

# F01: Altered Levels of Consciousness

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## Introduction

Altered level of consciousness is a common out-of-hospital emergency. Paramedics and EMRs/FRs are frequently faced with patients exhibiting changes to their baseline consciousness, ranging from unconsciousness to hyperarousal. The underlying causes are varied and numerous. Some of these conditions are relatively benign while others are rapidly lethal. Differentiating between these, in the out-of-hospital environment, can be extremely difficult. In assessing and caring for these patients, paramedics and EMRs/FRs should focus on broad goals, such as maintaining a patent airway, supporting oxygenation, ventilation, and circulation. Acknowledging and treating potentially reversible causes must be considered throughout.

## Essentials

- Regardless of the underlying cause, patients with altered levels of consciousness are at high risk of functional airway obstruction and hypoxia. Management of oxygenation and ventilation must take priority over a search for potentially reversible causes.
- Syncope should be considered a diagnosis of exclusion. Paramedics and EMRs/FRs must look for reversible or life-threatening causes of unconsciousness and rule these out prior to considering syncope as the cause of the altered level of consciousness.
- The search for reversible causes should be conducted systematically. A number of mnemonics exist to guide paramedics and EMRs/FRs in their investigations. Regardless of which tool is used, paramedics and EMRs/FRs should consider, at a minimum:
  - Alcohol and intoxicants
  - Epilepsy, endocrine (hypoglycaemia), electrolytes
  - Insulin
  - Overdoses, accidental or intentional
  - Underdosing of medication or uremia
  - Trauma
  - Infection
  - Psychosis
  - Sepsis, shock, stroke
  - Hypotension
  - Hypoxia
  - Hypo or hyperthermia
- If a potentially reversible cause is found, refer to the appropriate CPG for management details.

## Additional Treatment Information

- All patients with an altered level of consciousness require comprehensive monitoring, including blood glucose measurements, temperature, and a 12-lead ECG.
- Complete a physical exam with specific attention to lateralizing neurological symptoms,
- Patients who have regained consciousness must have a FAST-VAN assessment performed.

## Referral Information

Patients who experience syncope are often inclined to refuse service. The diagnostic tests required to safely include or exclude potential causes of syncope or transient loss of consciousness are not available in the out-of-hospital environment. Paramedics and EMRs are expected to follow the appropriate guidelines with respect to these refusals.

## General Information

- Syncope is a clinical syndrome in which a transient loss of consciousness is caused by a period of diminished cerebral blood flow. By definition, the duration of the event is usually brief with a spontaneous to normal baseline consciousness. Recovery from syncope is usually rapid and complete with episodes rarely lasting more than a minute or two. Syncope can also be a sign of a potentially serious and life threatening condition. Some patients experience syncope without warning. They lack pre-syncope signs or symptoms and experience a sudden collapse followed immediately by a return to normal mental status. Paramedics and EMRs/FRs should consider these patients to have suffered from a cardiac dysrhythmia until proven otherwise, regardless of vital signs or ECG findings.
- Immediately life-threatening causes of syncope or unconsciousness include:
  - Cardiac dysrhythmias with or without associated ischemia
    - [→ C01: Acute Coronary Syndrome](#)
    - [→ C02: Bradycardia](#)
    - [→ C03: Narrow Complex Tachycardia](#)
    - [→ C04: Wide Complex Tachycardia](#)
  - Structural heart disease (outflow obstruction or cardiomyopathy)
  - Hypovolemia from occult hemorrhage
    - [→ D01: Shock](#)
    - [→ D02: Bleeding](#)
  - Hypotensive distributive shock
  - Pericardial tamponade
  - Pulmonary embolism resulting in obstructive shock
    - [→ C06: Pulmonary Embolism](#)
  - Hypoglycemia
    - [→ E01: Hypoglycemia and Hyperglycemia](#)
  - Heat exhaustion and stroke
    - [→ I02: Hyperthermia](#)
  - Cerebrovascular accidents including TIAs and subarachnoid hemorrhage
    - [→ F03: Stroke](#)
  - Toxicity from anticonvulsants, beta blockers, calcium channel blockers, benzodiazepines, or narcotic analgesics
    - [→ J01: Approach to Toxic Exposures](#)
    - [→ J07: Beta Blockers](#)
    - [→ J09: Calcium Channel Blockers](#)
    - [→ J12: Opioids](#)
- Some patients experience syncope without warning. They are devoid of any pre-syncope signs or symptoms and experience a sudden collapse followed immediately by a return to normal mental status. This type of syncope should be considered to be from a cardiac dysrhythmia until proven otherwise, even if the vital signs are normal upon arrival on scene.
- Loss of postural tone is inevitable with a loss of consciousness, resulting in a collapse that can cause traumatic injuries. Longer periods of real or apparent loss of consciousness suggest either an alternative cause, or a concurrent injury that prolongs the syncopal event.
- Patients can have symptoms associated with syncope without loss of consciousness. This is referred to as pre-syncope and should be investigated and managed in the same manner as syncope.
- Vasovagal syncope is a common and benign cause of syncope. It occurs due to an inappropriate response by the autonomic nervous system, typically to triggers such as changes in posture, pain, the sight of blood, or extreme emotional distress. Prodromal symptoms are common and can include a feeling of lightheadedness or dizziness, weakness, nausea, blurred vision, and a general sensation of unwellness or unease. Patients may be pale and diaphoretic. Vasovagal syncope is a diagnosis of exclusion and should be considered only after all potentially serious, life-threatening causes have been ruled out.
  - Bezold-Jarisch Reflex: Common cause of Neuro-cardiogenic syncope (aka, vasovagal syncope)
    - **\*\*Adrenergic stimuli (pain/emotion)\*\***
    - --> Exaggerated catecholamine release

- ↑ Sympathetic tone ++
- ↑  $\beta$ 1 contractility, before  $\alpha$ 1 can ↑ preload
- ↑ Ventricular contraction on under-filled chamber
- ↑ Mechanoreceptor activation from exaggerated contractile force
- --> Homeostatic vagal tone
- ↑ Vasodilation / Bradycardia ++
- --> SYNCOPE

## Interventions

### First Responder

- Position the patient; if symptoms suggest hypotension, lay flat provided this does not increase symptoms
- If no suggestion of hypotension, place patient in position of comfort
- Maintain airway as required
  - → [B01: Airway Management](#)
- Provide supplemental oxygen as required
  - → [A07: Oxygen Administration](#)
- Obtain and document capillary blood glucose measurement; correct hypoglycemia if present
  - → [E01: Hypoglycemia and Hyperglycemia](#)

### Primary Care Paramedic – All FR and EMR interventions, plus:

- Assess for source of syncope
- Monitor for signs of improvement if patient initially hypoperfusing
- Obtain vascular access and correct hypoperfusion
  - → [D03: Vascular Access](#)

### Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- Provide advanced airway management if required
- Correct rhythm disturbances

## Evidence Based Practice

Syncope

### Supportive

- [12-Lead ECG](#)
- [Physical counterpressure maneuvers](#)

### Neutral

- [Clinical Decision Making Rule](#)

### Against

## References

1. Benditt D. Syncope in adults: Clinical manifestations and diagnostic evaluation. In UpToDate. 2019. [\[Link\]](#)

2. Benditt D. Syncope in adults: Epidemiology, pathogenesis and etiologies. In UpToDate. 2019. [\[Link\]](#)

## Practice Updates

- 2023-09-29: added glucagon and blood glucose measurement to FR interventions

## F02: Seizures

Mike Sugimoto

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### Introduction

A seizure is the result of abnormal and sudden electrical activity in the brain that can be caused by a wide range of conditions. Seizures can be a symptom of an underlying acute medical or neurological condition, or they can lack a clear etiology (as in the case of epilepsy). The main goals of seizure management are to stop the seizure, protect the patient from secondary injury such as aspiration or trauma, evaluate for and treat potentially reversible causes, and provide safe, expeditious conveyance to hospital.

### Essentials

- Seizures can be traumatizing for bystanders and family. First-time seizures are particularly disturbing.
- Benzodiazepines are the first line therapy for active seizures.
- Consider important causes of seizures:
  - Hypoglycemia
  - Hypoxia
  - Traumatic head injury
  - Drug overdose, intoxication, or withdrawal
  - Exposure to toxic substances
  - Electrolyte disturbances
  - Cerebrovascular accidents
  - Infections and fevers, including infectious of the central nervous system
- Care more specifically for the patient than the patient's seizures
- For women who are, or who may be pregnant, consider the role of eclampsia
  - → [L03: Eclampsia](#)
- For children, see CPG M04 or M12
  - → [M04: Pediatrics: Neurological](#)
  - → [M12: Neonatal: Neurological](#)

### Additional Treatment Information

- Protection of the airway and maintenance of effective oxygenation and ventilation is of critical importance. Profound hypoxia can develop in patients with prolonged seizure activity.
- As a general rule, paramedics should consider controlling seizures in patients who continue to seize after their arrival on-scene. Taking travel time into consideration, these patients are often seizing for upwards of ten minutes by the time an ambulance crew makes contact.
- Patients with known seizure disorders are often prescribed benzodiazepines to be administered by family or caregivers. Paramedics must be aware of this possibility and adjust their dosing strategies accordingly.
- Do not provide prophylactic benzodiazepines to patients who are not currently seizing.
- The duration of the postictal phase is often variable. Patients may exhibit a wide range of behaviors, none of which are intentional and none of which should prompt intervention from law enforcement. Wherever possible, paramedics and EMRs/FRs should provide patients with a quiet, non-stimulating space to recover from their seizure, while protecting them from further harm.

### Referral Information

Patients with well-established seizure disorders who experience a single, self-limited seizure, may wish to decline conveyance to hospital.

Consultation with OniCall is required.

## Interventions

### First Responder

- Protect the patient from physical harm
- Provide supplemental oxygen as required
  - → [A07: Oxygen Administration](#)
- Attempt to place an oropharyngeal airway if required to maintain patency (do not force mouth open)
  - → [B01: Airway Management](#)
- Consider [Oral 40% Glucose Gel](#)

### Emergency Medical Responder – All FR interventions, plus:

- Provide supplemental oxygen to maintain SpO<sub>2</sub> ≥ 94%
  - → [A07: Oxygen Administration](#)
- Consider use of nasopharyngeal airway
  - → [PR07: Nasopharyngeal Airway](#)
- Consider and search for reversible causes
- Obtain and document capillary blood glucose measurement.
  - Treat hypoglycemia if able without risk to airway management
    - → [E01: Hypoglycemia and Hyperglycemia](#)

### Primary Care Paramedic – All FR and EMR interventions, plus:

- Treat hypoglycemia
  - → [E01: Hypoglycemia and Hyperglycemia](#)
- Consider supraglottic airway device in patients who are no longer seizing but remain profoundly obtunded and require airway management
  - → [PR08: Supraglottic Airways](#)
- If indicated as per [venipuncture ethical decision making](#), start IV [D03: Vascular Access and Fluid Administration](#)

### Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- When indicated, control seizures
  - [MIDAZOLam](#) intramuscularly; may repeat once if seizures continue and if IV access is unsuccessful
  - Obtain vascular access
    - → [D03: Vascular Access](#)
  - If seizures continue, [MIDAZOLam](#) intravenously; may repeat every 2-5 minutes as required
  - Modify doses for smaller/elderly individuals
  - [OniCall consultation recommended](#) to discuss additional dosing instructions.
- Consider intubation or advanced airway management for seizures refractory to treatment or continued profound unconsciousness
  - → [B01: Airway Management](#)

### Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:

- Attempt to arrest seizures with anticonvulsants; consider:
  - Benzodiazepines ([MIDAZOLam](#))
  - [Propofol](#)
  - [Ketamine](#)
  - [Call ETP prior to initiating antiepileptic](#)
    - [Levetiracetam](#)
    - [PhenyTOIN](#)

- [Phenobarbital](#)

- In unstable patients refractory to conventional treatments, consider the use of a neuromuscular blockade and intubation to maintain physiologic norms
  - [Call ETP prior to paralysis treatment.](#)
  - Consider evaluating serum electrolytes in searching for underlying (and potentially treatable) causes
- Secure airway if required
  - [→ PR18: Anesthesia Induction](#)
  - [→ PR29: Mechanical Ventilation](#)

## Evidence Based Practice

Seizure (Adult)

### Supportive

- [Diazepam-IV](#)
- [Lorazepam-IV](#)
- [Midazolam-IM](#)
- [Diazepam-IM](#)
- [Diazepam-PR](#)
- [Lorazepam-IM](#)
- [Midazolam-IV](#)
- [Status epilepticus scale](#)
- [Midazolam-IN](#)
- [Propofol](#)

### Neutral

### Against

## F03: Stroke

Marc-Andre Gessaroli

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### Introduction

An acute stroke is a sudden non-traumatic ischemic or hemorrhagic insult to the brain. Transient ischemic attacks (TIAs) are events that present similarly to an acute ischemic stroke, but resolve completely and spontaneously within minutes to hours. Despite the resolution of symptoms, TIAs are important warning signs that indicate a patient is at high risk for ischemic stroke. The main goals of care include rapid and accurate recognition of stroke symptoms, establishing the time of symptom onset (or the 'last seen normal' time, as applicable), and timely conveyance to an appropriate stroke centre.

### Essentials

- To minimize mortality and disability, effective stroke management involves multiple providers and a system of care. Early recognition, appropriate clinical pathway selection, and communication are all essential.
- Apply the FAST-VAN exam as part of patient assessment.
  - → [Tool: FAST-VAN calculator](#)
- Patients with suspected acute stroke and TIAs should be preferentially conveyed to stroke care centres or to an emergency department with CT imaging capabilities.
- 'Hot stroke' patients are defined as those with a positive FAST screening score and an onset of symptoms within the last six hours, or who woke up with symptoms.
- 'Hot stroke' patients whose VAN exam is positive may have a large vessel occlusion that benefits from endovascular thrombectomy (EVT). Regional guidelines or clinical pathways may direct these patients to a particular centre with EVT capabilities.
- Approximately 15% of all strokes are the result of an intracranial haemorrhage (ICH). These patients are more likely to deteriorate rapidly despite aggressive out-of-hospital care.

### Additional Treatment Information

- A negative FAST-VAN exam does not exclude a stroke.
- Paramedics and EMRs/FRs should suspect a hemorrhagic stroke in patients who present with stroke symptoms and:
  - Glasgow Coma Score < 10
  - A history of severe headache
  - Nausea and vomiting
  - Bradycardia and hypertension
  - Unequal pupils
  - Abnormal respiration patterns

### Referral Information

Resolved TIAs require conveyance to an appropriate stroke centre or emergency department for further evaluation. Use an appropriate clinical pathway where available:

- Fraser Health:
  - [Surrey to Royal Columbian CT](#)
  - [Fraser East](#)
- Vancouver Coastal:
  - [Vancouver and Richmond](#)
  - [North Shore and Sea-to-Sky](#)



- Island Health:
  - [Stroke Pathway - Gulf Islands](#)
  - [Stroke Pathway - South Island](#)
  - [Stroke Pathway - West Coast](#)
- Interior Health:
  - [Interior Health Stroke Pathway](#)

## Interventions

### First Responder

- Place in a position of comfort if possible; otherwise, position as necessary for care
- Manage airway as required
  - [→ B01: Airway Management](#)
- Provide supplemental oxygen as required
  - [→ A07: Oxygen Administration](#)

### Emergency Medical Responder – All FR interventions, plus:

- Provide supplemental oxygen to maintain  $\text{SpO}_2 \geq 94\%$ 
  - [→ A07: Oxygen Administration](#)
- Obtain and document capillary blood glucose measurement; treat hypoglycemia with oral glucose as patient's condition permits
  - [→ E01: Hypoglycemia and Hyperglycemia](#)
  - [Oral 40% Glucose Gel](#)
- Obtain and document onset of symptoms or 'last seen normal' time
- Minimize on-scene time
- Notify receiving facility while en route

### Primary Care Paramedic – All FR and EMR interventions, plus:

- Obtain vascular access:
  - [→ D03: Vascular Access and Fluid Administration](#)
  - Select a site above the level of the wrist using a size 18 G, preferably on the right side
- Enrol in [FRONTIER trial](#) if indicated and within study area. [EPOS consultation via CliniCall is mandatory](#) prior to enrolling patients in FRONTIER trial (do not open medication until authorization received).

### Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:

- Anesthesia:
  - Phase 1
    - Secure airway if required; use an appropriate induction strategy and intubation procedure based on patient and environment specificity
    - [Call ETP prior to paralytic administration.](#)
      - Post-call consultation permitted for RSI in emergency situations
  - Phase 2
    - Deep sedation is required; target RASS 5 without complete or burst suppression
    - Propofol is the preferred agent for phase 2 anesthesia
    - Use narcotic analgesia as required
    - Use EEG-guided anesthesia if appropriate
    - Maintain neuromuscular blockade as required
    - [Call ETP prior to paralytic administration.](#)
      - Post-call consultation permitted for RSI in emergency situations
- Manage hemodynamic instability:

- Target MAP > 65 mmHg and systolic blood pressure > 90 mmHg
- Crystalloid and/or vasopressor administration may be required
- Consider short term [phenylephrine](#) administration
- For long term support, consider [norepinephrine](#)
- For suspected intracranial hemorrhage or subarachnoid hemorrhage in the unconscious patient, maintain blood pressure < 160 mmHg:
  - Consider [labetalol](#)
  - Consider [hydralazine](#)
- Optimize cerebral venous out-flow:
  - Raise head of bed to 30° (Unless the CVA is thrombo-embolic in nature with severe carotid stenosis then keep flat and supine.)
  - Promote venous drainage (e.g., loosen cervical collars, ETT ties loose, trans-pulmonary PEEP of 0 cmH<sub>2</sub>O, trans-pulmonary plateau pressure < 25 cmH<sub>2</sub>O)
  - Maintain neck neutrality
  - If no esophageal balloon in place, set PEEP 5-12 cmH<sub>2</sub>O
  - Decompress stomach if required
- Mechanical ventilation strategies:
  - BVM with PEEP valve: maintain adequate oxygenation while preserving adequate cerebral venous drainage
  - Ensure oxygenation goals are being met (SpO<sub>2</sub> > 97%, PaO<sub>2</sub> 100-150 mmHg)
  - Ensure ventilation goals are being met (EtCO<sub>2</sub> 35-40 mmHg, PaCO<sub>2</sub> 35-40 mmHg)
  - Minimize Pplat while maintaining ventilation goals
- Control seizure activity:
  - Consider etiology and patient presentation when selecting appropriate agent:
    - [midazolam](#)
    - [ketamine](#)
    - [propofol](#)
  - Consider the side effect of hypotension: pressors may be required to maintain hemodynamic goals
  - Consider the utility of [phenytoin](#) or [phenobarbital](#) for seizing and seizure prophylaxis; treat based on the etiology, patient presentation, requirement for neuromuscular blockade, and conveyance context
- Monitor for signs of raised ICP and cerebral herniation:
  - [EVD monitoring](#)
  - [Call ETP for EVD consult](#)
  - Neurological exam findings:
    - Unilateral pupillary dilation considered to be related to a rise in intracranial pressure
    - Decorticate or decerebrate posturing
    - Seizure activity
    - ONSD of < 6 mm
  - Consider osmotic therapy:
    - [Hypertonic saline](#)
    - [Call ETP prior to administration of hypertonic saline](#)
    - [Mannitol](#)
  - Consider [nimodipine](#) for reduction in vasospasm
- Maintain capillary blood glucose between 6-10 mmol/L
- [Arterial or venous blood gas](#) analysis:
  - Adjust mechanical ventilation to ensure adequate oxygenation, appropriate ventilation, and safe ground ventilating parameters
- Consider anti-emetic administration:
  - [Dimenhydrinate](#)
  - [Metoclopramide](#)
  - [Ondansetron](#)

- Other considerations:
  - Avoid steroid use
- In the context of hemorrhagic stroke and the patient on anticoagulation
  - Consider [prothrombin complex concentrate](#)

Neurological emergencies or urgencies are time sensitive and may require immediate intervention. Minimizing scene times may have significant effects on patient outcomes.

## Evidence Based Practice

Stroke-CVA-TIA

### Supportive

- [Advanced Notice/ Optimal Trip Destination](#)
- [Mobile Stroke unit](#)
- [Drip and ship](#)
- [HEMS](#)
- [Stroke Diagnosis Scales \(any\)](#)
- [Stroke scale: CPSS](#)
- [Stroke scale: LAMS](#)
- [Stroke scale: RACE](#)
- [12-Lead ECG](#)

### Neutral

- [ASA/Aspirin](#)
- [Magnesium](#)
- [Blood Glucose Control](#)
- [Hypertension Control](#)

### Against

## References

1. Alberta Health Services. AHS Medical Control Protocols. 2020. [\[Link\]](#)
2. Ambulance Victoria. Clinical Practice Guidelines: Ambulance and MICA Paramedics. 2018. [\[Link\]](#)

## F04: Headache

Joe Acker

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Reviewed: March 01, 2021

### Introduction

Headache is a generalized term given to any pain in the region of the head above eye level. Pain from headaches can be acute or chronic, generalized or localized, and can range from mild to severe. The pain may occur on one or both sides of the head, be isolated to a single location, or extend as a band across the skull. Paramedic and EMR/FR assessment of a patient with a headache should include a detailed history followed by a thorough general and neurological examination. The underlying cause of the pain cannot be diagnosed in the out-of-hospital setting and conveyance to hospital is usually required.

### Essentials

- Acetaminophen is an effective first-line analgesic for managing headaches in the out-of-hospital environment.
- Nitrous oxide is considered safe and may be effective for managing headaches.
- Treat nausea and vomiting as required.
- Paramedics and EMRs are not to administer acetylsalicylic acid for headache.
- Opioids are of limited benefit in the treatment of migraines. MORPHine may not be effective and may be associated with delayed recovery. FentaNYL should only be used to treat severe headache where other measures have failed and where conveyance to the treating facility is prolonged.

### Additional Treatment Information

- Severe dehydration may cause headaches. IV fluid replacement may be beneficial in these cases.
- Analgesia may not be effective in patients who suffer from previously diagnosed cluster headaches. High flow oxygen may be beneficial in these cases.

### Referral Information

Headache management depends upon in-hospital diagnosis; this cannot take place in the out-of-hospital environment. Paramedics and EMRs must provide interim symptom relief until a definitive diagnosis can be made and appropriate management plan developed. Patients who suffer from migraine or chronic headaches may have a pre-defined treatment plan and will seek care only when that plan has failed or the presentation of the headache is new or unusual.

### General Information

- The common types of headache include:
  - Vascular
    - Migraines and cluster headaches
    - Can last from minutes to days
    - Characterized by intense/throbbing pain, photosensitivity, nausea, vomiting, and sweating
    - Sudden onset/most severe ever headache (thunderclap) may indicate subarachnoid hemorrhage
  - Tension
    - Often starts in the morning as mild and worsens throughout the day
    - Characterized by a dull, achy pain
  - Organic
    - Less common
    - Caused by tumours, infection, or other diseases of the brain
- Headaches can be a minor inconvenience or may be debilitating. Occasionally a serious medical emergency may present with headache as a symptom. These include:

- Subarachnoid hemorrhage
  - Sudden onset, severe, instantaneously peaking headache (a 'thunderclap' headache)
- Hemorrhagic strokes
  - Onset of a sudden and severe headache
- Other vascular etiologies
  - Giant cell arteritis, carotid or vertebral artery dissection, venous thrombosis
- Meningitis
  - Continuous throbbing headache (usually in occiput) with sudden onset of fever, nausea, vomiting, confusion, and stiff neck
  - Frequently associated with a rash which may be maculopapular, petechial, or urticarial
  - A decreased headache secondary to the administration of metoclopramide is not diagnostic in nature; do not make further treatment or conveyance decisions based solely on a response to the medication
  - Paramedics and EMRs/FRs should use droplet precautions if meningitis is suspected
- Acute angle-closure glaucoma
  - Headache with severe pain to ipsilateral eye with associated visual changes or visual loss
- Carbon monoxide toxicity

## Interventions

### First Responder

- Place patient in position of comfort; the patient may be more comfortable if the environment can be made dark/dim and quiet
- Manage airway as required
  - → [B01: Airway Management](#)
- Supplemental oxygen as required
  - → [A07: Oxygen Administration](#)

### Emergency Medical Responder – All FR interventions, plus:

- Consider analgesia
  - → [E08: Pain Management](#)

### Primary Care Paramedic – All FR and EMR interventions, plus:

- Obtain vascular access:
  - → [D03: Vascular Access](#)
  - Consider volume replacement for dehydration
- Consider analgesia for symptom relief:
  - [Nitrous oxide](#)
  - [Acetaminophen](#)
- Consider antiemetic for symptom relief:
  - [Dimenhydrinate](#)

### Advanced Care Paramedic – All FR, EMR, and PCP interventions, plus:

- Consider analgesia for severe pain:
  - [Fentanyl](#)

### Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:

- Investigations to address and treat underlying etiology
- Consider NSAIDs
  - Ketorolac
  - Acetaminophen
- Consider opioid

- Hydromorphone
- Morphine
- Other medications (Ondansetron, Metoclopramide)

## Evidence Based Practice

Headache-Migraine

### Supportive

- [Ketamine](#)
- [Metoclopramide](#)
- [Metoclopramide plus diphenhydramine](#)
- [Nitrous Oxide](#)
- [NSAIDs](#)

### Neutral

- [Acetaminophen IV](#)
- [Oxygen](#)
- [Fluid Bolus](#)

### Against

## References

1. Alberta Health Services. AHS Medical Control Protocols. 2020. [[Link](#)]
2. Ambulance Victoria. Clinical Practice Guidelines: Ambulance and MICA Paramedics. 2018. [[Link](#)]
3. Queensland Ambulance Service. Clinical practice guidelines: Neurological/headache. 2017. [[Link](#)]

