Acute Management of Migraine and Migraine-Like Headache

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Connecticut Children's

What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.

Objectives of Pathway

- To facilitate provider comfort in managing migraine-like headache through standardization of therapy, including second line agents
- To improve emergency department throughput of patients who present with migraine-like headache
- To standardize care of children with migraine-like headache, both in the emergency department and upon disposition

Why is this pathway necessary?

- New guidelines by the American Academy of Neurology published in 2019
  - Incorporation of sumatriptan NS
- Variation in provider practice
  - Use of prochlorperazine, metoclopramide, ondansetron, among others
- Unclear discharge planning
  - Which patients might benefit from admission
  - With whom should patients with migraine headache refractory to initial outpatient management follow up

Background

- Migraines: common reason for ED presentation
  - Most common cause of acute and recurrent headache in children and adolescents
  - Estimated 1% of all visits; translates to over 600 annual evaluations at CT Children's annually
  - Inpatient admissions: between 3-32%
- High morbidity
  - Depression
  - Decreased quality of life
- Large variability in practice
  - Intravenous normal saline, metoclopramide, prochlorperazine, promethazine, ondansetron, diphenhydramine, non-steroid analgesic drugs, steroids and triptans

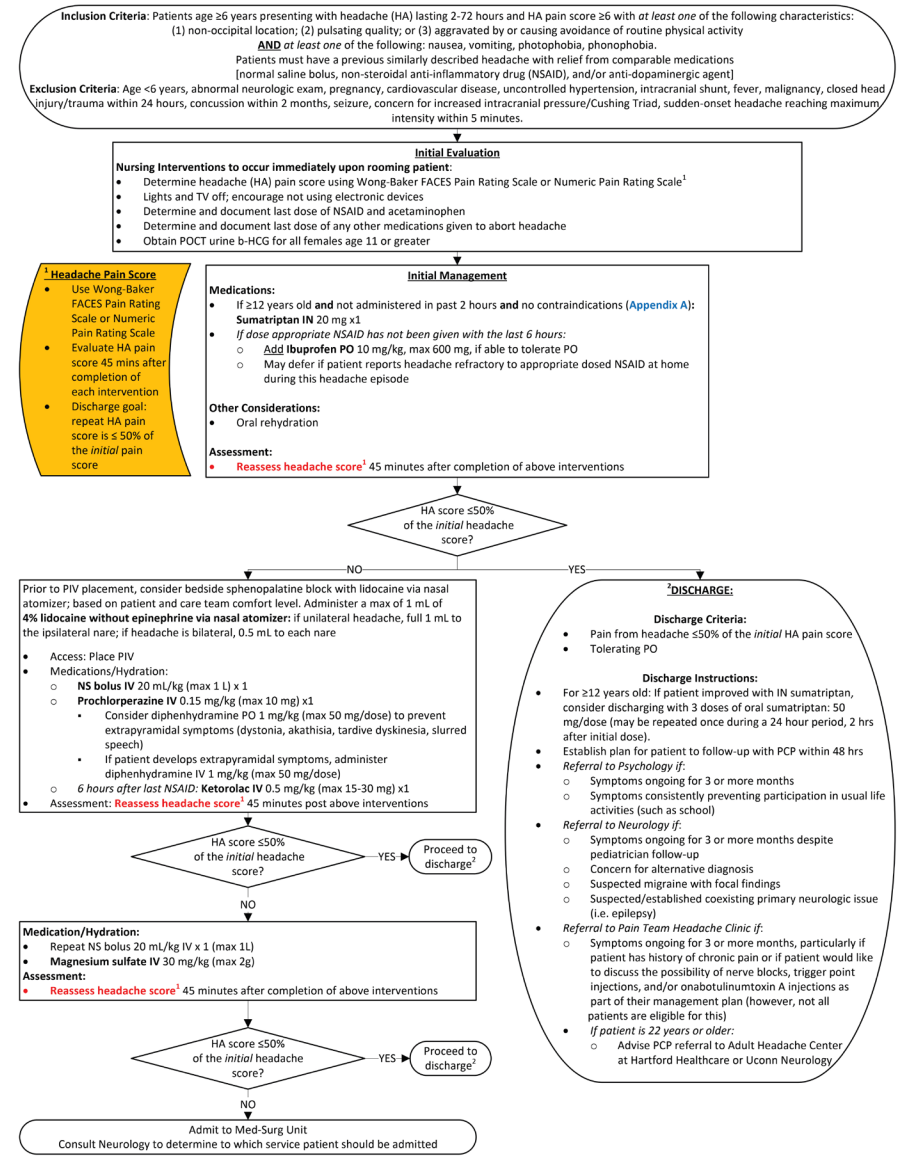
This is the Acute Management of Migraine and Migraine-Like Headache Clinical Pathway.

We will be reviewing each component in the following slides.

CLINICAL PATHWAY:

Acute Management of Migraine and Migraine-Like Headache

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



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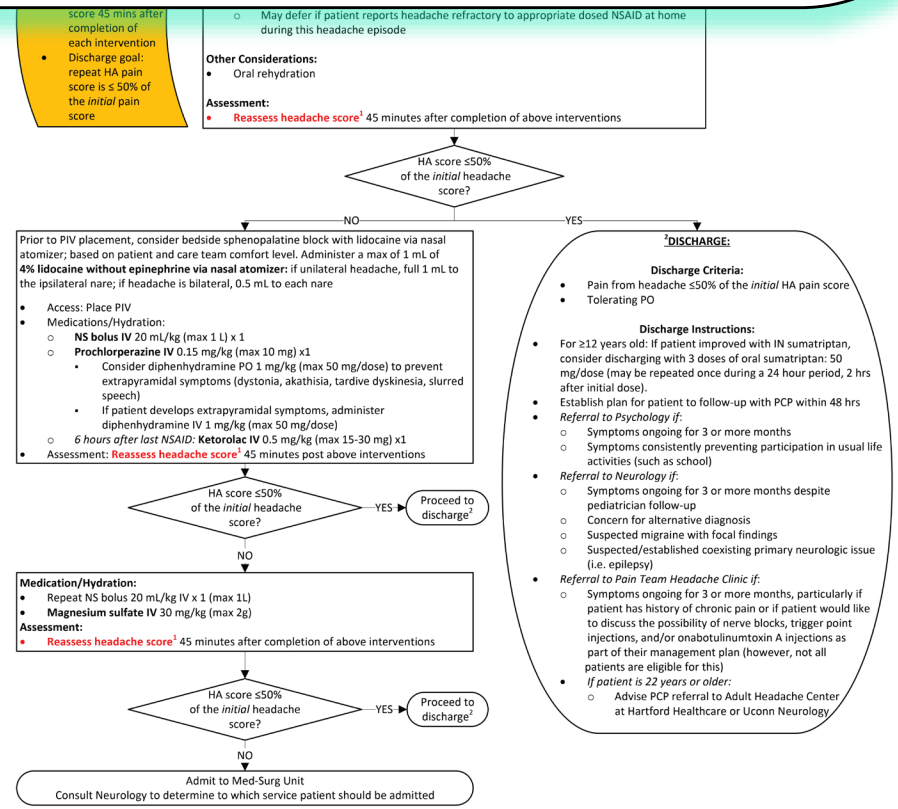
Inclusion Criteria: Patients age ≥6 years presenting with headache (HA) lasting 2-72 hours and HA pain score ≥6 with *at least one* of the following characteristics: (1) non-occipital location; (2) pulsating quality; or (3) aggravated by or causing avoidance of routine physical activity
AND *at least one* of the following: nausea, vomiting, photophobia, phonophobia.
Patients must have a previous similarly described headache with relief from comparable medications [normal saline bolus, non-steroidal anti-inflammatory drug (NSAID), and/or anti-dopaminergic agent]
Exclusion Criteria: Age <6 years, abnormal neurologic exam, pregnancy, cardiovascular disease, uncontrolled hypertension, intracranial shunt, fever, malignancy, closed head injury/trauma within 24 hours, concussion within 2 months, seizure, concern for increased intracranial pressure/Cushing Triad, sudden-onset headache reaching maximum intensity within 5 minutes.

It is important to note that only patients that meet these specific criteria can be managed like migraines.

The presence of any concerning features, such as fever, injury and seizures, are concerning for an alternative etiology and should be evaluated and treated off pathway.



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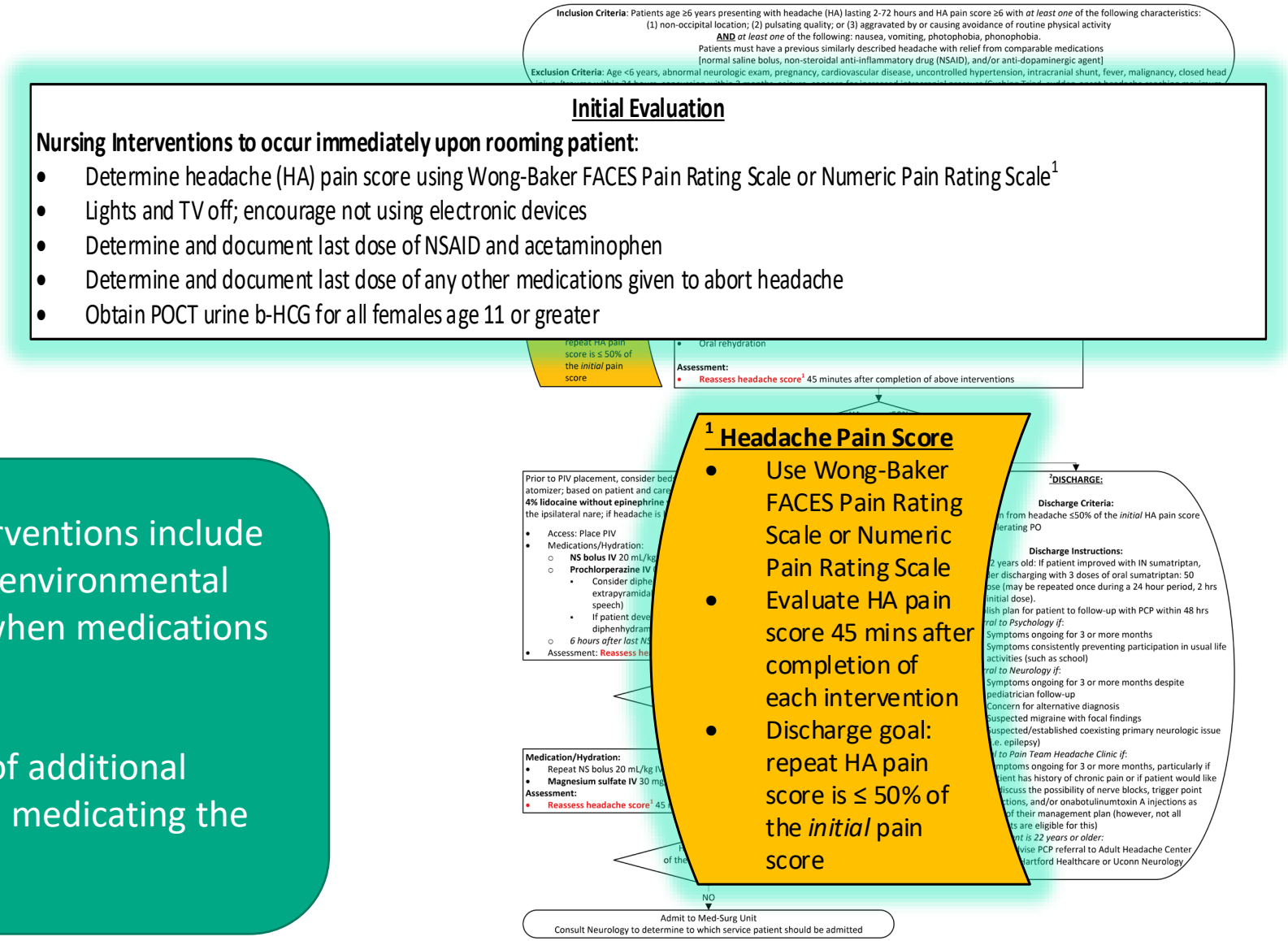

Upon rooming the patient, nursing interventions include pain evaluation, controlling potential environmental triggers, and obtaining information on when medications were given last.

This will allow for accurate timing of additional medications, and avoid over (or under) medicating the patient.

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Exclusion Criteria: Age <6 years, abnormal neurologic exam, pregnancy, cardiovascular disease, uncontrolled hypertension, intracranial shunt, fever, malignancy, closed head

Initial Evaluation

Nursing Interventions to occur immediately upon rooming patient:

- Determine headache (HA) pain score using Wong-Baker FACES Pain Rating Scale or Numeric Pain Rating Scale[1]
- Lights and TV off; encourage not using electronic devices
- Determine and document last dose of NSAID and acetaminophen
- Determine and document last dose of any other medications given to abort headache
- Obtain POCT urine b-HCG for all females age 11 or greater

repeat HA pain score is ≤ 50% of the *initial* pain score

- Oral rehydration

Assessment:

- Reassess headache score[1] 45 minutes after completion of above interventions

Prior to PIV placement, consider bed
atomizer; based on patient and care
4% lidocaine without epinephrine
the ipsilateral nare; if headache is

- Access: Place PIV
- Medications/Hydration:
  - **NS bolus IV** 20 mL/kg
  - **Prochlorperazine IV**
    - Consider diphe extrapyramida speech)
    - If patient deve diphenhydram
  - *6 hours after last NS*
- Assessment: Reassess he

Medication/Hydration:

- Repeat NS bolus 20 mL/kg IV
- **Magnesium sulfate IV** 30 mg

Assessment:

- Reassess headache score[1] 45

of the

NO

Admit to Med-Surg Unit
Consult Neurology to determine to which service patient should be admitted

[2]**DISCHARGE:**

Discharge Criteria:
n from headache ≤50% of the *initial* HA pain score
lerating PO

Discharge Instructions:
2 years old: If patient improved with IN sumatriptan,
er discharging with 3 doses of oral sumatriptan: 50
ose (may be repeated once during a 24 hour period, 2 hrs
initial dose).
lish plan for patient to follow-up with PCP within 48 hrs
ral to Psychology if:
Symptoms ongoing for 3 or more months
Symptoms consistently preventing participation in usual life activities (such as school)
ral to Neurology if:
Symptoms ongoing for 3 or more months despite pediatrician follow-up
Concern for alternative diagnosis
Suspected migraine with focal findings
Suspected/established coexisting primary neurologic issue (e. epilepsy)
l to Pain Team Headache Clinic if:
mptoms ongoing for 3 or more months, particularly if ient has history of chronic pain or if patient would like discuss the possibility of nerve blocks, trigger point ctions, and/or onabotulinumtoxin A injections as f their management plan (however, not all ts are eligible for this)
nt is 22 years or older:
vise PCP referral to Adult Headache Center artford Healthcare or Uconn Neurology

[1] Headache Pain Score

- Use Wong-Baker FACES Pain Rating Scale or Numeric Pain Rating Scale
- Evaluate HA pain score 45 mins after completion of each intervention
- Discharge goal: repeat HA pain score is ≤ 50% of the *initial* pain score

Note that pain scores are evaluated using either the Wong-Baker FACES Pain rating scale, or the Numeric Pain Rating Scale.

After a baseline pain score is determined, routine evaluations will occur 45 minutes after completion of each intervention outlined. This will allow providers to determine if pain is being appropriately managed.

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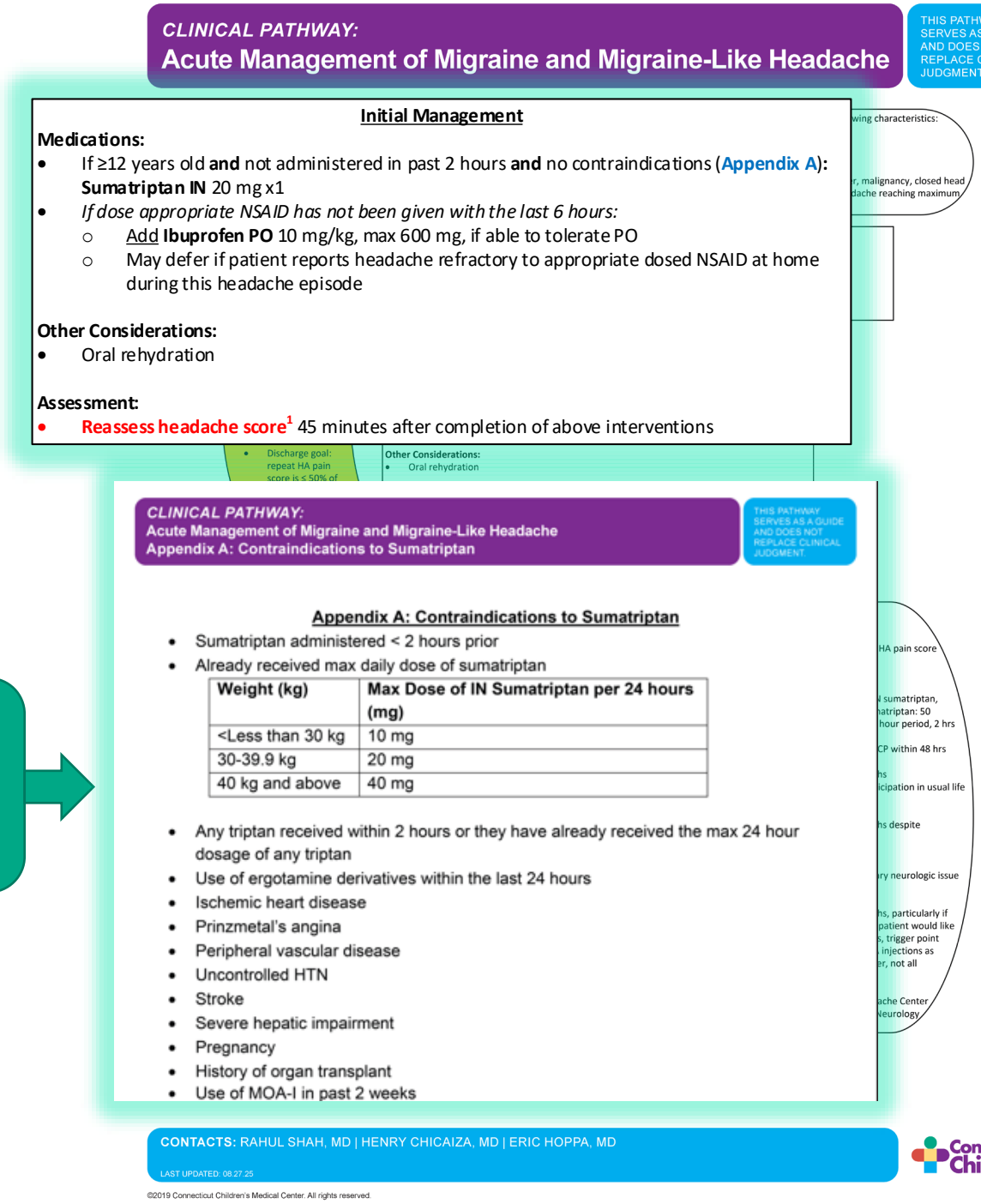
Intranasal sumatriptan and NSAIDs have the best evidence for acute migraine management, and are utilized as the primary interventions here.

Sumatriptan can be used as long as no contraindications exist.

Appendix A outlines contraindications to Sumatriptan use.



CLINICAL PATHWAY:
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Initial Management

Medications:

- If ≥12 years old **and** not administered in past 2 hours **and** no contraindications (Appendix A): **Sumatriptan IN** 20 mg x1
- *If dose appropriate NSAID has not been given with the last 6 hours:*
  - Add **Ibuprofen PO** 10 mg/kg, max 600 mg, if able to tolerate PO
  - May defer if patient reports headache refractory to appropriate dosed NSAID at home during this headache episode

Other Considerations:

- Oral rehydration

Assessment:

- **Reassess headache score**[1] 45 minutes after completion of above interventions

CLINICAL PATHWAY:
Acute Management of Migraine and Migraine-Like Headache
Appendix A: Contraindications to Sumatriptan

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Appendix A: Contraindications to Sumatriptan

- Sumatriptan administered < 2 hours prior
- Already received max daily dose of sumatriptan

Weight (kg)	Max Dose of IN Sumatriptan per 24 hours (mg)
<Less than 30 kg	10 mg
30-39.9 kg	20 mg
40 kg and above	40 mg

- Any triptan received within 2 hours or they have already received the max 24 hour dosage of any triptan
- Use of ergotamine derivatives within the last 24 hours
- Ischemic heart disease
- Prinzmetal's angina
- Peripheral vascular disease
- Uncontrolled HTN
- Stroke
- Severe hepatic impairment
- Pregnancy
- History of organ transplant
- Use of MOA-I in past 2 weeks

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  - Add **Ibuprofen PO** 10 mg/kg, max 600 mg, if able to tolerate PO
  - May defer if patient reports headache refractory to appropriate dosed NSAID at home during this headache episode

Other Considerations:

- Oral rehydration

Assessment:

- **Reassess headache score**[1] 45 minutes after completion of above interventions

In addition, oral rehydration can be initiated.

It is important to reassess the headache score **45 minutes** after these interventions.

Prior to PIV placement, consider bedside sphenopalatine block with lidocaine via nasal atomizer; based on patient and care team comfort level. Administer a max of 1 mL of **4% lidocaine without epinephrine via nasal atomizer:** if unilateral headache, full 1 mL to the ipsilateral nare; if headache is bilateral, 0.5 mL to each nare

- Access: Place PIV
- Medications/Hydration:
  - **NS bolus IV** 20 mL/kg (max 1 L) x 1
  - **Prochlorperazine IV** 0.15 mg/kg (max 10 mg) x1
    - Consider diphenhydramine PO 1 mg/kg (max 50 mg/dose) to prevent extrapyramidal symptoms (dystonia, akathisia, tardive dyskinesia, slurred speech)
    - If patient develops extrapyramidal symptoms, administer diphenhydramine IV 1 mg/kg (max 50 mg/dose)
  - *6 hours after last NSAID:* **Ketorolac IV** 0.5 mg/kg (max 15-30 mg) x1
- Assessment: **Reassess headache score**[1] 45 minutes post above interventions

HA score ≤50% of the *initial* headache score? — YES → Proceed to discharge[2]

NO

Medication/Hydration:

- Repeat NS bolus 20 mL/kg IV x 1 (max 1L)
- **Magnesium sulfate IV** 30 mg/kg (max 2g)

Assessment:

- **Reassess headache score**[1] 45 minutes after completion of above interventions

HA score ≤50% of the *initial* headache score? — YES → Proceed to discharge[2]

NO

Admit to Med-Surg Unit
Consult Neurology to determine to which service patient should be admitted

[2]DISCHARGE:

Discharge Criteria:

- Pain from headache ≤50% of the *initial* HA pain score
- Tolerating PO

Discharge Instructions:

- For ≥12 years old: If patient improved with IN sumatriptan, consider discharging with 3 doses of oral sumatriptan: 50 mg/dose (may be repeated once during a 24 hour period, 2 hrs after initial dose).
- Establish plan for patient to follow-up with PCP within 48 hrs
- *Referral to Psychology if:*
  - Symptoms ongoing for 3 or more months
  - Symptoms consistently preventing participation in usual life activities (such as school)
- *Referral to Neurology if:*
  - Symptoms ongoing for 3 or more months despite pediatrician follow-up
  - Concern for alternative diagnosis
  - Suspected migraine with focal findings
  - Suspected/established coexisting primary neurologic issue (i.e. epilepsy)
- *Referral to Pain Team Headache Clinic if:*
  - Symptoms ongoing for 3 or more months, particularly if patient has history of chronic pain or if patient would like to discuss the possibility of nerve blocks, trigger point injections, and/or onabotulinumtoxin A injections as part of their management plan (however, not all patients are eligible for this)
- *If patient is 22 years or older:*
  - Advise PCP referral to Adult Headache Center at Hartford Healthcare or Uconn Neurology

[1] Headache Pain Score

- Use Wong-Baker FACES Pain Rating Scale or Numeric Pain Rating Scale
- Evaluate HA pain score 45 mins after completion of each intervention
- Discharge goal: repeat HA pain score is ≤ 50% of the *initial* pain score

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If the headache score decreased to ≤50% of the initial headache score that the nurse obtained upon arrival, and is tolerating PO, then the patient can be prepped for discharge

The outlined discharge plan is crucial for adequate outpatient management to avoid relapses and returns to ED

Primary management will be through the PCP, with specific criteria to refer to specialists, including Psychology, Neurology, Pain Team Headache Clinic

If the patient is 22 years or older, please refer to adult specialists listed in pathway

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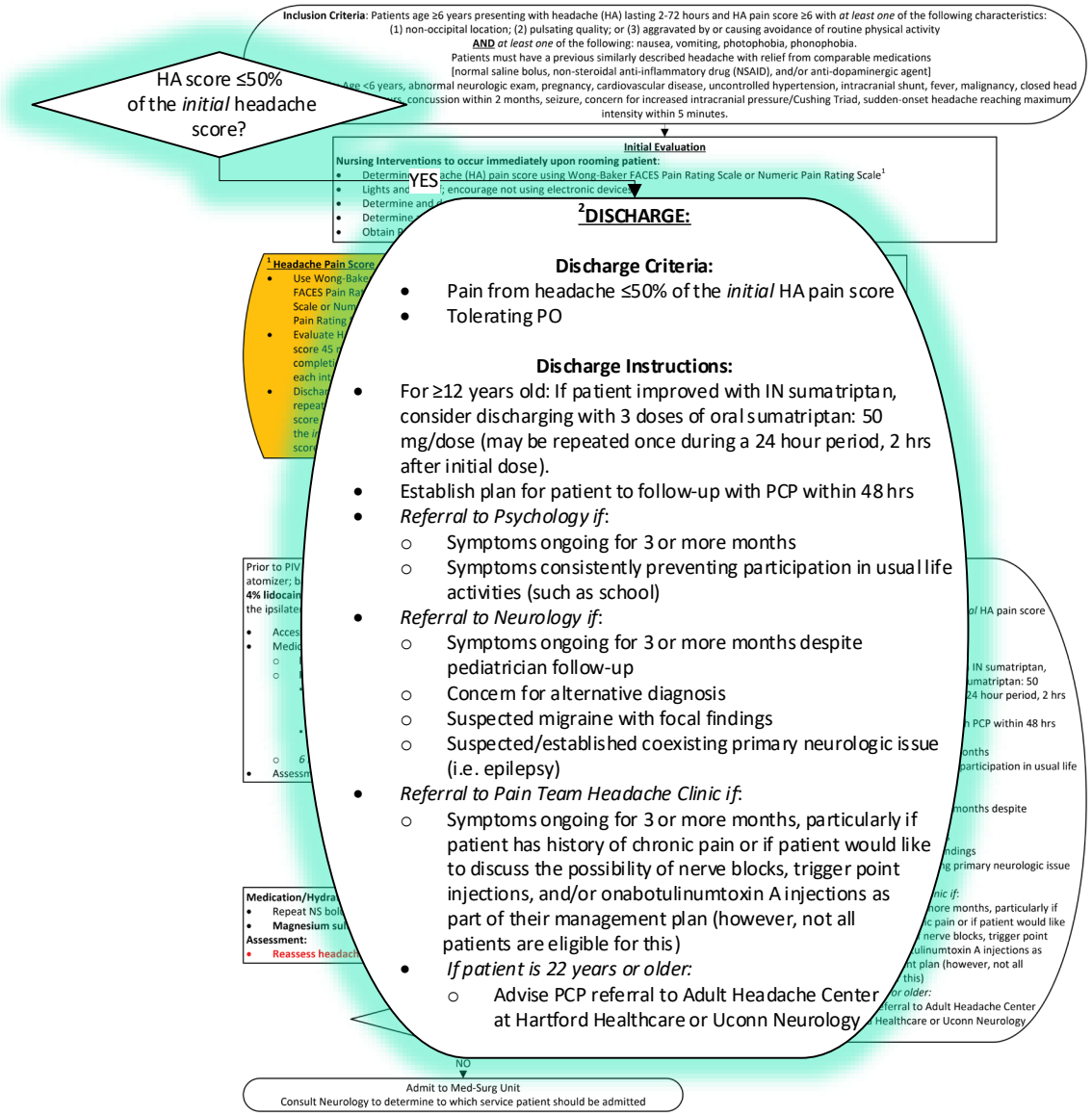

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Secondary Interventions:

After the initial management, if the reassessment headache score is not ≤50% of the *initial* headache score obtained upon arrival, further interventions are recommended.

Sphenopalatine Block:

If patient and provider comfortable, may try a sphenopalatine block via nasal atomizer prior to placing a PIV for IV medications

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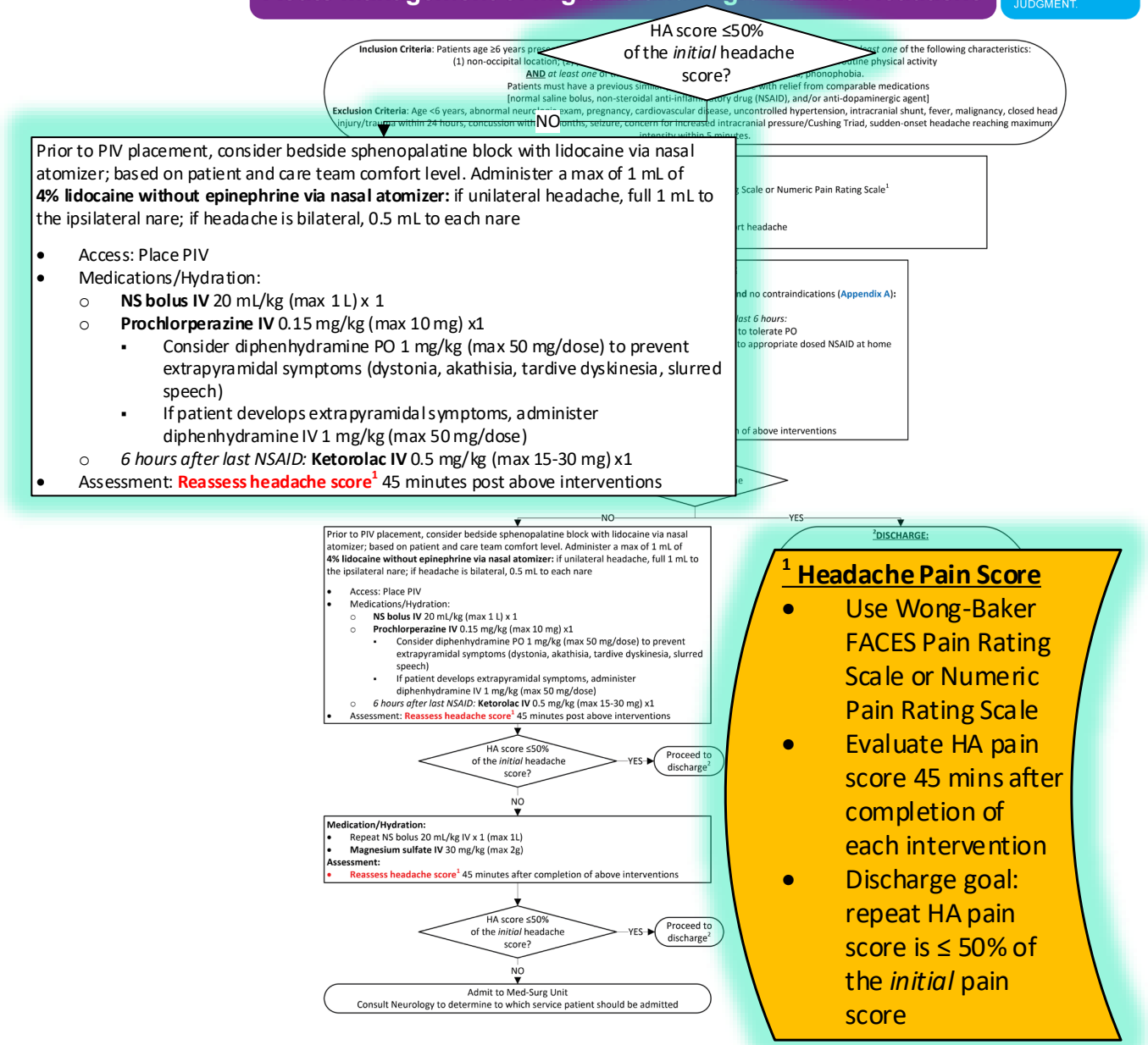

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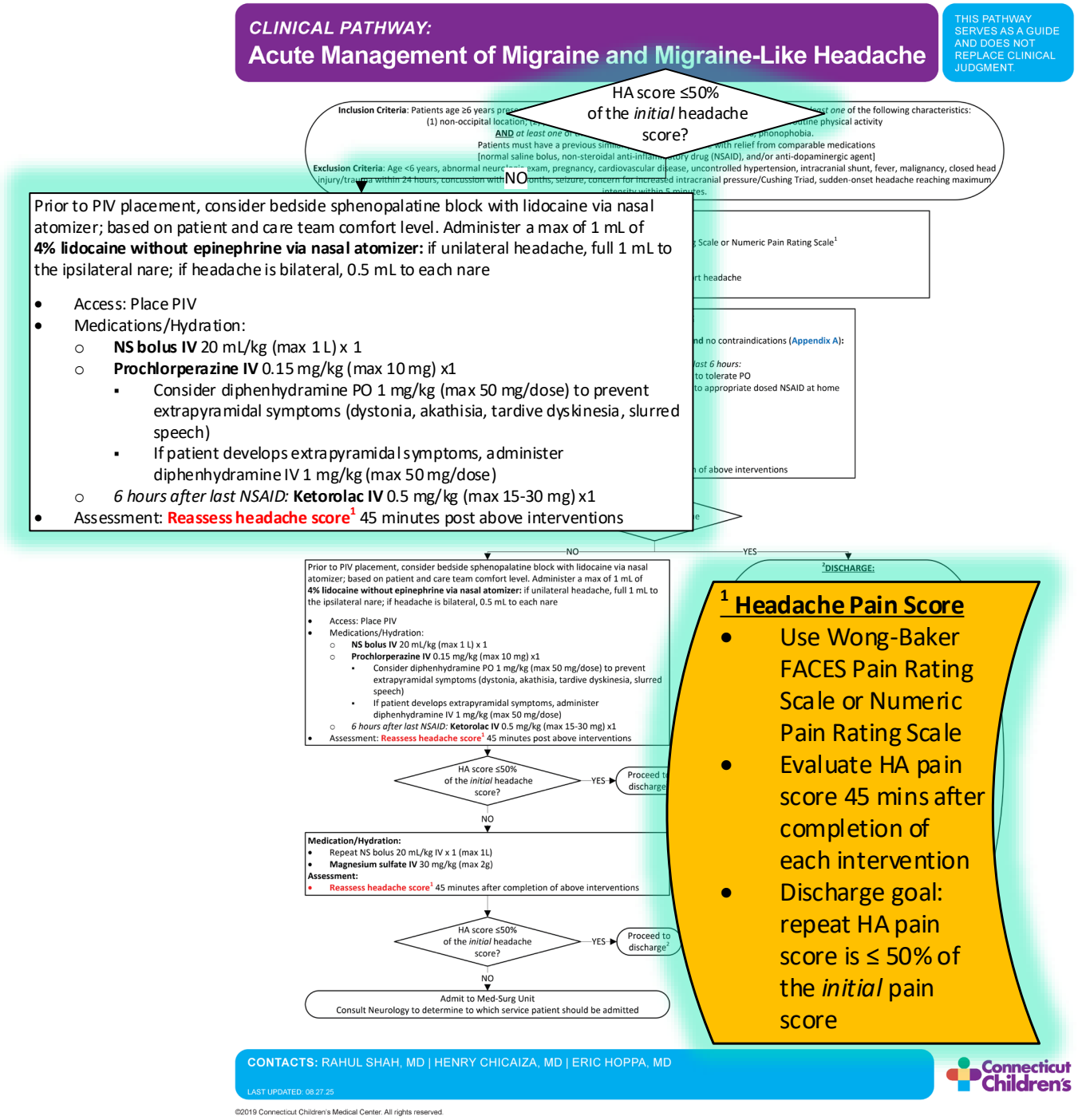
Secondary Interventions Continued:

If sphenopalatine block is not used or if unsuccessful, place PIV for administration of NS bolus, prochlorperazine, and ketorolac

Recent studies show that prochlorperazine is superior to metoclopramide in reducing return visits – and is recommended as a secondary intervention.

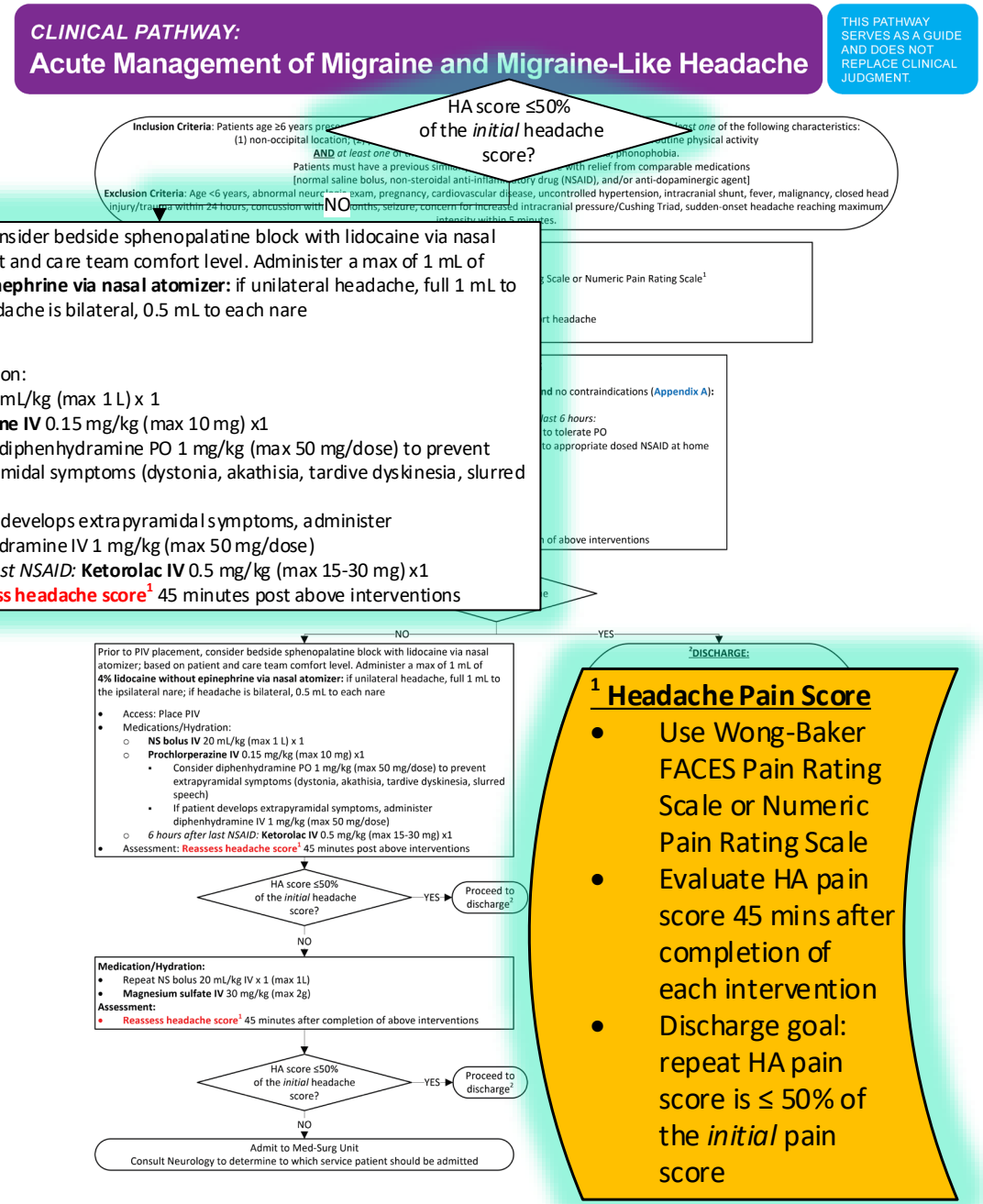
Specific criteria for diphenhydramine are given, as recent studies show that it can be associated with return visits.

Adult literature suggests that 10-15 mg of ketorolac may be the therapeutic ceiling for analgesia, thus only 1 dose is recommended. However, may try up to 30 mg.



Secondary Interventions:

After completion of all the secondary interventions, wait 45 minutes and reassess the headache score.



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Secondary Interventions:

If the reassessment score has improved to be ≤50% of the initial headache score obtained upon arrival, then may consider discharge.

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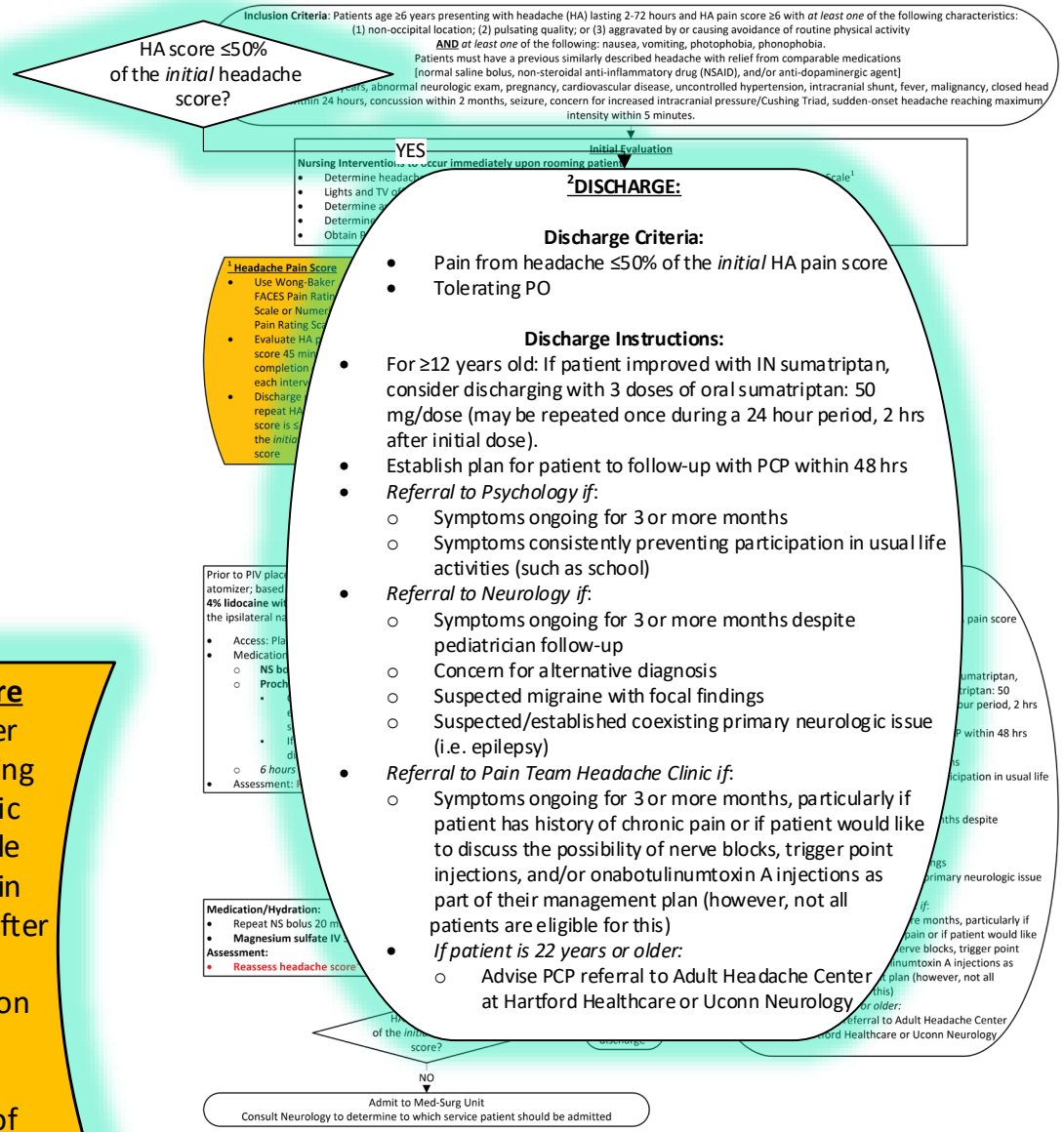

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Tertiary Interventions:

However, if the headache score continues to be elevated after the secondary interventions are complete, tertiary interventions would include repeating the NS bolus and trialing magnesium sulfate.

Again, 45 minutes later, the headache score should be reassessed.

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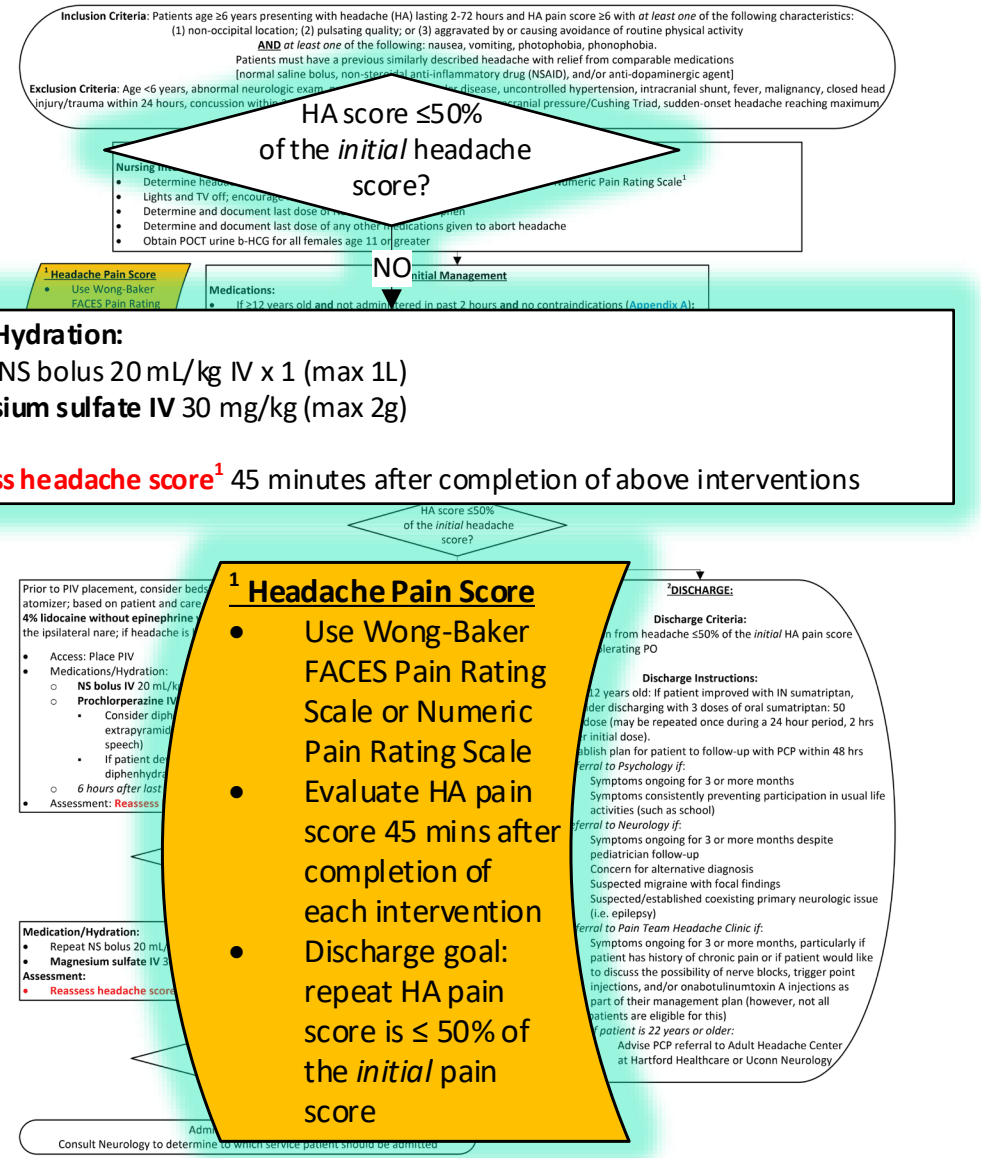

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Tertiary Interventions:

If there is adequate improvement in headache score after the tertiary interventions, the patient may be considered for discharge.

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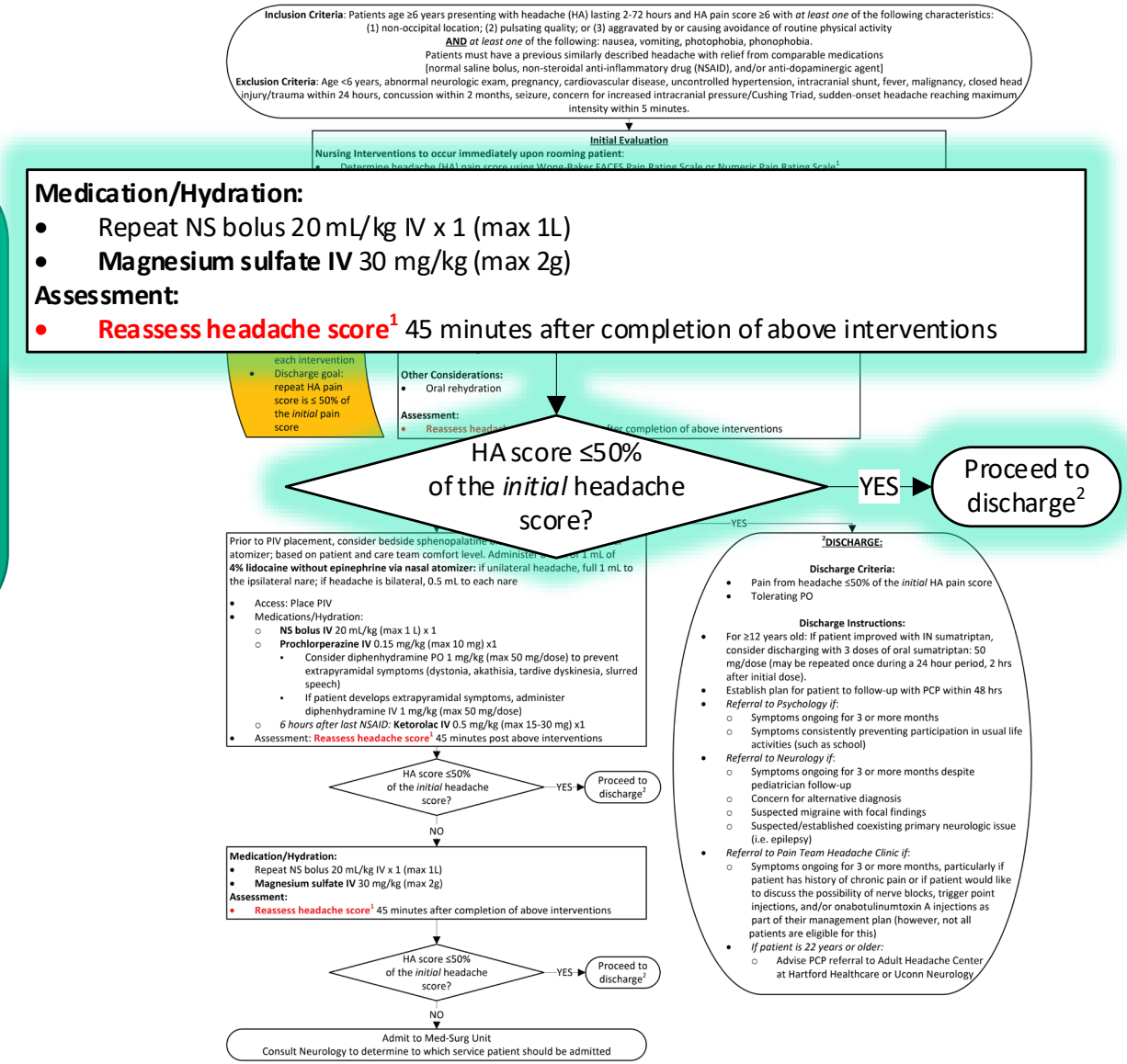

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If there is no adequate improvement after the tertiary interventions, admission to med/surg unit is warranted for further management.

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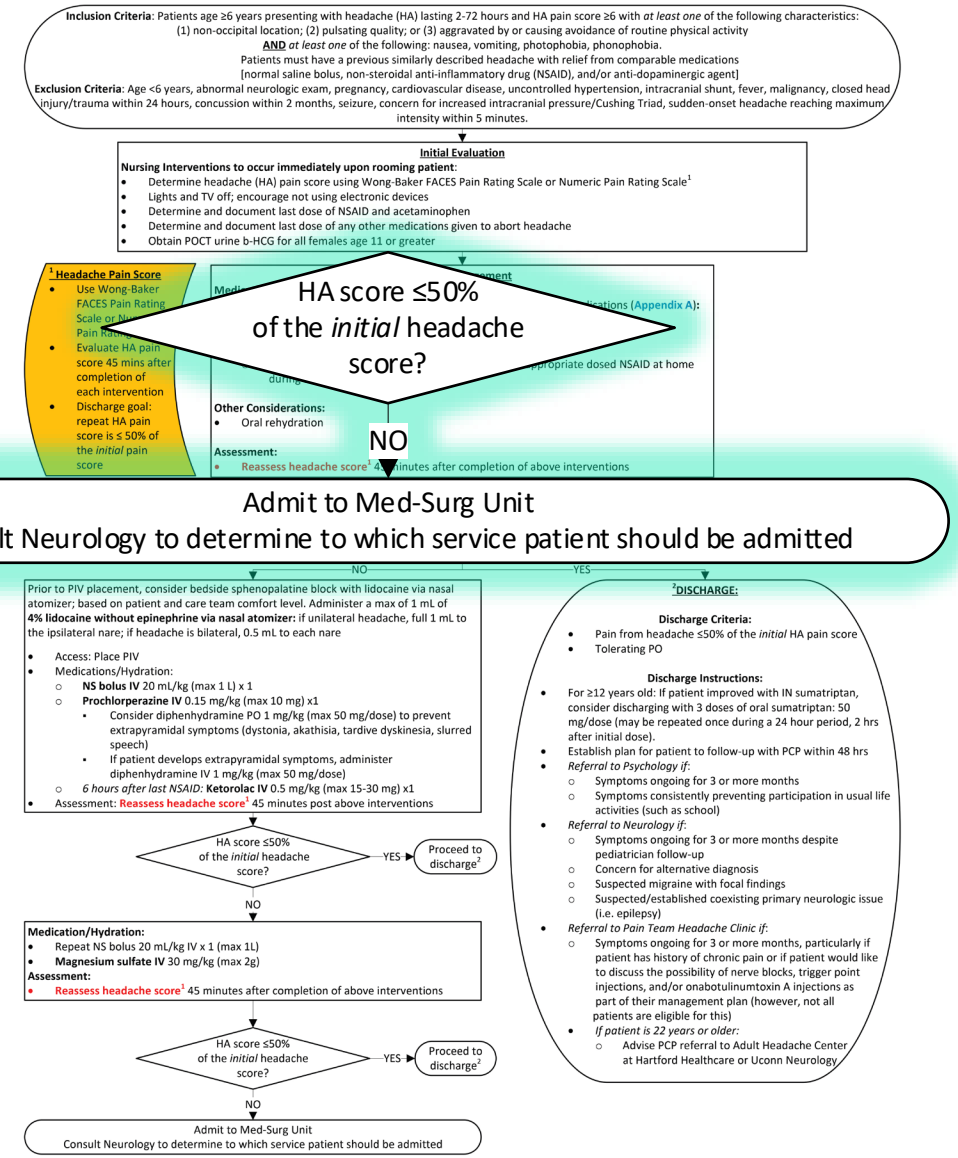

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Review of Key Points

- Migraines may occur in school-aged children
- Among suggested therapies, intranasal Sumatriptan and NSAIDs have the best evidence of efficacy
- Sphenopalatine block via nasal atomizer may be an effective secondary intervention if patient and provider comfortable with this
- Most recent evidence suggests that:
  - Prochlorperazine is superior to metoclopramide in reducing return visits
  - Diphenhydramine may be associated with return visits
- Adult literature suggests that 10 or 15 mg of ketorolac may be the therapeutic ceiling for analgesia, but may try up to 30 mg

Quality Metrics

- Percentage of eligible patients managed per pathway
- Percentage of patients with migraine who are admitted to the hospital
- Rate of return to ED for headache within 48 hours
- Rate of return to ED for headache within 7 days
- Time from arrival to ED to administration of first dose of medication
- Average time from ED arrival to disposition
- Average pain score at disposition
- Percent change in pain score from time of initial evaluation to time of disposition
- Usage of IN sumatriptan
- Usage of sphenopalatine block

Pathway Contacts

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- Erica Hoppa, MD
  - Department of Pediatrics; Division of Pediatric Emergency Medicine

References

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Thank You!

About Connecticut Children's Clinical Pathways Program

The Clinical Pathways Program at Connecticut Children's aims to improve the quality of care our patients receive, across both ambulatory and acute care settings. We have implemented a standardized process for clinical pathway development and maintenance to ensure meaningful improvements to patient care as well as systematic continual improvement. Development of a clinical pathway includes a multidisciplinary team, which may include doctors, advanced practitioners, nurses, pharmacists, other specialists, and even patients/families. Each clinical pathway has a flow algorithm, an educational module for end-user education, associated order set(s) in the electronic medical record, and quality metrics that are evaluated regularly to measure the pathway's effectiveness. Additionally, clinical pathways are reviewed annually and updated to ensure alignment with the most up to date evidence. These pathways serve as a guide for providers and do not replace clinical judgment.