This care process model (CPM) was created by the OB/GYN Development Team, a group within Intermountain’s Women and Newborns Clinical Program, to address nausea and vomiting of pregnancy (NVP) and hyperemesis gravidarum when other causes of NVP have been ruled out and intrauterine pregnancy has been confirmed. The guidelines derive from Intermountain practice outcomes and expert consensus as well as recommendations of recent publications summarizing evidence-based treatment of NVP and hyperemesis gravidarum.

**Why Focus ON NVP AND HYPEREMESIS?**

- **NVP is common.** Normal nausea and vomiting affects ~75% of pregnant women and can be usually easily treated with specific precautions. Although some women can self-manage NVP with adjustments to diet and daily activity, others require treatment to help them function in their daily lives and maintain a healthy pregnancy.\(^{ACOG}\)

- **Unmanaged NVP is costly.** Failure to manage NVP early can lead to escalation of symptoms, unnecessary hospitalization, and development of hyperemesis gravidarum. Hyperemesis is a severe form of NVP affecting 1 – 2% of pregnant patients. It is characterized by a greater than 5% loss of body weight, dehydration, electrolyte abnormalities, and sometimes, severe issues such as renal failure and Wernicke’s encephalopathy.

- **NVP treatment is not uniform.** Some providers unnecessarily avoid pharmacologic therapies that have been shown to be safe and effective.

- **Evidence-based guidelines improve outcomes.** The implementation of evidence-based care standards improves quality of life for the patient, reduces the risk of maternal and fetal complications, and cuts healthcare costs.\(^{ACOG, MCP}\)

**Key points in this CPM**

- **Corticosteroids are NOT part of routine treatment,** but can be used after MFM consultation and if after 12 weeks. Although the largest placebo-controlled trial showed no benefit for their use in hyperemesis, a more recent systematic review found that women with severe nausea and vomiting may benefit from corticosteroids.\(^{YOS, MCP}\)

- **PICC lines should not be used in pregnant patients.** Multiple studies have shown that maternal complications associated with PICC line placement are substantial during pregnancy.\(^{HOL}\)
ALGORITHM: NVP / HYPEREMESIS MANAGEMENT

Patient presents with NVP / hyperemesis

- Intrauterine pregnancy confirmed AND other potential causes of NVP ruled out (a)?
  - yes
  - no → IDENTIFY underlying condition(s) and provide care as needed

Provide supportive measures

- Distribute morning sickness handout (see page 4)
- Prescribe supportive medications as needed (see page 3)

if symptoms do not improve in 3 – 5 days

Prescribe first-line medications

Prescribe pyridoxine monotherapy; then, add doxylamine, dimenhydrinate, or promethazine as needed (see page 3)

if symptoms do not improve in 3 – 5 days

- Evaluate urinary ketones, and/or instruct patient to monitor daily with ketone strips

if symptoms do not improve in 3 – 5 days

- patient NOT dehydrated
- patient dehydrated

GIVE ACUTE hydration (b)

if symptoms do not improve within a week

GIVE CHRONIC hydration protocol (c), ADD first-line IV medication (see step 5 on page 3)

if symptoms do not improve in 3 – 7 days

- CONSULT with maternal-fetal medicine re: nutritional interventions (d)

IV medication needed for > 4 weeks, OR continuous long-term IV fluids needed?

- yes
- no → CONTINUE chronic hydration protocol (c); then, TRANSITION to more conservative care as tolerated

Note: Ketone strips are available without a prescription at local pharmacies at $8 – $10/bottle of 50 strips.
## MEDICATIONS

The medications listed in the table below have been shown to reduce symptoms of NVP without evidence of teratogenicity. ACOG, APGO Note that steroids do not appear in these guidelines; evidence has shown that intravenous methylprednisolone does not reduce symptom duration or readmission rates for hyperemesis gravidarum.

**Note:** Start with supportive measures. If patient shows no improvement, proceed with first-line, second-line, and fluid-replacement treatments as necessary.

### TABLE 1: Stepwise medication guide for NVP / hyperemesis (Proced to next steps only if no improvement)

<table>
<thead>
<tr>
<th>Medication name</th>
<th>Class</th>
<th>Dose and frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1: Supportive measures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Docusate sodium (Colace)</td>
<td>laxative</td>
<td>100 – 200 mg PO once daily</td>
</tr>
<tr>
<td>Diphenhydramine (Benadryl)</td>
<td>antihistamine</td>
<td>25 – 50 mg PO at bedtime</td>
</tr>
<tr>
<td>Famotidine (Pepcid)</td>
<td>H2 receptor antagonist</td>
<td>20 mg PO every 12 hours</td>
</tr>
<tr>
<td><strong>STEP 2: First-line medications (start with pyridoxine monotherapy; add doxylamine if not improved)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyridoxine (vitamin B6) monotherapy</td>
<td>vitamin</td>
<td>10 – 25 mg PO 3 – 4 times daily (may be used alone or in combination with doxylamine)</td>
</tr>
<tr>
<td>Doxylamine (Unisom)*</td>
<td>antihistamine</td>
<td>12.5 mg PO 3 – 4 times daily</td>
</tr>
<tr>
<td>If no improvement, add ONE of the following:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimenhydrinate (Dramamine)</td>
<td>antihistamine</td>
<td>25 – 50 mg PO every 4 – 6 hours</td>
</tr>
<tr>
<td>(do not exceed 400 mg/day)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promethazine (Phenergan)**</td>
<td>dopamine antagonist</td>
<td>12.5 – 25 mg PO/PR every 4 – 6 hours</td>
</tr>
<tr>
<td><strong>STEP 3: Second-line medications (add or switch to ONE of these if patient not dehydrated. If dehydrated, see step 4)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metoclopramide (Reglan)</td>
<td>prokinetic agent</td>
<td>5 – 10 mg PO/IM every 8 hours</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>serotonin antagonist</td>
<td>4 mg PO every 8 hours OR 8 mg over 15 min IV every 12 hours</td>
</tr>
<tr>
<td>Prochlorperazine**</td>
<td>dopamine antagonist</td>
<td>25 mg PR every 12 hours</td>
</tr>
<tr>
<td><strong>STEP 4: Acute hydration and IV fluids (add BOTH)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LR first liter, then D5 1/4 NS</td>
<td>fluid replacement</td>
<td>Dose/frequency based on patient need. Use a peripheral line.</td>
</tr>
<tr>
<td>Thiamine MVI-12</td>
<td>vitamin supplementation</td>
<td>100 mg IV x 1 dose, 1 vial per day. Use a peripheral line.</td>
</tr>
<tr>
<td><strong>STEP 5: Chronic hydration (continue IV fluids as above), and add or switch to ONE of the following:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metoclopramide (Reglan)</td>
<td>prokinetic agent</td>
<td>5 – 10 mg PO/IM every 8 hours (avoid in young patients)</td>
</tr>
<tr>
<td>Ondansetron (Zofran)</td>
<td>serotonin antagonist</td>
<td>8 mg IV every 12 hours</td>
</tr>
<tr>
<td><strong>STEP 6: Consult with Maternal-Fetal Medicine about enteral feeding and PICC-line placement</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Follow up weekly with all patients requiring acute or chronic hydration.

- Some pharmacies will compound 10 mg doxylamine + 10 mg pyridoxine in a sustained release form. The recommended dosage is 2 doses PO at bedtime and 1 dose PO twice a day as needed.
- Prochlorperazine (Compazine) and promethazine (Phenergan) have been removed as IV medications because they are damaging to blood vessels.

### ALGORITHM NOTES (SEE PAGE 2)

(a) Other potential causes of nausea and vomiting:
NVP that begins after 10 weeks of gestation is almost certainly due to other causes. A number of physical findings, such as abdominal tenderness, fever, abnormal neurological exam, or goiter, can point to other conditions.

(b) Acute hydration via PCP office, infusion center, or home health:
REFER patient to PCP, infusion center, or home health for therapy as follows:
- **Hydrate** via peripheral line as follows:
  - LR first liter, then D5 1/4 NS (giving LR first lowers risk of hypokalemia)
  - Thiamine 100 mg IV x 1 dose
  - MVI-12 (1 vial per day)
- **Monitor** daily weight and urinary ketones.
- **Obtain** BMP, and correct electrolyte abnormalities as needed.
- **Continue** supportive measures and medications as needed.

FOLLOW UP with patient weekly.

(c) Chronic hydration via home health:
REFER patient to home health for ongoing therapy as follows:
- **Continue** IV fluids.
- **Add or switch** to a first-line IV medication (see table on page 4).
- **Consult** with maternal-fetal medicine if patient requires continuous, long-term IV fluids.

FOLLOW UP with patient weekly.

(d) Nutrition consult with maternal-fetal medicine:
CONSULT with maternal-fetal medicine to evaluate need for the following therapies:
- Enteral feeding
- Steroids

FOLLOW UP with patient weekly.
RESOURCES

Patient resources

The Intermountain Women and Newborns clinical program and Patient and Provider Publications team have developed patient education materials to directly support treatment recommendations in this care process model. Education for patients and families increases patient compliance with a treatment plan.

Intermountain-approved patient education materials

The following Intermountain-approved patient education resources can be accessed and ordered online at minimal cost.

- **As the iCentra EMR system is implemented**, search for Intermountain items in the patient education module.
- **Log in to intermountainphysician.org**, and search for the patient education library under A–Z. Then, search item number or title in the appropriate area.

Provider resources

To find this CPM, clinicians can go to intermountainphysician.org/clinicalprograms, and select "Nausea and Vomiting of Pregnancy" or "Hyperemesis Gravidarum" from the Clinical Topics A–Z menu.

REFERENCES


This CPM presents a model of best care based on the best available scientific evidence at the time of publication. It is not a prescription for every physician or every patient, nor does it replace clinical judgment. All statements, protocols, and recommendations herein are viewed as transitory and iterative. Although physicians are encouraged to follow the CPM to help focus on and measure quality, deviations are a means for discovering improvements in patient care and expanding the knowledge base. Send feedback to Calla Holmgren, MD, Maternal Fetal Medicine, Intermountain Healthcare (Calla.Holmgren@imail.org).

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