their precipitating illness may precipitate further anxiety.

By the time these teens are evaluated, many have been out of school for months and there are real obstacles to reintegration. The school board's home-schooling program may be a convenience that teens, parents, and teachers are reluctant to relinquish. However, persistent school absence diminishes the motivators to recovery. Furthermore, the lack of a timetable often reinforces disordered patterns of eating and sleeping, leading to secondary complaints of fatigue. Without accommodation to normal demands, teens are unlikely to break this cycle.

Medication may play a role in bridging the patient back to normalcy. The intestinal prokinetics may be particularly useful. Canadian physicians have access to domperidone maleate, which enhances gastric emptying without the extrapyramidal problems seen with metoclo-

pramide or the disturbing cardiac arrhythmias seen with cisapride. Low dose antidepressant medication may both decrease anxiety and decrease visceral hyperalgesia, which is the physiologic process contributing to pain experienced in this condition. Most patients respond to a program, which includes evaluation, acknowledgement, explanation, support, normalization, and medication. Various forms of relaxation therapy would seem logical for these teens in particular, but some children prone to this syndrome are less likely to slow down enough to use these less dramatic initiatives. CME

References

1. Wood J: Enteric nervous control of motility in the upper gastrointestinal tract in defensive states. *Dig Dis Sci* 1999; 44(Suppl. 8):44-52.
2. Li BU, Issenman RM, Sarna SK: Second International Scientific Symposium on Cyclic Vomiting Syndrome. *Dig Dis Sci* 1999; 44(suppl. 8).
3. Andrews PLR: Physiology of Nausea and Vomiting. *Br J Anaesth* 1992; 69:2-19.
4. Li BU, Sferra T: 1999 Vomiting in J. Hyams and R. Wylie (Eds) *Pediatric Gastrointestinal Disease*, 2nd Edition, (pp.14-31) Philadelphia: W.B. Saunders
5. Andrews PLR, Davis CJ: The mechanism of emesis induced by anti-cancer therapies in *Emesis in Anti-Cancer Therapy: Mechanisms and Treatment* PLR Andrews, GJ Sanger (eds) London, Chapman and Hall 1993 pp. 163-178
6. Sigurdson L, Flores AF, Putnam PE, et al: Post viral gastro-paresis in children: Presentation, treatment and outcome. *J Ped Gastroenterol Nutr* 1996; 23
7. O'Brien MD, Bruce BK, Camilleri M: The rumination syndrome—Clinical features rather than manometric diagnoses. *Gastroenterology* 1995; 108:1024-29.
8. Chial HJ, Camilleri M, Williams DE, et al: Rumination Syndrome in children, adolescents and adults, Diagnosis, treatment and prognosis. *Pediatrics* 2003; 111(1):158-62.

Take-home message



It is reasonable to offer tips to the family of a queasy teen at the outset of a medical evaluation:

- The symptoms are very real and probably result from the body's response to stress.
- Both physical and emotional issues play a part.
- A rehabilitation model will be used.
- There will not be an immediate cure, but the goal will be the progressive improvement.
- School attendance is essential.

Net Readings

1. <http://web.nami.org/youth/teendep.html>
2. <http://www.aafp.org/afp/990401ap/1823.html>