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Trauma Trivia What 3 symptoms are classic findings in a patient with fat embolism syndrome? (Answer is located at the end of the newsletter.)

- a) Fever, tachycardia, elevated white blood cell count
- b) Dyspnea, neurological changes, petechial rash
- c) Hypotension, jugular vein distension, muffled heart sounds
- d) Chest Pain, respiratory distress, hemoptysis

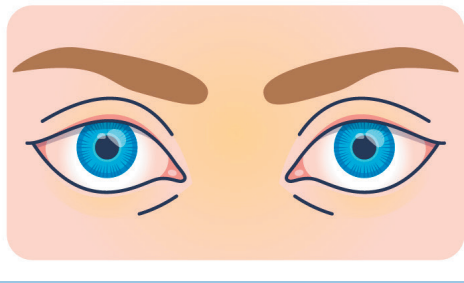
Today's Quote:

"There is no better compass than compassion." -Amanda Gorman

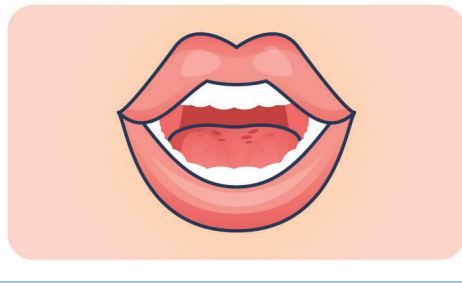
Featured Topic:

The Glasgow Coma Scale and Why Accuracy Matters

EYE OPENING



VERBAL RESPONSE



MOTOR RESPONSE



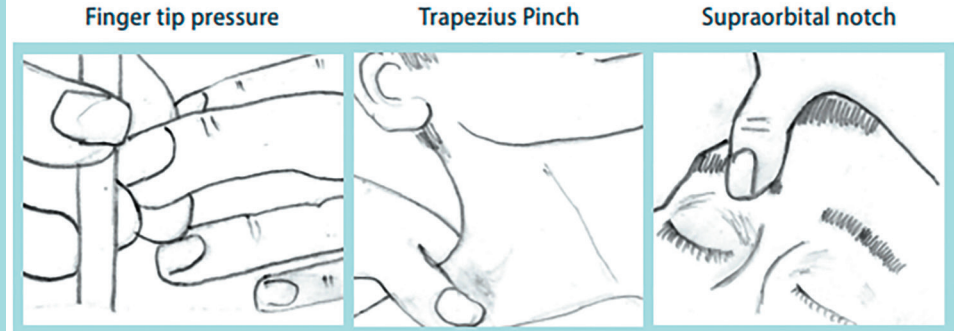
The Glasgow Coma Scale (GCS) is a quick, simple and objective way of determining the level of consciousness. Patients are assessed in three categories and assigned a score. When totaled, scores range from 3-15. There have been several published studies which state there is a high rate of disparity between a GCS reported by EMS and the GCS reported by the hospital providers. The trauma teams at ECMC and Golisano Children's Hospital have noted similar concerns. GCS should be determined early in the assessment of a patient and repeated with each set of VS or change in condition. It is important to obtain the GCS before the patient is intubated or receives sedating or paralyzing medications.

The GCS has been used for 50 years. Although the meaning has stayed the same, slight wording modifications have been made to the charts over the years. Whichever chart you utilize, it is important that we understand how to interpret the patient responses and assign the correct score. In an effort to correctly communicate the patient's GCS, **we are asking all EMS providers to report the GCS using plain language from each category.** This will clarify for us exactly where the patient is deficient and help us trend changes over the course of the patient stay. Eye opening =E, verbal response =V, and motor response =M. For example, a patient that is alert but confused and follows commands would be documented as E4 V4 M6. When giving prehospital report and handoff, report the GCS using the categories and descriptions. For example: **"Eye opening is spontaneous, Verbal is confused, Motor is obeys commands."** This method helps the healthcare team see where the deficits are and how they trend. Please also note any pre-existing variables such as baseline confusion due to dementia, speech loss from a stroke, substance abuse or intellectual disabilities.

Best Eye Response	Best Verbal Response	Best Motor Response
Spontaneous (+4)	Oriented (+5)	Obeys commands (+6)
To verbal command (+3)	Confused (+4)	Localized pain (+5)
To pain (+2)	Inappropriate words (+3)	Withdrawal from pain (+4)
No eye opening (+1)	Incomprehensible sounds (+2)	Flexion to pain (+3)
	No verbal response (+1)	Extension to pain (+2)
		No response (+1)

In the **EYE** category, "spontaneous eye opening" means that you can open your eyes and keep them open on your own. Opening to "speech" could also mean SOUND. The patient may open their eyes to the sound of your equipment being placed on the floor instead of you asking the patient to "open your eyes." Additionally, the term "pain" is better interpreted to mean a momentary, minor discomfort; excessive pain is not needed. When using pressure to score the Eye and Motor categories, firm pressure should be applied for up to 10 seconds, on the fingertips/nailbeds, then the trapezius muscle ("trapezius pinch"), and finally the supraorbital notch is used, if necessary, to elicit a response. Do not apply pressure to an area of injury. Sternal rubs should be avoided due to the tissue damage it can cause.

Sites for Physical Stimulation



In the **VERBAL** category, "inappropriate words" means any lack of structured phrases or sentences. Additionally, "incomprehensible sounds" is any audible verbal effort. This may include moans, groans, or other verbal noises.

When assessing the **MOTOR** category, ask the patient to follow a command that is not a reflex (like squeezing a finger). Instead, ask the patient to wiggle toes or stick out their tongue. If a patient is unable to follow commands, the stimulus should be applied to the trapezius or supraorbital notch site. "Localizing" is when the patient intentionally reaches up to the clavicles as if to push the stimulus away (trapezius pinch or supraorbital notch). "Withdraws from pain" is otherwise known as normal flexion and is reflex-like and without intention. The elbow will flex rapidly and the hand will move to mid chest level or a body part will move away from the stimulus. "Abnormal flexion" is described as a slow bend at the elbow, rotating of the forearm and curling the wrist on the chest, otherwise known as decorticate posturing. In "extension," the arms will straighten and rotate in and back. Both "abnormal flexion" and "extension" typically display a stiffening of the legs with pointed toes in addition to the arm movements. A lack of response in any category is documented as "No Response" and still earns 1 point in each category.

There may be circumstances which prevent you from accurately scoring a patient. For example, you cannot score eye opening if the eyes are swollen shut. Intubated patients are unable to verbalize. Please report any circumstances which prevent you from scoring a category.

GCS in Infants and Children

What about infants and young children? The verbal and motor categories have been reworded to better match the capabilities of infants and young children from birth to about age 2 years of age.

Best Eye Response	Best Verbal Response	Best Motor Response
Spontaneous (+4)	Coos, babbles (+5)	Moves spontaneously / purposefully (+6)
To verbal stimuli (+3)	Irritable cries (+4)	Withdraws to touch (+5)
To pain (+2)	Cries in response to pain (+3)	Withdraws to pain (+4)
No response (+1)	Moans in response to pain (+2)	Flexor posturing to pain (+3)
	No response (+1)	Extensor posturing to pain (+2)
		No response (+1)

Accuracy of GCS is very important for activating the trauma team and ensuring that the proper resources are ready when the patient arrives. Please, get a GCS prior to calling pre-hospital report. Utilize a reference chart and do not guess. Any GCS below 15 should be reported by category, using plain language. Report any changes in GCS while the patient has been in your care.

Resources:

- Video demonstration: www.glasgowcomascale.org/#video
- GCS Aid "Do It This Way" poster is free to download at www.glasgowcomascale.org

Tranexamic Acid (TXA)

Tranexamic Acid is an antifibrinolytic agent used to reduce mortality in trauma patients by helping prevent blood clot breakdown (fibrinolysis) by inhibiting plasmin activity, stabilizing fibrin, and reducing bleeding. It is most effective when administered intravenously within 3 hours following an injury (the sooner the better) when the patient is showing indications of significant hemorrhage. The CRASH-2 trial demonstrated that early administration reduced the risk of death from bleeding by approximately one-third.

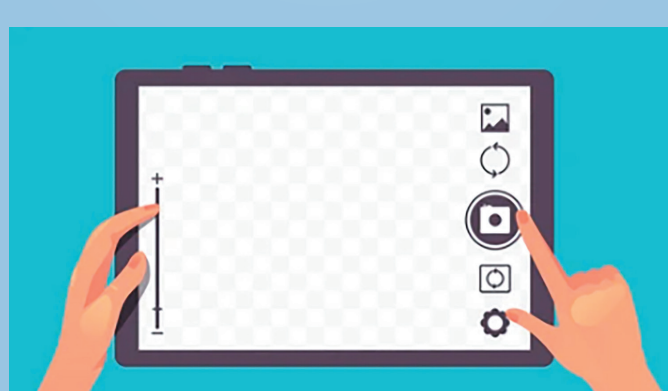


NYS Protocol allows for the administration of TXA 2 grams IV/IO over 10 minutes to the patient who exhibits signs of hemorrhagic shock (trauma or OB) and has a systolic BP <100 mmHg and MAP <65 mmHg. Do not delay transport to administer TXA. Upon arrival at the trauma center, **please report the time and dose of TXA administration to trauma team.**

Reminders from ECMC:



Please include a photo attachment of the mobility device in injury of your patient. There are many interpretations for these devices and your photo will assist us in properly coding the mechanism of injury. We are looking for photos of e-bikes, dirt bikes, hover boards, e-scooters, mobility scooters, bikes, and all other micro mobility devices.



Trauma Trivia Answer:

b) Dyspnea, neurological changes, petechial rash

These are the 3 classic findings in a patient with fat embolism syndrome (FES). FES is a rare but serious condition that occurs when fat globules enter the blood stream. This can obstruct blood vessels and lead to various symptoms. This typically happens following a long bone or pelvic fracture, where fatty bone marrow is present. While FES can occur after any fracture, it is most commonly associated with significant trauma. Other causes could include liposuction, orthopedic surgery and pancreatitis. FES is more common in males and typically effects those aged 10-40 years. Symptoms develop within 12-72 hours following the injury and symptoms can include:

- Respiratory distress
- Neurological symptoms (lethargy, confusion, altered level of consciousness)
- Petechial rash: tiny red/purple spots on the skin, often on the neck, upper chest, axilla or conjunctiva.
- Other symptoms such as decreased urine output, general malaise and fever may occur

We would love to hear any suggestions, questions or requests for future issues. Please forward them to bmoses@ecmc.edu

Q&A: In future issues, we would like to answer your questions. Please use the QR code to submit a question to be answered in future editions of **Trauma Talk.**

