

Code Blue: Medicine for Authors

Natalie Dale, MD

1

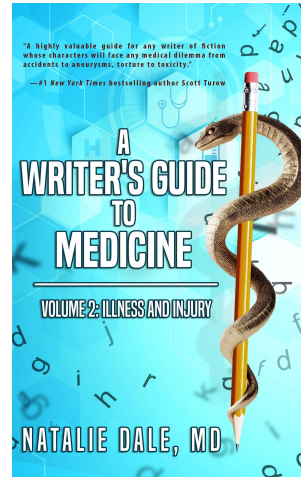
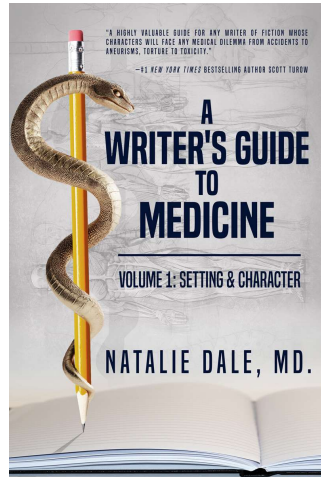
About Me

- Before medical school
 - Trained as an EMT
 - Worked on a rural ambulance
 - Studied public health
- Chicago Medical School
- Neurology residency at OHSU
- Began writing full-time in 2018
- **Not a practicing physician**



2

The “Writer’s Guide to Medicine” Series



3

This presentation is intended to help writers of fiction accurately depict medicine. It should **not** be construed as medical advice, guidance, or a substitute for medical care by a healthcare professional.

4

Overview

Medical Basics

- ABC Approach to Emergencies
- Blood Loss
- Medication Administration

Medical Tropes

- Knocked Unconscious
- Amnesia
- Medically-Induced Coma

5

c-ABC Approach to Emergencies

- A = Airway with c-spine protection
- B = Breathing
- C = Circulation
- "c" = CPR
 - Check for pulse
 - No pulse, start CPR

6

Airway with c-spine protection

- Signs of airway occlusion
 - Noisy breathing, choking sounds, wheezing, hoarse voice
 - No sound and frantic
 - Unconscious: blue-tinged lips, copious drooling, no chest movement
- Opening the airway
 - Position the victim
 - Remove foreign body
 - Intubation
- C-spine
 - Cervical spine
 - C3, 4, 5 keeps the diaphragm alive
 - How to protect it
 - “Hold c-spine”
 - C-collar
 - Pet peeve: flapping c-collars

7

Breathing

Signs

- No rise/fall of chest
- Breathing too fast or too slow
- Agonal breathing

How to Help

- Narcan
- Mouth-to-mouth
- Bag-valve mask ventilation
- Other ventilation assistance
 - Ventilator
 - CPAP, BiPAP

8

Circulation

Signs

- Bleeding
- Bruising
- Slow, weak, or thready pulse
- Cool, clammy skin
- Low blood pressure

How to Help

- Stop the bleeding
 - Tourniquet
 - Bandage + pressure
 - Surgery
- Give fluids
- Give blood
- Give medications

9

Breaking Down the Cliché: CPR = Clean, Pretty, Reliable

- CPR is exhausting
- CPR is gross
 - If you aren't breaking bones, you aren't doing it right.
- Survival after CPR is rare
 - Full return to functionality after CPR is even more so

10

Blood Loss...

...can be INTERNAL or EXTERNAL

11

ED0

Symptoms of blood loss

- **10% blood loss (0.5L)**
 - Minimal symptoms
 - Blood donation
- **20% blood loss (1L):**
 - Anxiety, dizziness, pass out when they stand up
- **30% blood loss (1.5L):**
 - Woozy, drowsy, trouble focusing.
 - Fast heart rate, breathing fast and shallow
 - Hemorrhagic shock
- **40% blood loss (2L)**
 - Lose consciousness
- **50% blood loss (2.5L)**
 - Dead



12

Slide 12

EDO 10% = Starbucks Grande

30% = 2 wine bottles

Edward Dale, 2022-04-05T22:28:41.579

Breaking Down a Cliché: Passing out Solves the problem

- Bleeding fast enough to pass out means they're bleeding fast enough to die
- Need treatment
 - Surgery
 - Tourniquet
 - Blood pressure support
 - IV fluids
 - IF blood products
 - Blood pressure stabilizers ("pressors")



13

Administering Medications

14

Methods of Medication administration

- Oral (most common)
 - Anything that is swallowed
 - Slow (minutes-hours)
- Intravenous (IV)
 - Injected into the veins
 - Fastest (seconds)
- Intramuscular (IM)
 - Injected into the muscle
 - Fast (minutes)
- Subcutaneous (SubQ)
 - Injected just beneath the skin
- Inhalation
 - Breathed into the lungs
 - Fast (minutes)
- Transmucosal
 - Through mucous membranes
 - Nostrils (“snorting”)
 - Gums/cheek/under tongue
 - Rectal/Vaginal
 - Fast (seconds-minutes)
- Transdermal
 - Through the skin
 - Slow (hours)

15

Breaking Down a Cliché: Inject in the neck

- Don't do it!
- Not feasible
- Doesn't work any faster
- Instead, try intramuscular injection



16

Knocked Unconscious

AKA a traumatic brain injury

17

ED1

Hit to the head (TBI)

- No loss of consciousness
 - Concussion (Grade 1 or 2)
 - Headache, nausea/vomiting, ringing in the ears, numbness/tingling, dizziness, sensitivity to light/sound
 - Trouble concentrating, memory trouble, depression, moodiness, irritability, etc.
 - Posttraumatic amnesia <24 hours
 - Recovery in days-weeks
- Brief unconsciousness (Seconds-30minutes)
 - Severe concussion (Grade 3)
 - Posttraumatic amnesia >24 hours
 - Epidural hematoma

ED0



- <6 hours unconscious
 - Moderate head injury
 - Requires hospitalization & maybe ICU
- >6 hours unconscious
 - Severe head injury – diffuse axonal injury
 - ICU treatment
 - Likely permanently disabled, may be persistent vegetative state

18

Slide 18

EDO Moderate: 50% permanent disability

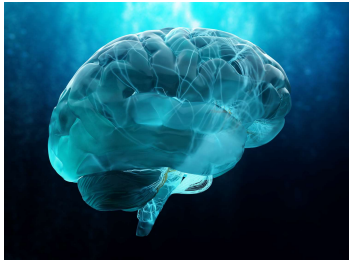
Edward Dale, 2022-04-13T23:07:12.882

ED1 Also, the likelihood of a knockout punch is slim

Edward Dale, 2022-04-14T17:13:52.617

Brain Herniation

- Brain encased in skull
- Mass pushes it around
- Indication for medically-induced coma



- Signs of impending brain herniation
 - Headache
 - Nausea/vomiting
 - Changes in mental status
 - Drowsy
 - Cushing's Triad
 - High blood pressure
 - Slow heart rate
 - Irregular breathing (or not breathing)
 - Blown pupil
 - Dilated
 - Fixed

19

Other Methods

- Ether
 - 15-20 minutes
- Chloroform
 - 5 minutes
- Strangulation
 - 30 seconds*
 - Will quickly regain consciousness



20

So, what can you do?

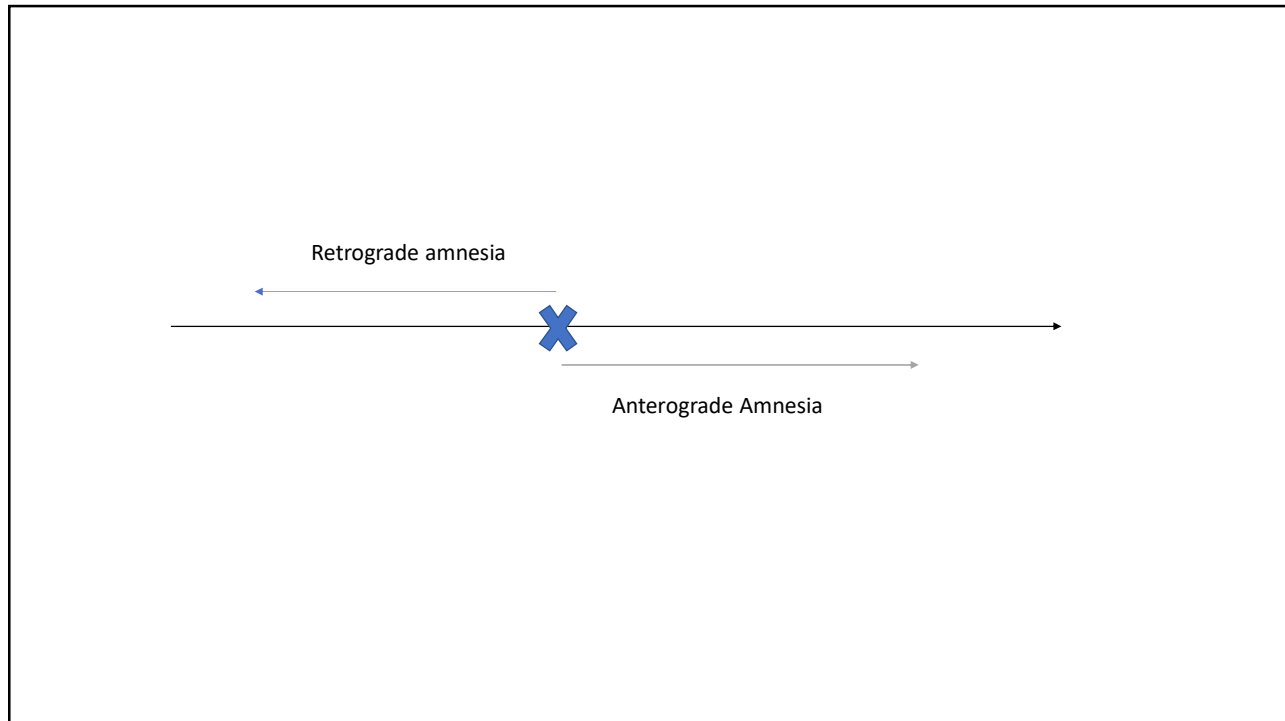
- No safe way to be instantaneously knocked unconscious with no sequelae
 - Brief unconsciousness with concussion
- Next best thing: intramuscular sedative
 - Midazolam (Versed): 15 min
 - Haloperidol (Haldol): 30 min
 - Even easier with IV access

21

Amnesia

I'm sorry, who am I?

22



23

Posttraumatic amnesia

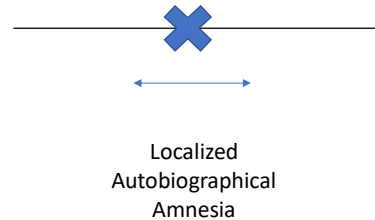
- Amnesia that occurs after brain injury
 - Anterograde amnesia = Trouble Making new memories
 - Retrograde amnesia = Trouble remembering events leading up to injury
 - Personality changes
 - Impulsive
 - Temperamental
 - Unusually docile
 - May not recognize family
 - Disoriented
- Temporary (minutes to weeks)
 - The more severe the injury, the longer it lasts



24

≠ Autobiographical amnesia

- Loss of personal memories
 - Localized = Forgetting specific personal events (wedding, car accident, rape, etc.)
 - Generalized = Forgetting identity (rare)
 - Name
 - Likes/dislikes
 - Identity of relatives, friends and loved ones
- Causes
 - Diffuse brain damage
 - Will have other signs of brain damage
 - Psychiatric = Dissociative amnesia



25

Dissociative Amnesia

- Psychiatric disorder affecting ~1.8% of population
- Due to trauma
- Usually localized
 - Forgets a traumatic event or specific period of time
 - Generalized autobiographical amnesia VERY rare
 - Almost always associated with combat veterans or victims of sexual assault
- **Dissociative fugue**
 - Dissociative amnesia + travel
 - May assume a new identity in a new place
 - Lasts hours to months
 - Rare (0.2% of population), but does happen
 - Strongly associated with traumatic experiences and/or desire to escape a life

26

The Medically-Induced Coma

A mythical creature rarely seen in the wild

27

Coma

- Coma = a state of prolonged unresponsiveness
 - Requires profound insult to the brain
 - Coma is NOT a diagnosis
 - Prognosis depends on:
 - Cause of coma
 - Anoxic brain injury worst prognosis
 - Duration of coma
 - Usually days to a few weeks
 - Recovery is gradual, if at all
- Causes of coma include:
 - Brain bleed
 - Diabetic crisis
 - Drugs (alcohol, opioids, etc.)
 - Lack of blood flow to brain (*anoxic injury*)
 - Carbon monoxide poisoning
 - Near-drowning
 - Heart attack
 - Strangulation
 - Stroke
 - Sustained seizures
 - Traumatic brain injury

28

Sedation

- Medications given to depress the level of consciousness
- Levels of sedation
 - Minimal = relaxed but awake
 - Moderate = drowsy
 - Deep = asleep
- Can breathe on their own
- Recovery in minutes
- Excellent prognosis
- Uses of sedation
 - Anxious or violent patients
 - Burn victims
 - Dental procedures
 - Painful procedures
 - Ventilated patients
- Sedation is commonly used

29

Therapeutic Coma

- “Medically-Induced Coma”
- Sedation so deep the body is completely unresponsive, even to pain.
 - Temporary coma induced by medications
- Requires intubation
- Lasts hours-days
- Recovery very gradual
- Terrible prognosis

Refractory Status Epilepticus

- Long-lasting seizure that isn't responding to the usual medications
- Goal = Smother electrical activity of brain to stop the seizure

Increased Intracranial Pressures

- Elevated pressure inside the skull
- Usually due to massive brain injury
 - Stroke
 - Traumatic brain injury
- Goal = slow brain activity to prevent brain herniation

30

What to do instead: Ventilator

- Unable to talk
- Sedated, uncomfortable
- Reasons for being ventilated
 - Asthma
 - Brain Injury
 - Cardiac arrest
 - Chest Trauma
 - COVID-19
 - Pneumonia
 - Sepsis
 - Stroke

31

More Resources

Internet Resources

- Medscape Reference
- Medline Plus
- Healthline
- UpToDate
- PubMed (scientific papers)
- Government resources
 - NHS.UK
 - Health.Gov
- Hospital Resources
 - Mayo Clinic
 - Cleveland Clinic
- University Resources

Reference Books I love

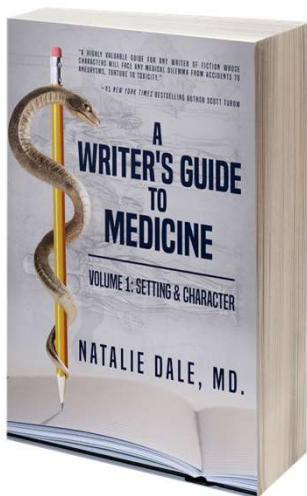
- A Taste for Poison by Neil Bradbury, PhD
- Body Trauma by David W. Page, MD
- Diagnosis & Statistical Manual of Mental Disorders (DSM-5)
- Stiff by Mary Roach
- Violence: A Writer's Guide by Rory Miller

32

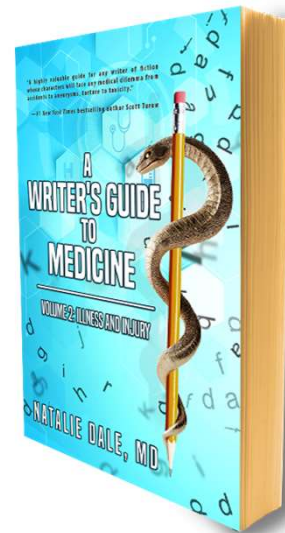
Questions?

33

Available in Kindle & Paperback



• Join my newsletter!
Nataliedaleauthor.com



34