NAUSEA/VOMITING OF PREGNANCY ALGORITHM

(HELP Score <20)

1. B6/Pyridoxine 10–25 mg PO with or without Doxylamine 10-25 mg q 6-8 h
   (Either separately or as delayed release combination)
2. Thiamin/Benfotiamine 100 mg PO 1-3 times per day (250 mg daily PO minimum after 20 weeks)
3. Continue prenatal vitamin if tolerated or change to single vitamins (B1, B9, D with K, Ca, Mg).
4. Add gastric/esophageal protection at bedtime with onset of vomiting or poor intake. (See shaded box below.)

DEHYDRATION?

NO — ***(HELP Score <32)***

Add up to 1 from each class:

1. Antihistamine (discontinue doxylamine)
   - *Dimenhydrinate* 25-50 mg q 4–6 h PO or PR (limit to 200 mg per day if taking doxylamine)
   - *Diphenhydramine* 25–50 mg PO q 4–6 h
   - *Meclizine* or *Cyclizine* 25 mg PO q 6-8 h
2. Dopamine Antagonist (Use only 1 at a time or alternate.)
   - *Metoclopramide* 2.5-10 mg q 6-8 h PO or ODT
   - *Promethazine* 25 mg q 4-6 h PO or PR (avoid IM/IV)
   - *Prochlorperazine* 5-10 mg q 6-8 h PO or 25 mg PR q 12 h
   - *Domperidone* 10-20 mg PO q 6-8 h

Add DAILY bowel care + serotonin antagonists (5-HT3) (prescribe on a strict schedule, NOT prn):

1. Bowel Care: Daily stool softener, magnesium (citrate, oxide), polyethylene glycol + stimulant laxative or enema up to 3x per week prn
2. *Ondansetron* 4-8 mg q 3-6 h PO or ODT, or ODT given vaginally (max 32 mg per day) ***OR***
3. *Granisetron* 1 mg q 12 h PO or 3 mg TD patch (give 1 mg oral/IV dose on days 1 and 2 until steady state)
   NOTE: Monitor EKG if risk of QT prolongation.

Consider NUTRITION (see box on right) + FLUIDS + 1+ of the following:

1. *Mirtazapine* 15 mg q 8 h PO or ODT (d/c other 5HT-3)
2. *Methylprednisolone* (if 9+ weeks) 16 mg q 8 h PO or IV for 3 days. Taper over 2 weeks. Maintain on lowest effective dose if needed. Avoid administration exceeding 6 weeks.
3. *Chlorpromazine* 25–50 mg IV or 10–25 mg PO q 4-6 h
4. Olanzapine 5 mg PO q 8-12 h
5. Gabapentin 300-800 mg PO q 8 h

GERD or gastric/esophageal protection options:

1. Calcium antacid (avoid Aluminum, Bismuth or Bicarbonate)
2. H2 antagonist BID: *famotidine* 20-40 mg PO/IV
3. Proton Pump Inhibitor (PPI) q 24 h at bedtime
   - *Esomeprazole or pantoprazole* 40 mg PO or IV q HS
   - *Lansoprazole* 15-30 mg PO or ODT q HS

YES — ***(HELP Score ≥32)***

IV fluids and dilute vitamins; infuse slowly:

1. NS or LR + MVI + B1 + B6 + B Complex (w/B2, B3, B9)
   - Add prn: KCl, Na, vit D, Zn, Se, Fe, Mg & Ca
   - Always give 200 mg B1 IV w/dextrose (prevent WE).
   - Slowly replace low/marginal electrolytes (prevent ODS).
   - Consider restricted PO intake for 24-72 h (gut rest).
   - Consider midline or central line for frequent IVs.
2. **Always include Thiamin/B1 100-500 mg IV q 8 h daily.**
3. Choose MVI containing vitamin K or add vitamin K prn.

+

If oral meds ineffective or not tolerated, change to *1 OF THE FOLLOWING with daily Bowel Care (see box on left):*

1. *Ondansetron*:
   - IV: 4-8 mg over 15 minutes q 3-6 h (up to 32 mg) or continuous infusion
   - Subcutaneous (SubQ) continuous infusion: 8 mg starting dose, then 12-40 mg/day; wean slowly to PO if stable
2. *Granisetron* 1mg q 12 h IV or continuous infusion or TD

If symptoms continue, add one or both of these meds:

1. *Dimenhydrinate* or *Diphenhydramine* 25-50 mg q 4–6 h IV
2. *Metoclopramide*:
   - IV: 2.5–10 mg q 8 h SLOW infusion
   - SubQ continuous infusion: 2.5-10 mg loading dose, then up to 60 mg/day

*** Wean IV/SubQ to PO very slowly when stable, then monitor for at least 24 hours before discharge to home.**
*** Consider enoxaparin for DVT prophylaxis**

NUTRITION - If weight loss ≥7% and/or persistent HG:

1. Consult with GI & Nutrition & IV access team.
2. Prevent Refeeding Syndrome: Very slowly restart nutrition & closely monitor weight, cardiac rhythm and electrolytes (especially phosphate) for 1+ week.
3. Consider EN/PN until gaining weight on PO intake.
   - *Enteral nutrition*: Gradually increase infusion (after resting GI tract) with or without additional parenteral/enteral fluids. (NJ or G/J-tube preferred). Insert SMALL bore nasal tube under sedation. Often poorly tolerated.
   - *Parenteral nutrition (partial peripheral or total central)*

IMPORTANT NOTES:

1. If symptoms persist, follow arrows to next level of care and consider non-oral forms of medications such as compounded, transdermal, IV, or SubQ. ALWAYS wean medications very slowly.
2. After IV therapy, use non-oral options or move slowly to oral medications as tolerated.
3. Most medications can cause QT prolongation, consider EKG or cardiac monitoring for high risk patients, high doses of medications, multiple medications, or electrolyte & vit B1 abnormalities.
4. Intramuscular injections (IM) not recommended due to muscle atrophy and pain sensitivity.
5. Dehydration and nutrient (e.g. electrolytes, B1) deficiencies decrease treatment response.
6. Start prophylactic anticoagulation for DVT if prolonged immobility/hospitalization over 72 hours.
7. Weaning too early or rapidly may result in worsening or refractory symptoms.
8. See less common medications on the HER Foundation website: www.hyperemesis.org/meds.
9. HELP = HyperEmesis Level Prediction Score. Learn more: www.hyperemesis.org/tools.

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Hyperemesis Gravidarum (HG) is diagnosed when a patient has nausea and vomiting that requires medication and/or intravenous therapy due to severe nausea and/or vomiting with poor intake, possible weight loss, and debility. Failure to adequately treat may result in refractory and prolonged symptoms, along with serious complications for both mother and child. HG is caused in part to genes (e.g. *GDF15*) that reduce appetite, alter taste, and cause nausea, vomiting and muscle wasting. Additionally, infections, stress, and nutrient deficiencies (e.g. B1, Mg, and K+) worsen symptoms and may increase GDF15 hormone levels. (hyperemesis.org/research/#cause)

ANTIEMETIC ESSENTIALS

1st Step: Δ dose/frequency
2nd Step: Δ route (SubQ, TD, rectal, IV, compounded)
3rd Step: Add/replace a medication

- Avoid abrupt Δ's in 1st trimester.
- Prevent/proactively treat side-effects.
- Give IV fluids SLOWLY and dilute irritating medications.
- Try continuous antiemetic infusions.
- **Cocktail:** Antihistamine + serontonin antagonist + acid reducer + promethazine OR metoclopramide + IV vitamins

Once stable for 2 weeks on IV or subcutaneous infusions, try transitioning to oral dosing, then if fails PO trial, return to IV/SubQ. Wait 2-4 weeks or until symptoms improve for 2 weeks before weaning again. Repeated failures to wean in later pregnancy suggest medications may be needed until delivery.

Kimber's RULE OF 2'S

Wean medications for HG:

Wean each medication in 2nd trimester or later | After 2 weeks with minimal symptoms | Over 2+ weeks

ADDITIONAL MEDICATION TIPS

- Serotonin Syndrome - avoid combining serotonin antagonists with SSRIs and SSNIs
- Headache - common with ondansetron; switch to another serotonin antagonist
- Ptyalism - use anticholinergic medication
- Anxiety/panic - common with metoclopramide (esp. IV push)
- EPS - commonly caused by phenothiazines and metoclopramide; switch medication/class at onset; limit duration

The Genes Have Spoken:
not in her HEAD but in her GENES

PATIENT/FAMILY EDUCATION

- Symptom relief not 100%
- Most meds don't help nausea
- Multiple meds typical
- May need non-oral meds
- Dose changes common
- Dosing same in pregnancy
- Don't stop meds abruptly
- Meds possible until delivery

I's of IMMEDIATE INTERVENTION

- Inability to tolerate antiemetics
- Intake of ≤1.5 meal/day
- Inadequate UOP/ketonuria
- Increasing weight loss (>2 lbs (1 kg) per week)
- Inability to cope or function
- Increasing HELP Score (>20)

Δ = Change
GERD = gastroesophageal reflux disease
GI = gastrointestinal
IM = Intramuscular
IV = Intravenous
LR = Lactated Ringers
MFM = Maternal-Fetal Medicine
ODS = Osmotic Demyelination Syndrome - includes CPM = Central Pontine Myelinolysis
PMAD = Perinatal Mood/Anxiety Disorder
HELP = HyperEmesis Level Prediction Score
PO = Per oral
PTSD = Post Traumatic Stress Disorder
SubQ = Subcutaneous
h = hours
UOP = urine output
UTI = Urinary Tract Infection
WE = Wernicke's encephalopathy

WERNICKE'S ESSENTIALS **Screen each visit**

Causes: Thiamin/B1 and electrolyte deficiency/shifts
Risks: Infection, diuretic, malabsorption, atrophy, malnutrition
Signs: Change in vision or speech or gait or mental status, abdominal pain, headache, cardiac symptoms (tachy then brady), somnolence, dizziness, weakness, aphasia, tremor, irritability, spastic paresis, seizure, myalgia, myoclonus, anorexia, dysphagia, elevated transaminase, refractory HG
Diagnosis: MRI may be normal. Assume WE if B1 ↓ symptoms.
Prevention/Ongoing Recovery: Oral/IV thiamin 100-500 mg PO/IV 1-3x daily; continue until consistent, healthy diet for 3+ months. Take while breastfeeding for mother/baby.
Acute Care: Thiamin 500 mg IV TID until asymptomatic, 5+ days. (See WE & Thiamin Fact Sheets. hyperemesis.org/tools)

SUMMARY OF CLINICAL KEYS

1. Changing medications abruptly/frequently may cause severe/refractory symptoms. Combine different classes.
2. Increasing dose, increasing frequency, changing route and combining medications can improve treatment efficacy.
3. Scheduled dosing and non-oral medications are beneficial.
4. Lack of nutrition/hydration reduce medication response, worsen symptoms, and increase risks/complications.
5. Side-effects are better prevented than managed.
6. If a history of HG or severe symptoms, rapidly intervene and move to non-oral medications when orals not tolerated.
7. Wean each medication separately and slowly after 2+ weeks of minimal symptoms with adequate PO intake and hydration.
8. Medication and IV therapy may be needed until delivery.
9. Listen as patients can offer valuable insight into their care.
10. HG is traumatic so treat with compassion and refer to the HER Foundation for resources. hyperemesis.org/support

COMFORT MEASURES

- Private room (avoid triggers)
- Avoid IM injections (atrophy)
- Warm IV fluids/blankets
- Use anesthetic for IVs
- Offer preferred foods when feeling least ill

CONSULTS/ADJUNCTIVE CARE

Consults: GI, nutrition, home health, mental health, social work, perinatology/MFM, case management, physical therapy
Adjunctive care: hypnosis, acupuncture, homeopathy, osteopathic manipulation

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