NAUSEA/VOMITING OF PREGNANCY ALGORITHM

(HELP <20)

1. B6/Pyridoxine 10–25 mg PO with or without Doxylamine 10-25 mg 3 or 4 times per day. (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 as tolerated then change to single vitamins (B1, B9, D, Ca).
4. Add gastric/esophageal protection at bedtime with onset of vomiting or poor intake. (See shaded box below.)

DEHYDRATION?

NO → ***(HELP <32)***

YES → ***(HELP >32)***

Add up to 1 from each class:

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

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Add a daily bowel care option(s) and serotonin antagonist:

1. Bowel Care: Stool softener, magnesium (citrate, oxide), polyethylene glycol + stimulant laxative or enema <3x per week prn.
2. *Ondansetron* 4-8 mg q 6 hours (not prn) PO or ODT, or ODT given vaginally ***OR***
3. *Granisetron* 1 mg q 12 hours PO or 3 mg TD patch (may need 1 mg oral dose on days 1 and 2)
   NOTE: Replace electrolytes & monitor EKG if risk of QT prolongation.

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Consider NUTRITION (see box to right) and one of the following:

1. *Mirtazapine* 15 mg q 8 hours PO or ODT (Dose not established for HG. Discontinue other serotonin antagonists.)
2. *Methylprednisolone* (if 9+ weeks) 16 mg q 8 hours PO or IV for 3 days. Taper over 2 weeks. Maintain on lowest effective dose if needed. Avoid administration exceeding 6 weeks.
3. *Prochlorperazine* 5-10 mg PO q 6-8 hours
4. *Chlorpromazine* 25–50 mg IV or 10–25 mg PO q 4-6 hours

GERD or gastric/esophageal protection options:

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

Select IV fluids and dilute vitamins; infuse slowly:

1. Thiamin 100-500 mg IV 3 times daily
2. Banana Bag with B Complex
3. NS or LR + MVI + B Complex (B1, B2, B3, B6, B9)
   - Add prn: KCl, Na, Vit K, Vit D, Zn, Se, Fe, Mg & Ca.
   - Always give 200 mg B1 with IV dextrose (prevent WE).
   - Slowly replace low/marginal electrolytes (prevent CPM).
   - Consider restricted PO intake for 24-72 hours (gut rest).
   - Consider midline or central line for frequent IVs.

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If oral meds ineffective or not tolerated, change to *ONE OF THE FOLLOWING with daily bowel care (see options on left box):*

1. *Ondansetron*:
   - IV: 4-8 mg over 15 minutes q 6 hours 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 hours IV or continuous infusion

If needed, add one or both of these meds:

3. *Dimenhydrinate* or *Diphenhydramine* 25-50 mg q 4–6 hours IV
4. *Metoclopramide*:
   - IV: 5–10 mg q 8 hours SLOW infusion
   - SubQ continuous infusion: 5-10 mg starting dose, then 20-40 mg/day

***Wean IV/SubQ to PO when stable, then monitor for at least 24 hours before discharge.**

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NUTRITION - If weight loss ≥7% and/or persistent HG, consult with GI & Nutrition & IV Therapy:

1. *Enteral therapy*: Gradually increase infusion (after resting GI tract) with or without additional parenteral/enteral fluids. (NJ or J/G-tube preferred). Insert SMALL bore nasal tube under sedation.
2. *Intravenous fluids and/or parenteral nutrition*
   - Prevent Refeeding Syndrome: Slowly restart nutrition & monitor weight, cardiac rhythm and electrolytes (especially phosphorus!).
   - Continue until gaining weight on PO intake and meds.

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 meds 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 medication effectiveness.
6. Weaning too early or rapidly may result in worsening or refractory symptoms.
7. HELP = HyperEmesis Level Prediction Score. Learn more: www.hyperemesis.org/tools.

HER® Foundation
HYPEREMESIS EDUCATION & RESEARCH HYPEREMESIS.ORG

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

- Avoid abrupt Δ's in 1st trimester.
- Wean over 2+ weeks if asymptomatic.
- Prevent/proactively treat side-effects.
- Give IV fluids slowly and dilute irritating medications.
- Try non-oral meds and continuous antiemetic infusions.
- **Cocktail:** Antihistamine + 5HT3 antagonist + acid reducer + promethazine OR metoclopramide.

Once stable for 2 weeks on IV or subcutaneous infusions, try transitioning to oral or SubQ, then if fails return to IV. 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:

Over 2+ weeks | After 2+ weeks without symptoms | In 2nd trimester or later

PREVENT OR TREAT ADDITIONAL ISSUES

Issues: ptyalism, GERD, encephalopathy, gastroparesis, UTI, insomnia, helicobacter pylori, embolus (bedrest), sepsis, and nutritional deficiencies leading to arrhythmias & hemorrhage

Medication side-effects: severe constipation, serotonin syndrome, anxiety, headache, extrapyramidal symptoms, arrhythmias

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

EDUCATE PATIENTS

- 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 meal/day
- Inadequate UOP/ketonuria
- Increased weight loss (>2 lbs (1 kg) per week)
- Inability to cope or function
- Increasing HELP Score

Δ = Change
IM = Intramuscular
SubQ = Subcutaneous
IV = Intravenous
TID = 3 times/day
MFM = Maternal-Fetal Medicine
GERD = gastroesophageal reflux disease
UTI = Urinary Tract Infection
LR = Lactated Ringers
WE = Wernicke's encephalopathy
ODS = Osmotic Demyelination Syndrome
UOP = urine output
GI = gastrointestinal
PTSD = Post Traumatic Stress Disorder
PMAD = Perinatal Mood/Anxiety Disorder
HELP Score = HyperEmesis Level Prediction Score (hyperemesis.org/tools)
PO = Per oral

WE/ODS ESSENTIALS **Screen each visit**

Causes: Thiamin 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
Prevention/Ongoing Recovery: oral/IV thiamin 100-500 mg 1-3x daily; continue until consistent, healthy diet for 3+ months after HG resolves. 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 or frequently may cause more severe or refractory symptoms.
2. Increasing dose, increasing frequency, changing route and combining medications can improve treatment efficacy.
3. Scheduled dosing and non-oral medications are beneficial.
4. Inadequate nutrition and hydration often reduce medication response and worsen symptoms.
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 if orals not tolerated.
7. Wean each medication separately and slowly after 2+ weeks of minimal symptoms with adequate intake and hydration.
8. Medication and IV therapy may be needed until delivery.
9. Listen as women 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 (PTSD/PMAD), perinatology/MFM
Adjunctive care: hypnosis, acupuncture, homeopathy, osteopathic manipulation

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