Pediatric Clinical Care Guide

Cannabis Hyperemesis Syndrome (CHS)

Guideline Introduction

Authors | Version history | Disclaimers

Key to using guideline

- *This is a guideline, not a policy. Patient variation and other factors may impact management decisions.*
- Use hyperlinks to navigate around in the document rather than scrolling. Clicking on the underlined word or phrase will take you to the page.
- Green boxes represent steps in an algorithm
- Yellow shapes represent decision branch points or key points of concern/caution

Inclusion Criteria

- Patient >/= 12 years of age in the ED and general medical units
- Meets the Rome IV diagnostic criteria* for CHS (#3 may not apply)
- High suspicion for CHS**
- Known or suspected cannabis use
  - History of regular use (weekly or more often for weeks to months)
  - Positive urine toxicology screen
- Other diagnoses considered, but ruled out with appropriate work-up

Exclusion Criteria

- Patient < 12 years of age
- Weight < 40 kg
- Severe, unexplained weight loss
- Pregnancy
- History of prolonged QTc syndrome
- First episode of vomiting without recurrent pattern
- Concern for acute abdomen (rigidity, guarding) or abdominal trauma
- Concern for sepsis
- Shock or hemodynamic instability requiring immediate resuscitation
- Signs of urgent GI pathology (bloody stool)
- Suspected intracranial pathology
- Identified alternative etiology for vomiting (metabolic, toxic, infectious, endocrine, CNS, inflammatory, obstructive, or GU pathology)

***Rome IV Diagnostic Criteria for CHS**

(must include all of the following):

1. Stereotypical episodic vomiting resembling cyclic vomiting syndrome (CVS) in terms of onset, duration, and frequency
2. Presentation after prolonged use of cannabis
3. Relief of vomiting episodes by sustained cessation of cannabis use

*May be associated with pathologic bathing behavior (prolonged hot baths or showers)

*Criteria fulfilled for the **last 3 months** with symptom onset at least 6 months prior to diagnosis*

****High suspicion for CHS, defined as:**

- Recurrent or intractable vomiting and/or abdominal pain without an identified alternative etiology
- Episodes lasting hours to days
- Episodes separated by weeks to months with return to baseline health between episodes
- Symptom relief with hot showers/baths
- Symptom improvement with cannabis cessation

Hyperlinks

To make a referral

Norton Children's providers: Go to Epic Ambulatory

Community providers: Scan the **QR code** or call **(833) 559-7337 (PEDS)**

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ED Initial Diagnosis and IVF Management

History and Physical Examination

- Full medical history and physical exam with attention to:
  - Cannabis use: frequency, duration, route, dose, abstinence periods
  - Cyclic vomiting pattern with symptom-free intervals
  - Response to hot showers/baths
  - Previous treatments tried and effectiveness or lack thereof
- HEADSSS assessment should be performed in all adolescent patients
- Screen for **red flags**
  - Fever
  - Weight loss
  - Hematemesis
  - Bilious emesis
  - Focal abdominal pain
  - Chest pain, dyspnea
  - Neurologic symptoms
  - Co-ingestions

→ If red flags present, exit guideline

Initial Diagnostic Testing

- CBC, CMP, lipase, UA
- Point-of-care glucose
- Urine pregnancy test
- EKG (prior to QT-prolonging meds)
- Optional testing based on clinical indications
  - Urine toxicology
  - Serum toxicology
  - ESR
  - GC/CT testing
  - Abdominal x-ray (2 view)
  - Chest X-ray

→ If testing suggests alternative diagnosis, exit guideline

Hyperlinks

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ED Initial Management

CHS diagnosis confirmed

Supportive care (All patients)

- IV fluid bolus (NS or LR)
- Consider ondansetron if not already given in tirage ; Note: **often ineffective in CHS**
- Correct electrolyte abnormalities
- Avoid opioids unless pain is severe and refractory

Review current EKG **AND** manually calculate QTc using the Bazett formula

Is the QTc prolonged? (>470 msec in males, >480 msec in females)

No

Normal QTC (see Med Table for dosing)

- First line
  - Haloperidol PO/IV (May give repeat dose PRN. Max daily dose = 5 mg) **AND/OR**
  - Topical Capsaicin
- Second line:
  - Haloperidol PO/IV **OR**
  - Lorazepam PO/IV **OR**
  - Diphenhydramine PO/IV (max single dose = 50 mg) **AND/OR**
  - Topical Capsaicin

Yes

Prolonged QTC (see Med Table for dosing)

- First line
  - Olanzapine CDT **AND/OR**
  - Topical capsaicin
- Second line:
  - Lorazepam PO/IV **OR**
  - Diphenhydramine PO/IV (max single dose = 25 mg) **AND/OR**
  - Topical Capsaicin

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Disposition from the ED

Symptoms are adequately controlled?

No

Consider **adjunctive therapies**. Response to these therapies is mixed in CHS.

- Famotidine 1 mg/kg (max dose = 20 mg) IV
- GI cocktail: Maalox 30 mL + diphenhydramine 25-50 mg PO
- Prochlorperazine 5 – 10 mg PO, or 25 mg suppository PR, or 2.5 – 10 mg IV
- Promethazine 12.5 mg PO/PR

Only if patient is being **admitted** to the hospital, can consider:

- Lidocaine 5% patch OR
- Scopolamine 1 mg patch

Yes

No

Discharge Criteria:

- Tolerating oral intake
- Adequately hydrated
- Adequate pain control
- Significant improvement or resolution of emesis

Proceed to ED Discharge Planning, Education, and Medications

Admission criteria:

- Refractory symptoms
  - Persistent nausea/vomiting despite treatment
  - Uncontrolled abdominal pain
  - Multiple recent ED visits without symptom resolution
- High-risk features
  - Dehydration requiring ongoing IV fluids
  - Electrolyte abnormalities
  - AKI
  - Persistent tachycardia or hypotension
- Social/safety concerns
  - Inability to be discharged to a safe environment
  - Lack of reliable follow-up
  - Family not comfortable with discharge

If a lidocaine and/or scopolamine patch is applied in the ED, clear handoff to the admitting team is required to ensure appropriate monitoring and timely removal.

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ED Discharge Planning, Education, and Medications

Discharge Planning and Education

- Provide education and set expectations on CHS
  - Symptoms may persist for weeks to months
  - Encourage cannabis cessation (if patient is not willing, encourage abstinence for at least 6 months or 3 emetic cycles)
- Provide harm-reduction counseling and state-specific resources
- Close PCP follow up

- Consider blocking note based on patient preference
- Encourage discussion with family, especially if patient has multiple visits for CHS

- Consider follow up with PCP or Cardiology if QTc is prolonged to assess need for continued monitoring
- Consider Gastroenterology referral
- Consider Adolescent Medicine, Social Work, or Psychology referral for substance use counseling

Evaluate need for **home medications**

- Capsaicin 0.075% TID PRN
  - Use gloves for application to back of arms or abdomen. Thoroughly wash hands after application. Avoid face and eyes. Discontinue if any skin irritation/burning.
- Famotidine 1 mg/kg PO BID (max 20 mg/dose) x 2 weeks
- Olanzapine 5-10 mg PO BID PRN
- Hydroxyzine 25-50 mg q6h PO PRN (max 50 mg/dose)
  - May be useful for concurrent anxiety
- Ondansetron 0.15 mg/kg PO Q6H PRN (max 8 mg) ; *Only if found to be beneficial*
- Intranasal Naloxone
  - Use once PRN if concern for possible opioid overdose. Strongly consider, even if patients do not have opioid use disorder.
- If concurrent nicotine use disorder, consider prescribing Nicotine Replacement Therapy. Suggested Dosing:
  - If >10 cigarettes per day OR 1+ pods per day of e-cigarettes: Nicotine patch 21 mg/day x 4-6 weeks, then 14 mg/day x2 weeks → 7 mg/day x2 weeks
  - If <10 cigarettes per day OR 0.5-1 pod per day of e-cigarettes: Nicotine patch 14 mg/day x 6 weeks→ 7 mg/day x 2 weeks
  - If a "few hits" per day: Nicotine patch 7 mg/day x 2 weeks
  - Nicotine lozenge (2 mg Q2H prn, max 8 mg/day)

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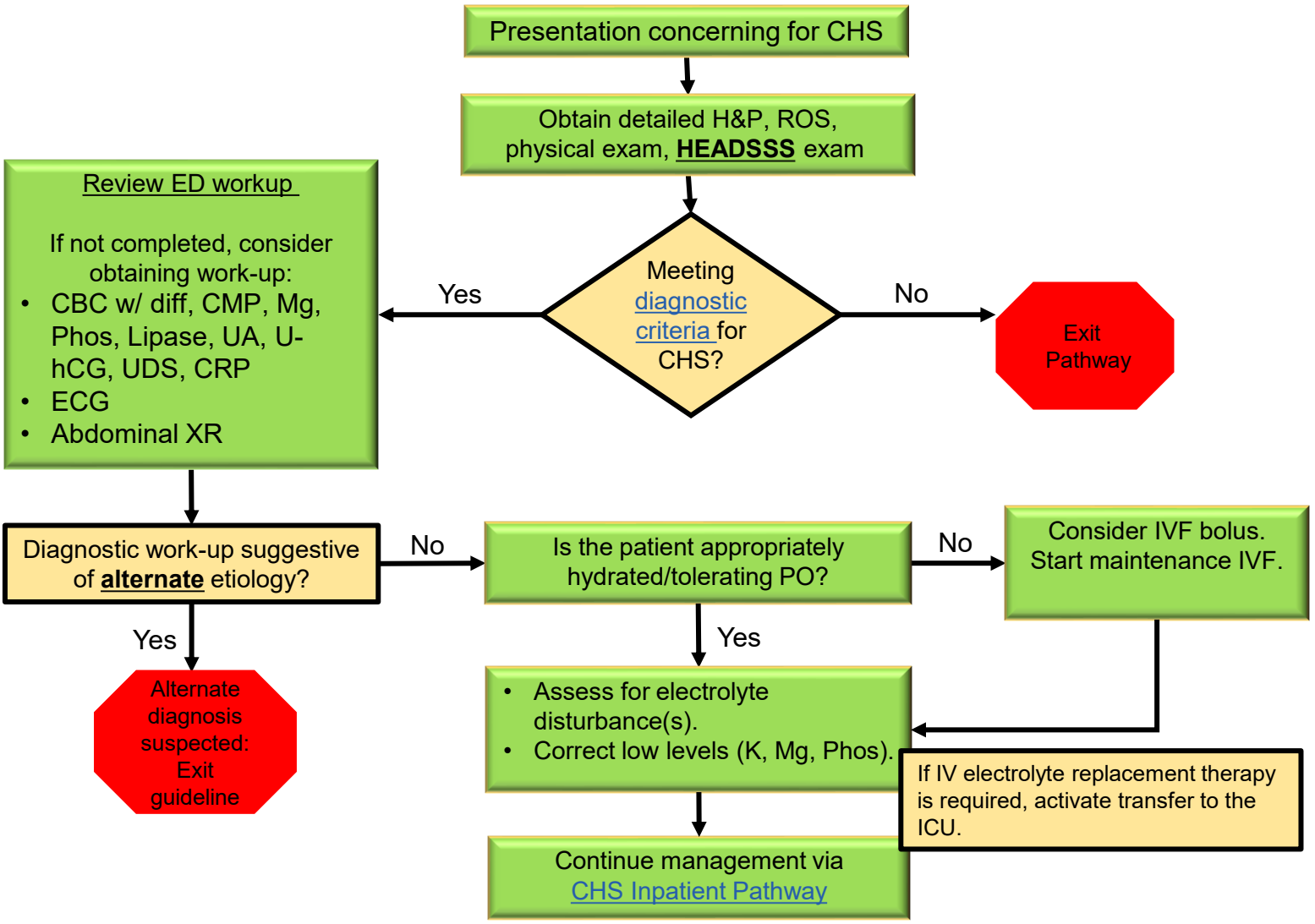
Inpatient Initial Diagnosis and IVF Management

- Upon admission, each provider should RE-EVALUATE CHS diagnosis from the emergency department
  - Ensure other differential diagnoses have been thoroughly excluded
- If clinical presentation remains consistent with CHS, enter the inpatient pathway
- Several exit points exist if the CHS diagnosis is no longer suspected or less likely



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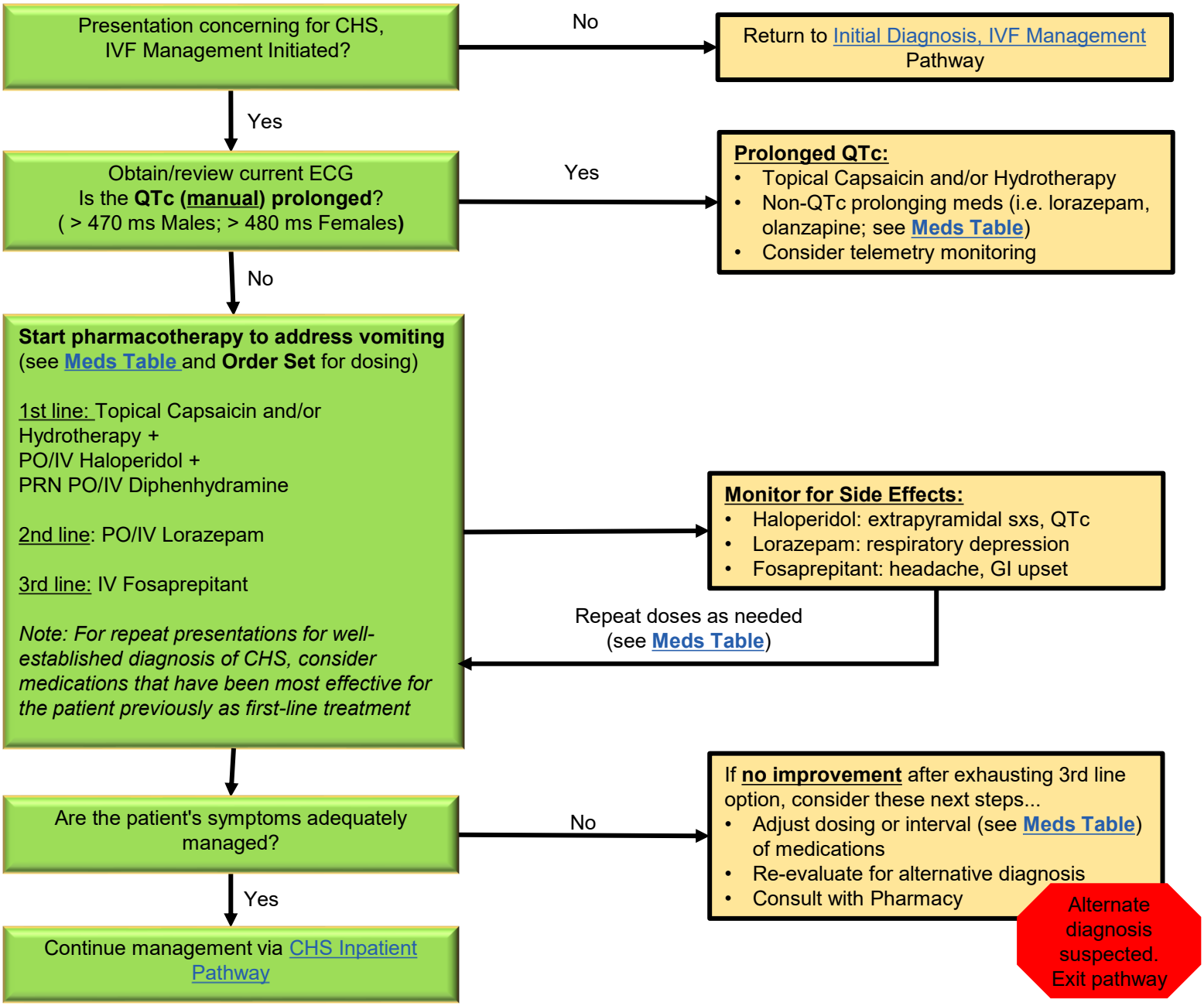
Inpatient: Medication Management & Monitoring (1 of 2)



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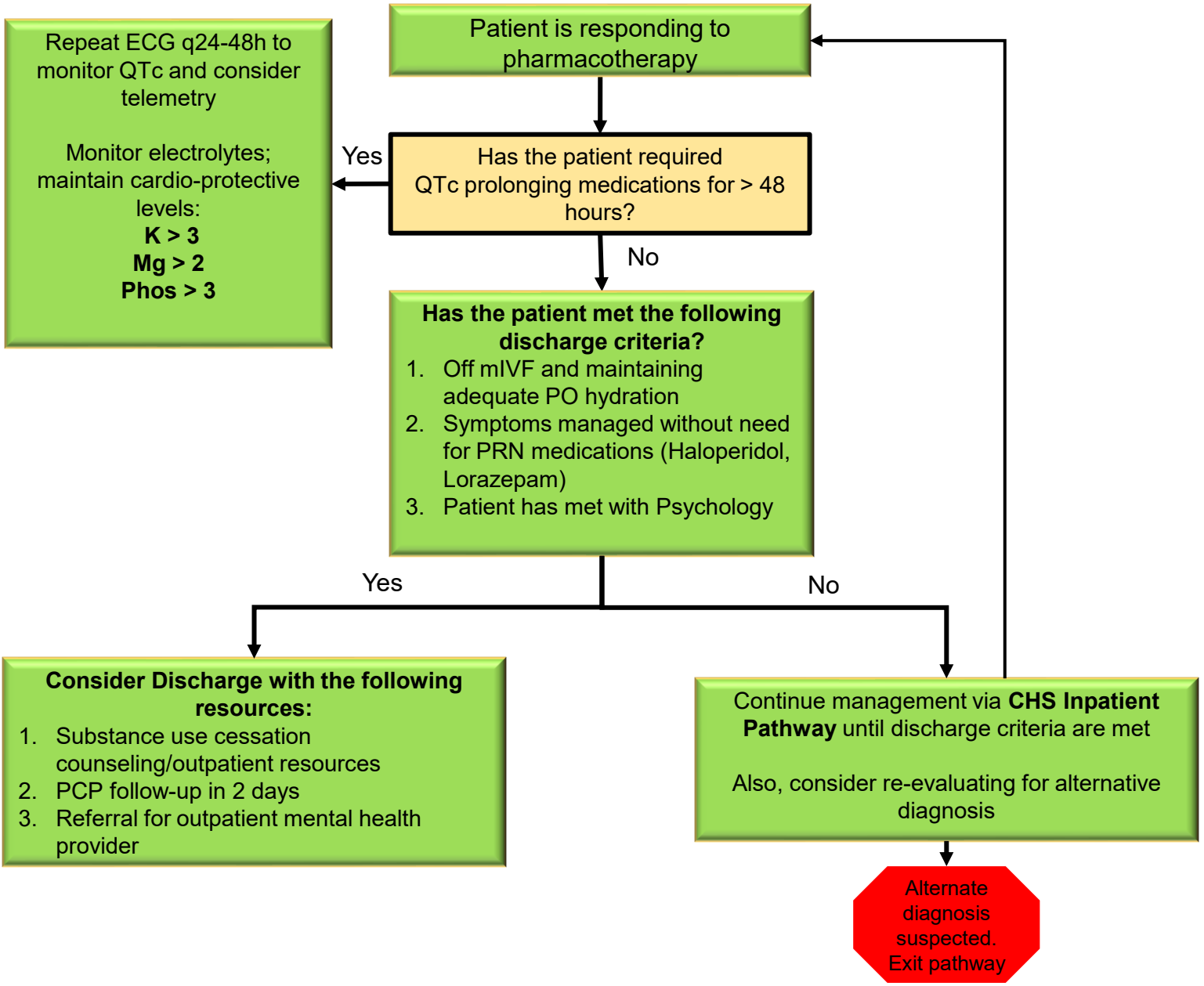

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Medication Dosing and Pharmacology

Medication	Tier on CHS Inpatient Guideline	Forms	Dosing	Frequency	Max Dose	Potential Side Effects	Monitoring Required
Capsaicin	1st	Topical cream	0.075%	Apply thin film to abdomen or back of arms TID/QID PRN	NA	Burning/redness at application site	n/a
Haloperidol	1st	Oral IM IV	0.05-0.1 mg/kg	q6h - q8h PRN	2.5 mg	**QTc prolongation**, extrapyramidal symptoms, drowsiness	ECG q24-48h, BP, HR
Diphenhydramine	1st/2nd	Oral IV	0.5-1 mg/kg	q6h - q8h PRN	25-50 mg	**QTc prolongation**, drowsiness, anticholinergic	ECG q24-48h, Urinary retention
Lorazepam	2nd	Oral IV	0.05 mg/kg	q8h PRN	2 mg	Drowsiness, respiratory depression	HR, BP, RR
Olanzapine	2nd	ODT	5-10 mg	BID PRN	10 mg	Drowsiness, anticholinergic	n/a
Fosaprepitant (Emend)	3rd	IV	4 mg/kg	q24h PRN	150 mg	Headache, diarrhea, constipation	Hypersensitivity reaction

***Note*:** Traditional anti-emetics such as **ondansetron** and **promethazine** have been shown to lack efficacy in patients with CHS. Both are **QTc prolonging** agents. These should not be considered as first-line treatments unless a specific patient is known to be significantly responsive to these.

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Cannabinoid Hyperemesis Syndrome

Background and Rationale

Primary Aim Statement: To provide standardized, evidenced-based care to adolescents presenting with cannabinoid hyperemesis syndrome.

Background:

Cannabinoid hyperemesis syndrome (CHS) has become a prevalent problem for pediatric patients in recent years due to high potency THC products that are available and heightened awareness amongst healthcare providers. CHS is characterized by severe, cyclical episodes of nausea, vomiting, and abdominal pain in adolescents who use cannabis chronically and heavily. CHS is distressing for patients and often necessitates care in pediatric emergency departments and can require hospitalization. While treatment of CHS in pediatric patients has not been as widely studied as that in adults, the existing literature shows that certain medications (topical capsaicin, haloperidol, lorazepam) have greater efficacy than traditional anti-emetics. However, traditional anti-emetics (ondansetron, promethazine) are often still prescribed as first line treatment, without benefit, which can then result in prolonged ED and hospital stays. This guideline seeks to standardize care of pediatric patients cared for at Norton Children's Hospital for cannabinoid hyperemesis syndrome (CHS).

Pathophysiology of Cannabinoid Hyperemesis Syndrome

General

- Not well understood.
- Chronic cannabinoid use desensitizes and downregulates cannabinoid type 1 (CB1) receptors.
- Overstimulation of TRPV1 due to chronic cannabis use can lead to visceral vasodilation and cutaneous vasoconstriction, causing nausea/vomiting, abdominal pain.
- Usually, chronic weekly cannabis use ranging from 1-4 years.

3 clinical phases

- **Prodromal**- days to weeks; morning nausea, fear of vomiting, abdominal discomfort, usually normal eating habits; maintain/increase cannabis use to self-medicate.
- **Hyperemetic** – hours to days; timing varies but usually 48 hours or less; paroxysmal intense episodes of NBNB N/V, mild or profuse abdominal pain; weight loss common (70% over 5kg)
- **Recovery**- lasts weeks to months; wellness, weight restoration, better eating

Mechanism of action capsaicin and hydrotherapy

- Heat causes cutaneous vasodilation, drawing blood flow away from GI/viscera to skin, relieving pain
- Heat is a sensory distractor from the pain
- Heat and Capsaicin act on the cutaneous/superficial transient receptor potentialvanilloid-1 (TRPV1) receptors, activating them to provide relief through vasodilation;TRPV1 receptors are thought to be dysfunctional in chronic cannabinoid use

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Differential Diagnosis in Cannabinoid Hyperemesis Syndrome

Rome IV Diagnostic Criteria for Cyclic Vomiting Syndrome

Must include all of the following:
- Stereotypical episodes of vomiting regarding onset (acute) and duration (< 1 week)
- At least three discrete episodes in the prior year and two episodes in the past 6 months, occurring at least 1 week apart
- Absence of vomiting between episodes, but other milder symptoms can be present between cycles

*Criteria fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis
Supportive remark: History or family history of migraine headaches

Differential Diagnosis for CHS

GI	Neurologic	Genitourinary	Endocrine	Other
• Gastroenteritis • Gastritis/PUD • SMA syndrome (high risk for this in CHS with weight loss) • Inflammatory bowel disease • Functional abdominal pain • Gallbladder pathology • Constipation • Bowel obstruction • Pancreatitis • Appendicitis • GERD	• Elevated intracranial pressure • Cerebral vascular accident • Concussion • Vestibular disorders • Migraine • Dysautonomia	• Nephrolithiasis • Urinary tract infection • Pregnancy • Ovarian/ testicular torsion	• Diabetic ketoacidosis • Thyroid disorders • Endocrine tumors	• Cannabis withdrawal syndrome • Cyclic vomiting syndrome • Rumination syndrome • Eating disorders • Metabolic, genetic disorders • Ingestion

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Comprehensive History Taking I Patient with Suspected CHS

HEEADSSS Assessment

Home & Environment
Education & Employment
Eating & Exercise
Activities
Drugs/Substances
Sexuality
Suicide/Depression
Safety

Dot phrase for HEEADSSS assessment: ".HEADSSS" (from user Julia Sparks)

Best practices when performing a HEEADSSS assessment:

1. Politely ask family member to step out for a moment
2. Use non-judgmental language
3. Re-iterate confidentiality and purpose for asking questions
4. Specifically ask the patient about disclosure. Can this information be shared with family?
5. If appropriate document details of conversation in a *Mature Minor Note* in Epic

Common Physical Exam Findings in CHS

- Nauseous, uncomfortable
- Abdomen soft +/- vaguely tender
- Lack of peritoneal signs (rebound, guarding)
- Dehydration (tacky mucous membranes, delayed capillary refill)

Best practices for asking about THC use:

1. Clarify how THC is used (edible, smoking, vaping) and source of THC (natural vs synthetic products)
2. Determine frequency of use
3. Determine motivations for use. Does the patient comment on perceived benefits and/or potential adverse effects from THC use?
4. Do they have craving or withdrawal symptoms?
5. Are they interested in quitting?

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Diagnostics

How to Calculate QTc Manually:

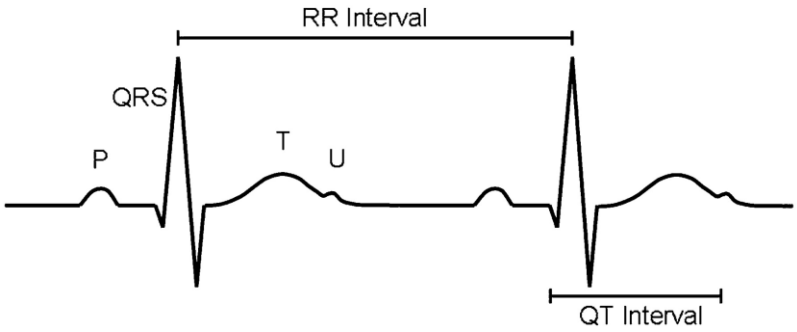
https://www.mdcalc.com/calc/48/corrected-qt-interval-qtc

If QTc manual calculation > 460 ms, please use non-QTc prolonging antiemetics (see Table)

Low K, Phos, Mg can all happen in CHS (vomiting, poor PO), and then worsen risk for prolonged QTc and resultant Torsades de pointes. Maintain normal levels of these in patients on QTc prolonging meds.

Bazett's Formula

$$QTc = \frac{QT}{\sqrt{RR}} \quad \begin{matrix} \text{msec} \\ \text{sec} \end{matrix}$$



Expected lab findings:

- Signs of dehydration (hemoconcentration, elevated BUN +/- prerenal AKI, elevated spec gravity on UA)
- Persistent vomiting and dehydration can lead to:
  - Hypochloremia
  - Hypokalemia
  - Hypomagnesemia
  - Hypophosphatemia
- Mixed AGMA + metabolic alkalosis from emesis

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Version	Date	Guideline Owner	Summary of Edits	Next Revision Due
1	February 2026	Julia Sparks, MD		

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1. Aziz, I., Palsson, O. S., Whitehead, W. E., Sperber, A. D., Simren, M., & Tornblom, H. (2019). Epidemiology, Clinical Characteristics, and Associations for Rome IV Functional Nausea and Vomiting Disorders in Adults. *Clin Gastroenterol Hepatol*, *17*(5), 878-886. https://doi.org/10.1016/j.cgh.2018.05.020
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