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## Nutrition Therapies for Managing Gastrointestinal Symptoms During Pregnancy



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Gastrointestinal symptoms of pregnancy are common and can interfere with quality of life and the ability to consume adequate oral intake. The occurrence of symptoms varies throughout pregnancy; while nausea and vomiting predominantly affect patients during the first trimester, other symptoms may progressively worsen throughout the length of gestation without relief until the postnatal period. Common symptoms prevalent during pregnancy include nausea and vomiting, gastroesophageal reflux, constipation, and diarrhea. Clinicians can introduce nutritional interventions for the management of mild symptoms prior to pharmacologic intervention, but it is important to monitor for adequate relief. Individuals with chronic GI disorders – such as inflammatory bowel disease, gastroparesis, metabolic dysfunction-associated steatotic liver disease, and irritable bowel syndrome – face an increased risk for malnutrition and may require ongoing care from a gastroenterologist and a registered dietitian during pregnancy.

### INTRODUCTION

The forty-week period of gestation is a time of heightened need for nutritional optimization for both the parent and developing fetus. Changes in the gastrointestinal (GI) tract result from hormonal and physiologic intra-abdominal adaptations during pregnancy and may quickly affect quality of life as well as adequate oral nutrition. The American College of Obstetrics and Gynecology

(ACOG) and former Institute of Medicine (IOM) recommendations for specific gestational weight gain ranges for pregnancy are based on pre-pregnancy Body Mass Index (BMI) (See Table 1).<sup>1</sup> While these ranges continue to be researched and updated, clinicians should still measure adequacy of weight gain throughout gestation to avoid over- or undernutrition. A recent systematic review of over one million pregnant individuals revealed that 23% did not meet weight gain parameters and 47% exceeded them.<sup>2</sup> Monitoring gestational weight milestones is important to prevent poor fetal development and pregnancy outcomes, such as small-for-gestational-age (SGA) infants and

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preterm birth when undernutrition is present.<sup>2</sup> Pregnancy-related GI symptoms can also affect quality of life, and managing mild pregnancy GI symptoms safely and adequately through diet is the recognized first-line treatment (See Table 2).<sup>3-6</sup> The purpose of this review is to identify the most common GI symptoms experienced during pregnancy, highlight the first-line nutrition therapies for these ailments, and discuss updates and considerations for pregnant individuals diagnosed with GI disorders.

**Common Gastrointestinal Symptoms During Pregnancy**

***Nausea and Vomiting***

Nausea and vomiting (NV) in pregnancy is the most common GI symptom that affects between 50-90% of pregnant individuals and interferes the most with adequate oral intake and ability to reach pregnancy weight goals.<sup>3,4,7</sup> Beginning early in the first trimester and subsiding after 20 weeks, the etiology of NV can be attributed to various hormonal changes.<sup>8,9</sup> For example, increased estrogen and human chorionic gonadotropin affect GI motility while progesterone inhibits motility and can cause delayed gastric emptying.<sup>8,9</sup> Clinicians should be sure to rule out any other causes of nausea during pregnancy, such as gastroenteritis, biliary disease, gastroparesis (GP), gastroesophageal reflux disease (GERD), peptic ulcers, pancreatitis, hepatitis, pyelonephritis, appendicitis, and irritable bowel syndrome (IBS).<sup>4,9</sup>

Nutritional remedies that can be implemented for NV during pregnancy include:<sup>4,7,8,9</sup>

- Identifying triggering foods (based on smell, taste, or texture)
- Eating smaller and more frequent meals
- Modifying textures of foods to a smaller particle size
- Choosing bland foods and snacks that are generally higher in protein and lower in fat
- Supplementing with ginger (250 mg capsules four times per day) or vitamin B6 (10-25 mg every eight hours) before advancing to pharmacologic treatments

**Table 1. Gestational Weight Gain per ACOG/IOM Recommendations (2013)<sup>1</sup>**

BMI	Classification	Gestational Weight Gain Goals
<18.5	Underweight	28-40 lbs
18.5-24.9	Normal	25-35 lbs
25-29.9	Overweight	15-25 lbs
>30	Obese	11-20 lbs

If nutrition interventions to reduce NV are unsuccessful, next-line treatment includes H1-receptor antiemetics such as doxylamine, promethazine, and dimenhydrinate.<sup>8</sup> Additional pharmacological intervention should be used on a case-by-case basis after identifying the certain risks and benefits of medication use in this population. The use of prenatal vitamin and mineral supplementation at least one month before conception may reduce the occurrence and severity of NV in pregnancy.<sup>4</sup> Clinicians should encourage patients to do so, especially in the preconception visit and fertility clinic setting.

***Hyperemesis Gravidarum***

Intractable and sustained vomiting – hyperemesis gravidarum (HG) – can lead to severe complications such as metabolic disturbances, dehydration, micronutrient deficiencies, Wernicke’s encephalopathy, and even death from thromboembolism or cardiac arrest.<sup>4,10</sup> HG affects a much smaller percentage of pregnancies with various estimates placing its prevalence at approximately 1- 3%.<sup>4,7</sup> Research by Fezjo et al. in recent years has shown a causative genetic etiological component of worsening NV and HG related to a hypersensitivity to increased levels of growth and differentiation factor 15 (GDF15) from which future therapies may one day be derived.<sup>10,11</sup> Other contributing factors that have shown to be related to HG onset include changes to the amount of progesterone, estrogen, thyroid hormones, and leptin during pregnancy.<sup>4</sup> Physiological changes during pregnancy include abnormalities with gastric transit and lower esophageal sphincter (LES) resting pressure, which may increase the severity of NV and risk of developing HG.<sup>4</sup>

**Table 2. Nutrition-Related Applications for Common GI Symptom Management**

Common GI Symptoms	Practical Nutrition-Related Interventions for Patients
<b>Nausea and Vomiting</b>	<ul style="list-style-type: none"> <li>• Texture modification for fruits, vegetables, and proteins to soft and small particle size: fork-tender consistency, blended, steamed, stewed, slow-baked, roasted.</li> <li>• Smaller meals with more frequency to ensure adequate nutrient intake.</li> <li>• Supplementation with ginger and Vitamin B6.<sup>8</sup></li> <li>• Limit offending foods (based on smell, taste, or texture) that worsen nausea.</li> <li>• The use of prenatal vitamin and mineral supplementation one month prior to conception can reduce occurrence and severity.<sup>4</sup></li> </ul>
<b>Hyperemesis Gravidarum</b>	<ul style="list-style-type: none"> <li>• Emphasis on calories and protein at each meal.<sup>4</sup></li> <li>• Electrolyte and micronutrient monitoring and replacement.</li> <li>• EN or PN support if intake remains inadequate.</li> </ul>
<b>Gastroesophageal Reflux Disorder</b>	<ul style="list-style-type: none"> <li>• Smaller meals with more frequency to ensure adequate nutrient intake.</li> <li>• Final meal or snack consumed 2-3 hours before bed.</li> <li>• Limit offending foods that worsen symptoms. Common GERD triggers include caffeine/coffee, spicy foods, greasy or high-fat foods, chocolate, peppermint, acidic fruits, heavy creams or gravies, and vinegar.</li> <li>• Limit high-volume intake and over-eating. Separating fluids from meals may help reduce the volume of items entering the stomach at one time.</li> </ul>
<b>Constipation</b>	<ul style="list-style-type: none"> <li>• Increased fiber intake if inadequate. Aim for 25-35 grams per day and increase slowly by a few grams each day.</li> <li>• Increased hydration if inadequate. Aim for 60-64 ounces per day.</li> </ul>
<b>Diarrhea</b>	<ul style="list-style-type: none"> <li>• Increased soluble fiber intake (e.g., oatmeal, banana, potato).</li> <li>• Use of oral rehydration solutions (ORS) if diarrhea is severe/persistent.</li> <li>• Review all medications and supplements as some may cause or worsen diarrhea (such as certain antibiotics, laxatives, motility agents, magnesium citrate or oxide).</li> </ul>

Manifestations that may present in a clinical exam and that are used to diagnose HG include weight loss (5% or greater), dehydration, ketonuria, orthostasis, micronutrient deficiencies, inadequate oral intake (usually consuming less than 50% of needs), and electrolyte imbalances.<sup>4,7</sup> Some severe cases require hospitalization and parenteral administration of fluids and electrolytes. In the acute inpatient setting, a regular diet should be the primary goal with modifications as needed, with the supplementation of enteral nutrition (EN) reserved for those who continue to experience weight loss and are refractory to medical interventions.<sup>4</sup>

Malnutrition and inadequate gestational weight gain are concerning consequences of HG.<sup>4</sup> It is important to consult a registered dietitian (RD) to monitor for these clinical repercussions and assess

when escalation to EN is important. Nasogastric tubes with use of antiemetic medication are preferred first, as post-pyloric feeding tube placement requires imaging for placement confirmation that will expose the fetus to radiation.<sup>4</sup> Dietitians should start with polymeric enteral formulas and evaluate tolerance before considering a transition to a semi-elemental enteral formula or an alternative access method. If vomiting remains intractable and there is persistent intolerance to oral and EN support, parenteral nutrition (PN) may become necessary to provide the adequate caloric and protein needs for fetal development and prevention of malnutrition. In lieu of clinical guidelines for this population subset, the decision to escalate to PN must be managed on a case-by-case basis.<sup>4</sup> Providing

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treatment early for NV in pregnancy may help delay the progression to HG, and it is important for clinicians to recognize when escalation of care is essential before severe metabolic disturbances arise.<sup>7,8</sup>

#### **Gastroesophageal Reflux**

Instances of heartburn, regurgitation, and epigastric pain during pregnancy are often related to GERD, though it is important to rule out other GI disorders that may present with similar symptomatology.<sup>9</sup> GERD is a common GI disorder that currently affects 1 in 3 U.S. adults and during pregnancy it has an even higher prevalence of 50-85% with symptoms usually persisting until delivery.<sup>8,9,12</sup> Clinical manifestations are diagnosed just as with nonpregnant individuals, with an important note that barium imaging studies should be avoided in pregnant patients due to fetal radiation exposure.<sup>9</sup>

The etiology of GERD in pregnancy may be attributed to hormonal changes (for example, progesterone can affect the LES) or physiological changes to intra-abdominal pressure and motility due to an enlarging uterus.<sup>8,9,13</sup> The first-line treatment for reflux and associated symptoms includes changes to diet, meal planning, and sleep position.<sup>9</sup> Recommendations include:<sup>9</sup>

- Ceasing intake a few hours before bed
- Eating smaller meals with increased frequency
- Identifying triggering and offending foods and avoiding them
- Raising head of bed during sleep
- Lying on the left side

Schuitenmaker et al. investigated sleep positions on non-pregnant individuals while measuring esophageal pH in 57 adult participants and determined that sleeping in the left lateral decubitus position offered a shorter esophageal acid exposure time and increased acid clearance when compared to right lateral or supine sleep positioning.<sup>14</sup> The clinical practice update from the American Gastroenterological Association (AGA) lists modifications to lifestyle and diet as

best practice advice.<sup>15</sup> Weight loss is the traditional recommendation to reduce GERD symptoms but would not be appropriate to recommend during pregnancy.<sup>15</sup>

If the first-line treatment of altered diet and lifestyle change does not improve symptoms, physicians may consider antacids as a second-line therapy.<sup>14</sup> Antacids containing aluminum, calcium, and magnesium are considered an acceptable treatment in normal doses, but those containing sodium bicarbonate or magnesium trisilicate are not.<sup>16,17</sup> Additional pharmacologic therapy is needed if prior interventions are not effective at managing symptoms on a case-by-case basis. There is a paucity of human study data for GI medications during pregnancy, but some medications have been classified by the Food and Drug Administration (FDA) to be acceptable or lower risk.<sup>9,16</sup> The FDA currently does not have a classification for antacids during pregnancy. While antacid use may be beneficial at treating GERD symptoms for 30-50% of pregnant patients, for the rest it may not be sufficient.<sup>17</sup> After approaching symptom management with lifestyle change and antacids, clinicians can use histamine-2 receptor blockers, which are classified by the FDA as Category B and have been shown in studies to be safe during pregnancy.<sup>17</sup> If unsuccessful, the next approach involves proton pump inhibitors; while classified as Category C, studies have largely indicated their safety during pregnancy even though there is a lack of research around their efficacy at treating symptoms in pregnant patients.<sup>17</sup>

#### **Constipation**

Constipation during pregnancy is one of the more common GI symptoms with a global prevalence of 32.4% per recent meta-analysis data.<sup>18</sup> Contributing factors in the complex etiology may include decreasing motility and smooth muscle contractility from progesterone production, increased intra-abdominal pressure from an expanding uterus, decreased physical activity level, iron supplementation, and changes to diet such as including more fat- and protein-rich foods to meet nutritional needs during pregnancy.<sup>18,19</sup>

Treatment for constipation during pregnancy differs based on the severity of symptoms; mild cases may be improved with lifestyle modifications



involving increased dietary fiber intake and adequate hydration.<sup>9,18</sup> Clinicians can discuss safe bulking agents such as psyllium fiber or methylcellulose.<sup>8</sup> Additionally, education and counseling on how to consume fiber in the diet can be achieved with a referral to an RD. After addressing nutrition and lifestyle changes, further medical management to include osmotic laxatives or stimulants should be started only under the discretion of a physician and for more severe cases.<sup>8,18,19</sup> For those suffering with co-occurring GI ailments during pregnancy, osmotic laxatives can worsen bloating, cramps, flatulence, and nausea and therefore may not be a welcomed method of constipation treatment.<sup>19</sup>

Hemorrhoids are a common complication of constipation and are prevalent in up to 80% or more of pregnancies.<sup>5,8</sup> The etiology can be attributed to the third trimester compression of the rectum from the expanding uterus, prolonged straining during constipation, and inadequate fiber intake to regulate bowel movements.<sup>5,8,19</sup> The first-line treatment for hemorrhoid prevention include:<sup>5</sup>

- Increased fiber
- Increased fluid intake
- Improved toileting regimen to limit the amount of time and straining during defecation

Poskus et al. conducted a clinical trial researching the inclusion of dietary strategies for prevention of hemorrhoids in 260 randomized pregnant patients across three medical centers.<sup>20</sup> The intervention group received education on drinking adequate fluid, increased fiber intake from bran, fruits, vegetables, and nuts, exercising 3-5 times per week for at least 30-60 minutes, spending less than three minutes on the toilet, not ignoring any urgency to use the bathroom, attempting a bowel movement 30-40 minutes after eating, and washing after bowel movements.<sup>20</sup> This group showed a significantly reduced occurrence of hemorrhoids by about 50% after receiving the education.<sup>20</sup>

### **Diarrhea**

Diarrhea and fecal incontinence are much less common GI symptoms that can occur during pregnancy compared to nausea, vomiting, reflux,

and constipation.<sup>21</sup> Acute infection is the most common cause for diarrhea during pregnancy so it is important to rule out viral, bacterial, or parasitic infectious etiologies first.<sup>21</sup> If acute infection is not present, the noninfectious causes or factors leading to diarrhea during pregnancy may include hormonal changes, changes to diet, increased intra-abdominal pressure, and side effects of prenatal vitamins.<sup>21</sup> Clinicians should also consider preexisting conditions such as pelvic floor dysfunction, inflammatory bowel disease (IBD), IBS, lactose intolerance, overflow diarrhea from constipation, a history of anorectal surgeries, or ileal pouch anal anastomosis (IPAA).<sup>21</sup> Pregnant individuals with fecal incontinence may benefit from certain lifestyle modifications, which can include pelvic floor muscle training (PFMT) with or without biofeedback therapy.<sup>21</sup> A referral to a specialized physical therapist for a PFMT assessment may be useful.<sup>21</sup>

The first-line intervention for diarrhea includes a slow introduction and increase in dietary intake of soluble fiber (e.g., banana, oatmeal, potato) or use of psyllium fiber supplementation.<sup>21</sup> Important nutrition interventions include consuming smaller and more frequent meals and adequate hydration with electrolytes via oral rehydration solutions (ORS) if diarrhea is frequent and signs and symptoms of dehydration are detected. Intravenous electrolytes and hydration may be necessary for prolonged diarrhea if metabolic abnormalities are present. Excluding whole food groups or overly restrictive diets are not indicated during pregnancy as this may lead to inadequate gestational weight gain or nutritional deficiencies. A consultation with an RD can help ensure patients are consuming adequate nutrition by finding alternatives for any nutrients that are being excluded.

Pharmacologic intervention for diarrhea during pregnancy should only be used in the most persistent and severe cases, and loperamide is the antidiarrheal most preferred.<sup>9,21</sup> It is important to know that diphenoxylate with atropine and bismuth preparations (Pepto-Bismol<sup>®</sup> and Kaopectate<sup>®</sup>) are contraindicated during pregnancy due to adverse fetal effects and that probiotics and empiric antibiotics are not routinely used in this population.<sup>9,21</sup>

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**Special Considerations for Gastrointestinal Disorders**

Pregnant individuals with chronic GI disorders may benefit from intervention by their healthcare team during preconception or early pregnancy. The nutrition interventions discussed above for nausea, vomiting, reflux, constipation, and diarrhea would be appropriate for those who have these symptoms superimposed upon their chronic disease, but it warrants a discussion with their healthcare provider and case-by-case evaluation. Below are special considerations during pregnancy for chronic GI disorders (See Table 3).

**Inflammatory Bowel Disease**

Risks associated with pregnancy in active IBD include miscarriage, increased risk of premature delivery, inadequate gestational weight gain, complications during labor/delivery, and SGA infants.<sup>22,23</sup> Adequacy of nutrition can play a vital role in reducing complications from inadequate gestational weight gain or decreased intake that may occur with active disease, GI complications, or surgical changes in GI anatomy from IBD.<sup>22</sup> In one recent cohort study, the risk of inadequate gestational weight gain was higher among those with Crohn’s disease (34.3%) and ulcerative colitis (26.7%) compared to those without IBD

**Table 3. Considerations for Gastrointestinal Disorders During Pregnancy**

GI Disorder	Considerations During Pregnancy
<b>Inflammatory Bowel Disease</b>	<ul style="list-style-type: none"> <li>• Pregnancy in active IBD can include increased risks of miscarriage, premature delivery, inadequate gestational weight gain, complications during labor and delivery, and SGA infants.<sup>22,23</sup></li> <li>• The AGA recommends remission for 3-6 months prior to conception to reduce flare risk during pregnancy.<sup>22</sup></li> <li>• PEN and EEN are safe nutritional interventions during pregnancy.<sup>29,30</sup></li> <li>• Working with an IBD-focused RD can help manage adequate intake and weight gain goals.</li> </ul>
<b>Gastroparesis</b>	<ul style="list-style-type: none"> <li>• Preconception planning is prudent as GP during pregnancy can lead to nutritional consequences and deficiencies for the patient and fetus.<sup>31</sup></li> <li>• Small particle size, low-fat, and low insoluble fiber diets.<sup>32</sup></li> <li>• RD consultation to recommend more easily tolerated foods, supplements, and oral nutrition shakes to ensure adequate nutrition.</li> </ul>
<b>Metabolic Dysfunction-Associated Steatotic Liver Disease</b>	<ul style="list-style-type: none"> <li>• Pregnancy outcomes with MASLD include higher rates of GDM, gestational hypertension, hypertensive complications, Caesarean sections, preterm births, and postpartum hemorrhage compared to other chronic liver diseases or no liver disease.<sup>33</sup></li> <li>• Weight loss is not recommended during pregnancy, but patients can adhere to ACOG/IOM gestational weight gain goals.</li> <li>• Reduction of sugar-sweetened beverages, added sugars, and ultra-processed foods.<sup>34</sup></li> </ul>
<b>Irritable Bowel Syndrome</b>	<ul style="list-style-type: none"> <li>• IBS is a common DGBI that may worsen during pregnancy, theoretically, due to increased hormone production or stress.<sup>36</sup></li> <li>• An RD during preconception is beneficial to assess diet quality and liberalization prior to becoming pregnant if currently on a restricted diet.</li> <li>• Initiating restrictive diets, such as the high-FODMAP elimination phase if appropriate, should be done under the close guidance of an RD and if no response, then discontinued.<sup>36</sup></li> </ul>

Partial Enteral Nutrition-PEN; Exclusive Enteral Nutrition-EEN; Metabolic Dysfunction-Associated Steatotic Liver Disease-MASLD; Disorders of Gut-Brain Interaction-DGBI

(19.4%).<sup>24</sup> Twenty percent of participants with IBD in a second cohort study experienced inadequate weight gain and had increased risk for preterm birth, intrauterine growth restriction (IUGR) and SGA.<sup>25</sup> Poor nutrition in early pregnancy can further affect fetal development from insufficient vitamin and mineral intake, and those with active IBD flaring are at a higher risk of food intolerance and inadequate intake.

Guidelines from the 2019 AGA IBD Parenthood Project Workgroup recommend women with IBD to be in remission for 3-6 months prior to conception to reduce the risk of flare during pregnancy.<sup>22</sup> IBD-trained RDs can help patients navigate dietary concerns, ensure quality nutrition and micronutrient intake, and monitor for appropriate gestational weight gain if flares occur during pregnancy. Many organizations' recent clinical guidelines and practice updates have recognized the importance of having specialized RDs as part of an IBD interdisciplinary team.<sup>26-28</sup> A thorough nutrition assessment can determine whether certain interventions, such as steroid-sparing exclusive enteral nutrition (EEN) or other nutrition therapies, would be beneficial and safe during pregnancy. A recent case report of a 35-year-old woman eight weeks pregnant with moderately severe ileal Crohn's disease showed clinical remission and weight gain after 6 weeks of the Crohn's Disease Exclusion Diet (CDED) and partial enteral nutrition (PEN).<sup>29</sup> The patient gained appropriate gestational weight (10.3 kg), delivered at 40 weeks, and sustained remission up to 12 weeks postpartum.<sup>29</sup> A retrospective observational study of fifteen women with active CD showed that peptide-based EEN was effective at inducing remission in 85.7% of

participants without any changes in pregnancy outcomes compared to a non-EEN group.<sup>30</sup> The women in the study were pregnant or preparing for pregnancy and had experienced a relapse or complication for which they were refractory to or contraindicated for other treatment modalities.<sup>30</sup> In addition to PEN or EEN, specialized therapeutic diets for IBD may also be beneficial for patients as long as they are robust enough to provide adequate micronutrients; monitoring and evaluation by an RD can determine on a case-by-case basis whether a specialized diet is too restrictive for a pregnant individual based on their recall of usual intake. A list of IBD-specific nutrition resources in **Table 4** may be beneficial for helping patients expand their diets healthfully during pregnancy.

**Gastroparesis**

GP is a chronic disorder of delayed gastric emptying that presents nutritional consequences for the patient and fetus during pregnancy. It is prudent to conduct preconception multidisciplinary planning – including diet education – for those with pre-existing disease who wish to become pregnant.<sup>31</sup> There is a lack of data on the efficacy and safety of medications used to treat GP in the pregnant population.<sup>31</sup> The 2022 guidelines on gastroparesis from the American College of Gastroenterology (ACG) provide nutrition interventions that include small particle size, low-fat, and low insoluble fiber diets.<sup>32</sup> These are appropriate interventions during pregnancy so long as they are not overly restrictive and remain varied enough to provide adequate nutrition for appropriate gestational weight gain.

Nausea, vomiting, and pain associated with GP may often lead to decreased intake.<sup>31</sup> A referral

**Table 4. Resources for Inflammatory Bowel Disease**

IBD-Specific Resources	Organization
Gut-Friendly Recipes	Crohn's & Colitis Foundation: <a href="http://gutfriendlyrecipes.org">gutfriendlyrecipes.org</a>
2020 Consensus Guidelines for Nutrition	International Organization for the Study of Inflammatory Bowel Disease: <a href="http://ioibd.org">ioibd.org</a>
MyIBDLife Parenthood Project	American Gastroenterological Association: <a href="http://myibdlife.gastro.org">myibdlife.gastro.org</a>
Evidence-Based Nutrition Therapies	Nutrition Therapy for Inflammatory Bowel Disease: <a href="http://nutritionaltherapyforIBD.org">nutritionaltherapyforIBD.org</a>

to an RD can help to manage suboptimal intake, oral food intolerances, micronutrient deficiency that may result, and recommendations for whether nutrition support therapies are needed. An RD can provide education on the importance of smaller meals in higher frequency, texture modification for better tolerance, and the use of oral nutrition supplements; an RD can evaluate a patient's diet pattern and quality to ensure adequacy and recommend the best-absorbed supplements (such as liquids or chewable tablets) that will be better tolerated.

### ***Metabolic Dysfunction-Associated Steatotic Liver Disease***

Patients with metabolic dysfunction-associated steatotic liver disease (MASLD or MASH) would benefit from preconception interdisciplinary intervention for management of this chronic disease. Over the last decade, there has been an increase in the incidence of fatty liver diseases among the U.S. population under 40 years old.<sup>33</sup> One study looking at 18 million U.S. pregnancies between 2012-2016 identified over 5600 pregnancies with MASLD (previously known as NAFLD) and found significantly more cases of gestational diabetes mellitus (GDM), gestational hypertension, hypertensive complications, Caesarean sections, preterm births, and postpartum hemorrhage compared to other chronic liver diseases or no liver diseases.<sup>33</sup>

Weight loss is not recommended during pregnancy but adherence to the ACOG/IOM gestational weight gain is an appropriate intervention. Nutritional interventions include the reduction of sugar-sweetened beverages, added sugars, and ultra-processed foods as these are associated with worsened MASLD status.<sup>34</sup> The addition of a Mediterranean-style dietary pattern (which is high in dietary fiber and monounsaturated fatty acids), and reduction of red meat have also been related to a reduced incidence of MASLD.<sup>34</sup>

### ***Irritable Bowel Syndrome***

IBS is classified as a disorder of gut-brain interaction (DGBI) and characterized by recurrent abdominal pain and altered bowel habits.<sup>35</sup> The subgroups of this DGBI are based on bowel status and include IBS with constipation (IBS-C),

IBS with diarrhea (IBS-D), and IBS with mixed or alternative bowel habits (IBS-M).<sup>35</sup> While there is a lack of extensive study on the effect of pregnancy on IBS, a theoretical association to explain how IBS symptoms may worsen during pregnancy is the change in hormones.<sup>36</sup> Increased estrogen during pregnancy can affect gut-brain axis regulatory mechanisms, visceral hypersensitivities, and gut motility.<sup>36</sup> Luteal hormone production, which is highest in the first trimester, can affect the migrating motor complex and increase risk of both constipation and small intestinal bacterial overgrowth.<sup>36</sup> Increased stress could also play a role in IBS status during pregnancy.<sup>36</sup> Regarding pregnancy outcomes, having IBS during pregnancy was associated with increased risks of miscarriage and ectopic pregnancy compared to individuals without IBS, although this information is based on a retrospective trial and more studies of this population are needed.<sup>36</sup>

A majority of patients with IBS report that their symptoms are food-related, and dietary modification for the exclusion of offending foods (such as gas-producing foods, high lactose content, or foods high in fermentable oligosaccharides, disaccharides, monosaccharides, and polyols known as FODMAPs) remains as first-line treatment for the general IBS population.<sup>36,37</sup> In a survey of over 1500 gastroenterologists in the U.S., 60% reported that their patients associate their symptoms with food and were inclined to restrict foods on their own, using dietary modifications that included reducing lactose (33%), eliminating gluten (24%), lowering fat content (6%), or trying low FODMAP diet (2%).<sup>37</sup> Half of patients used 'trial and error' to determine which foods were problematic.<sup>37</sup> Over half of the gastroenterologists reported that they use dietary modification as a first-line treatment strategy to 75% of their patients.<sup>37</sup> The most common dietary therapy recommended to patients was a low FODMAP diet (77% of respondents), with high-fiber and lactose-reduced as the next most common (both at 45%).<sup>37</sup>

The dietary modifications and recommendations for the general IBS population should involve careful consideration during pregnancy to ensure adequacy of nutrient intake.<sup>36</sup> Prior to conception, patients with IBS would benefit from consulting with an RD to evaluate baseline adequacy of



their diet and to trial diet liberalization. Ongoing follow-ups during pregnancy is recommended if worsening IBS symptoms develop or affect oral intake. Restrictive diets, such as the high-FODMAP elimination phase, should only be started under the close supervision of a registered dietitian.<sup>36</sup> If no improvement is observed, the diet should be discontinued. Patients who are on restricted diets for IBS management and become pregnant should also be closely observed for appropriate gestational weight gain and micronutrient adequacy.<sup>36</sup>

### CONCLUSION

Clinicians can implement nutritional interventions as useful first-line therapies during pregnancy for many common GI symptoms. Involving an RD during early pregnancy can help those who are experiencing weight loss and inadequate intake from common ailments like nausea, vomiting, reflux, diarrhea, and constipation. Nutrition education during the preconception stages is a beneficial option for those with chronic GI disorders such as IBD, GP, MASLD, and IBS. Patients who are not meeting their gestational weight gain milestones will benefit from frequent RD follow-ups throughout gestation, particularly during the second and third trimesters. There remain gaps in knowledge with a myriad of research opportunities within the pregnant population, especially regarding disease etiology, pharmacologic management, and the role of nutrition in GI disease management. ■

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**Answers to this month's crossword puzzle:**

1	E	P	I	T	H	E	L	I	A	L	L	A	Y	E	R
	N		N		O		E		B		10	U	S	E	I
11	D	U	C	T	U	L	A	R		12	E	M	E	T	I
	O		L		R		K		13	S		B			E
14	S	L	I	T		15	D	Y	S	P	H	A	G	16	I
	C		N		17	V	E	G		L		R		N	18
19	20	O	R	A	L		21	R	U	M	E	N		22	O
23	P	I	T		24	A	M	T		N		25	U		E
	Y		26	I	27	O	T	A		28	C	O	L	L	A
			29	O	P	T		30	D	O	G		C		E
31	32	D	E	N	S	I	T	Y		33	R	T	E	34	S
35	A	T						36	E	R	A		R		T
37	B	A	38	R	I	U	M			39	P	L	A	C	I
	S		A		D		42	N		43	H	O	T		O
			44	D	I	E	T	A	R	Y				45	N
															A
															G