MANAGEMENT OF

Nausea and Vomiting of Pregnancy (NVP) and Hyperemesis Gravidarum

2018 Update

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. [MCP, ACOG]

Note: Nausea and vomiting that begin after the early second trimester are almost certainly due to other causes and should be diagnosed and treated accordingly. This CPM should only be used after other causes of NVP have been ruled out and intrauterine pregnancy has been confirmed.

WHAT'S INSIDE?

MEASUREMENT & GOALS

Intermountain aims to:

- **Reduce** the number of women unnecessarily hospitalized for NVP or hyperemesis.
- **Reduce** the number of pregnant women who develop ketonuria as a result of hyperemesis.
- **Increase** the number of patients who achieve adequate oral fluid intake (30–35 mL/kg/day or ~2 L/day).

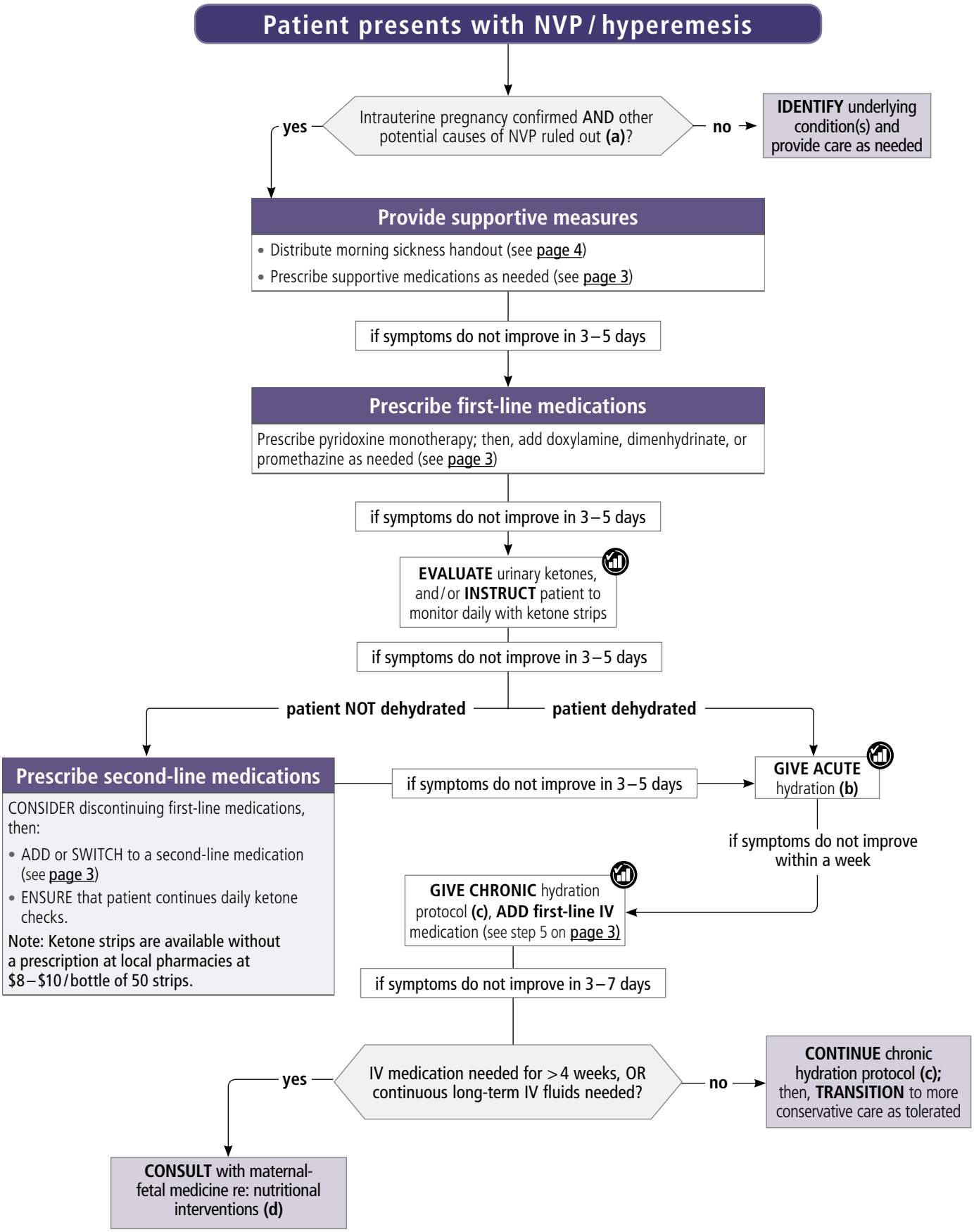
Indicates an Intermountain measure

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]

Intermountain® Healthcare

ALGORITHM: NVP / HYPEREMESIS MANAGEMENT



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.

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.[YOS]

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

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

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

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.[MCP]

BIBLIOGRAPHY

Carstairs SD. Ondansetron use in pregnancy and birth defects. *Obstet Gynecol.* 2016;127(5): 878-883.

Hsu JJ, Clark-Glena R, Nelson DK, Kim CH. Nasogastric enteral feeding in the management of hyperemesis gravidarum. *Obstet Gynecol.* 1996;88(3):343-346.

Koren G, Clark S, Hankins GD V, et al. Maternal safety of the delayed-release doxylamine and pyridoxine combination for nausea and vomiting of pregnancy; A randomized placebo controlled trial. *BMC Pregnancy Childbirth.* 2015;15(1):59.

Oliveira LG, Capp SM, You WB, Riffenburgh RH, Carstairs SD. Ondansetron compared with doxylamine and pyridoxine for treatment of nausea in pregnancy: A randomized controlled trial. *Obstet Gynecol.* 2014;124(4): 735-742.

CPM DEVELOPMENT TEAM

Calla Holmgren, MD
Dina Olsen
Laura Sittig, PhD (Medical Writer)

Intermountain® Healthcare

RESOURCES

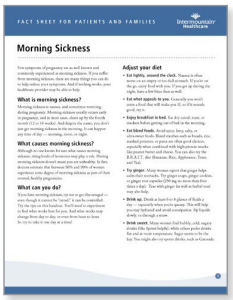
Patient resources

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.

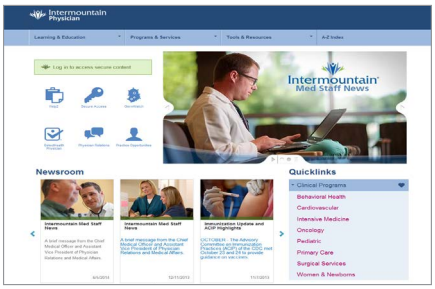
- **As the iCentra EMR system is implemented,** search for Intermountain items in the patient education module.
- **Log in to** Intermountainphysician.org**,** and search for the patient education library under A–Z. Then, search item number or title in the appropriate area.


Morning Sickness

Morning Sickness fact sheet

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

ACOG Committee on Obstetric Practice. American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin No. 189: Nausea and Vomiting of Pregnancy. *Obstet Gynecol.* 2018;131(1):e15-e30.

APGO Association of Professors of Gynecology and Obstetrics (APGO) Educational Series: Nausea and Vomiting of Pregnancy. http://www.nationalperinatal.org/Resources/APGO%20Educational%20Series%202011.pdf. Updated 2011. Accessed August 28, 2018.

HOL Holmgren C, Aagaard-Tillery KM, Silver RM, Porter TF, Varner M. Hyperemesis in pregnancy: An evaluation of treatment strategies with maternal and neonatal outcomes. *Am J Obstet Gynecol.* 2008;198(1):56.e1-4.

MCP McParlin C, O'Donnell A, Robson SC, et al. Treatments for hyperemesis gravidarum and nausea and vomiting in pregnancy: A systematic review. *JAMA.* 2016;316(13):1392-1401.

YOS Yost NP, McIntire DD, Wians FH Jr, Ramin SM, Balko JA, Leveno KJ. A randomized, placebo-controlled trial of corticosteroids for hyperemesis due to pregnancy. *Obstet Gynecol.* 2003;102(6):1250-54.

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).