

# CODES

Toral Patel (PGY3)

# OVERVIEW

## CODE WHITES

1. SOB
2. SEPSIS/FEVER
3. AMS
4. Chest Pain
5. HTN

## CODE BLUES

What is MY ROLE?

# CODE WHITES

You get a page that says CODE WHITE....

OR a page that you answer and the RN says: "Pt in Bed 67 \_\_\_\_\_, I'm calling a CODE WHITE".....

WHAT DO YOU DO?

# FOR EACH CASE:

- 1) Initial approach to a patient: Stabilizing the patient (seconds to minutes)
- 2) Evaluation of a patient and ddx
- 3) Management options (how do I fix this? Does pt need transition of care?)

# SHORTNESS OF BREATH



# INITIAL APPROACH (SECONDS/MINUTES)

## Vitals : Stable/unstable –sick?

### HR

- tachycardia (arrhythmia, ST 2/2 edema or PE, SIRS/sepsis)

### BP

- Severe HTN (flash pulmonary edema), hypotension (large PE, MI, sepsis)

### Temp

- Fever: PNA, VTE

### O2 Sats

## Current/baseline Oxygen requirement

## Patient's appearance/mental status/new complaints (eg emesis, CP)

- Hypercapnia, hypoventilation, aspiration event

## Recent meds/transfusions/IV fluids

- Consider narcotics → hypoventilation, TRALI, continuous IV fluids w/pulmonary edema

# OXYGEN THERAPY

Nasal cannula: 24-44% FiO<sub>2</sub>

- Each “liter” is ~4% above 20% (1L is 24%, 2L 28%, 3L 32%, 4L 36%, 5L 40%)

Venturi mask: ~50%

Non-rebreather: 100%

AmbuBag (Bag Valve Mask): 100% with manual ventilator support

High flow oxygen therapy

Continuous positive airway pressure (CPAP): useful in **hypoxia**

- Reduces pulmonary edema (afterload reduction, direct effect on hydrostatic pressure)

Bi-level positive airway pressure (BiPap): useful in **hypercapnia**

- Gradient between iPap/ePap helps offload CO<sub>2</sub>

Endotracheal intubation

- If patient is unable to protect their airway, vomiting (can't use NIPPV), or...you think they need it.

# ADDITIONAL INVESTIGATIONS??

## CXR

- Diffuse process (alveolar vs interstitial)
- Focal infiltrate (PNA, atelectasis, aspirate, infarction)
- Extrapulmonary findings (pleural/pericardial effusion, PTX)

## EKG

- Ischemic changes
- Arrhythmias
- Signs of Right heart strain

## ABG

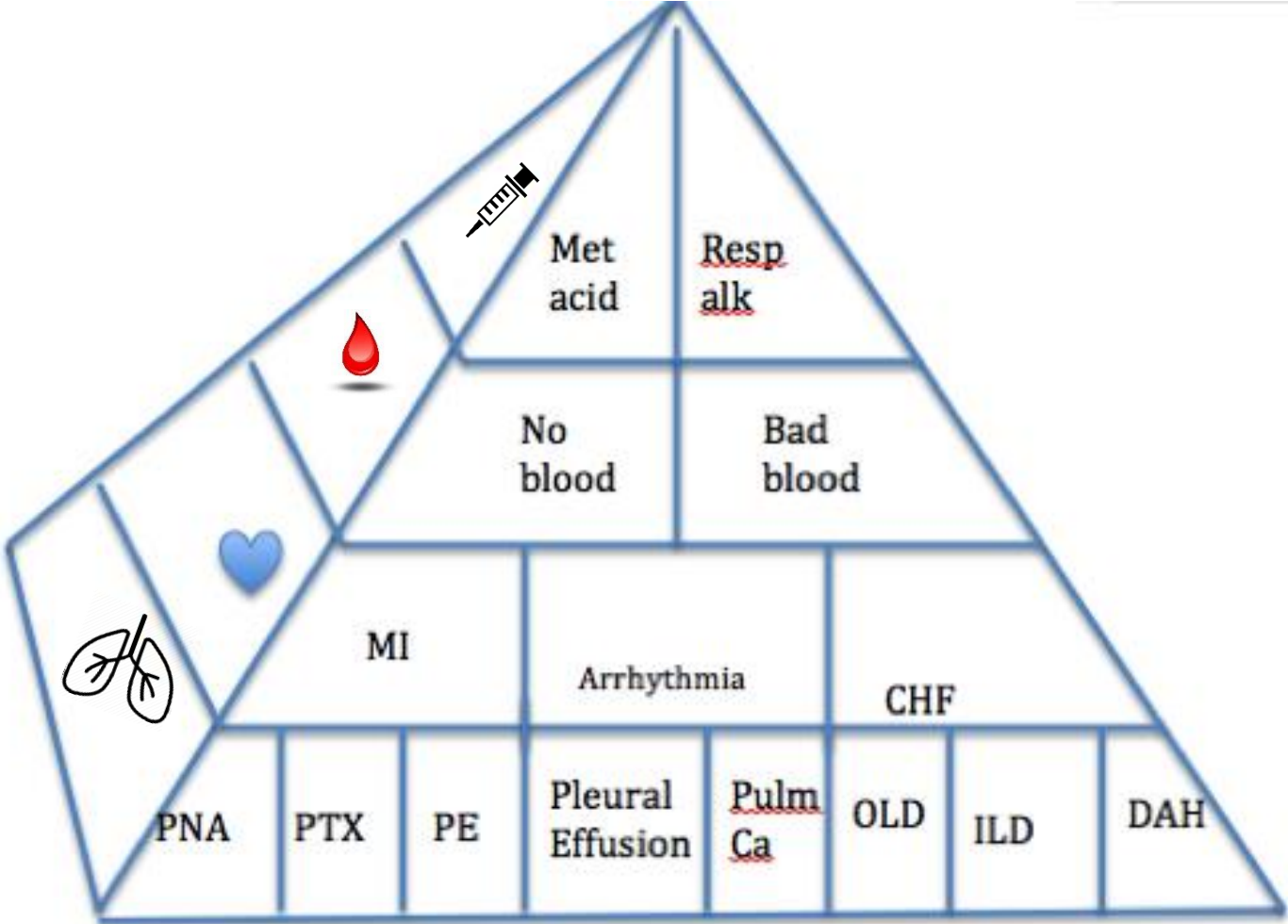
- Resp acidosis? (acute vs chronic vs acute on chronic) /resp alkalosis other derangements

Well's Criteria: consider D-dimer vs CT Angiography vs V/Q scan

Consider CBC, RFP, BNP, Troponin



# CAUSES OF DYSPNEA



# FEVER/SEPSIS



# ..get called pt's temp is 38.3

- Evaluate patient (History, Physical, ROS, Vitals)
- blood cultures, urine cultures, look for the source, imaging. Tx choice based on host/suspected organism.
- Review previous cultures
- Febrile while on antibiotics: What is missing in your coverage? Drug fever?
- Evaluate for non-infectious causes

# INITIAL APPROACH (SECONDS/MINUTES)

**Vitals : Stable/unstable –sick?**

**Labs:**

**Source**

- Lung- sputum cx, Legionella/Strep urine Ag, flu A+B, respiratory viral panel
- Blood- Bcx: 2 peripheral + 1 from each line the pt has (central lines, HD lines, art lines, etc)
- Urine- UA + Ucx
- GI- C diff, fecal leuks, stool cx, diagnostic paracentesis
- Other- culture of any drainage, LP, ESR, CRP

**Imaging-** CXR, TTE, CT, MRI?

**Patient's appearance/mental status/new complaints**

- Hypercapnia, hypoventilation, aspiration event

**Recent meds/transfusions/IV fluids**

- Consider narcotics→hypoventilation, TRALI, continuous IV fluids w/pulmonary edema

**\*\*\*\* ALWAYS CULTURE BEFORE STARTING  
ANTIBIOTICS \*\*\*\***

# SIRS CRITERIA

- Temperature

> 38.0 or < 36.0

- HR

> 90

- Respiratory status

RR >20 or PaCO<sub>2</sub> <32

- WBC

>12,000 or <4,000 or >10% bands

- 2 out of 4

**\*\*\*\* BP IS NOT A SIRS CRITERIA \*\*\*\***

# WHEN TO TRANSFER TO MICU

- Sepsis
  - Usually can treat on the floor
- Severe sepsis
  - Floor or MICU depending on how severe the organ dysfunction is
    - Severe lactic acidosis → MICU
    - Respiratory distress → MICU
- Septic shock
  - MICU

# EMPIRIC ANTIBIOTICS:

## **Sepsis :**

- Vanc/Zosyn or Vanc+Aztreonam+metronidazole (if anaerobic infection suspected)

## **Cellulitis w/ abscess:**

- Oral: Bactrim or Doxy
- IV: Vancomycin

## **Cellulitis w/o abscess:**

- Oral: Keflex or Bactrim
- IV: Vancomycin or Cefazolin

## **Necrotizing STI:**

- IV: Van/Zosyn or Vanc/Aztreonam/Metronidazole

## **Intra-abdominal infections/Biliary tree infections**

Oral: Augmentin or Cipro+metronidazole

IV: Zosyn or Aztreonam+metronidazole

Add Vanc if high suspicion for MRSA/unstable patient

## **CAP:**

Ceftriaxone/Azithro or Levofloxacin

## **Aspiration:**

Augmentin or Moxifloxacin

# EMPIRIC ANTIBIOTICS:

## Endocarditis

- Native valve: Vanc+Ceftriaxone+Gentamycin or Vanc+Gent
- Prosthetic valve: Vanc+Gent+ Rifampin

## Joint Infection

- Ceftriaxone+Vanc or Aztreonam+Vanc
- Post-surgical: Vanc/Zosyn or Vanc/Aztreonam

## Diabetic Foot

- Vanc/Zosyn or Vanc+Aztreonam+metronidazole

## Bacterial meningitis:

- Ceftriaxone and Vanc or Meropenem +Vanc
- Add Amp if elderly

## Complicated UTI

- Not Cipro or Nitrofurantoin

## C.Diff

- Mild: Metronidazole
- Severe: PO Vanco
- Complicated: PO Vanc +IV metronidazole



# DRUG-INDUCED FEVER

- 5% of cases of drug hypersensitivity reactions
- Usually accompanied by exanthema, hepatic, renal or pulmonary dysfunction
- Peripheral eosinophilia can be seen
- Most common: beta-lactams, sulfonamides, anticonvulsants

# ALTERED MENTAL STATUS



# SO many causes.....

## ▶ Encephalopathies

### ▶ Hypoxic encephalopathy

### ▶ Metabolic encephalopathy:

- ▶ Hypoglycemia

- ▶ Hyperosmolar states (hyperglycemia)

- ▶ Hyponatremia

- ▶ Hyponatremia

- ▶ Hypercalcemia

- ▶ Uremia

- ▶ Hepatic encephalopathy

- ▶ Organ failure

- ▶ Addison's disease

- ▶ Hypothyroidism

- ▶ CO2 narcosis

### ▶ Toxins

### ▶ Hypertensive encephalopathy

## ▶ Drug reactions like NMS

## ▶ Environmental causes

### ▶ Hypothermia

### ▶ Hyperthermia

## ▶ Deficiency state

### ▶ Wernicke encephalopathy

## ▶ Sepsis

## ▶ Primary CNS disease or trauma

## ▶ Direct CNS trauma

### ▶ Diffuse axonal injury

### ▶ Subdural/epidural hematoma

## ▶ Vascular disease

### ▶ Intraparenchymal hemorrhage

## ▶ Subarachnoid hemorrhage

## ▶ Infarction

### ▶ Hemispheric, brainstem

## ▶ CNS infections/inflammation

### ▶ Encephalitis

### ▶ Anti-NMDA receptor encephalitis

## ▶ Neoplasms

## ▶ Seizures

### ▶ Nonconvulsive status epilepticus

### ▶ Postictal state

## ▶ Psychiatric

## ▶ Acute psychosis

## ▶ Malingering

And this list is not complete...

# INITIAL APPROACH (SECONDS/MINUTES)

**Vitals : Stable/unstable –sick?**

**Labs:**

**Imaging- CXR, TTE, CT, MRI?**

**Call A BAT?!**

**Patient's appearance/mental status/new complaints**

**Recent meds/transfusions/IV fluids**

**\*\*Call pt's family for baseline**

**HTN**



# INITIAL APPROACH (SECONDS/MINUTES)

## **Vitals : Stable/unstable –sick?**

- What are the full vitals?
- Is she symptomatic?
- Can you recheck a manual BP?
- What size cuff did you use?
- Is she in pain?
- Did she get her regularly scheduled meds?
- I'm at a code, can I call you back?

## **Labs:**

## **Imaging-**

**Patient's appearance/mental status/new complaints**

**Recent meds/transfusions/IV fluids**

# HYPERTENSIVE URGENCY VS EMERGENCY

- If admitted for other reasons, slowly lower BP with oral medications over days
  - No good evidence to guide timeframe or choice of medication
  - In general, lower systolic/MAP NMT 25% or to 160/100
- Rapid correction below auto-regulatory range can cause ischemia
  - Cerebral (stroke)
  - Coronary (MI)
  - Renal (AKI)
- Reasons to *potentially* lower over hours:
  - Known aortic or cerebral aneurysm
  - High risk of MI (known CAD, DMII)

# MEDS

- Hypertensive Urgency → ORAL MEDS!!
  - Rapid overcorrection can be very harmful
  - Start low, go slow
- IV Hydralazine → BAD
  - Severe, unpredictable hypotension + reflex tachycardia
- Labetalol → GOOD
  - Except in acute decompensated HF
- Dilt gtt → NEVER in acute HFrEF
- Always ask: “What is the EF?”

## Fast Acting PO Formulations

- Hydralazine (25 mg)
- Nifedipine (30 mg)
- Isosorbide dinitrate (10 mg)
- Clonidine (0.1 mg)
- Labetolol (200-400 mg)

## IV Options on the Floor

- Hydralazine 5 mg
- Labetolol 10-20 mg



# HEART RHYTHMS



# INITIAL APPROACH (SECONDS/MINUTES)

**Vitals : Stable/unstable –sick?**

**Telemetry/EKG: brady vs tachy**

**Labs:**

**Recent meds/transfusions/IV fluids**

# AFIB WITH RVR

- Treat the underlying etiology
- Rate Control
  - **Metoprolol (5 mg IV x3 vs. 12.5-25 mg PO)**
  - **Calcium Channel Blocker -> Diltiazem (10-20 mg IV and start gtt at 5-15 mg/hr)**
  - **Digoxin (0.500 mg | 0.25 mg | 0.25 mg -> 1 mg load over 18 hours)**
- Rhythm Control
  - **Amiodarone (150 mg IV bolus and start gtt at 0.5 mg/hr)**
  - Dofetilide
  - Flecainide
- **DCCV**
  - When should this be performed?
  - How do you do this?

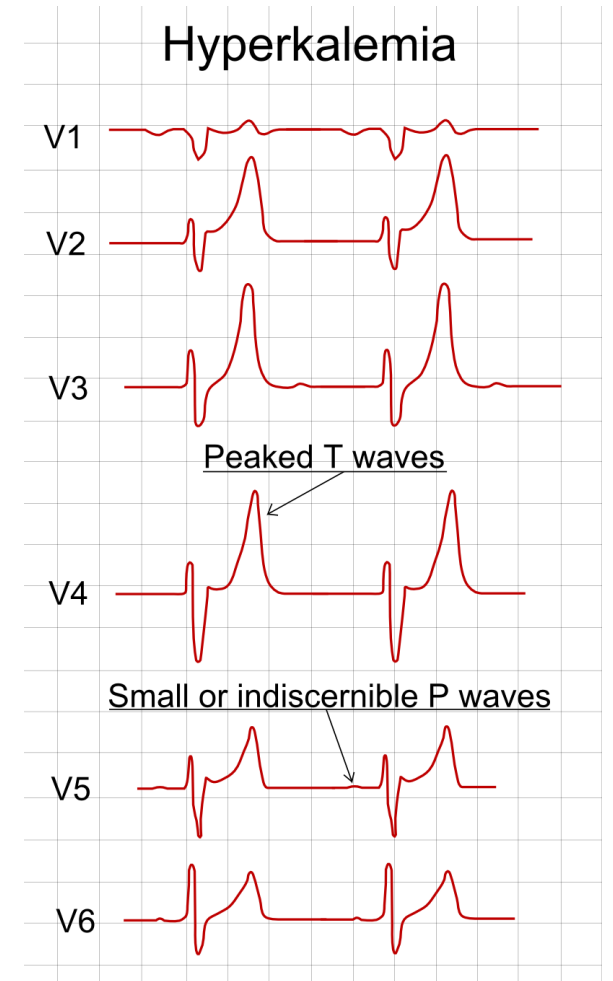
# HYPER-K

- Temporizing Measures

- Calcium gluconate
- Insulin and Dextrose
- Albuterol
- Sodium Bicarbonate

- Removal of K

- Kayexalate
- Lasix
- HD
- CVVH?



# ACLS/BLS

Tachycardia....

Bradycardia.....

# CHEST PAIN



# INITIAL APPROACH (SECONDS/MINUTES)

**Vitals : Stable/unstable –sick?**

**Labs:**

**Imaging/EKG**

**Patient's appearance/mental status/new complaints**

**Recent meds/transfusions/IV fluids**

DDx:

Acute coronary syndromes

Pulmonary embolism

Aortic Dissection

Pneumothorax

Pericarditis with tamponade

Esophageal Rupture

# DDX:

- Cardiac
  - MI
  - Pericarditis
  - Myocarditis
  - Aortic Stenosis
  - Vasospasm
  - Cocaine chest pain
  - Cardiac syndrome X
  - Stress cardiomyopathy
- Pulmonary
  - PE
  - PNA
  - Asthma/COPD
  - Acute Chest Syndrome
- Pleura
  - Pleuritis
  - Pneumothorax
- Aorta
  - Dissection
  - Perforated ulcer
- Chest wall
  - Costocondiritis/musculoskeletal
  - Sternitis
  - Tietze syndrome
  - Zoster
- Esophagus
  - Esophageal Spasm
  - Eosinophilic Esophagitis
  - Esophageal Rupture/Perforation
  - GERD
- Mediastinum
  - Mediastinitis
  - Mediastinal tumors
- RUQ pathology
  - Pancreatitis
  - Hepatitis
  - Cholecystitis
  - choledocolithiasis
- Panic attack
- Therapeutic Trials (if you are not really sure)
  - Angina/ACS: try some sublingual NTG
  - GERD: Ranitidine, Maalox, BMX
  - Anxiety: anxiolytics
  - Costochondritis/MSK Pain: NSAIDs, ketorolac



# TYPICAL VS. ATYPICAL CHEST PAIN

## Typical

Characterized as discomfort/pressure rather than pain

Time duration >2 mins

Provoked by activity/exercise

Radiation (i.e. arms, jaw)

Does not change with respiration/position

Associated with diaphoresis/nausea

Relieved by rest/nitroglycerin

## Atypical

Pain that can be localized with one finger

Constant pain lasting for days

Fleeting pains lasting for a few seconds

Pain reproduced by movement/palpation

- Scale Insulin (on-site)
- H1N1 Information
- Rapid Referral
- ODH Test
- Algorithm
- UHCMC E
- Portal Fe**
- ePrescrip
- ePrescrip
- E-mail
- Phone Dir
- Send a T
- Portal Su
- Only)
- External -
- Personal
- Logout
- Clinical**
- Patient S
- Patient H
- Clinical S**
- Electronic
- OB Link
- PACS - ID
- Radiology
- UHCare**
- Daily Activation Hotsheets (on-site)
- Physician Resources (on-site)
- UHCare Home Page (on-site)
- UHCare Downtime Procedures (on-site)
- Cardiovascular Systems**
- Anticoagulation Monitoring Service Referral
- EKG - UH Sites**
- Camtronics (on-site)
- CardioLab (Prucka) (on-site)
- Heartlab (on-site)
- Holter Sentinel Web

http://uhmuseweb.uhhs.com/

CV Web

Search

Patient ID:

Patient Last Name:

Patient First Name:

Search

Select from the following:

- site 1 UHC
- site 2 Ahuja
- site 3 CONNEAUT
- site 4 BEDFORD
- site 5 RBC
- site 6 Richmond Heights
- site 7 Geauga Regional
- site 8 GENEVA
- site 9 SEIDMAN
- site 30 MT SINAI

**Extra "0" before MRN (9 digits total)**

up copy, stress tests and echo reports

Go see the patient!

**Sign in with: UHHS/username and usual UH system password**

# ACS: US/NSTEMI

- Labs:
- Imaging:
- You administer the following medications:
  - ASA 324 mg
  - Plavix 600 mg
  - Heparin 4000 subQ bolus and start a gtt
  - Atorvastatin 80 mg qsh
  - 0.4 SL nitro

Requested By:  Me  Other:

Source:

Allergy Details

Session

Type: Standard

Reason: Immediate Activation

Manual Entry

Searching for ...

acute coron

Order

Cost

 Acute Coronary Syndrome  
(Unstable Angina Chest Pain)

Add...

View...

Item Info

Add to Favorites

Message

Drug Info



Edit...

Delete

Copy...

Add Specimen...

Indication...

Mark as Done

Immediate Activation

Submit Order(s) for JONES, JAYDEN M

Hide Worksheet

Cancel

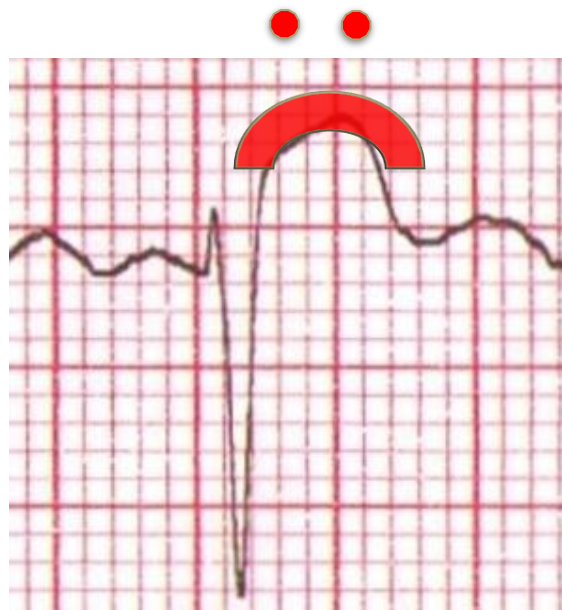
Help



# ST ELEVATIONS

Acute Pericarditis	Acute MI	Benign Early Repolarization
Diffuse ST segment elevation	ST elevation in anatomically contiguous leads; possible reciprocal ST depression	ST elevation predominant in V2-V5, may be widespread
ST elevations concave	ST elevations convex	ST elevations concave
PR depression	No PR Depression	No PR Depression
T waves upright	T waves invert as infarction evolves	T wave may be inverted
		J point notching/slurring

OR, TO PUT IT MORE SIMPLY:



Scary



Not Scary

# MORE SCENARIOS: PT IS CONSTIPATED

Medication	Usual adult dose
<b>Bulk-forming laxatives*</b>	
Psyllium	Up to 1 tablespoon ( $\cong$ 3.5 grams fiber) 3 times per day
Methylcellulose	Up to 1 tablespoon ( $\cong$ 2 grams fiber) or 4 caplets (500 mg fiber per caplet) 3 times per day
Polycarbophil	2 to 4 tabs (500 mg fiber per tab) per day
Wheat dextrin <sup>†</sup>	1 to 3 caplets (1 gram fiber per caplet) or 2 teaspoonsful (1.5 gram fiber per teaspoon) up to 3 times per daily
<b>Surfactants (softeners)</b>	
Docusate sodium	100 mg 2 times per day
Docusate calcium	240 mg 1 time per day
<b>Osmotic agents</b>	
Polyethylene glycol (macrogol)	8.5 to 34 grams in 240 mL (8 ounces) liquids
Lactulose	10 to 20 grams (15 to 30 mL) every other day. May increase up to 2 times per day.
Sorbitol	30 grams (120 mL of 25 percent solution) 1 time per day
Glycerin (glycerol)	One suppository (2 or 3 grams) per rectum for 15 minutes 1 time per day
Magnesium sulfate	One to two teaspoonsful ( $\cong$ 5 to 10 grams) dissolved in 240 mL (8 ounces) water 1 time per day
Magnesium citrate	200 mL (11.6 grams) 1 time per day
<b>Stimulant laxatives</b>	
Bisacodyl	10 to 30 mg as enteric coated tabs 1 time per day
	10 mg suppository per rectum 1 time per day
Senna	2 to 4 tabs (8.6 mg sennosides per tab) or 1 to 2 tabs (15 mg sennosides per tab) as a single daily dose or divided twice daily



# THERE ARE ALWAYS MORE SCENARIOS

- Patient is complaining of nausea
  - Prochlorperazine (Compazine)
    - 10 mg PO or 5-10 mg IVPB
  - Promethazine (Phenergan)
    - 12.5-25 mg PO or 25 mg IVPB
  - Ondansetron (Zofran)
    - 4 mg IV or 4-8 mg PO
  - Metoclopramide (Reglan)
    - 5-10 mg IVPB or PO
- Patient is complaining of MSK pain
  - Lidocaine patch/gel/cream
  - Tylenol
  - NSAIDs
  - Diclofenac cream (\$\$\$)
  - Tramadol
  - Narcotics

# CODE BLUE

You are the Wearn intern on call, working on notes in the Wearn team room. Code Blue is called for a patient on Lakeside 20. Your senior is MIA. You run down the hall and are the first on the scene. What do you do?

#1 Check your pulse!!!

#2 .....RUN.....

CODE BLUE.... Also known as a DR. HEART (at the VA)



# WHO GOES TO THE CODE

Interns, senior residents, AIs, and 3<sup>rd</sup> year medical students on Long Call on wards and in MICU

DACR/VACR/NACR

Anesthesia team

Respiratory Therapists

Critical care nurses (from MICU/CICU)

Critical care pharmacist (Business hours M-F)

# WHO RUNS THE CODE?

First resident on the scene or DACR/VACR/NACR

What does the leader of the code do?!

# ROLES DURING THE CODE

- Stabilizing/managing airway
- Managing code cart
- Medication administration
- Recording timing of events
- Line for chest compressions (preferably 4 deep)
- Checking labs and past medical history, telemetry
- Pulse checker
- Thinking through Hs and Ts
- Calling the patient's family
- Crowd control
- Obtaining emergency access

# HIGH QUALITY CPR IS KEY

Rate approx 100/min

Compression depth >2 inches (5cm) in adults

Allow complete chest recoil after each compression

Minimize interruptions

Rotate every 2 minutes

# ALWAYS DISCUSS CODE STATUS WITH PATIENTS

All patients admitted to the hospital should be asked about their code status

It's important to discuss the morbidity associated with ACLS

Statistics regarding survival after arrest

Adverse outcomes of CPR and Advanced Airway Support