

Northwest Community EMSS
Continuing Education
Chronic Adult Illnesses
Susan Wood, R.N., BSN, Paramedic



National EMS Education standard:

Epidemiology, psychosocial impact, presentations, prognosis, and management patients who are involved in an abusive or neglectful situations and the role EMS plays in care and education.

Assigned readings:

This handout; NWC EMSS SOPs;

Goal: Strengthen participants' ability to assess and recognize chronic adult illnesses and provide appropriate patient care and disposition based on SOP guidelines.

OBJECTIVES:

Upon completion of the class, each participant will independently do the following with a degree of accuracy that meets or exceeds the standards established for their scope of practice:

1. Describe how the body normally metabolizes and controls blood glucose.
2. Separate the signs and symptoms of DKA into those that reflect acidosis and those that reflect dehydration.
3. Define stroke and cite the incidence and epidemiology of stroke.
4. Identify and provide rationale for the EMS resources that must be prepared to identify and/or treat stroke.
5. Explain and sequence the components of a complete pt assessment for stroke.
6. Explain common complications of stroke and their implications for EMS care.
7. State the factors that contribute to poor outcomes in stroke.
8. Determine the most appropriate receiving hospital using the Stroke Decision Tree in the SOPs.
9. Identify Quick Sequential Organ Failure Assessment (qSOFA) findings as indicators of sepsis.
10. Create a treatment plan for a field impression of septic shock, according to the NWC EMSS SOPs.
11. Analyze the protocol for sepsis and septic shock and incorporate sepsis alerts into hospital OLMC reports.
12. Analyze the need for adequate pain management for the chronic pt with pain.
13. Defend the proper treatment of the patient needing IV vs. IN pain management in the acute setting.
14. Determine the proper treatment for the patient with excited delirium in the acute care setting.
15. Explain the benefits of the humeral IO insertion site as opposed to a proximal tibial site for patients in shock.
16. Sequence the steps for humeral head IO insertion and identify, on at least 2 adults, the correct insertion site.

NWC EMSS CE

Chronic Illness: Why can it be so confusing?

Introduction

Altered mental status is a condition, not an illness; however this is what EMS is often called for leaving the crew to question the underlying reason or reasons for such condition. It is essential to understand and review all possibilities that could lead one to present in such a manner. Only through thorough physical assessment can accurate and timely treatment occur for patients.

Differential Diagnosis

When attempting to relay through all of the possibilities that a patient with altered mental status could have as an illness, some things are of great prevalence to EMS.

First assessment priority for EMS is to identify potential causes for patients having altered mental status

EMS is called to the home of a 75 year old patient with altered mental status. Identify some underlying potential causes for this condition based on specifics found in SOP?

Of the potential problems listed above, circle the causes that can also impact children.

It seems as if the possible causes are almost limitless, however to assist in remembering each one, all can be classified into 4 basic categories: Fuel, ignition, transport and exchange (Miller, 2016).

Fuel

If we take the conversation to a logical progression, there are a few things the body, specifically the brain needs to work; one being FUEL. When the fuel is low, things do not run very well. The brain needs energy, in the form of adenosine triphosphate (ATP) to function; therefore glucose is the essential fuel to maintain the body's normal state of health. If the body can be compared to a car, glucose is the gasoline. When driving a long distance you burn (fuel) gasoline, causing exhaust or waste. Just like a

car, when the body burns such fuel, energy is produced along with waste products.

In a car, a bit of water in an exhaust pipe drains. In the body, CO2 is cellular (respiration) exhaust emitting carbon dioxide, thus capnography is essential to help one to determine the ability of the body to work effectively. Anything that deviates from this creates an ineffective program.

When a car is not working properly, it may start to smoke and emit fumes; thus when the body is not properly working, lactic acid builds up from anaerobic metabolism. This inefficiency causes low productivity (2 moles of ATP vs. 36 moles). This could be as a result of respiratory distress, lack of dietary intake, invasion of the body causing infection, or alteration in glucose (Dunn, 2017).

Ignition Problem

Patients with poor nutrition have many potential problems.

Electrolytes are a basic necessity for the body to properly function as well. If the car



won't start, driving any distance is doubtful. People who are chronic alcoholics lack thiamin, a vitamin B element that helps the body's cells transform carbohydrates to energy. Patients with cancer or anyone who is neutropenic (low white blood cells) is considered immunocompromised. The body's immune system is damaged and cannot fight off infection. These patients become very susceptible to any simple illness and energy is very low.

Transport problem

A car needs replenishment of fuel in order to move; thus a trip to the gas station is needed from time to time. Again, if we relate this to the body, the oxygen and glucose



(through dietary intake) must be gathered for the body to operate. Through respiration, the body collects oxygen, but it also must be transported to the cells; this is where the cardiovascular system plays a key role (provided it is working properly).

Through the vascular system, oxygen is carried via hemoglobin while

glucose is carried by plasma to reach each and every cell. Now, glucose is only able to enter into the cells through a door with a specific key, known as insulin. If insulin is not available or only available in insufficient amounts (aka diabetes mellitus) then the energy from glucose may not be able to be utilized and then the body will start to find others sources to be used as energy. Once that energy is utilized, it creates waste products (carbon dioxide and water) and is eliminated by the same transport system by the major pumping action of the heart. As we age or if structural integrity is somehow damaged, this pumping action becomes ineffective. If either the pump, change in volume of fluid, or container is damaged, altered mental status will result.

The pump can become damaged through the aging process; hence why the large majority of the elderly patients seen by EMS have heart failure (HF). Stress on the system can and will lead to greater ineffectiveness. **EMS Management** includes placing the patient on a cardiac monitor and performing a 12 lead ECG with transmission.



Fluid volume becomes affected due to trauma through exsanguination which will interrupt the oxygen on the hemoglobin from reaching its target; the cells. If a medical reason is the underlying cause of a lack of blood flow to the brain, such as a thrombotic stroke, this will result in an altered mental status. The question is always, when should fluid replacement be an option? If hypovolemia is from exsanguination such as in trauma, our system SOPs do allow for volume replacement up to one liter (2016, p. 39). If a patient's blood is much like syrup (from too concentrated levels of sugar) then volume should be given to decrease the concentration such as with diabetes (2016, p. 32). If a patient with diabetes has an elevated blood sugar level as a stress response to a HF exacerbation, then fix the underlying problem rather than just symptom management as they are not dehydrated. Patients with hyperglycemia, acidosis, and dehydration should have volume replacement as discussed with DKA or HHNS also found on SOP p. 32.

Interruption of the fluid, the pump or the container will result in a patient presenting with an AMS!

If insult occurs to the container, as seen in spinal cord injury, the container will dilate and becomes enlarged (SOP, p. 49-50). Patients in neurogenic shock are hypotensive, needing volume replacement up to 1 L in accordance with SOP to achieve & maintain the SBP \geq 90 with a MAP of \geq 65. If additionally the HR and BP persistently stay low, atropine in 0.5 mg increments should be given to adult patients every 3 minutes to a max dose

of 3 mg. However if it is the BP that remains low, norepinephrine started at 8 mcg/min should be the priority to try and shrink the container. Without adequate perfusion, the patient will remain with an AMS.

Septic patients NEED volume replacement

Patients in anaphylaxis or with sepsis, have an increased release of histamine and the vessels "leak" causing there to be a fluid shift from intravascular to interstitial (third spacing). Especially patients, who are in sepsis or septic shock, are incredibly dry and need larger amounts of volume replacement, but the patient population affected, generally tends to be the elderly population (not always, as children can be at greater risk for sepsis, therefore do not get tunnel vision) and they may not be able to handle large amounts of fluid replacement without putting great amounts of stress on the heart. **Good and continued assessment will be key for proper treatment** of these patient populations (see attachment A in handout).

Exchange Problem

The last part of the process is ensuring a proper exchange process. A car needs an engine, some way in which to use the fuel as well as a way in which to allow elimination of the waste products.

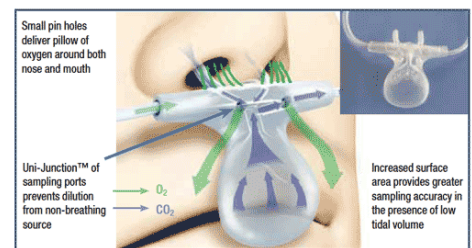
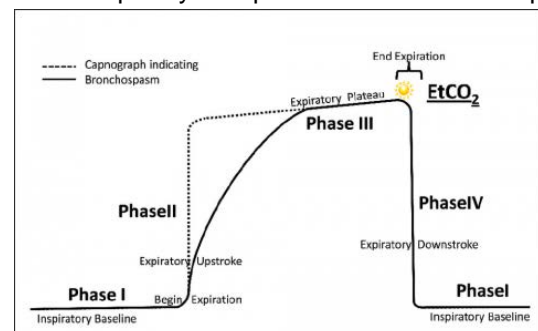


Figure 3. CO₂ sampling/O₂ delivery for non-intubated patients. Source: Oridion Capnography, Inc., Needham, MA. Used with permission.

In the body, oxygen and carbon dioxide must be able to come in and out via the processes of ventilation and respiration; thus it is essential to assess each patient for adequacy in gas exchange. Through obtaining a good history, physical exam, utilization of the proper tools in the tool box, EMS can identify deficits and create a treatment plan. One tool that should be placed on patients to identify a problem (inadequate perfusion) is capnography. Capnography of course measures end tidal carbon dioxide and when adequately interpreted can assist with patient



treatment planning. If a patient has a history of asthma or pneumonia, there is obstruction. Capnography will demonstrate that through a _____ waveform. A decrease in proper oxygenation can cause an altered mental status. EMS can administer bronchodilators to improve gas exchange and if able, use CPAP as well.

The Proper Assessment leads to Critical Intervention

So now that the discussion has taken us for a “ride” with the science behind why patients can become altered, confused, agitated or comatose, now exploration takes us to the critical nature that makes the prehospital setting so uncertain.

Literally almost anything can cause a patient to have an altered mental status.

Identify in the first column how EMS will acutely identify that the listed problem is known – History or physical assessment? In the third column, describe the intervention in accordance with SOP.

Hx or assessment?	Problem	Intervention
	Hypoglycemia	
	MI	
	Stroke	
	Head Injury	
	Hypoxia	
	Sepsis	

Unfortunately EMS patients cannot always provide adequate or accurate information to the provider or much of the information is unreliable, therefore minimal history is obtained and reliance on assessment is key.

Scenario:

EMS is called to a business for a middle aged person who only complains of being lethargic. He is A + O x 4, but dozes off during conversation. He does seem to answer questions appropriately when asked and then appears to “drift back off to sleep.” He apologizes and said this is definitely NOT normal of him.

What assessment should be completed?

Medical exam findings can be subtle and not always so easy to pick up on if specific problems are not suspected.

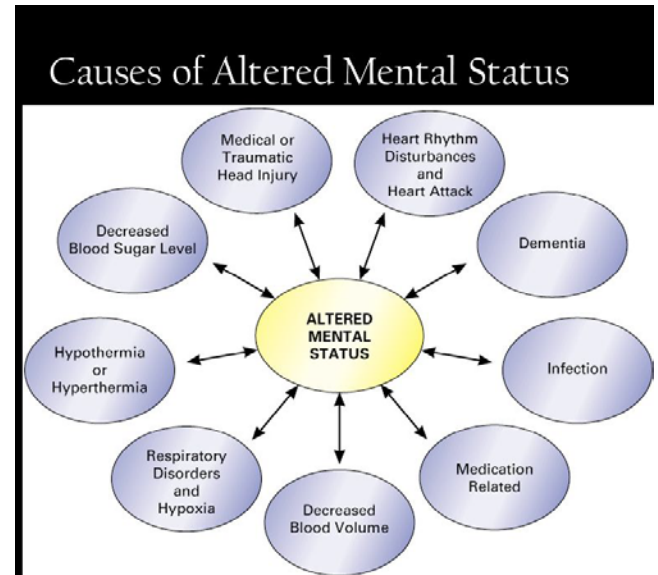
“Frequent Flyers”

It is not uncommon for EMS to see repeat customers from time to time. This can be a good thing, as one provider may remember a part of the patient’s history that can help to provide valuable information on how to treat the condition of the patient. However, just because the patient had something wrong with them on the last EMS visit, does not guarantee the same thing to be wrong with the patient today. Be warned not to fall into the trap of tunnel vision. Perhaps it is known by this crew that the patient has long standing CVD, HTN, and angina. What was missed is the major stroke the patient also accrued when in the care

of another shift. Today the call came in for syncope. Perhaps the issue is neurovascular rather than cardiovascular and a full and thorough assessment is what is needed to make that determination.

One thing at a Time-Wishful Thinking

Everyone wishes that patients would only have one thing wrong with them at any given time, but that is wishful thinking. Often one part of a patient’s medical history can



exacerbate another. Multiple issues arise and need tending to in the same encounter. The patient presents with AMS and EMS checks a blood glucose and finds it to be low. Dextrose replacement is given and the glucose is rechecked and now within normal limits but the patient remains with AMS. Now that one issue has been identified and fixed, but a deficit remains, continued assessment must be pursued. There is nothing to say that the patient isn’t also having a stroke or an MI today!

The Long and the Short of Things

EMS is called for a patient who is complaining of right arm pain in an elderly person. The patient is apparently in quite a bit of pain and there is significant bruising, a skin tear, and that is all the patient really is concerned about at this time. Distracting as the arm can be, it is not a life threat. The patient asks for pain management and after proper assessment it is given. Once the patient is calmer, they explain that the doctor prescribed a higher dose of medication and this had made them unstable in ambulation and they even feel as if there is loss of time lapses throughout the day. The patient will eventually admit that they feel as if they have had a few syncopal episodes in the last week since the medication changes. Do not get in trenched in the small picture, that the big picture is hardly noticed; both issues must be addressed in this situation as well (Miller, 2016).

You Know What they say about Assumptions

“123 Holly Lane, been there, done that...” is what is going through the paramedics mind at 0700 when Mrs. Smith calls from the nursing home. She just wants



[illegible]

1. Altered mental status: 6 reasons why a complete assessment is critical (2016). Miller, N. EMS 1.com. Retrieved from:
<https://www.ems1.com/ems-education/articles/110798048-Altered-Mental-Status-6-reasons-why-a-complete-assessment-is-critical/>
2. How to identify and treat major causes of acute altered mental status, (2016). Miller, N. EMS World. Retrieved from:
<https://www.ems1.com/ems-education/articles/147666048-How-to-identify-and-treat-major-causes-of-acute-altered-mental-status/>
3. Dunn, C. (2010). EMT Training: Pathophysiology handout.
4. Mattera, C. (2017). Paramedic Training Handouts and PP.