Altered Mental Status

Feb, 2013 Review Training

2 CME Credits
Recognizing changes in a patient’s level of consciousness is important to the EMS provider. Altered Level of consciousness is a strong indication of problems to the central nervous system. Four things we all need for an adequate level of conscious is Sugar, Oxygen, Intact neural pathways, and intact reticular activating system (RAS).

• Sugar (in the form of glucose) is the fuel on which the brain runs.

• Oxygen is needed by the brain cells to carry out metabolism. A sudden lack of blood flow to the brain or lack of oxygen will shut the brain down in 5 to 10 seconds.

• Neural Pathways are groups of nerves that run through the brain and carry signals from the brainstem to various destinations in the brain. These pathways can be disturbed by trauma, tumors, chemicals or electrical interference (which causes seizures). Stroke, epilepsy, and trauma are different events that affect these pathways resulting in altered mental states.

• Reticular activating system maintains wakefulness and controls consciousness. The RAS is composed of several neuronal circuits connecting the brainstem to the cortex. The ascending reticular activating system is not truly a single tangible anatomic structure; however, it is a network of nerve cells and fibers that extend from the spinal cord through the lower brainstem and continue upward toward the mesencephalon and thalamus. The impulses are then distributed throughout the cerebral cortex. The ARAS continuously receives sensory input that allows the body to remain in a wake or sleep state, remain aware of surroundings and respond appropriately while awake. The ARAS has an effect on both the autonomic nervous and motor systems, which in turn control the body’s cardiovascular, respiratory and motor response to external stimuli.

Consciousness is a condition in which an individual is fully responsive to stimuli and demonstrates awareness of the environment. An alteration in mental status is due to central nervous system (CNS) injury or illness. EMT’s evaluate mental status by checking responsiveness, how patients respond to external stimuli and Orientation, patient’s memory and thinking ability.

Responsiveness is assessed using the AVPU scale:

Alert – patient’s eyes are open spontaneously without stimuli.

Verbal – patient’s eyes open when spoken to.

Painful – patient responds to painful stimuli in some way.

Unresponsive – patient does not respond spontaneously to any stimuli.

Orientation is how the patient responds verbally. This evaluates the patient’s ability to think and test their memory. The 4 common questions used to evaluate this are:

Person – What is your name?

Place – Can you tell me where you are?
Time – What is today's date?

Events – what happened to you today?

If the patient is alert and oriented to person, place, time, and events, their mental status is normal. Altered mental status (AMS) is a variation from normal. It is our job to determine what is the cause of the altered mental status and can we fix it.

Causes of Altered Mental Status:

- Hypoglycemia - Decreased Blood Sugar level. Signs and symptoms include rapid onset, cool, pale, clammy skin, AMS, slurred speech, weakness or numbness of extremities.

- Medical or traumatic head injury - Traumatic brain injury can have wide-ranging physical and psychological effects. Some signs or symptoms may appear immediately after the traumatic event, while others may appear days or weeks later. Signs and symptoms include loss of consciousness from a few minutes to hours, AMS, slurred speech, inability to awaken from sleep, weakness or numbness in the extremities, loss of coordination, loss of bladder control or bowel control, persistent headache or headache that worsens, repeated vomiting or nausea, convulsions or seizures, dilation of one or both pupils of the eyes, clear fluids draining from the nose or ears.

- Heart Rhythm disturbances – Alteration in the electrical conduction system of the heart causing irregular heart rhythms. Signs and symptoms include chest pain, pain in the arm, neck, back, shoulder, epigastric, or abdomen, shortness of breath, nausea/vomiting, diaphoresis, AMS, weakness, dizziness, Irregular pulse, pale or cool skin and syncope.

- Heart attack – Acute Myocardial Infarction is the decreased or absent blood flow to cardiac tissue causing the tissue to die. Signs and symptoms include chest pain, pain in the arm, neck, back, shoulder, epigastric, or abdomen, shortness of breath, nausea/vomiting, diaphoresis, AMS, weakness, dizziness, Irregular pulse, pale or cool skin and syncope.

- Dementia – Dementia is usually a chronic condition that causes a malfunction of normal brain activity resulting in impaired cognition, memory loss, and abstract thought. It could be caused by certain medications, brain tumors, heart disease, urinary retention, and many other underlying diseases. Signs and symptoms include progressive onset, chronic changes, loss if short term memory, decline in intellectual abilities, decline in judgment, decline in math abilities, decline in abstract thought.

- Infection – Infections can be viral or bacterial and signs and symptoms include weakness, fatigue, fever, signs and symptoms of shock, symptoms specific to type of infection, general aches/pain, nausea/vomiting, signs of dehydration.
• Medication and illegal drugs – Drugs that depress the central nervous system, for example narcotics or alcohol. Signs and symptoms include AMS, loss of balance, constricted pupils, respiratory depression, and slurred speech.

• Respiratory and Hypoxia – Often caused by Asthma, COPD, Pulmonary Embolism, pulmonary Edema. Signs and symptoms include labored respirations, pale or cyanotic skin, retractions, use of accessory muscles, fatigue, tachycardia, tachypnea, noisy respirations, AMS, anxious, restless

• Hypothermia or Hyperthermia - is a condition in which core temperature drops or raises beyond the required temperature for normal metabolism and body functions which is defined as 35.0 °C (95.0 °F). If exposed to cold or heat, the internal mechanisms are unable to replenish and the core temperature fluctuates. As body temperature decreases or rises the characteristic symptom that occurs is Altered Mental Status.

• Stroke – is an inadequate amount of blood being delivered to a portion of the brain caused by blockage of a vessel or a ruptured cerebral artery. Time is a critical factor in the emergency care for stroke patients. Recognizing the sign and symptoms of stroke is critical. Signs and symptoms include AMS, weakness or numbness of extremities, slurred speech, headache, facial drooping, loss of balance, dizziness, and blurred vision.

• Seizures – Seizures are a sudden alteration in the normal mental status of the patient caused by a massive electrical discharge in the brain. Four stages of a seizure include:
  o Aura – warning of an oncoming seizure involving some type of sensory perception
  o Tonic – muscle rigidity
  o Tonic-clonic – convulsive activity
  o Postictal – recovery phase when patient gradually becomes more responsive. Typically last 10 – 30 min.

  Signs and symptoms include AMS that progressively improves during postictal state, weakness, convulsions, bladder/bowel incontinence, hemiparesis, and shallow respirations.

What is the underlying pathophysiology causing the patient's altered mental state? One commonly used mnemonic is AEIOUTIPS:

• Alcohol, ingested toxins;
• Epilepsy, endocrine, exocrine or electrolytes;
• Insulin;
• Overdose, opioids or oxygen deprivation;
• Uremia;
• Trauma;
• Infection, inherited defects;
• Psychosis, porphyria;
• Stroke, shock, space-occupying lesions;

It is important to document the findings in the terms of facts, not conclusions. Rather than documenting conclusions without supporting evidence, document your questions and the patient’s responses that led to your conclusion.

**Scene Safety**

Once on the scene of an AMS call the crews increase their chances of becoming the victim of acts of aggression and violence. Danger can threaten EMS providers at anytime and anywhere. There is no such thing as a "safe" neighborhood or a "safe" area of town. Emergency medical services personnel have been killed and or injured, in the line of duty. The causes and acts are becoming more and more random. They include injury and or fatal injuries resulting from motorists who have failed to yield the right away to the EMS vehicles equipped with state of the art flashers, sirens, and intersection lights. Drivers do not pay attention to Emergency Vehicles, and are distracted by blasting stereos, driving while intoxicated, and talking on cell phones just to name a few. Altered Mental Status is not limited to the patient.

The potential for scene violence & violent patients exists for all types of EMS responses, do not become complacent you must always remain vigilant.

**Scene Size-Up**

A patient with an altered level of consciousness should be approached carefully and in a non-confrontational manner. Patient rapport is essential to obtaining a thorough assessment; we can enhance their care by understanding their unique illness. Assuming an AMS patient is mentally ill can have catastrophic consequences when a treatable medical condition underlies their altered mental status.

Observation of the patient's surroundings may yield valuable clues. Is there evidence of ETOH or other drug ingestion, such as drug paraphernalia, empty bottles or telltale smells? Is there a clue to mechanism of injury? If no MOI is apparent then suspect the AMS to be form a medical illness. Is additional help needed? How many patients are there? If more than one patient, suspect some type of hazardous gas or poison causing the illness.

Assess Airway. Is it open? If not, use manual airway maneuvers to open the airway. Head-tilt, chin-lift or jaw thrust. Remember, if the AMS is severe the patient may lose the ability to maintain their airway. If
narcotic overdose is suspected and the airway is compromised and/or inadequate respiratory effort is present, BLS providers can now administer Narcan under the New York State Narcan pilot program.

Recent data from New York City indicate that more than 900 fatalities resulted from accidental overdoses during 2003. Close to 70% of these deaths involve the use of opioids/heroin.

**Suspected Opioid overdose protocol for BLS providers in the Suffolk county pilot demonstration project**

Patient must have suspected narcotic overdose and respiratory depression. Naloxone is not given to rule out opiate use.

I. Perform initial assessment. Of ventilator status is inadequate (patient is cyanotic, altered mental status, respiratory rate is less than 10) support respiration according to Respiratory / Arrest Failure protocol

II. Determine potential for narcotic overdose (at least one of the following)
   a. History of overdose from bystanders
   b. Paraphernalia consistent with opiate/narcotic use
   c. Medical history consistent with opiate/narcotic use
   d. Respiratory depression with pinpoint pupils

If I or II are true THEN proceed with NALOXONE as follows:

III. Open sealed NALOXONE container and remove on unit dose of Naloxone
    a. Examine for appropriate labeling, expiration and appearance
    b. Attach mucosal atomizer device (MAD) to the syringe.

IV. Insert MAD into left nostril and inject HALF the medication. Repeat into the RIGHT nostril.

V. Continue to support ventilation as appropriate while initiating transport to closest appropriate facility.

VI. Document vital signs every 5 minutes.

VII. If patient’s respiratory rate does not increase to greater than 10 within 10 minutes of initial Naloxone administration, repeat with second unit dose of Naloxone.

Relative Exclusion Criteria: (Medical Control Option)

- Cardiopulmonary Arrest
• Recent seizure activity either by report or signs of recent seizure activity (oral trauma, urinary incontinence)
• Pediatric patients
• Opiate use for therapeutic purposes prescribed by a physician
• Evidence of nasal trauma, nasal and/or epistaxis

All providers note: BLS Narcan is for adult patients. If the patient is showing signs of puberty or is larger than the Broselow Tape, they can be treated as an adult. Document these findings on your PCR.

ALS providers please note: If you meet a BLS and they have already administered a BLS medication, you are required to transport with them.

After a call where BLS Narcan is administered, telephone Medical Control (444-3600). Then, upon return to HQ, complete the Call Review form, copy the PCR, fax both to Suffolk County EMS (853-8307), and place the faxes in the Second Deputy Chief’s mailbox.
New York State BLS Protocols for Altered Mental Status:

Altered Mental Status
(NON-TRAUMATIC AND WITHOUT RESPIRATORY OR CARDIOVASCULAR COMPLICATIONS)

Note:
Request Advanced Life Support if available.
Do Not delay transport to the appropriate hospital.

Note:
This protocol is for patients who are not alert (A), but who are responsive to verbal stimuli (V), responding to painful stimuli (P), or unresponsive (U).

I. Assess the situation for potential or actual danger. If the scene/situation is not safe, retreat to a safe location, create a safe zone and obtain additional assistance from a police agency.

Note:
Emotionally disturbed patients must be presumed to have an underlying medical or traumatic condition causing the altered mental status.

Note:
All suicidal or violent threats or gestures must be taken seriously. These patients should be in police custody if they pose a danger to themselves or others. If the patient poses a danger to themselves and/or others, summon police for assistance.

II. Perform initial assessment. Assure that the patient’s airway is open and that breathing and circulation are adequate. Suction as necessary.

III. Administer high concentration oxygen. In children, humidified oxygen is preferred.

IV. Obtain and record patient’s vital signs, including determining the patient’s level of consciousness. Assess and monitor the Glasgow Coma Scale.

   A. If the patient is unresponsive (U) or responds only to painful stimuli (P), transport immediately, keeping the patient warm.
Altered Mental Status, continued

B. If the patient has a known history of diabetes controlled by medication, is conscious and is able drink without assistance, provide an oral glucose solution, fruit juice or non-diet soda by mouth, then transport, keeping the patient warm.

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<td>Do not give solutions by mouth to patients who are unconscious or to patients with head injuries.</td>
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V. If underlying medical or traumatic condition causing an altered mental status is not apparent; the patient is fully conscious, alert (A) and able to communicate; and an emotional disturbance is suspected, proceed to the Behavioral Emergencies protocol.

VI. Transport immediately, keeping the patient warm.

VII. Ongoing assessment. Repeat and record the patient’s vital signs, including the level of consciousness and Glasgow Coma Scale enroute as often as the situation indicates.

VIII. Record all patient care information, including the patient’s medical history and all treatment provided, on a Prehospital Care Report (PCR).

Suffolk County Advanced Life Support Protocols for Altered Mental Status:

ALTERED MENTAL STATUS

Transport of patients with altered mental status secondary to suspected CVA or head trauma should not be delayed. In those types of cases, this protocol should be implemented while enroute to the hospital.

STANDING ORDERS

• IV NS at KVO and perform a blood glucose determination.

• If the glucose concentration is below 80 milligrams/deciliter administer Dextrose 25 grams IV (50cc of a 50% solution). If the glucose concentration is 80 milligrams/deciliter or higher CONTACT MEDICAL CONTROL.

• Thiamine 100 milligrams IV – if malnourished / alcoholic
**IF IV CANNOT BE ESTABLISHED AFTER 2 ATTEMPTS**

- Glucagon 1 milligrams IM

**IF A NARCOTIC OD IS SUSPECTED – MAY BEGIN WITH**

- Naloxone, up to 2 milligrams IV or IM

If AMS is completely resolved after either medicine and the vital signs remain stable, transport the patient to the closest appropriate emergency department and Signal 34 Medical Control after the alarm. If AMS persists, CONTACT MEDICAL CONTROL.

**MEDICAL CONTROL OPTIONS**

- Repeat any of the above
- Endotracheal Intubation1

1 The use of Pulse Oximetry, ETCO2 Capnography, and Cardiac Monitoring is required on all intubated patients with a perfusing pulse.
Altered Mental Status

1. What are the four things we all need for adequate level of consciousness?
   a. Oxygen, water, sleep, food
   b. Sugar, Oxygen, Intact neural pathways, and intact reticular activating system
   c. Intact neural pathways, and intact reticular activating system, neuronal circuits, epilepsy
   d. Oxygen, Intact neural pathways, sleep, orientation

2. What are the four stages of a seizure?
   a. Grand Mal, Epilepsy, Tonic, Clonic
   b. Partial on set, epilepsy, simple, generalized
   c. Onset, Paradox, Hypertrophic, clobazam
   d. Aura, Tonic, Tonic-Clonic, Postictal

3. Infection can cause Altered Mental Status?
   a. True
   b. False

4. Which acronym is commonly used to measure responsiveness?
   a. AEIOUTIPS
   b. Broselow
   c. AVPU
   d. ACDU

5. What safety concerns should every crew take into consideration when dealing with a patient exhibiting signs/symptoms of AMS.
   a. AMS patients often become violent
   b. Bystanders can become violent
   c. Drivers on or close to the scene may not be paying attention to the crews
6. Recent data from New York City indicate that more than 900 fatalities resulted from accidental overdoses during 2003. What percentage was from the use of opioids/heroin?
   a. 70%
   b. 80%
   c. 90%
   d. 10%

7. An adult patient is found lying on the floor unconscious with respirations of 8 bpm. The patient’s mother states that she found him when she got home from work and that his only medical condition was a fractured femur 3 months ago from a car accident. The mother states that the patient is on oxytocin for pain. What should be the next step for the BLS crew?
   a. Request advanced life support if available.
   b. Begin respiratory care according to Respiratory Arrest/Failure protocol
   c. Administer intranasal Narcan
   d. All of the above

8. An adult patient is found lying on the floor unconscious with respirations of 9 bpm. The patient’s mother states that she found him when she got home from work and that his only medical condition was a fractured femur 3 months ago from a car accident. The mother states that the patient is on oxytocin for pain. What should be the next step for the ALS crew?
   a. Call Medical Control
   b. Naloxone, up to 2 milligrams IV or IM
   c. Endotracheal Intubation
   d. None of the above.

9. A BLS crew gives a dose of Naloxone and the respirations are still below 10. What should the BLS crew do next?
   a. Give a signal 4
   b. Drive faster
   c. Give a second dose of Naloxone
   d. All of the above
10. What is reticular activating system?
   a. Neuronal circuits connecting the brainstem to the cortex
   b. Groups of nerves that run through the brain and carry signals from the brainstem to various destinations in the brain
   c. Signals sent from the spine to the lower extremities
   d. Nerve endings found in the brain

11. An acute Myocardial Infarction can cause AMS?
   a. True
   b. False

12. What documentation(s) MUST a BLS crew do after administering Narcan?
   a. Call Medical Control
   b. Fax the PCR and Narcan data sheet to Suffolk EMS
   c. Put the PCR and Narcan data sheet in the Second Deputy’s Mailbox
   d. All of the above

13. All are Relative Exclusion Criteria for NALOXONE except:
   a. Pediatric patients
   b. Pregnant Women
   c. Cardiopulmonary Arrest
   d. Evidence of nasal trauma, nasal and/or epistaxis

14. Consciousness is a condition in which
   a. An individual is fully responsive to stimuli and demonstrates awareness of the environment
   b. An individual is responsive to most stimuli
   c. An individual is able to talk and answer questions
   d. All of the above
15. If the patient is alert and oriented to person, place, time, and events there mental status is normal.
   a. True
   b. False