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Spring 5-2017

## Gastroparesis: A Literature Review of Disease Manifestations and Existing Treatment Methods

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GASTROPARESIS: A LITERATURE REVIEW OF DISEASE MANIFESTATIONS  
AND EXISTING TREATMENT METHODS

by

Sara M. DeMello

A Thesis Submitted in Partial Fulfillment  
of the Requirements for a Degree with Honors  
(Nursing)

The Honors College

University of Maine

May 2017

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## Abstract

Gastroparesis is a chronic disease that causes paralysis of the stomach and intestines. Although gastroparesis can sometimes be caused by trauma or as a result of abdominal surgery the majority of cases are idiopathic, meaning that the cause of onset is unknown. Patients with the disease experience nausea, vomiting of undigested food, malnutrition, and dehydration. A large percentage of IG (idiopathic gastroparesis) patients have to rely on a feeding tube for their nutrients because of their lack of ability to digest food, which is messy, cumbersome, and noisy. There are several methods of symptom management for IG, but no cure. Current treatments include the use of medications to try and stimulate gastric motility as well as more obscure experimental treatments such as using botulinum toxin to lessen the paralysis.

This thesis serves as a literature review of current studies on IG and the frequently used methods of managing the disease. The thesis also serves as an opportunity to look at an often neglected aspect of IG, which is the effect that the illness has on the mental health of its sufferers. The illness leaves patients socially isolated, which leads to increased rates of mental illness such as anxiety and depression. Nursing is not only about caring for the patient's illness, but caring for the patient on a holistic level, which means looking out for their mental, emotional, and spiritual health as well as the physical. I want to use this thesis as a way to call attention to the struggles that IG sufferers face on both the physical and mental plane in an attempt to raise awareness for this illness through educating the public.

Gastroparesis is an intestinal disease that is estimated to affect more than 1.5 million Americans (Temple University Health System, 2016). The disease causes a decrease in intestinal motility that can range from mild to severe and, in some cases, leave the gastrointestinal tract completely paralyzed. The result is retention of food in the stomach, which causes nausea, bloating, abdominal distention, and vomiting. Studies have shown that in recent years there has been a drastic increase in the prevalence of the illness with “an increase of 138% over 10 years in the number of patients being diagnosed and hospitalized with gastroparesis” (Bennell & Taylor, 2013, p. 2816). The increase in disease prevalence may be a result of improved accuracy of detection and diagnosis. In years past, the vague symptoms that define gastroparesis may have been mistaken for those of another gastrointestinal (GI) ailment. It is also possible that symptoms may have been dismissed as being all in the patient’s mind due to the transient nature of the illness. However, as more and more information about gastroparesis is revealed, it is becoming more recognized as a disease that can be severely debilitating to a person’s life on both a physical and psychological level. Physical consequences of living with the illness include malnutrition, poor drug absorption, and loss of glycemic control (Potter & Snider, 2013). Psychological consequences can include the development of mental illnesses such as depression and anxiety (Liu, Song, Zhang, Zhou, Ni, 2014). As a result of these daily challenges, many gastroparesis sufferers tend to avoid social events out of fear of being unable to manage their illness in public. This leaves many patients socially isolated, which only perpetuates any psychological consequences they may be experiencing.

For many other cultures around the world, social interactions are centered around food (Bennell & Taylor, 2013). Friends meet for lunch, families spend precious limited time together during dinner, and work meetings are conducted “over” coffee. While most people don’t stop to think about it, the common variable in social interaction is the presence of food. People bond over food; so what happens when a person has a medical condition that makes them unable to eat?

### **Aims**

This paper aims to comprehensively examine the literature to better understand patients with gastroparesis and will provide discussion about (a) normal gastrointestinal function; (b) pathology of gastroparesis; (c) physiological symptoms; (d) psychological implications; and (e) provide a review of the literature on current treatments; and (f) a proposal for a future study that investigates the public’s awareness of gastroparesis and will provide data rooted in evidence to develop programs to educate people on the disease.

### **Purpose**

The purpose of this paper is to examine gastroparesis and the current treatments used to manage the disease. This paper will explain psychological implications of living with the illness. This is important because holistic healthcare management requires treatment of the body, mind, and spirit (Simkin, 2012). If the physical symptoms of the illness are treated without giving adequate attention to any potential mental health issues, then effective coping and comprehensive treatment may never be achieved (Portillo & Crowley, 2010). This paper will increase awareness, which is a first step in working towards holistic care.

## **Methods**

To meet the aim of this review, articles and reference books were used to explain the physiology and pathophysiology of gastroparesis and current treatment. Then, a review of the literature was conducted for (a) studies about mental health complications that gastroparesis patients commonly face; and (b) current treatments. The following databases searched: CINAHL, PubMed, and Nursing Reference Center. The following search terms were included: gastroparesis, idiopathic gastroparesis, signs and symptoms, diagnostic tests, and treatment options. These treatment options included pharmacological methods of treatment, such as azithromycin treatment, as well as non-pharmacological methods of treatment such as gastric electrical stimulation and botulinum toxin therapy. Studies were included if they were full-text articles, published between 2007 and 2017. Studies were included beyond the recommended five-year search (i.e., dating back to 2007) because there was paucity in the literature on gastroparesis patients and psychological implications. Articles were excluded if the pathology discussed was not gastroparesis or the study was conducted using pediatric patients.

## **Review Findings**

### **Gastrointestinal Function**

The function of the gastrointestinal system is to breakdown food into its molecular components for absorption and distribution. The gastrointestinal system consists of the mouth and throat, esophagus, stomach, and intestines. There are also other accessory organs that are required for digestion and absorption such as the liver, pancreas, and gallbladder.

Within the wall of the digestive tract lies the enteric plexus of the enteric nervous system (ENS) (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2013; Tate, 2012). The sensory neurons within the plexuses allow for signal exchanges between the GI tract, the central nervous system (CNS), and the autonomic nervous system (ANS) (Tate, 2012). The ENS is a critical neuroregulator in the stimulation of and communication with the GI tract. It detects changes in the composition of digestive contents, mechanical changes, such as stretching of the GI tract walls, and can stimulate or inhibit contraction of the smooth muscle within the walls of the stomach and intestines (NIDDK, 2013; Tate, 2012). When food enters the stomach the elastic walls of the organ stretch to accommodate the increased volume of gastric contents. This mechanical change in the organ is detected by the neurons in the enteric plexus and communicated to the parasympathetic nervous system, which initiates two types of muscular contractions, mixing waves and peristaltic waves (NIDDK, 2013; Tate, 2012). Mixing waves are low intensity contraction and serve the purpose of mixing food with the stomach's gastric juice to create a mixture of semi-digested food called chyme. Then, much stronger peristaltic contractions move the chyme forward toward to pyloric sphincter (NIDDK, 2013; Tate, 2012).

The pyloric sphincter is the ring of muscle that separates the stomach from the small intestine (Tate, 2012). It opens as a result of the peristaltic waves and empties the stomach contents into the small intestine (Tate, 2012). The rate at which the sphincter allows contents to flow from the stomach to the intestines is delicate and primarily regulated by the degree of stomach wall distention (Tate, 2012). If the rate of food movement is slow, the amount of nutrients that can be absorbed is slowed and this can

lead to the acidic gastric juice damaging the stomach's lining (Tate, 2012). A delayed rate of gastric emptying is one of the primary issues in patients with gastroparesis.

Once the partially digested food (i.e., chyme) has moved into the small intestine, the absorptive cells within the intestinal lining, which are equipped with microvilli, release digestive enzymes and absorb nutrients from the digested food (NIDDK, 2013; Tate, 2012). Peristaltic contractions continue to move the chyme through the small intestine to the ileocecal valve that is opened by the peristaltic contractions and allows the remaining digested food into the large intestine. This process of digested food passing from the stomach through the large intestines takes approximately 18 to 24 hours with strong peristaltic contractions, called mass movements, occurring three to four times a day (Tate, 2012). These peristaltic contractions of the large intestine are initiated as a result of intense enteric and parasympathetic stimulation (NIDDK, 2013; Tate, 2012).

If at any point during digestion the neurological communication between the ENS of the digestive tract and the CNS/ANS is impeded or ineffective, the mixing and peristaltic contractions is impaired. Without the presence of the contractions, the movement of food through the digestive tract will slow or cease. This not only leaves undigested food trapped in the stomach, but also prevents the body from absorbing nutrients from the food. The sudden decrease in peristaltic contractions and gastric motility causes specific manifestations.

### **Gastroparesis**

People suffering from gastroparesis have a decrease or a halt in gastric motility. The cessation in regular gastric motility prevents the stomach from emptying due to the absence of nerve communication necessary to create smooth muscle contractions. An



illness is thought to trigger this pathology although the details of which illnesses and the mechanism behind the triggering is not completely understood. According to Bennell and Taylor (2013), “The etiology is multifactorial, and the main categories are idiopathic (56%), diabetic (29%) and surgery (13%)” (p. 2816). The majority of gastroparesis cases are idiopathic, meaning that it arises spontaneously and the cause is unknown.

The pathology is accompanied by abrupt changes in the patient’s life, which can be difficult for life adjustment (Liu et al., 2014). Perhaps one of the most frustrating aspects for the patient is not knowing the cause of the illness (Bennell & Taylor, 2013). For a patient who has a new onset illness, there is often a need to understand how the illness arose and what caused it. Understanding the origin of the illness can be a way of coping for the patient by giving them a sense of control through understanding. Because the cause of so many gastroparesis cases is unknown, it can make the patient feel like they are not in control of themselves or their life, which is distressing and requires time to accept living with the pathology (Bennell & Taylor, 2013).

Diabetes is found to be a cause of gastroparesis, and it is the most common known cause of the disease (NIDDK, 2012). Diabetes is a disease that causes elevated blood glucose levels because the pancreas cannot produce insulin or produces insufficient amounts of insulin (Cleveland Clinic Staff, 2013). Over time, the high blood glucose will cause damage to various body structures, including the vagus nerve (NIDDK, 2012). The vagus nerve innervates the gastrointestinal (GI) tract and stimulation of the nerve has a parasympathetic effect, meaning that it induces GI motility. Therefore, any damage to the nerve will lead to a decrease in GI stimulation and movement, leading to the onset of gastroparesis.

The third cause of gastroparesis may be a gastric surgical procedure (Bennell & Taylor, 2013). A large abdominal surgery can cause the intestines to stop functioning and, sometimes, this organ does not “wake up” or begin to function again. As the patient recovers from the surgery they will present with an inability to keep food down and an absence of bowel sounds. Types of abdominal surgeries that can result in gastroparesis include surgeries on the stomach or intestinal resections, such as a Whipple procedure. A Whipple procedure is typically used as a way to bypass and remove a tumor in the duodenum, pancreatic head, proximal bile duct, or ampulla (Marcason, 2015). This procedure involves removing the pylorus, the head of the pancreas and the distal bile duct, the duodenum, and the first few inches of the jejunum (Marcason, 2015). Because of the extensive nature of this procedure, damage to the vagus nerve is possible because of its close proximity to the surgical site, which can lead to partial or complete intestinal paralysis.

### **Symptoms of Gastroparesis**

**Physical symptoms.** The lack of gastric movement often times leads to vomiting undigested food that has remained in the stomach for prolonged periods of time, sometimes days (Mayo Clinic Staff, 2014). There is delayed emptying from the stomach which results in an accumulation of food from several meals (i.e., several days) retained in the stomach; the stomach becomes overfilled. In addition, the trapped food starts to decay in the stomach, which produces a buildup of gas in the stomach. The combination of the decaying food and the increased stomach volume is what leads to the vomiting. Other symptoms of gastroparesis include bloating, pain, feelings of fullness after not eating much, weight loss, malnutrition, lack of appetite, and erratic blood glucose levels

(Mayo Clinic Staff, 2014). The particular symptoms are caused by several different aspects of the decreased GI movement. For example, the bloating feelings of fullness, lack of appetite, and pain are a result of the retention of food in the stomach. As the retained food decays in the stomach the resulting gas buildup leaves the patient with bloating and pain and makes them feel full without ingesting food. These feelings can be rather unpleasant and render the patient with a lack of appetite.

Weight loss and malnutrition is caused by the inability to absorb nutrients from undigested food (Mayo Clinic Staff, 2014). The majority of nutrient absorption occurs in the small intestine. However, if the muscles in the stomach and intestines are not contracting the food is not able to move out of the stomach and into the small intestine. If the food doesn't reach the small intestine the body never has the opportunity to absorb nutrients from the food, resulting in weight loss and malnutrition. These symptoms are rather vague and can be transient. Therefore, the disease can be difficult to detect, leading to frustration for afflicted people trying to find a diagnosis or learn how to manage the illness (Bennell & Taylor, 2013).

**Psychological symptoms and comorbidities.** Patients with gastroparesis can also develop mental illness as a result of their physical disease. Surprisingly, results from the current literature search from 2007-2017 only found two articles (Bennell & Taylor, 2013; Liu et al., 2014). Research has found that people suffering from gastroparesis are afflicted with higher rates of depression and anxiety (Bennell & Taylor, 2013). Patients with gastroparesis struggle with both mental and physical manifestations, which can be exhaustive for the patient.

The literature finds higher rates of depression due to feelings of social isolation (Bennell & Taylor, 2013). The inability to eat and lack of enjoyment from food contributes to feelings of depression. Often, patients perceive a lack of understanding with their experiences, which leads to their feelings of social isolation. This highlights the role of the healthcare provider and the importance of viewing the patient holistically to provide care on the physical, mental, and emotional levels. Patients with gastroparesis are often physically managed with little emphasis on the mental wellbeing of a person afflicted with a chronic illness (Simkin, 2012).

Social isolation is discussed in current studies on the disease (Bennell & Taylor, 2013). Bennell and Taylor conducted a 2013 qualitative study that examined the psychological effects that many gastroparesis patients face. The study found that many people with gastroparesis suffer from some degree of social isolation as a result of the disease. The study found food and the act of eating provides more than nutrition; what we eat and who we eat with plays an important role in creating and improving bonds between people on both the individual and community level (Bennell & Taylor, 2013). While participants in the study valued the social interaction that mealtimes offered they were often hesitant about participating in social events because of their illness. At any social interaction that involved food, there is the constant risk of vomiting in public, leading to a great deal of insecurity for the person with gastroparesis. As an attempt to combat this risk, some participants stated that they would attend social events, but not eat any food while at the event. This, however, created a whole new set of issues and insecurities for the patient attempting to socialize or eat in public. One particular participant described how uncomfortable her friends and family became when she did not

eat at a social event and how equally uncomfortable it made them when she does choose to eat and ends up vomiting. The reactions of loved ones led this participant to avoid socializing altogether and to eat only when she is alone to avoid the risk of publicly vomiting. When one participant was asked about her attempts at socializing she simply responded, “I just won’t now. I think it’s when I eat at home and I want to be sick, I know I am in a safe environment (Bennell & Taylor, 2013, p. 2818)”. This theme was not an uncommon one amongst the participants. Many of them had come to find socializing a burden and avoided social events whenever possible, especially if the event was one centered around food.

The participants in the study exhibited different ways of coping with their illness. Some strove to maintain some degree of social activity by seeking out activities that did not revolve around food or eating, such as sewing classes (Bennell & Taylor, 2013). These participants remained consistent in the belief that while the illness was a part of them, it did not define them. Other participants had a less positive outlook on their illness. For these participants, the loss of social eating was a cause of significant social isolation and precipitated much individual distress.

Despite each participant’s individual response to living with gastroparesis the study found a distinct link between the prevalence and severity of mental illness and the severity of the person’s gastroparesis. The link between affect and GI motility was also found by Bielefeldt et al. (2009) who found significant correlation between symptom scores and depression ( $p < .05$ ). The score of depression determined disease severity better than gastric emptying (Bennell & Taylor, 2013). Four psychometric measures (i.e., emotional distress/mood state, personality, coping style, emotional suppression) were

used to examine GI transit time because these measures influence the rate of gastric emptying. Participants with more effective coping strategies, for example, usually showed better rates of gastric emptying. These measures provided baselines for each patient and a way to gauge the effectiveness of the interventions made during the study. The study concluded that the more severe the delay in gastric emptying the higher the scores were for depression, anxiety, hypochondriasis, and anger suppression.

In another study by Liu et al. (2014) the psychological side effects of gastroparesis were examined from another perspective. The study compared the severity of symptoms and rate of recovery in postsurgical gastroparesis patients. One group of patients received extensive psychotherapy as part of their treatment regimen, while the control did not.

Liu et al.'s (2014) study consisted of 120 patients who had been diagnosed with postsurgical gastroparesis syndrome, divided into two random groups. The patients in the experimental group received intense psychotherapy in addition to their normal treatment of physical symptoms. The psychotherapy included supportive mental health consultations, symptomatic bedside mental interventions, pharmacotherapy, music therapy, and massage therapy. Left-side-lying positions were encouraged to aid patients with the amount of gastric reflux experienced because the position facilitate gastric emptying. In addition, mouth hygiene and face-washing were performed after vomiting to improve patients' self-esteem, and adequate room ventilation was provided to reduce odor after instances of vomiting. These various efforts were made in an attempt to reduce the patients' overall psychological stress and potentially improve gastric function.

Liu et al. (2014) found an improved rate of gastric emptying in the patients that received psychotherapy as well as significantly lower rates of depression and anxiety. These patients had an overall improvement in disease severity as well as in their ability to manage their physical symptoms. The control group found no improvement in physical symptoms or in their psychological state or with their rates of anxiety and depression remaining constant throughout the study. The study found that patients with a more severe form of the disease had higher depression and anxiety scores (see Table A for study findings)

### **Diagnosing Gastroparesis**

In order to confirm a diagnosis of gastroparesis a patient must undergo a series of tests. After the initial physical exam and review of the patient's medical history, blood tests, and upper GI endoscopy tests are obtained to rule out any structural abnormalities that could be blocking the intestines and preventing normal digestion (NIDDK, 2012). An upper gastrointestinal (GI) endoscopy is a procedure that involves a small, flexible tube that has a light and a camera on the end (NIDDK, 2012). The procedure is performed by a gastroenterologist in either a hospital or outpatient setting. The tube is fed down the esophagus and into the stomach and duodenum to examine the intestinal lining and search for potential blockages (NIDDK, 2012).

In addition to an upper GI endoscopy, an upper GI series may be performed as well. The purpose of this test is to look specifically at the small intestine. The patient must refrain from eating (i.e., fast) for 8 hours before the test and is then instructed to drink a barium cocktail (NIDDK, 2012). Barium clings to the walls of the stomach and intestines and, therefore, makes it easy to see any food that is trapped in the stomach

when an abdominal x-ray is taken (NIDDK, 2012). The presence of food in the stomach after the 8 hours of pre-test fasting is highly indicative of gastroparesis (NIDDK, 2012).

A gastric emptying scintigraphy is commonly used to confirm a suspected diagnosis of gastroparesis. After the patient eats a bland meal that contains a small amount of radioactive dye, a radiologist uses an external camera to take images of the patient's abdomen at specific intervals (one, two, three, and four hours after the meal was eaten) to check the amount of gastric emptying (NIDDK, 2012).

After a diagnosis of gastroparesis has been confirmed, different methods of treatment are discussed. There are several techniques that are currently in use to try and lessen the symptoms of gastroparesis, although there is currently no cure. The positive diagnosis of gastroparesis can be life-altering.

### **Treatment Options**

The literature search from 2007-2017 found five studies that discussed treatment options for gastroparesis. Although these options may help lessen the severity of the symptoms, there is no cure for gastroparesis. Some of the treatment options include medications, botulinum toxin injections, and gastric electrical stimulation.

For some patients, disease symptoms may be managed through the use of various medications. Antibiotics such as azithromycin and erythromycin have been found to have prokinetic effects that increase gut contractility, by stimulating motility receptors in the gut (Potter & Snider, 2016). While erythromycin has been shown to only have effects on the antrum, azithromycin has proved to be effective in improving small bowel as well as antrum dysmotility (Potter & Snider, 2016). Considering the two antibiotic options, azithromycin is found to be more effective due to its ability to stimulate larger amounts



of gastric movement. Erythromycin only stimulates movement in the antrum the effectiveness and usefulness of the drug is limited. Other drugs, such as metoclopramide and domperidone, may also be administered for their prokinetic effects and antiemetic effects (Potter & Snider, 2016). Both of these drugs help control nausea, which diminishes the physical discomfort that gastroparesis patients face.

Botulinum toxin injections are another type of treatment for gastroparesis. Botulinum toxin is a nerve blocking agent that is better known as Botox (NIDDK, 2012). The toxin is administered by passing an endoscope into the stomach and injecting directly into the pylorus (NIDDK, 2012). The toxin blocks neuromuscular transmission by (a) binding to nerve terminal receptor sites, (b) entering the nerve terminals, and (c) preventing the release of acetylcholine (DeSantis & Huang, 2007). DeSantis and Huang (2007) discuss several that used botulism toxin for treatment. The toxin is injected into a muscle and causes partial chemical denervation in the muscle tissue, resulting in localized paralysis (DeSantis & Huang, 2007; see Table B for article findings). In this particular scenario the result is paralysis of the pyloric sphincter in a widened position to better allow food to move from the stomach into the duodenum (NIDDK, 2012). The intent is to decrease the accumulation of food in the stomach, which will limit the frequency of nausea and vomiting experienced by the patient. In addition, there is an increase in nutrient absorption because more food can pass to the small intestine, where absorption primarily occurs. The food will not become trapped in the stomach and vomiting is inhibited.

Gastric electrical stimulation is a method of treatment that is being studied and may serve as an alternative method for patients who do not respond well to diet or

medications. A gastroenterologist may place a gastric neurostimulator laparoscopically (NIDDK, 2012; Iyer, Nazif, Vazquez, & Reiffel, 2012). The neurostimulator is very similar to a cardiac pacemaker and uses two leads that are attached to the gastric fundus (Iyer et al., 2012). The device is battery powered and sends electrical impulses through the walls of the stomach in an attempt to help reduce nausea and vomiting for the patient (NIDDK, 2012). For some patients, use of a gastric pace-making device has proven to be extremely useful and has effectively rid the patient of any gastroparesis symptoms (Iyer et al., 2012).

For some patients, however, none of these treatment options prove to be effective at managing their disease symptoms. These patients will likely have a feeding tube placed in order to ensure adequate nutritional intake. A nasojejunum tube (i.e., NJ-tube), is a common type of feeding tube used in patients with gastroparesis (NIDDK, 2012; Pellico, 2013). This tube is inserted through the nose to the jejunum and allows food to be fed straight into the small intestine rather than passing through the stomach first (NIDDK, 2012; Pellico, 2013). This type of GI tube can be useful because it bypasses the stomach, which is often the site of food trapping and stagnation that leads to nausea and vomiting of the undigested food. Tubes placed directly into the small intestine can reduce the risk of patients experiencing gastroesophageal reflux and aspiration pneumonia (NIDDK, 2012; Pellico, 2013).

There are numerous drawbacks to having a feeding tube placed. The food that the patient receives through the tube is all liquid, as solids would clog the tube too easily. As a result, many patients experience something known as “dumping syndrome”. This is a direct result of the large amounts of liquid nutrition supplement that the patient is getting

through the feeding tube as exhibits as a feeling of fullness followed by nausea and diarrhea (Pellico, 2013). The diarrhea can lead to dehydration, hypotension, and tachycardia (Pellico, 2013). In addition to dumping syndrome, other issues can develop with feeding tubes, such as premature removal, infection, blockage, bloating, cramping, and constipation (Pellico, 2013).

### **Proposed Study**

The purpose of this proposed study is to gain more understanding of the public's awareness of this disease. The main focus would be on healthcare providers and facilities to determine the current holistic management practices of gastroparesis patients based on their knowledge of the disease's causes, manifestations, treatment methods, and awareness of the extent of psychological and social implications of this disease. The study would be a qualitative design including demographic questions for participants and guided focus groups interviews (See Appendix A that includes demographic questions for study participants and Appendix B that includes focus group content questions). The 60-minute focus group discussions will be held to fully understand the gaps in caring for patients with gastroparesis. Content analysis would be used to find themes in the interviews. These findings could be used to frame an educational program to provide healthcare team members with information needed to understand and properly treat patients with this disease. Education will include not only current methods of treating physical symptoms of the disease, but also information from studies on the benefits of treating the psychological symptoms of the disease in conjunction with the physical.

### **Conclusion**

The medical community is still working towards gaining a better understanding of gastroparesis and the many ways in which the disease affects patients. The literature provided information on many evolving and developing treatments for physical disease manifestations and sheds light on the psychological manifestations that patients may also experience. Implementing a treatment plan that worked on lessening a patient's psychological symptoms had a positive effect on the patient's physical symptoms. Treating for psychological comorbidities is a simple way to provide more holistic care to gastroparesis patients. By implementing the findings of these studies, healthcare providers will be able to improve quality of life and, potentially, gastric function for gastroparesis patients.

Table A

*Gastric Function in Patients Who Received Psychotherapy Intervention vs. Control Group*

Dependent Variable	Control Group	Mental Intervention Group	p-value
Time to Onset of Postsurgical Gastroparesis Syndrome (PGS) (days)	7.5	5.0	<0.0001
Daily Gastric Fluid Volume (ml/day)	1087.5	950.0	0.0007
Period of Gastric Drainage Volume >600ml/day (days)	15.0	8.5	<0.0001
Time to Eating Recovery After Developing PGS (days)	24.0	15.0	<0.0001

(Liu et al., 2014)

Table B

*Effectiveness of Botulinum Toxin Injections on Rate of Gastric Emptying*

Dependent Variable	Before Botulinum Injections	After Initiation of Botulinum Treatment	p value
Mean Gastric Emptying time (mins)	339.1	227.3	Not significant (Lacy et al.)
Gastric retention rate (%)	27	14	p=0.038 (Miller et al.)
Total Symptom Severity score	15.3	9	p=0.006 (Miller et al.)

(As cited by DeSantis & Huang,  
2007)

APPENDIX A  
Demographic Questions

Age	20-30	31-40	41-50	Over 50	
Gender	Male	Female			
Professional Work Position	MD	RN	CNA	ARNP/PA	Other
Place of Employment	Hospital	Clinic	Other		

APPENDIX B

Focus Group Question Template

- 1) What have you heard of gastroparesis?
- 2) What do you know about gastroparesis including pathology, manifestations, and treatment methods?

Pathology	Manifestations	Treatment Methods
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- 3) Do you know anyone with gastroparesis or have you ever worked with a patient who had gastroparesis? Y/N; what is your experience with these patients?
- 4) What do you think is the most effective treatment?
- 5) What do you think are the biggest need of patients with gastroparesis?
- 6) How/when do you teach these patients?
- 7) What are your thoughts about including family members in the education?
- 8) What do you think of holistic medicine?
- 9) What types of holistic medicine practices do you use?
- 10) Tell me what type of information would be best to know when caring for patients with the disease?

## References

- Bennell, J., & Taylor, C. (2013). A loss of social eating: the experience of individuals living with gastroparesis. *Journal of Clinical Nursing, 22*, 2812-2821.
- Cleveland Clinic Staff. (2013, 4). *Diabetes mellitus: An overview*. Retrieved from Cleveland Clinic: <https://www.niddk.nih.gov/health-information/digestive-diseases/digestive-system-how-it-works#food>
- DeSantis, E., & Huang, S. (2007). Botulinum toxin type A for treatment of refractory gastroparesis. *American Journal of Health-System Pharmacists, 64*, 2237-2240.
- Iyer, V., Nazif, T., Vazquez, J., & Reiffel, J. (2012). A most unusual pacemaker. *The Authors Journal Compilation, 35*, 203-205.
- Liu, Y., Song, X., Zhang, Y., Zhou, L., & Ni, R. (2014). The effects of comprehensive mental intervention on the recovery time of patients with postsurgical gastroparesis syndrome. *Journal of Clinical Nursing, 23*, 3138-3147.
- Marcason, W. (2015). What Is the Whipple procedure and what Is the appropriate nutrition therapy for it? *Journal of the Academy of Nutrition and Dietetics, 115*, 168.
- Mayo Clinic Staff. (2014, January 15). *Diseases and conditions: Gastroparesis*. Retrieved from Mayo Clinic: <http://www.mayoclinic.org/diseasesconditions/gastroparesis/basics/symptoms/con-20023971>



- National Institute of Diabetes and Digestive and Kidney Diseases. (2012, June). *Digestive diseases: Gastroparesis*. Retrieved from National Institute of Diabetes and Digestive and Kidney Diseases: <https://www.niddk.nih.gov/health-information/digestive-diseases/gastroparesis>
- National Institute of Diabetes and Digestive and Kidney Diseases. (2013, June). *The digestive system and how it works*. Retrieved from National Institute of Diabetes and Digestive and Kidney Diseases: <https://www.niddk.nih.gov/health-information/digestive-diseases/digestive-system-how-it-works#food>
- Potter, T., & Snider, K. (2013). Azithromycin for the treatment of gastroparesis. *The Annals of Pharmacotherapy*, 47, 411-415.
- Portillo, M., & Cowley, S. (2010). Working the way up in neurological rehabilitation: The holistic approach of nursing care. *Journal of Clinical Nursing*, 20, 1731-1743.
- Simkin, P. (2012). Moving beyond the debate: A holistic approach to understanding and treating effects of neuraxial analgesia. *Birth: Issues in Perinatal Care*, 39(2), 327-332
- Tate, P. (2012). *Seeley's principles of anatomy and physiology* (pp. 646-653). Columbus, SC: McGraw-Hill Publishing Company.
- Temple University Health System. (2016). *Gastroparesis*. Retrieved from Digestive Diseases Center at Temple University Hospital: <http://digestive.templehealth.org/content/Gastroparesis.htm>

