

This article launches *Emergency Department (ED)*, a series of articles discussing topics important to family physicians working in the ED. This department will cover selected points to help you avoid pitfalls and improve patient care in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

Coma Conundrum

by Sam Campbell, MB, BCh, CCFP(EM)

A 22-year-old man is brought into the department unconscious after “passing out” at a party. He arrives being ventilated by a bag/valve mask. At the party, he was dancing energetically, went to lie down and proceeded to vomit. He could not be roused by his friends. No seizure activity had been witnessed.

- Apart from respiratory rate of 6 per minute, his vital signs are normal. He does not respond to any stimuli initially and is afforded a Glasgow Coma score of 3/15.
- His pupils are constricted but reactive, his face is covered in vomit.
- On auscultation, his breath sounds reveal coarse crepitations in both upper lung fields. Naloxone 2 mg IV is administered with no effect.
- He appears to be making no effort to protect his airway, and a decision is made to obtain a definitive airway. Attempts at intubation are met with teeth clenching. He returns to his obtunded state right after a brief period of agitation and flailing at caregivers. His airway is finally secured by performing a rapid sequence intubation.
- “Routine” blood tests are all within normal limits. Of note, his serum ethanol levels are “undetectable.” His chest X-ray demonstrates right upper lobe infiltrate compatible with aspiration pneumonitis.
- After a period of observation, he becomes abruptly awake and pulls out his endotracheal tube.
- He calms down and does not remember the previous night’s events, but does admit to taking some gamma-hydroxybutyrate (GHB).
- GHB is a recreational drug implicated in an increasing frequency of cases of coma presenting to the emergency department (ED). GHB is colourless, odourless and tasteless. It can cause coma of rapid onset if taken in sufficient doses.

1. **What are the priorities in managing comatose patients in the ED?**
2. **What empiric medication should be used in this case?**
3. **What is “rapid sequence intubation”?**
4. **How should aspiration pneumonitis be managed in the ED?**

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Answers & Discussion

1. What are the priorities in managing comatose patients arriving at the ED?

The priorities in managing a comatose patient do not differ substantially from those of any critically ill patient. Attention to the ABC's (Airway, Breathing, and Circulation) are paramount, followed by obtaining a thorough history from witnesses and family/friends and a careful "secondary survey," or detailed clinical examination. Although in this case, a diagnosis of substance abuse seems likely, one must always consider additional causes of coma. A mnemonic can help to ensure no differentials are forgotten (Table 1). Early consultation is advised for physicians who do not regularly manage such patients.

Table 1

TVINS in the EMD — LEAFS

Consideration of the various mechanisms by which each category could render a patient unconscious helps ensure that no diagnosis is missed, and may allow specific, goal-directed re-evaluation of a patient in whom initial assessment has failed to yield a cause for coma.

Causes of coma above the neck	Causes of coma below the neck
T rauma	E ssentials (vital signs): Temperature ↑ or ↓, BP ↑ or ↓, pulse ↑ or ↓, RR ↓, glucose ↑ or ↓, SaO ₂ ↓
V ascular	
I nfective	M etabolic L ytes (Na ⁺ , K ⁺ , Ca ⁺ , <i>etc.</i> ↑ or ↓)
N eoplastic	E ndocrine (Thyroid, PYH, adrenal, <i>etc.</i> ↑ or ↓)
S eizures	A cid/base
	F ailures (Brain, heart, lung, kidney, liver, <i>etc.</i>)
	S epsis
	D rugs/diet

2. What empiric medication should be used?

Consider administering Dextrose, Oxygen, Naloxone and Thiamine to all patients with coma of unknown cause. This "Coma Cocktail," remembered by the mnemonic "DONT," will empirically treat certain common causes and consequences of this picture, such as hypoglycemia, narcotic overdose and hypoxia. It may also treat or prevent Wernicke's encephalopathy. Flumazenil (a benzodiazepine antagonist) is **not** indicated. Several case reports describe uncontrollable arrhythmias or seizures precipitated by flumazenil in patients who had taken mixed overdoses or who were benzodiazepine dependent.

Physicians who wish to perform RSI should attend an airway management course.

Further empiric therapy may need to be considered before a diagnosis is reached. Examples include antibiotics in suspected sepsis or meningitis, or acyclovir in suspected herpes encephalitis. Substance abuse or overdose is a frequent cause of coma, and early contact with a poison centre should be considered.


3. What is “rapid sequence intubation” (RSI)?

RSI refers to the simultaneous administration of an induction agent and a paralytic drug to facilitate endotracheal intubation in critically ill patients. Use of the strategy has been shown to increase the chance of success in definitive airway management and has become standard practice in emergency airway management. This strategy is not advised in physicians not specifically trained in the procedure and in the management of the difficult airway, and those wishing to utilize this strategy should consider enrolling in an airway management course.

4. How should aspiration pneumonitis be managed in the ED?

Aspiration of oropharyngeal contents is seen frequently in the ED. Aspiration pneumonitis implies chemical injury to the lung tissue by sterile gastric contents (which may cause fever, leukocytosis, and pulmonary infiltrates). Aspiration pneumonia, however, implies secondary bacterial infection. These are two distinct syndromes that should be managed differently.

The ED management of aspiration pneumonitis includes endotracheal intubation in cases at ongoing risk for further aspiration, and suctioning of the upper airway. The routine use of prophylactic antibiotics less than 48 hours of suspected or witnessed aspiration is **not** recommended, as it may select for resistant organisms should a pneumonia ensue. Uncomplicated aspiration pneumonitis generally resolves within 48 hours; if it does not, broad spectrum antibiotics are indicated at this stage.

Initial antibiotic therapy **is** appropriate in cases of aspiration involving small bowel obstruction, immuno-suppression, bacterial colonization of gastric contents, or severe dental caries, all of which carry a higher risk of rapidly progressive pneumonia. 

For references or more information, contact us at diagnosis@sta.ca.