INTRODUCTION

Headache is among the most common complaints encountered by emergency healthcare clinicians. The goal of managing a patient with headache involves identifying emergent versus non-emergent etiologies of the patient's pain while adequately managing their symptoms.

Headaches considered "emergent" are those due to time sensitive conditions, or conditions with potential to cause significant morbidity, deficits, or sometimes even mortality if not addressed in a timely manner. These causes of headache must always be ruled out, using a combination of history, physical exam, and possibly subsequent testing. Most headaches encountered in emergency medicine are in fact non-emergent, and the focus then shifts to symptom control.

It is important that the clinician be familiar with signs and symptoms that suggest an emergent underlying pathology, since failure to recognize warning signs can lead to adverse outcomes. Subsequent management of symptoms will involve a combination of both pharmacological and non-pharmacological interventions.

SAFETY

Clinicians should be aware of any potential environmental toxicologic sources of headache such as carbon monoxide.

As with any patient encounter, clinicians should follow routine practices as some underlying causes of headache can be infectious in nature such as meningitis or other serious influenza-like illness.

Severe headache can also be accompanied by an altered level of consciousness, agitation, and/or combativeness and clinicians should assess the potential for personal risk. Consider the utilization of additional resources.

ASSESSMENT

The first goal of assessment is to determine if there are signs and symptoms that would indicate an emergent or time sensitive underlying cause for the patient's headache. A thorough assessment is the most important tool in differentiating between emergent and non-emergent causes. Emergent etiologies and their accompanying signs and symptoms are outlined in Figure 1.

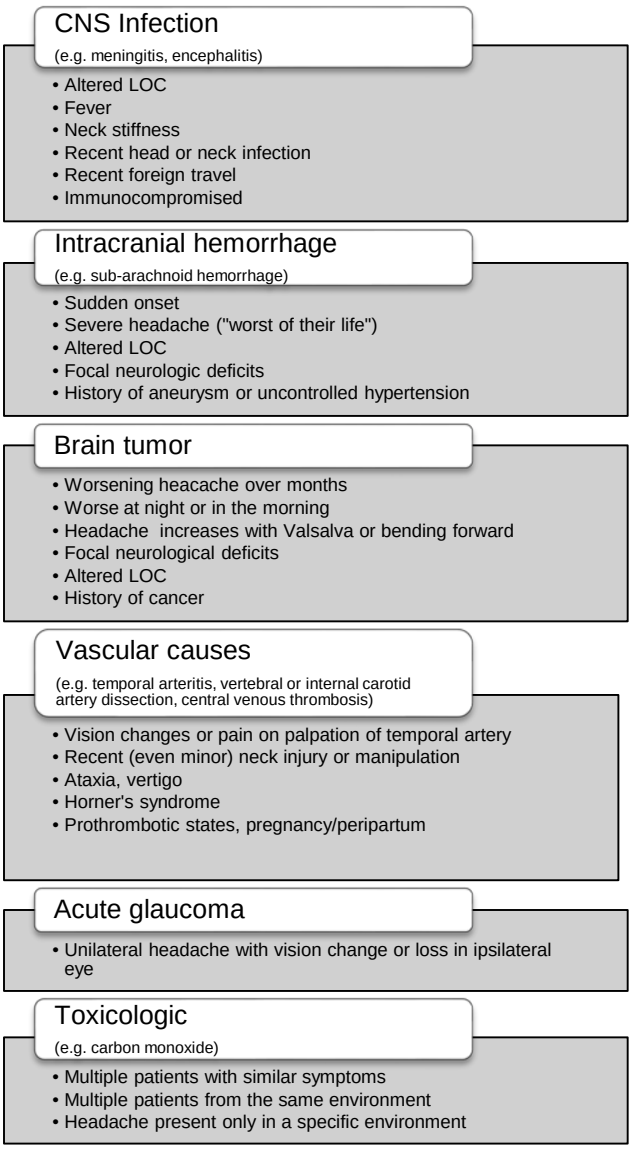

Figure 1: Signs and Symptoms of Emergent Etiologies of Headache

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History

Obtaining a history is one of the most important steps to help establish a differential diagnosis for a patient with headache. Initial assessment should focus on the onset, severity, quality, radiation, and characteristics that improve or worsen the symptoms. An acute onset/new headache is generally considered higher risk, and is more likely to be secondary to an emergent underlying etiology than a chronic headache exacerbation.

Low risk patients typically have a history of chronic headaches and report no substantial changes in their usual headache pattern; have no new concerning historical features (e.g. seizure, trauma, and/or fever), no neurologic symptoms, and no high-risk comorbidities or medications (e.g. anticoagulants).

Physical Assessment

In addition to those found in Figure 1, high-risk physical assessment findings that suggest a serious underlying cause of headache include:

- Altered level of consciousness
- Abnormal vital signs (including fever)
- Pupillary changes and/or vision changes
- Neurologic abnormalities
- Nausea or vomitting

The single-best clinical indicator that there is an intracranial pathology responsible for headache is the presence of neurological symptoms. The Cincinnati Prehospital Stroke Scale is an assessment tool that clinician use to help identify if a CVA may be present. It evaluates three major physical findings including facial droop, arm drift, and speech abnormalities. An ischemic stroke typically presents with focal neurological deficits that correspond to the vascular territory involved. It is rare for an ischemic stroke to present with headache. Hemorrhagic stroke, however, typically presents with headache associated with confusion, altered LOC, and/or neurologic deficits. Neurological symptoms in the setting of headache can include pupillary or facial asymmetry, vision loss, changes in mental status, sensory changes, limb weakness, nuchal rigidity, or ataxia. These neurological signs and symptoms can be subtle in older populations.

Migraine Headache

Migraine is a disorder of recurrent attacks (4 or more in a 12 month period). The attacks unfold through a cascade of events that occur over the course of several hours to days. A typical migraine attack progresses through four phase.

Prodrome: The majority of people experience prodromal symptoms 24-48 hours prior to the migraine onset. Typical symptoms include euphoria, depression, irritability, cravings, constipation, and neck stiffness.

Aura: Many people experience neurological symptoms either prior to or during the early onset of the headache. Symptoms of an aura vary significantly, and may include visual or somatosensory stimuli and/or loss of function.

Headache: The headache of migraine tends to have a throbbing quality. As the severity increases over a number of hours, patients frequently experience nausea and sometimes vomiting. Many individuals report photophobia, phonophobia, or osmophobia.

Postdrome: During the postdromal phase, patients occasionally experience pain with movement, exhaustion, and occasionally positive feelings of mild elation or euphoria.

MANAGEMENT

The goal of emergency management of severe headache is to rapidly identify a potentially emergent underlying cause of the headache and transport to an appropriate facility. However, the majority of patients presenting with headache will ultimately be diagnosed with non-emergent etiologies such as either migraine or tension headache and management will focus on relief of symptoms.

Non-pharmacological: In cases of photo-, phono-, or osmo-phobia, reduction of lighting or noise, and avoidance of strong smells may be helpful.

Acetaminophen: Acetaminophen is an effective analgesic and should be the primary pharmacological intervention used by prehospital clinicians in managing headache (**PEP White**). Acetaminophen has also been shown to be effective in treating

associated symptoms of functional disability, photophobia, and phonophobia.

NSAIDs: A variety of NSAIDs such as ibuprofen or ketorolac have shown efficacy in the treatment of headaches, including migraines. In the setting of an undifferentiated headache, NSAIDs should not be administered due to the increased risk of hemorrhage with some underlying etiologies. Thus, NSAIDs should not be routinely administered in the prehospital setting without OLMC contact (**PEP 1 neutral**).

Opiates: Except in extreme cases, opiates should not be used for management of headache as they are generally not as effective as other medications such as acetaminophen. Opiates may also cause chronic migraines and medication overuse headaches.

Antiemetics: Antiemetics such as dimenhydrinate may be effective in reducing symptoms of nausea and vomiting associated with headache (**PEP 1 supportive**).

Oxygen and/or IV Fluids: Oxygen administration (**PEP 1 neutral**) and/or IV normal saline may be of benefit to patients with moderate to severe headache of varying etiologies.

Headaches in the Pediatric Population

Children also suffer from the same types of headaches as adults; however the clinician should consider that children often express pain differently than adults (e.g. crying, irritability, rocking, or hiding). As with adults, signs and symptoms of emergent causes of headache should be considered with particular attention to the possibility of intracranial infection.

Obtaining a good history can help the clinician determine the underlying etiology of the headache and if there are any associated findings. Determine the following:

- What is the description of the headache?
- How long has the headache been occurring?
- What was the child doing before the headache started?
- Was there any treatment prior to EHS arrival?
- Does anything make the headache better or worse?
- Have there been any changes in dietary intake?
- Has the child taken any medication recently? (headache is a common side-effect of many medications)

Headache in the presence of any of the following should lead the clinician to be concerned:

- Neurological findings (e.g. weakness, paresthesia, decreased level of consciousness, visual changes)
- Signs of infection (e.g. fever, neck pain or stiffness, ear pain)
- Vomiting
- Signs of discomfort (e.g. crying, irritability)

Management is generally symptom-dependent but may include:

- Administering oxygen
- Hydration
- Dimming the lights
- Putting a cool cloth on the head

Headache in this age group may be a result of significant social stressors, abuse, or neglect. The clinician should use the scene assessment, history and physical assessment to look for any suggestion of this.

TRANSFER OF CARE

Early notification of Emergency Department staff should be considered if additional resources are anticipated upon arrival at the ED. Verbal and written reports should include pertinent history, medications, precipitating factors, presence of high-risk features, and medication(s) administered.

CHARTING

In addition to the mandatory fields it is important to document the following in the ePCR text fields:

- Time of onset and severity
- Any potential occupational or environmental etiology
- Any high-risk history or physical findings
- Neurological exam findings
- Previous history of headache

- Treatments rendered by the patient prior to EMS contact
- Treatment provided by the clinician while on scene or during transport

Key Points - Headache

A careful history and physical examination remain the most important part of the assessment for patients with headache.

The presence of one or more high-risk features in a patient with an acute headache increases the possibility of a serious underlying illness and warrants further evaluation.

Relief of symptoms is important regardless of the underlying cause.

KNOWLEDGE GAPS

Despite the relatively high prevalence of patients who are seen with headache in the prehospital setting, there is a relative paucity of research and knowledge in this area.

EDUCATION

The optimal management of headaches is under continual review for ongoing continual medical education. Any recommendations for content delivery can be directed to the Performance and Development Department.

QUALITY IMPROVEMENT

Important elements include [1] non-transport rates and subsequent relapse rates, [2] presence of stable vital signs, and [3] comprehensive documentation.

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PEP 3x3 TABLES for HEADACHE

Throughout the EHS Guidelines, you will see notations after clinical interventions (e.g.: **PEP 2 neutral**). PEP stands for: the Canadian **P**rehospital **E**vidence-based **P**rotocols Project.

The number indicates the Strength of cumulative evidence for the intervention:
1 = strong evidence exists, usually from randomized controlled trials;
2 = fair evidence exists, usually from non-randomized studies with a comparison group; and
3 = weak evidence exists, usually from studies without a comparison group, or from simulation or animal studies.

The coloured word indicates the direction of the evidence for the intervention:
Green = the evidence is supportive for the use of the intervention;
Yellow = the evidence is neutral;
Red = the evidence opposes use of the intervention;
White = there is no evidence available for the intervention, or located evidence is currently under review.

PEP Recommendations for Headache Interventions, as of 2015/06/11. PEP is continuously updated. See: https://emspep.cdha.nshealth.ca/TOC.aspx for latest recommendations, and for individual appraised articles.

Headache

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)	• Nitrous Oxide	• NSAIDs • Oxygen		• Actetaminophen IV
	2 (fair evidence exists)				
	3 (weak evidence exists)				

Nausea and Vomiting

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)	• Antiemetic (Central) • Antiemetic (GI Action)			
	2 (fair evidence exists)				
	3 (weak evidence exists)				

*PEP is the **Canadian Prehospital Evidence-based Protocols Project.** Every clinical intervention is given a recommendation based on the strength of available research evidence (1 = randomized controlled trials and systematic reviews of RCTs; 2 = studies with a comparison group; 3 studies without a comparison group or simulation) and direction of the compiled evidence: **supportive** of intervention; **neutral** evidence for intervention; or **opposing** evidence for intervention). See: **https://emspep.cdha.nshealth.ca/TOC.aspx***

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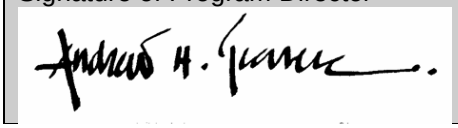
Signature of Program Director 		Signature of program Document Coordinator Marty Warren *Electronically Signed*