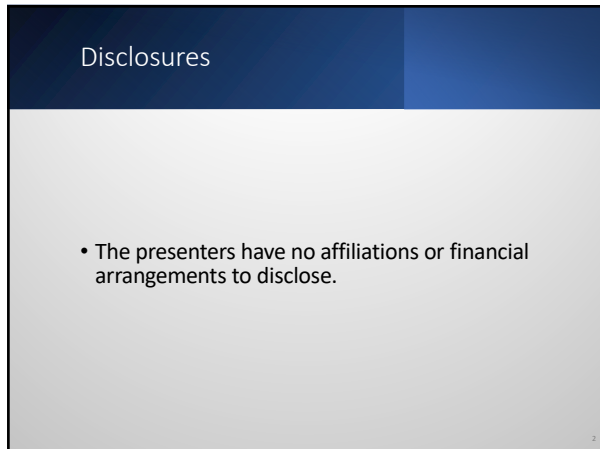
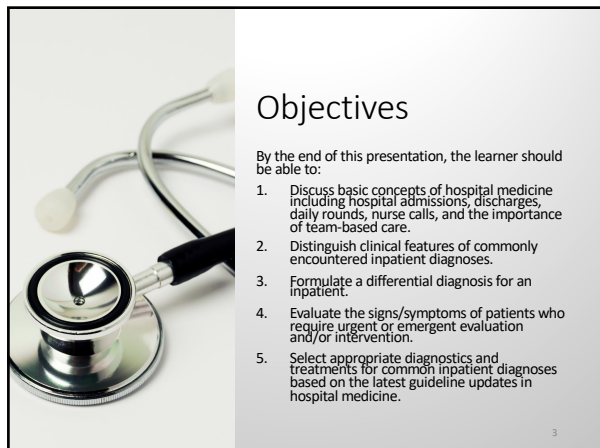


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3

Turn it on!



Cool Kids
Carry Pagers

<http://zenius.com/107224>
<http://en.wikipedia.org/wiki/Pager>

4

4


Today's Responsibilities

Morning Rounds List

- Mrs. Smith
- Mr. Williams
- Mrs. Keith

Other Assignments

- ER pager: new admissions
 - Mr. Grayson
- Floor pager: RN calls
 - Mr. Mitchell
 - Mr. Flowers



5

5



Mrs. Smith

6

6

Mrs. Smith

Sign out:

- 72-year-old female with type 2 DM, CKD stage II, depression
- HD #4: Admitted with sepsis 2/2 influenza A, placed on oseltamivir + supportive care
- She is improving and likely ready for discharge today.

7

7

Mrs. Smith

- She appears well when you enter the room, PE is unremarkable, and all vital signs are WNL.
- She reports his symptoms are improving and she feels well enough to go home. She has been afebrile > 24 hours.
- Ready for discharge?

8

8

Mrs. Smith

- As you are walking out the door... "Hey, what should I do about this diarrhea I started having?"
- She reports 6 episodes of loose, watery diarrhea over the past 12 hours; She denies abdominal pain, n/v, and she has been tolerating a diet.

9

9

Clostridioides (Clostridium) difficile

- Most recognized cause of infectious diarrhea in healthcare settings
 - **Healthcare-onset (HO) CDI:** > 3 days after hospital admission
- **Risk Factors:** antibiotics*, advanced age, recent hospitalization, severe comorbid illness, enteral feeding, GI surgery, IBD, chemotherapy, gastric acid suppression
- Responsible for 15-25% of antibiotic associated diarrhea

10

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C. diff Testing

- **Who to test?**
 - new and unexplained ≥ 3 unformed stools in 24 hours
- Colonization vs. infection
- Repeat testing?
 - Do not perform within 7 days of same episode of diarrhea.
- Imaging?
 - Severe disease
 - Fulminant colitis

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C. diff and Antibiotics

- D/C inciting antibiotic ASAP
 - If ongoing abx indicated, consider those with lower CDI incidence
- **High-Risk antibiotics:**
 - Fluoroquinolones
 - 3rd/4th generation cephalosporins
 - Carbapenems
 - Clindamycin
- Practice antibiotic stewardship!

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C. Diff Treatment

- **Initial CDI:** Either vancomycin 125mg PO QID or fidaxomicin 200mg PO BID x 10 days
- **Fulminant CDI:** Vancomycin 500mg PO/NGT QID + metronidazole 500mg IV q8 hours
 - If ileus, consider rectal vancomycin
- **First recurrence:** Fidaxomicin x 10 days OR vancomycin tapered + pulsed regimen (dependent on initial tx)
- **Multiple Recurrences:** Fecal microbiota transplant

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IDSA C. diff Guidelines (2018)

Table 1. Recommendations for the Treatment of Clostridium difficile Infection in Adults

Clinical Definition	Supportive Clinical Data	Recommended Treatment*	Strength of Recommendation/ Quality of Evidence
Initial episode, non-severe	Leukocytosis with a white blood cell count of $\leq 15,000$ cells/mL and a serum creatinine level ≤ 1.5 mg/dL	<ul style="list-style-type: none"> • VAN 125 mg given 4 times daily for 10 days, OR • FXD 200 mg given twice daily for 10 days 	Strong/High Strong/High Weak/High
Initial episode, severe†	Leukocytosis with a white blood cell count of $> 15,000$ cells/mL, or a serum creatinine level > 1.5 mg/dL	<ul style="list-style-type: none"> • VAN, 125 mg 4 times per day by mouth for 10 days, OR • FXD 200 mg given twice daily for 10 days 	Strong/High Strong/High
Initial episode, fulminant†	Hypotension or shock, ileus, megacolon	<ul style="list-style-type: none"> • VAN, 500 mg 4 times per day by mouth or by nasogastric tube. If ileus, consider adding rectal instillation of VAN. Intravenously administered metronidazole (500 mg every 8 hours) should be administered together with oral or rectal VAN, particularly if ileus is present... 	Strong/Moderate (oral VAN); Weak/Low (rectal VAN); Strong/Moderate (intravenous metronidazole)
First recurrence	...	<ul style="list-style-type: none"> • VAN 125 mg given 4 times daily for 10 days if metronidazole was used for the initial episode, OR • Use a prolonged tapered and pulsed VAN regimen if a standard regimen was used for the initial episode (eg, 125 mg 4 times per day for 10–14 days, 2 times per day for a week, once per day for a week, and then every 2 or 3 days for 2–8 weeks); OR • FXD 200 mg given twice daily for 10 days if VAN was used for the initial episode 	Weak/Low Weak/Low Weak/Moderate
Second or subsequent recurrence	...	<ul style="list-style-type: none"> • VAN (8 tapered and pulsed regimen), OR • VAN, 125 mg 4 times per day by mouth for 10 days followed by rifaximin 400 mg 3 times daily for 20 days, OR • FXD 200 mg given twice daily for 10 days, OR • Fecal microbiota transplantation† 	Weak/Low Weak/Low Weak/Low Strong/Moderate

Abbreviations: FXD, fidaxomicin; VAN, vancomycin.
 *All randomized trials have compared 10-day treatment courses, but some patients (particularly those treated with metronidazole) may have delayed response to treatment and clinicians should consider extending treatment duration to 14 days in those circumstances.
 †The criteria proposed for defining severe or fulminant Clostridium difficile infection (CDI) are based on expert opinion. These may need to be reviewed in the future upon publication of prospectively validated severity scores for patients with CDI.
 ‡The option of the parent or other appropriate antibiotic treatment for at least 2 recurrences (ie, 3 CDI episodes) should be tried prior to offering fecal microbiota transplantation.

14


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Thanks, Dr. Google

- She has a few questions after she googles C. diff....
1. "Can I take an anti-diarrheal to slow it down?"
 2. "I take omeprazole because my neighbor told me it was good for me...do PPIs contribute to C. Diff?"
 3. "Should I be taking a probiotic?"
 4. "Can I spread this to my family?"

15

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Discussion Questions

Discuss your answers to the patient's questions:

1. "Can I take an anti-diarrheal to slow it down?"
2. "I take omeprazole because my neighbor told me it was good for me...do PPIs contribute to C. Diff?"
3. "Should I be taking a probiotic?"
4. "Can I spread this to my family?"

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RN is calling...


"Mr. Mitchell, an 89 YO gentleman who came in with a hip fracture yesterday is confused and pulling at his sheets. His daughter is very concerned. Can you come to the bedside?"

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Mr. Mitchell

- 89-year-old male with Alzheimer's dementia. At baseline he is A&O to his name only but at times will recognize his family.
- He was admitted yesterday with an impacted L subtrochanteric fracture. He just returned from surgery and is more confused. He cannot tell you his name and does not recognize his daughter. He is pulling at his sheets.
- His daughter asks why he is like this and when he will be back to normal.



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Features of Delirium

- DSM-5 definition requires all criteria to be met:
 1. Disturbance in attention and awareness
 2. Disturbance develops acutely and tends to fluctuate in severity
 3. At least one additional disturbance in cognition
 4. Disturbances are not better explained by a preexisting dementia
 5. Disturbances do not occur in the context of a severely reduced level of awareness/coma
 6. Evidence of underlying organic cause

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Hospital Delirium

- Most common surgical complication among older adults
 - 50% after high-risk surgery
- Hyperactive delirium only represents 25%
 - Hypoactive delirium = worse prognosis

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Delirium Risk Factors

Predisposing

- Dementia, stroke, Parkinson disease or other underlying brain disease
- Old age
- Functional disabilities
- Multiple medical problems

Precipitating

- Drugs/polypharmacy
- Surgery
- Anesthesia
- High pain levels
- Infection
- Dehydration
- Acute illness
- Immobility/restraints
- Malnutrition
- Bladder catheters
- Alcohol use



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“Round up the Usual Suspects”

- Post-operative
- Infections
- Medications (22-39%) or lack of
- Cardiopulmonary events
- Metabolic abnormalities
- Neurologic events
- Urinary and fecal disorders (retention, impaction)
- Substance intoxication or withdrawal
- Reduced sensory input



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Evaluation of Delirium

- Complete history and physical exam
- Gather details: when did it start, was there a medication change or a coinciding recent symptom (ie. cough)
- Review medications
- CBC w/diff, CMP, Ca²⁺, Mg²⁺, UA/urine culture
- ECG and CXR
- ABG
- If the cause is not clear after the initial work-up, consider:
 - Urine/blood toxicology screens
 - TSH, folate, vitamin B12, CSF analysis
 - Head CT/MRI, LP, EEG
 - Blood cultures
 - Bladder scan

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Confusion Assessment Method (CAM)

1. Acute change in mental status with fluctuating course (usually answered by RN or family)
2. Inattention
3. Disorganized thinking
4. Altered level of consciousness


(+) CAM requires 1 & 2 AND either 3 OR 4

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Treatment of Delirium

- Prevention is the primary goal!
- Identify and treat the underlying cause.
- Consider environmental factors.
 - Re-establish sleep-wake cycle
 - Day/night observation
 - Reorienting devices/memory cues
 - Family to bedside
 - Encourage use of hearing aids/glasses
 - RN – de-escalating techniques
 - Patient sitter if needed for safety
- Reassure patient/family/staff.



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Pharmacologic Treatment

- There are NO FDA approved medications.
- Avoid benzodiazepines (unless in ETOH withdrawal) and “sleepers”!
 - Melatonin
- Anti-psychotics are often used off-label.
 - **Black box warning**
“...conventional and atypical antipsychotics are associated with an increased risk of mortality in elderly patients treated for dementia-related psychosis...”

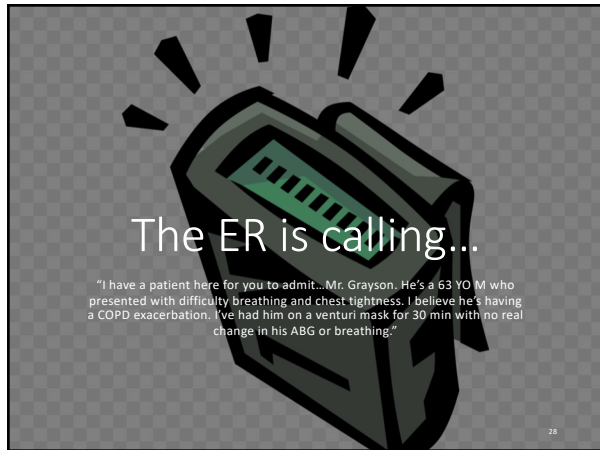
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Pharmacologic Treatment

- Stop and ask yourself.....
 - Do the symptoms need drug treatment?
 - Is this medication really going to help the symptoms?
 - What are the potential side effects?
 - How long will I have to continue it?



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Mr. Grayson

- **Medical history:** COPD, diagnosed 10 years ago; Paroxysmal A Fib; HLD
- **Meds:**
 - Fluticasone/vilanterol 25mcg/100mcg 1 puff inhaled daily
 - Albuterol 2.5mg nebulized q4 hours prn SOB or wheezing
 - Warfarin 2mg daily
 - Simvastatin 20mg daily
- **Vitals:**
 - BP 162/86 mmHg
 - HR 102 bpm
 - RR 26 br/min
 - T 98.8 F
 - SpO2 78% on room air → placed on Venturi mask

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Mr. Grayson's HPI

- Chest tightness x3 days
- Difficulty breathing x5 days, but worse today
- Cough seems to have increased some according to his wife, sputum is thicker and more yellow-colored
- Saw PCP 4 days ago, was given albuterol nebulizer which he has been using sparingly with no improvement
- Current smoker with 40 pack-year history
- Last FEV1 was 60% predicted 3 years ago
- Hospitalized once for an exacerbation about 8 years ago

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Mr. Grayson's Physical Exam

- **Gen:** Thin-appearing elderly gentleman sitting upright in bed and leaning over with his hands on his knees
- **CV:** Tachycardic, regular rhythm, no m/r/g, distal pulses 2+, no peripheral edema
- **Lungs (you are seeing him 30 min after Venturi mask placed on):** Tachypneic (RR 24), diffuse end-expiratory wheezing, prolonged expiratory phase, paradoxical abdominal movement with breathing, no accessory muscle use, no rales/rhonchi
- **Abdomen:** BS present, non-tender to palpation, no rebound/rigidity/guarding
- **Extremities:** Muscular atrophy noted, scattered ecchymoses
- **Skin:** Diaphoretic, slight purplish discoloration in hands and feet, no clubbing
- **Neuro:** Alert and oriented x3

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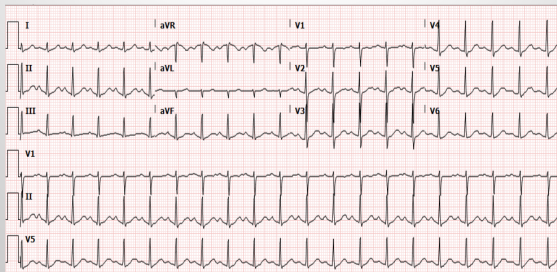
Chest x-ray



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ECG



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ABG

Value	Measure	Normal Range
pH	7.23	7.25-7.35
pCO2	58 mmHg	35-45 mmHg
pO2	66 mmHg	80-110 mmHg
HCO3	28 mmHg	21-28 mmHg


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- ### Additional Labs
- CBC → unremarkable
 - Troponins → 0.01 x3
 - D dimer → < 500 ng/mL
 - INR → pending

 - Rapid Influenza A/B PCR → negative
 - SARS-CoV-2 PCR → negative
 - Viral PCR → positive for *human rhinovirus*
 - Sputum culture → pending
- 35

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Discussion Questions

- Discuss an admission plan for this patient, including:
 - Additional labs/testing
 - Oxygen delivery
 - Medications
 - Additional supportive care

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Mr. Grayson's Admission Plan

1. Transition venturi mask → NIV trial with bilevel non-invasive ventilation.
2. Repeat ABG in 1-2 hours, sooner if clinical deterioration.
3. Start prednisone 40mg x 5-day course.
4. Start azithromycin 500mg x1, then 250mg daily for additional 4-day course.
5. Start ipratropium 0.5mg/albuterol 2.5mg nebulized q4 hours.
6. Start heparin 5000u SQ q8hrs for VTE prophylaxis.
7. Offer nicotine patch and educate on smoking cessation.

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Treatment of COPD Exacerbation

- **Goals of treatment**
 1. Minimize negative impact of current exacerbation
 2. Reduce risk of future exacerbation
- **Outline of treatment**
 1. Supplemental O2 +/- noninvasive mechanical ventilation (NIV)
 2. Increase dose and/or frequency of short acting bronchodilators +/- anticholinergic
 3. +/- Systemic corticosteroids
 4. +/- Antibiotics
 5. Long-acting bronchodilators (LABA) +/- inhaled corticosteroids (ICS)
 6. Investigate for severe Vitamin D deficiency!

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Bronchodilators in COPD Exacerbation

- Inhaled short-acting beta-adrenergic agonists (SABA) are mainstay of therapy in exacerbation
 - Anticholinergic often used in combo
- **Metered dose inhaler (MDI) = nebulizer**
 - If using nebulizer...air-driven > oxygen-driven
- Continue long-acting bronchodilators (LABA) +/- ICS or start as soon as possible before discharge

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Steroids in COPD Exacerbation

- **Systemic glucocorticoids**
 - Oral therapy = intravenous in most cases
 - Prednisone 40mg PO daily x 5 days
- **Inhaled corticosteroids (ICS)** combined with LABA x10 days
 - Possible reduction in exacerbations, particularly in severe disease
- Several studies have shown better efficacy of ICS with higher eosinophil counts
 - Oral steroids may have the same benefit, but more studies needed

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Glucocorticoids in COPD Exacerbation

<p><u>Potential Positive Effects</u></p> <ul style="list-style-type: none"> • Shorten recovery time • Improve: <ul style="list-style-type: none"> • FEV₁ • Oxygenation • Length of hospitalization • The risk of treatment failure and early relapse • Symptoms 	<p><u>Potential Negative Effects</u></p> <ul style="list-style-type: none"> • Even short bursts increase risk of pneumonia, sepsis, and death • Opportunistic infections • Undesirable side effects • Poorly controlled diabetes • Decreased bone density • Steroid myopathy
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Eosinophils + COPD

- **INSPIRE study** → LABA/ICS associated with significantly reduced exacerbation rates in patients with eosinophil counts ≥ 2% compared to LAMA
- **TRISTAN study** → LABA/ICS associated with significantly reduced exacerbation rates in patients with eosinophil counts ≥ 2% compared to placebo, but not vs. LAMA or LABA. No difference in patients with eosinophils < 2%
- **CORTICO-COP study** → eosinophil-guided therapy was non-inferior compared with standard of care for # of days alive and out of hospital AND reduced systemic corticosteroid exposure

GOLD 2020 recommends cut-off estimates

< 100 cells/ μ L = low likelihood of treatment benefit with ICS

> 300 cells/ μ L = greatest likelihood of treatment benefit with ICS

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Antibiotics in COPD Exacerbation

- Most guidelines recommend antibiotics in moderate to severe exacerbation requiring hospitalization

GOLD recommends three scenarios in which antibiotics should be given:

- Increase in dyspnea + sputum volume + sputum purulence
- Increase in sputum purulence + one other cardinal symptom
- Mechanical ventilation required (invasive or non-invasive)

Procalcitonin-guided initiation of antibiotics?

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Antibiotics in COPD Exacerbation

Empiric treatment options:

- Amoxicillin + clavulanic acid
- Macrolide
- Tetracycline

5-7 day course is recommended!

Factors to consider:

- Local bacterial resistance patterns
- History of *Pseudomonas*
- History of resistant pathogens

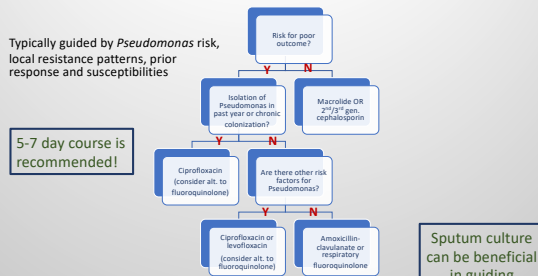
Sputum culture can be beneficial in guiding antibiotic therapy

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Antibiotics in COPD Exacerbation

Typically guided by *Pseudomonas* risk, local resistance patterns, prior response and susceptibilities



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Supplemental Oxygen and Non-Invasive Ventilation in COPD Exacerbation

- **Standard oxygen therapy**
 - Nasal cannula → 6L/min, FIO2 ~40%
 - Simple facemask → 6-10L/min, FIO2 up to 55%
 - **Venturi mask** → precise FIO2 of 24, 28, 31, 35, 40, or 60%
- **High-flow oxygen therapy**
 - Can deliver up to 60L/min
- **Non-invasive ventilation (NIV)**
 - Avoid the complications of invasive ventilation if possible!
 - Consider trial unless patient immediately deteriorating or absolute contraindication

Goal oxygen saturation = 88-92%

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Bilevel Non-Invasive Ventilation

<p>Indications in COPD Exacerbation:</p> <ul style="list-style-type: none"> • Acute respiratory failure leading to acute/acute on chronic respiratory acidosis • Persistent hypoxemia despite supplemental oxygen • Severe dyspnea with clinical signs suggestive of muscle fatigue • Trial in patients who are considered to require invasive ventilation 	<p>Absolute Contraindications:</p> <ul style="list-style-type: none"> • Unstable cardiopulmonary status/arrest • Facial/gastric/esophageal surgery • Facial trauma or burns • Reduced consciousness • Air leak syndrome • Inability to protect airway • Apnea • Uncooperative patient
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Invasive Mechanical Ventilation

- **No longer the 1st line treatment of acute respiratory failure during COPD exacerbation**
- Status-post arrest or severe unresponsive hemodynamic instability
- Severe ventricular/supraventricular arrhythmias
- Massive aspiration, persistent vomiting
- Inability to remove secretions
- Diminished consciousness/uncontrolled psychomotor agitation
- Failed/Unable to tolerate NIV and still hypoxemic

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Mr. Williams

Sign out:

- 74-year-old male with tobacco abuse and history of lung CA on chemotherapy presented with **12 hours of shortness of breath and chest pain**. He was found to have an acute PE along with RLE DVT, was admitted and started on IV unfractionated heparin.
- Yesterday was HD #3, symptoms had improved some, but he was still on 2L NC O2.

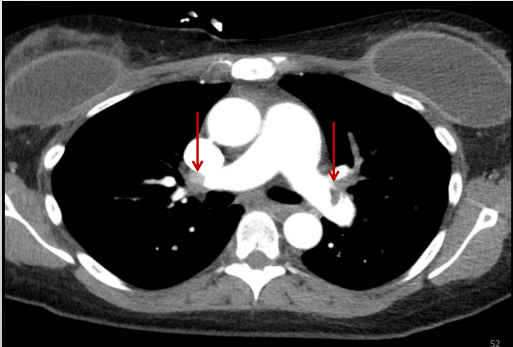
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Mr. Williams

- When you enter the room, he appears well and immediately asks if he can go home today. He reports that his symptoms have improved significantly from yesterday, and he was even able to ambulate the halls last night without oxygen.
- His VS are stable, and he came off supplemental O2 late last night, has been stable on RA through the morning.

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Mr. Williams



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PE in Malignancy

- PE is the second leading cause of death in cancer patients, aside from the cancer itself.
- Higher rates of recurrence despite anticoagulation **AND** higher rates of bleeding with anticoagulation than the general population.
 - These risks vary amongst different cancers.

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PE in Malignancy

- **ASCO VTE Clinical Practice Guideline Update 2020**
 - Initial AC options: LMWH>UFH, fondaparinux, rivaroxaban
 - Long-term: rivaroxaban, edoxaban added as options
 - Increase in major bleeding noted with DOACS, particularly in GI and possibly GU CA*

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Mr. Williams

Today's Plan:

1. Discharge home with close follow-up.
2. R/B/SE of various strategies for anticoagulation discussed, patient wishes for long term treatment with edoxaban.
3. Enoxaparin (1 mg/kg q 12 hours) to be used for total 5 days parenteral AC before starting edoxaban.
4. Reviewed transition times of AC, completed AC teaching and bleeding precautions given.
5. **SMOKING CESSATION !**

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Discussion Topics

- Is there a PE team in your hospital?
- If so, do you find it beneficial/useful?
- What is your comfort level with choosing the proper anticoagulant for patients?
- In patients with malignancy + PE, do you place most on LMWH or a DOAC?

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RN is calling...

"Mr. Grayson's INR came back at 9.2....what would you like me to do?"

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Supratherapeutic INRs

- INR 4.5-10 and no evidence of bleeding → the routine use of vitamin K is not suggested
- INR >10.0 and no evidence of bleeding → PO vitamin K
- VKA-associated major bleeding → rapid reversal of AC with 4-factor prothrombin complex concentrate (4F-PCC) is suggested rather than plasma
 - Vitamin K 5-10 mg IV should also be given concurrently
- Avoid things that may make the person bleed
 - Avoid foleys, IM injections, initiate fall precautions
 - Discontinue DVT prophylaxis/bridging therapy

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Vitamin K

- Warfarin inhibits Vitamin K but has an inconsistent effect
- Available IV, PO (SC and IM not recommended)
 - Same bioavailability at 24 hours
 - Some benefit to IV in life threatening bleeding given more rapid onset compared to PO
- Risk of anaphylaxis?
 - Low, related to dose and speed of infusion
 - D/t polyethoxylated castor oil (solubilizer)

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Prothrombin Complex Concentrates (PCC)

- **4-Factor PCC FDA Approved Indication:** Urgent reversal of acquired coagulation factor deficiency induced by vitamin K antagonist therapy in adult patients with acute major bleeding or need for urgent surgery/invasive procedure

- Co-administration with vitamin K

3-Factor	4-Factor
II, IX, X	II, IX, X
	VII
	Protein C&S

- Not studied in patients with thromboembolic events in last 3 mo.

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4F-PCC Dosing

- Warfarin Reversal

Baseline INR	Kcentra dose (units of factor IX/kg)	Maximum dose (units of factor IX)
2 - <4	25	Do not exceed 2500
4 - 6	35	Do not exceed 3500
> 6	50	Do not exceed 5000

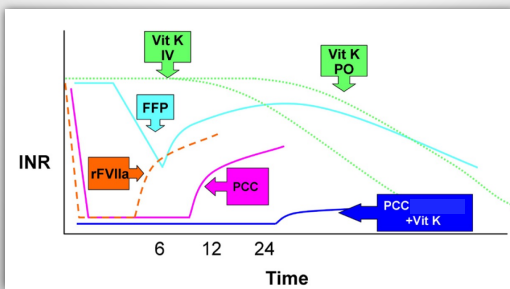
- DOAC reversal (OFF-LABEL)
 - 50 units/kg

- Max dose for warfarin and DOAC = Do not exceed 5,000 units

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Vitamin K vs. FFP vs. PCC



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Summary of Reversal Agents

Anticoagulant	Reversal Agent
Unfractionated heparin	Protamine sulfate
Low molecular weight heparin	Protamine sulfate
Warfarin	4Factor-PCC Vitamin K
Dabigatran	Idarucizumab
<u>Direct Xa inhibitors</u> Rivaroxaban Apixaban *Edoxaban and betrixaban off-label	Andexanet alfa


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Back to Mrs. Grayson...

- She has no evidence of bleeding
- Hold warfarin...
- Continue to monitor INR
- Bleeding precautions

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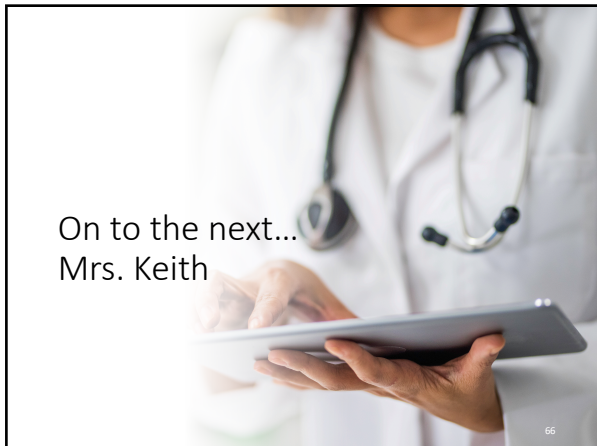


Discussion Topics

- What reversal agents have you used in your practice?
- What has your experience been with FFP for INR reversal? Is your hospital still using it much?

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On to the next...
Mrs. Keith

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Mrs. Keith

- Your attending left early to pick up his new racing bike.
- He calls you from the car asking you to see Mrs. Keith. She is a 56-year-old who was admitted for a "liver work-up". The nurse called him about 30 minutes ago, saying the patient was confused. He ordered a dose of lactulose and haloperidol.
- The nurse called again and said that she is getting worse. He wants you to see the patient.

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Mrs. Keith

- As you enter her room, she is A&O, appears restless, and is pacing around the room. She is anxious, diaphoretic, and has tremors of her UEs.
- Her BP is 190/95 with a HR of 129.
- The nurse reports that her morning labs, including an ammonia level, were normal except for: AST 152, ALT 70, and INR of 1.7.

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Alcohol Withdrawal

Signs and Symptoms

- | | |
|---|---|
| <ul style="list-style-type: none"> • Autonomic hyperactivity <ul style="list-style-type: none"> • Diaphoresis • Tachycardia • Systolic hypertension • Tremors • Insomnia • Transient hallucinations | <ul style="list-style-type: none"> • Nausea or vomiting • Psychomotor agitation and restlessness • Anxiety • Grand mal seizures • Loss of appetite to rejection of all food • Confusion |
|---|---|

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Spectrum of Withdrawal

Minor	Major/Severe
<ul style="list-style-type: none"> • Usually starts 6-10 hours after last drink • Main symptoms autonomic hyperactivity • Usually requires only supportive care 	<ul style="list-style-type: none"> • Symptoms more severe • Associated with: <ul style="list-style-type: none"> • Alcoholic hallucinosis • Withdrawal seizures • Delirium tremens

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Alcohol Withdrawal

Syndrome	Onset	Findings
Minor withdrawal	6 – 36 hours	Tremulousness, mild anxiety, headache, diaphoresis, palpitations, anorexia, GI upset
Seizures	6 – 48 hours	Single or brief flurry of generalized tonic-clonic seizures
Hallucinosi	12 – 48 hours	Visual, auditory, and/or tactile hallucinations
Delirium Tremens	48 – 96 hours	Delirium, agitation, tachycardia, hypertension, fever, diaphoresis


Patients can still be in withdrawal even with an elevated ethanol level!

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CIWA-Ar

- Clinical Institutes Withdrawal Assessment Scale for Alcohol, revised
 - Scored based on n/v, HA, sweats, tremor, agitation, anxiety, visual/auditory/tactile disturbances, orientation and clouding of sensorium
 - Score > 15 or lower score with a history of withdrawal seizures/DT, begin treatment



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Treatment

- Benzodiazepines → 1st line therapy
 - Acts on inhibitory GABA mediators to replace alcohol's depressant effects
 - Controls autonomic hyperactivity
 - Prevents alcohol withdrawal seizures
 - Benzo loading vs. symptom-triggered treatment?
- Prophylaxis for high-risk patients or history of seizures or DTs
 - Chlordiazepoxide
- MVI, folic acid, thiamine
- Other agents
 - B-Blockers, clonidine, neuroleptics (antipsychotics), seizure medications, barbiturates, baclofen, ETOH

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Discussion Topic

- What does your hospital's protocol look like for alcohol withdrawal patients?
- What are some of the typical challenges faced in patients with alcohol withdrawal?

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It's time to turn o-.....



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Mr. Flowers

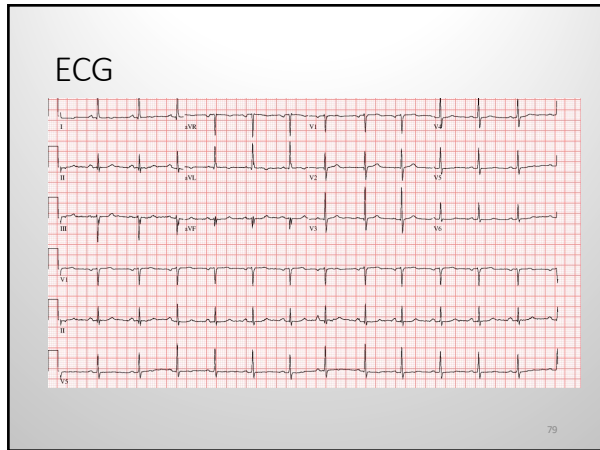
- Mr. Flowers is a 68-year-old male with history of HTN, HLD, CAD, HFpEF, and tobacco abuse (60 pack-year -hx). He was admitted about 24 hours ago with hypertensive urgency. At presentation, his BP was 200/128 and he did not have any signs of end-organ damage.
- Home anti-hypertensive regimen:
 - Lisinopril 10 mg daily
 - Metoprolol 25 mg BID
 - Lasix 20 mg daily
- He was given a dose of clonidine in addition to his usual anti-hypertensive regimen in the ED last night, and BP lowered to 160/98.

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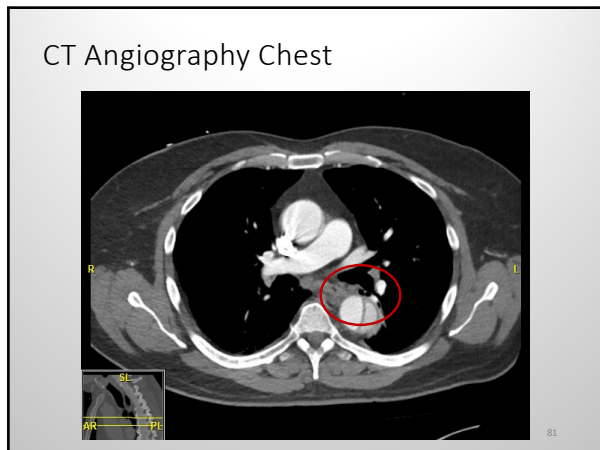
Mr. Flowers

- When you enter the room, he is sitting upright in bed, appears uncomfortable, and somewhat short of breath.
- He says he has a tearing sensation of pain in his upper middle back that began about one hour ago. He had the same pain yesterday, but it was much less severe, so he didn't mention it to anyone.
- Vitals: His BP is now 190/86. HR is 102 bpm. RR 18 br/min. SpO2 96% on RA.

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- ### Labs
- CBC: unremarkable
 - Troponin: initial is negative
 - D-dimer: 1,208 ng/mL (< 500 ng/mL*)
- 80



Acute Aortic Dissection

Risk Factors: <ul style="list-style-type: none"> • Hypertension (76.6%) • Hx of atherosclerosis (27%) • Known aortic aneurysm or previous aortic dissection • Previous cardiac surgery • Bicuspid aortic valve • Marfan syndrome • Iatrogenic • Cocaine use • Age • Male sex 	Signs: <ul style="list-style-type: none"> • Diastolic murmur (40% of type A) • Hypotension (>25%) • Syncope (13%) • Pulse deficits • Aortic regurgitation • CHF • MI • Cardiogenic shock • Neurologic symptoms 	Symptoms: <ul style="list-style-type: none"> • Sudden onset of severe chest pain (type A) or back pain (type B) <ul style="list-style-type: none"> • Abrupt onset • Painless (6.3%) • Atypical presentation – abdominal pain
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Aortic Dissection Detection Risk Score (ADD-RS)

- **ADD-RS:**
 - 1. High risk conditions:** Marfan syndrome or other CT disease, aortic valvular disease, family history, gene mutation, known thoracic aortic aneurysm, previous cardiac surgery or aortic manipulation
 - 2. High risk features:** pain in the chest back or abdomen that is abrupt, severe, or a ripping/tearing sensation
 - 3. High risk PE findings:** pulse deficit, SBP difference, focal neurologic deficit, aortic diastolic murmur, shock
- One point per each category met (any finding present)
- low risk = 0, intermediate risk = 1, high risk = 2-3

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D-Dimer in Acute Aortic Dissection

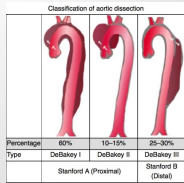
- **[ADD-RS score 0 or 1 + D-dimer < 500 ng/mL]** may be a *possible* rule out diagnostic strategy
 - If ADD-RS >1 should proceed to CT Angiography regardless of D-dimer
- Likely most useful in first 24 hours, for low-risk patients

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Management of Aortic Dissection

- **If hypotension or shock:**
 - IVF bolus +/- vasopressors
 - Surgical consultation
 - Review/additional imaging studies
 - Severe AR? Cardiac tamponade?



- **If stable, IV labetalol preferred**
 - Maintain HR <60, SBP <120 mmHg
- Pain control is essential
 - IV morphine reduces force of cardiac contraction
- Dissections involving the **ascending thoracic aorta** should have urgent operative or interventional management if able

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Hypertensive Crises

- Severe HTN, **SBP ≥180 and/or DBP ≥120 mmHg**
- **Hypertensive Urgency:** no signs of target-organ damage
- **Hypertensive Emergency:** signs of acute target-organ damage

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Hypertensive Crises

- Thorough H&P to help r/o signs/symptoms of target organ damage:
 - Chest pain/pressure
 - Acute severe back pain
 - Dyspnea
 - N/V
 - Focal or generalized neurologic symptoms
 - Papilledema or new hemorrhage/exudate on fundoscopy
 - Pregnancy
 - Acute head injury/trauma
 - Illicit drug use
 - Discontinuation or addition of medications

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Hypertensive Crises

- Complete workup:
 - ECG
 - CXR
 - UA
 - BMP
 - +/- Cardiac biomarkers
 - +/- TTE, BNP
 - +/- Brain imaging (CT, MRI)
 - +/- TEE or contrast-enhanced chest imaging

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Hypertensive Urgency Treatment

- Treat with oral medications: nicardipine, captopril, labetalol are good options
- Normalize BP gradually over 48 hrs to $\leq 160/95$ mm Hg
- Treat pain or anxiety as indicated.
- Usually no indication for hospitalization, but close f/u needed.

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Hypertensive Emergency Treatment

- Admit to ICU
- Treat BP in step-wise fashion, generally not recommended to lower too quickly d/t *autoregulation*
 1. Reduce SBP by no more than 10-20% in 1st hour
 2. Then, by a further 5-15% over the next 23 hours to 160/100 mmHg

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HTN Emergency Exceptions

- **Aortic dissection:** goal SBP < 120 mmHg in 1st hour
- **Acute ischemic stroke:** treat BP ≥185/110 mmHg if reperfusion, ≥220/120 mmHg if not
- **Acute hemorrhagic stroke:** varies; general goal SBP < 140 mmHg
- **Severe preeclampsia, eclampsia, or pheochromocytoma crisis:** goal SBP < 140 mmHg in 1st hour

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Hypertensive Emergency Treatment

Comorbidity	Recommended IV antihypertensive
Acute aortic dissection	Labetalol, esmolol
Acute pulmonary edema	Nitroglycerin, nitroprusside, clevidipine
ACS	Esmolol, nitroglycerin
Acute Renal Failure	Nicardipine, fenoldopam, clevidipine
Preeclampsia/Eclampsia	Hydralazine, labetalol, nicardipine

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Back to Mr. Flowers

- Move to ICU
- Place arterial line for BP monitoring
- IV labetalol → SBP < 120 mmHg ASAP
- Pain control → IV morphine
- TTE ordered
- Surgical consultation

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