Provincial Clinical Knowledge Topic

Primary Headaches, Adult – Emergency

V 1.0

Revision History

Version	Date of Revision	Description of Revision	Revised By
1.0	March 2017	Topic completed and disseminated	See Acknowledgements

Important Information Before You Begin

The recommendations contained in this knowledge topic have been provincially adjudicated and are based on best practice and available evidence. Clinicians applying these recommendations should, in consultation with the patient, use independent medical judgment in the context of individual clinical circumstances to direct care. This knowledge topic will be reviewed periodically and updated as best practice evidence and practice change.

The information in this topic strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards and align with Quality and Safety initiatives and accreditation requirements such as the Required Organizational Practices. Some examples of these initiatives or groups are: Health Quality Council Alberta (HQCA), Choosing Wisely campaign, Safer Healthcare Now campaign etc.

Goals of Management

1. Obtain a focused history and physical examination looking to identify patients with a serious secondary cause of headache
2. In patients without an identifiable secondary cause, attempt to determine the likely type of primary headache (e.g. – migraine, tension, cluster)
3. Consider symptomatic relief in all patients, regardless of the cause of headache
    - In patients with an identifiable primary headache subtype, provide targeted therapies as appropriate
    - Avoid contributing to medication overuse headaches by carefully considering this in the differential diagnosis of primary headache sufferers already using opiates, triptans, ergots, NSAIDs, or acetaminophen
4. Obtain specialty consultation and/or hospital admission when warranted (see Clinical Decision Support)

Clinical Decision Support

Clinical Assessment Tools

**See Appendix A for International Headache Society Criteria for diagnosis of migraine, tension, and cluster headaches

Table 1. Red Flags for serious secondary cause of headache[1,2]

- Sudden onset / thunderclap
- Altered mental status
- Fever with meningismus / nuchal rigidity
- Focal neurological deficits on physical examination, including pupillary exam
- Papilledema
- Clinical findings suggestive of Temporal Arteritis
- Clinical findings suggestive of Acute Angle Closure Glaucoma
- Neck pain / other findings suggestive of cervicocranial arterial dissection
- Risk factors for cerebral venous sinus thrombosis
- History of malignancy
- Immunocompromised
- Vomiting without other cause
- Suspected CO exposure
- New headache onset after age 50 years
- IV drug use (risk factor for CNS abscess)

The presence of a 'red flag' does not necessarily mandate imaging or other testing, but the absence of red flags makes it unlikely that testing will produce a clinically important result.

Table 2. POUNDing mnemonic for migraine headache[1]

- **P**ulsatile quality;
- duration 4-72 h**O**urs;
- **U**nilateral location;
- **N**ausea and/or vomiting;
- **D**isabling intensity (suffers often have to sit in a dark, quiet room)

If 4/5 present: LR (+) for diagnosis of 'definite migraine' = 5.8

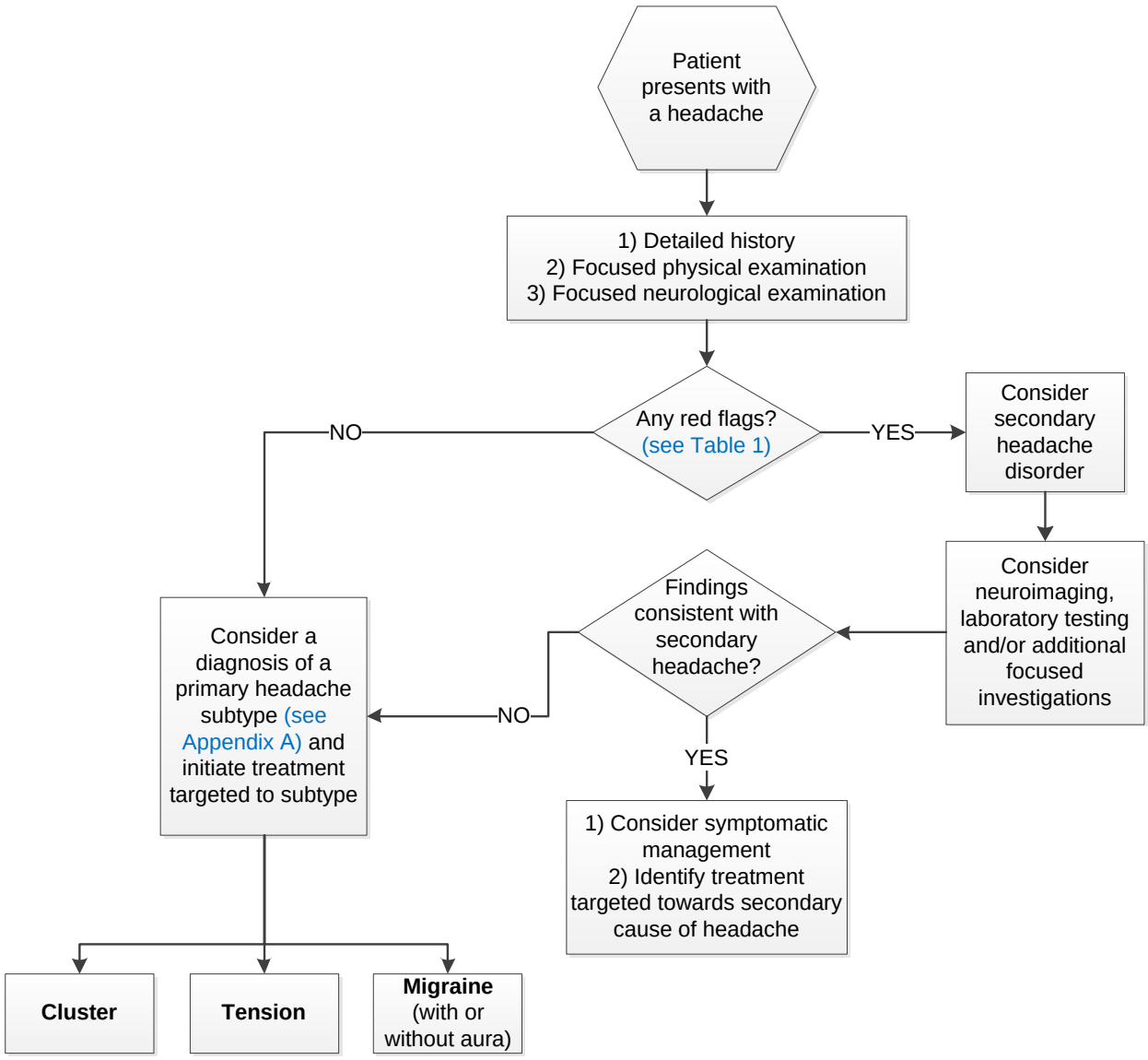
Table 3. Ottawa Subarachnoid Hemorrhage Rule[3]

For alert patients older than 15y with <u>new severe nontraumatic headache reaching maximum intensity within 1 hour</u>, investigate for subarahnoid hemorrhage if 1 or more of the following are present:

- Age 40 years or older
- Neck pain or stiffness
- Witnessed loss of consciousness
- Onset during exertion
- Thunderclap headache (instantly peaking pain)
- Limited neck flexion on examination

***May not be used for patients with new neurological deficits, previous aneurysms, previous subarachnoid hemorrhage, brain tumors, or history of recurrent headaches (≥3 or more episodes over the course of ≥6 months)

Figure 1. Headache Clinical Pathway



Initial Decision Making

1. Assess for the presence of any ‘red flags’ to suggest a secondary cause for headache (see Table 1)
    - Based on the findings order neuroimaging, laboratory testing, and/or additional focused investigations targeted towards the diagnosis of concern in patients exhibiting red flags. (*N.B. – the presence of a ‘red flag’ does not necessarily mandate imaging or further testing, but the absence of red flags makes it unlikely testing will produce a clinically important result)*
    - Provide symptomatic management (e.g. antiemetics, analgesia)
    - Identify treatments targeted towards any secondary causes of headache that become evident during the course of investigation
2. In patients without red flags:
    - Consider a diagnosis of a primary headache subtype (see Appendix A)
        - Migraine (with or without aura)
        - Tension
        - Cluster
        - Paroxysmal hemicrania
    - Suggest deferring any further investigations (imaging, labs) in patients with normal neurological examinations and a lack of any ‘red flags’ who meet the criteria for a primary headache subtype
    - Provide treatments targeted to the primary headache subtype

Order Set: Primary Headaches, Adult – Emergency

Order Set Components

Order Set Keywords: migraine; cluster headache; tension headache
Order Set Requirements: Allergies
Risk Assessment / Scoring Tools / Screening: see Clinical Decision Support section

Goals of Care Designation

☐ Goals of Care Designation: _____

Diet / Nutrition

☐ NPO
☐ NPO – May Have Sips, May Take Meds
☐ Clear Fluids
☐ Regular Diet
☐ Other Diet :_____

Patient Care

☐ Vital Signs: These orders need to be re-evaluated when the patient stabilizes or by two hours, whichever occurs first.
  ☐ as per provincial guideline
  ☐ every _____ hourly
  ☐ every _____ minute(s)
  ☐ Continuous cardiac monitoring

Intravenous Therapy

☐ Intravenous Cannula – Insert: Initiate IV
☐ IV Peripheral Saline Flush/Lock: Saline Lock

IV bolus or rapid infusion

  ☐ 0.9% sodium chloride infusion _____ mL as fast as possible

Maintenance IV Solutions

  ☐ 0.9% sodium chloride infusion at _____ mL/hour
  ☐ dextrose 5% - 0.9% sodium chloride infusion at _____ mL/hour
  ☐ dextrose 5% - 0.45% sodium chloride infusion at _____ mL/hour
  ☐ Other: _____ at _____ mL/hour

Lab Investigations

***Generally not indicated for primary headaches; may be useful in patients with history concerning for serious secondary cause (see Table 1), or for coexisting clinical concerns (e.g. – protracted vomiting / dehydration with concerns for electrolyte imbalance)*

Hematology

  ☐ Complete Blood Count (CBC)
  ☐ ESR (*for suspected temporal arteritis or polymyalgia rheumatica*)
  ☐ INR

Chemistry
☐ Electrolytes (Na, K, Cl, CO2)
☐ Glucose random level
☐ Creatinine
☐ C-Reactive Protein (*for suspected temporal arteritis*)

Blood Gases
☐ Blood Gas Venous
☐ Carboxyhemoglobin

Urine Tests
☐ Pregnancy Test, Urine - POCT

Special Fluids: CSF
☐ Cell count
☐ Gram stain, C&S
☐ Protein, glucose
☐ Viral studies

Diagnostic Investigations

***Defer neuroimaging in patients who have a normal clinical examination, who meet diagnostic criteria for a primary headache subtype, and have no "red flags" for a secondary headache disorder (see Clinical Assessment Tools).*

Advanced Imaging: *consider in patients with clinical features suggestive of a secondary cause of headache*

☐ CT Head, non-enhanced
- *See Clinical Assessment Tools for clinical features suggesting the need for imaging*
- *CT head is highly sensitive for SAH only when performed less than 6 hours after onset of headache; LP is indicated to rule out SAH if headache greater than 6 hours and negative CT*

☐ CT Head, Enhanced (*consider if abscess, neoplasm suspected*)
☐ CT Angiogram Head (*consider if aneurysm / AVM / cervicocranial arterial dissection / CVA suspected)*
☐ CT Venogram Head (*if cerebral venous thrombosis suspected*)
☐ MR Brain
- o If required, X-ray Orbits to rule out Foreign Body

☐ Electrocardiogram - 12 Lead

Medications

Table 4. Recommended pharmacologic treatment options in primary headache[4,5]

Migraine	Cluster	Tension
Preferred • metoclopramide • ketorolac • sumatriptan **Alternative** • dihydroergotamine • corticosteroids *(see below for details)* **Not Recommended** • morphine / other opioids • magnesium sulfate • haloperidol • propofol	**Initial** • oxygen • sumatriptan **Refractory** • octreotide • lidocaine **Paroxysmal Hemicrania** • indomethacin	• NSAIDs • acetaminophen

Nonopiate Analgesia

Oral

☐ acetaminophen tab 975 **or** 1000 mg PO once
☐ acetaminophen tab 325 to 1000 mg PO q4h PRN for pain (maximum 3000 mg/day)
☐ acetaminophen tab _____ mg PO _____
***Suggest 325 to 650 mg for mild to moderate pain, 975 to 1000 mg for moderate to severe pain*

☐ ibuprofen 400 mg PO once
☐ ibuprofen 200 to 400 mg PO q6h PRN for pain (maximum 1200 mg/day)
☐ ibuprofen _____ mg PO _____
***Suggest 200 mg for mild to moderate pain, 400 mg for moderate to severe pain*

Parenteral

********Recommend restricting ketorolac use to actively vomiting patients and using lowest effective dose*
☐ ketorolac 15 mg IV once
☐ ketorolac _____ mg IV _____

Antiemetics

***PO administration or slow infusion via IVPB are preferred for metoclopramide to reduce the risk of akathisia. Suggest 5 mg for mild/moderate nausea or if CrCl less than 40mL/min; 10 mg for moderate/severe nausea, and CrCl over 40mL/min*
☐ metoclopramide 10 mg PO once
☐ metoclopramide 5 to 10 mg PO q6h PRN for nausea/vomiting
☐ metoclopramide _____ mg PO _____

☐ metoclopramide 10 mg IVPB once
☐ metoclopramide 5 to 10 mg IVPB q6h PRN for nausea/vomiting
☐ metoclopramide _____ mg IVPB _____

***Avoid dimenhyDRINATE in patients 65 years of age or older due to increased risk of side effects including delirium. Suggest 25 mg for mild/moderate nausea, 50 mg for moderate/severe nausea*

☐ dimenhyDRINATE 50 mg PO once
☐ dimenhyDRINATE 25 to 50 mg PO q4h PRN for nausea/vomiting
☐ dimenhyDRINATE _____ mg PO _____

☐ dimenhyDRINATE 50 mg IV once
☐ dimenhyDRINATE 25 to 50 mg IV q4h PRN for nausea/vomiting
☐ dimenhyDRINATE _____ mg IV _____

***4 mg starting dose recommended for IV ondansetron*

☐ ondansetron 4 mg IV once
☐ ondansetron 4 mg IV to be repeated once 30 minutes after first dose PRN for nausea/vomiting
☐ ondansetron 4 mg IV q8h PRN for nausea/vomiting
☐ ondansetron _____ mg IV _____

☐ ondansetron tab 8 mg PO q8h PRN for nausea/vomiting
☐ ondansetron tab _____ mg PO _____

***Due to high cost, recommend reserving ondansetron DISINTEGRATING tab for actively vomiting patients without an IV*

☐ ondansetron DISINTEGRATING tab 8 mg PO q8h PRN for nausea/vomiting
☐ ondansetron DISINTEGRATING tab _____ mg PO_____

Additional Migraine Headache Therapies (see Table 4)

☐ SUMAtriptan 50 mg PO once; may repeat in 2 hours (maximum 200 mg/24hrs)
☐ SUMAtriptan 6 mg SUBCUTANEOUSLY once; may repeat in 1 hour (maximum 12 mg/24 hours)

☐ dihydroergotamine 1 mg IV once *(only beneficial if used for migraine headache in combination with metoclopramide) ***Contraindicated in hemiplegic or basilar migraine.*

Dystonia Prophylaxis or Treatment

***Prophylaxis may be considered when administering metoclopramide. However, clinical trials have failed to show a reduction in akathisia with this approach. Rate and route of administration are more likely to impact risk of developing akathisia – see Antiemetic section*

☐ diphenhydrAMINE 50 mg IV once
OR
☐ benztropine 1 mg direct IV once

Corticosteroids

***May be considered an adjunctive therapy to help reduce the rate of migraine headache recurrence. Corticosteroids are NOT considered effective in reducing acute migraine pain.*

☐ dexamethasone 10 mg IV/IM once

Opiate Analgesia

Should NOT be considered first-line or routine therapy in primary headache disorders; generally not recommended in the treatment of migraine headache

***For 'susceptible patients' defined as elderly, frail, low body mass, systemically unwell, or on medications known to cause sedation or lower blood pressure we recommend decreasing narcotic dosing by 50%.*

☑ Contact physician or nurse practitioner for reassessment if pain not controlled after administration of maximum dosage.

Oral

☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 2 tabs PO once
☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg 1 to 2 tabs PO every 4 hours PRN for pain
☐ codeine 30 mg-acetaminophen 325 mg-caffeine 15 mg _____ tabs PO _____

☐ oxyCODONE 5 mg-acetaminophen 325 mg 2 tabs PO once
☐ oxyCODONE 5 mg-acetaminophen 325 mg 1 to 2 tabs PO every 4 hours PRN for pain
☐ oxyCODONE 5 mg-acetaminophen 325 mg _____ tabs PO _____

☐ HYDROmorphone 1 mg PO once
☐ HYDROmorphone 1 to 2 mg PO every 4 hours PRN for pain
☐ HYDROmorphone _____ mg PO _____
***Suggest 1 mg for moderate pain and 2 mg for severe pain*

Parenteral

☐ HYDROmorphone 1 mg IV once
☐ HYDROmorphone 0.5 to 1 mg every 10 minutes PRN for pain (maximum 3 mg total)
☐ HYDROmorphone _____ mg IV _____
***Suggest 0.5 mg for moderate pain and 1 mg for severe pain*

☐ morphine 5 mg IV once
☐ morphine 2.5 to 5 mg IV every 10 minutes PRN for pain (maximum 15 mg total)
☐ morphine _____ mg IV _____
***Suggest 2.5 mg for moderate pain and 5 mg for severe pain*

☐ fentaNYL 50 mcg IV once
☐ fentaNYL 25 to 50 mcg IV every 5 minutes PRN for pain (maximum 200 mcg total)
☐ fentaNYL _____ mcg IV _____
***Suggest 25 mcg for moderate pain and 50 mcg for severe pain*

Consults

☐ Consult neurology
☐ Consult neurosurgery

Disposition Planning

1. Considerations for admission
    - Identification of serious cause of headache requiring admission for management
        - e.g. meningitis, SAH, cerebrovascular dissection, etc.
    - Unmanageable symptom burden despite ED treatment, regardless of cause of headache
    - Diagnostic uncertainty, serious causes of headache not yet excluded
2. Considerations for discharge
    - Serious causes of headache excluded
    - Manageable symptom burden at time of discharge
        - Consider prophylaxis if recurrent and/or severe migraine headaches.
3. Outpatient follow-up
    - In patients who are suitable for discharge, consider specialty clinic referral in the following circumstances:[2]
        - Recurrent and/or severe primary headaches, particularly if failed prophylaxis
        - Complex or atypical migraine headaches (e.g. – unusual auras)
        - Cluster headache or other uncommon primary headache (e.g. - paroxysmal hemicranias / hemcrania continua, persistent daily headache, trigeminal autonomic cephalalgias)
        - Significant changes with posture, cough, exertion (rule out Chiari malformation, dural CSF leak)
        - Diagnostic uncertainty resulting in lack of clarity regarding best management
4. Patient education / discharge instructions
    - Encourage patient to drink fluids after discharge.
    - Return to emergency department if headache worsens or recurs and simple measures ineffective
    - My Health Alberta
        - Recurring Migraine Headache: Care Instructions
        - Cluster Headache: Care Instructions
        - Migraine Headache: Care Instructions
        - Tension Headache: Care Instructions

Rural Considerations

1. Availability of advanced imaging
    - Consider transfer to tertiary ED via RAAPID if 'red flag' criteria present which indicate the need for imaging
2. Accessibility of outpatient resources
    - Consider consultation with on-call neurologist in cases warranting expedited outpatient follow-up if no access to urgent neurology clinics

Analytics

1. Key Outcomes
    - Clinical
        - Reduced proportion of patients requiring admission
        - Reduced need for opiate analgesia
        - Reduced use of imaging for headaches without 'red flag' features
        - Reduced rates of unplanned return to ED for headache within 72hr of discharge
    - Patient Experience
        - Received early, appropriate treatment for headcache with adequate symptomatic relief
2. Data Elements for Capture
    - Patient demographics
    - CEDIS presenting complaint and CTAS score
    - ED time markers (triage to physician, physician to consult and then to admission or physician to discharge) and outcome markers (consulted for admission, admitted to ICU / OR / ward, died)
    - ED diagnoses for headache using ICD-10
    - Site and Zone identifiers
    - Use of imaging (CT / CTA / CTV, MR / MRA, other)
    - Use of opiates, NSAIDs, triptans, maxeran, other headache therapies
    - Discharge destination (home, home care, family physician)
    - Discharge medications (opiates, other headache therapies)
3. Proposed Reports
    - Number (%) of ED patients triaged as headache
    - Number (%) of ED patients (by site/zone/hospital type or location [e.g. inner city]) for whom this order set is applied
    - Number (%) of ED patients (by site/zone/hospital type or location [e.g. inner city]) for whom imaging was completed (CT / CTA / CTV, MR / MRA, other)
    - Number (%) of ED headache patients (by site/zone/hospital type or location [e.g. inner city]) treated with opiates, NSAIDs, neuroleptics, maxeran, triptans, other)

- Number (%) of ED headache patients (by site/zone/hospital type or location [e.g. inner city]) admitted from the ED to ward / OR / ICU
- ED Length of stay for admitted and discharged patients with headache
- 72-hour 'unplanned' ED return visits for headache and % of those which were admitted

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Appendix A - Modified Diagnostic Criteria

Migraine Headache - with or without Aura[1]

Diagnostic criteria:

A. At least five attacks fulfilling criteria B-D
B. Headache attacks lasting 4-72 hour (untreated or unsuccessfully treated)[2;3]
C. Headache has at least two of the following four characteristics:
    1. unilateral location
    2. pulsating quality
    3. moderate or severe pain intensity
    4. aggravation by or causing avoidance of routine physical activity (e.g. walking or climbing stairs)
D. During headache at least one of the following:
    1. nausea and/or vomiting
    2. photophobia and phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.

Aura Criteria:

A. At least two attacks fulfilling criteria B and C
B. One or more of the following fully reversible aura symptoms:
    1. visual
    2. sensory
    3. speech and/or language
    4. motor
    5. brainstem
    6. retinal
C. At least two of the following four characteristics:
    1. at least one aura symptom spreads gradually over ≥5 min, and/or two or more symptoms occur in succession
    2. each individual aura symptom lasts 5-60 min
    3. at least one aura symptom is unilateral
    4. the aura is accompanied, or followed within 60 min, by headache
D. Not better accounted for by another ICHD-3 diagnosis, and transient ischaemic attack has been excluded.

Episodic Tension-Type Headache[1]

A. Episodes of headache occurring fulfilling criteria B-D
B. Lasting from 30 min to 7 days
C. At least two of the following four characteristics:
    1. bilateral location
    2. pressing or tightening (non-pulsating) quality
    3. mild or moderate intensity
    4. not aggravated by routine physical activity such as walking or climbing stairs
D. Both of the following:
    1. no nausea or vomiting
    2. no more than one of photophobia or phonophobia
E. Not better accounted for by another ICHD-3 diagnosis.

Cluster Headache[1]

A. At least five attacks fulfilling criteria B-D
B. Severe or very severe unilateral orbital, supraorbital and/or temporal pain lasting 15-180 min (when untreated)
C. Either or both of the following:
    1. at least one of the following symptoms or signs, ipsilateral to the headache:
        a. conjunctival injection and/or lacrimation
        b. nasal congestion and/or rhinorrhoea
        c. eyelid oedema
        d. forehead and facial sweating
        e. forehead and facial flushing
        f. sensation of fullness in the ear
        g. miosis and/or ptosis
    2. a sense of restlessness or agitation
D. Attacks have a frequency between one every other day and 8 per day for more than half of the time when the disorder is active
E. Not better accounted for by another ICHD-3 diagnosis.

Paroxysmal Hemicrania[1]

A. At least 20 attacks fulfilling criteria B-E
B. Severe unilateral orbital, supraorbital and/or temporal pain lasting 2-30 min
C. At least one of the following symptoms or signs, ipsilateral to the pain:
    1. conjunctival injection and/or lacrimation
    2. nasal congestion and/or rhinorrhoea
    3. eyelid oedema
    4. forehead and facial sweating
    5. forehead and facial flushing
    6. sensation of fullness in the ear
    7. miosis and/or ptosis
D. Attacks have a frequency above five per day for more than half of the time
E. Attacks are prevented absolutely by therapeutic doses of indomethacin
F. Not better accounted for by another ICHD-3 diagnosis.

References:

1. Modified from the International Headache Society International Classification of Headache Disorders, third edition (ICHD-3) system criteria.

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