

Intern Night Float Survival Guide

‘Your guide through the dark’

SUNY Upstate Medical University



List of Topics:	Page Number
Leaving Against Medical Advice (AMA)	4
Constipation	4
Pain Control	5
Acute Anemia	6
Low Urine Output	7
Hypoglycemia	8
Chest Pain	9
Arrhythmias/ACLS	10
Atrial Fibrillation	11
Hypertension	12
Acute GI bleed	13
Shortness of Breath	14
Oxygen Delivery system	15
Electrolyte Replacement	16
Hyponatremia	17
Hyperkalemia	18
Abdominal pain	19
Hypernatremia	19
Insomnia	19
Hyperglycemia	19
Agitation/Confusion	20
Fever	21
Sepsis	22
Phone Numbers	23

INTRODUCTION

Welcome to world of 'night float'. Night float is a unique rotation which gives you the autonomy of making many clinical decisions. Remember, '*with great power there must also come - great responsibility!*' (Ref: Ben Parker, Spiderman), after all, you are 'cross covering' for other physicians' patients. This book has been assembled by senior / chief residents as well as faculty members to help you with important tips and tricks to guide you through your night float rotation. It includes topics which the night float is most commonly contacted about by nursing staff. Each topic includes the information you need to obtain from nursing staff /chart and possible differential diagnosis and management based on etiology. Although this book has several helpful hints and references, please remember to use your clinical judgment in each individual case.

Remember: you always have your senior with you!

We look forward to working with you and we know it will be a great year! We also look forward to hearing any suggestion / tips from you to make this manual better.

Sincerely,
SUNY Upstate Medical University.
Department of Internal Medicine.

RESIDENT AUTHORS

Rushikesh Shah. M.B.,B.S.
Viren Kaul. M.B.,B.S.

FACULTY MENTOR

Amit Dhamoon. MD, PhD.

CONTRIBUTING AUTHORS

Omar Chaudhary. MD.
Harvir Singh Gambhir. M.B.,B.S., M.D.
Arpan Patel. MD.
Subhash Sitaula. M.B.,B.S.
Sumendra Joshi. M.B.,B.S.
Shalin Kothari. M.B.,B.S.

Syed Wajihuddin. M.B.,B.S.
Priyanka Pitroda. MD.
Aditya Kalakonda. MD.
Aakriti Pandita. M.B.,B.S.
Pallavi Kopparchy. M.B.,B.S.

PATIENT LEAVING AGAINST MEDICAL ADVICE

- Discharge against medical advice (AMA) is a situation in which a patient chooses to leave the hospital before the treating team recommends discharge.
- Review patient's chart and ensure that patient does not have a condition that impairs his / her capacity to make decisions. e.g psychiatric problems, mental retardation, encephalopathy, delirium.
- Suicidal patient, or patients admitted after attempting to commit suicide are not allowed to leave unless specifically recommended by psychiatry.
- Review sign out for instructions from primary team.
- Talk to patient. Most common scenarios when patients decide to do this are:
 - dissatisfaction with their care.
 - dissatisfaction with staff taking care of them.
 - feeling uninvolved. Feeling of not being updated on clinical progress.
 - inadequate pain control
 - personal problems.
- Attempt to answer patient's questions as directly as possible. Attempt to alleviate concerns by providing information. Resolve any medical concerns such as pain control if deemed reasonable.
- If patient decides to leave anyway, explain to him / her all possible consequences of leaving prior to completing treatment. Provide them with the appropriate AMA form to sign.
- Let the senior NF/ nocturnist know. Complete medical reconciliation to the best of your ability. Provide scripts if needed. NEVER prescribe controlled substance. Advise appropriate follow ups.
- Document your conversation with patient. You don't have to do the discharge summary but mention in brief why the patient chose to leave and that you explained the potential risks which he / she understood. Make sure to document that patient had the capacity to understand the decisions regarding his medical care.
- Inform the team and concerned attending in the morning.

CONSTIPATION

- Defined as decrease in frequency (< 3 BMs / week) or change in consistency to hard / lumpy stool or difficulty in evacuation with feeling of incomplete evacuation.
- Prior to prescribing medications, ensure patient is not obstructed. Is the patient passing flatus ? Any vomiting ? Abdominal pain ? If concerned, examine for signs of surgical abdomen.
- Review the chart to for medications which can cause constipation: opioids, anticholinergics, 1st degree antihistaminics.
- Evaluate patient's bowel medications. (All patients with opioids should be on bowel regimen)
- Once dynamic obstruction is ruled out, may order medications as follows:

Stool softeners :

- Docusate 100 mg BID: Takes 24 - 72 hours for onset of action.

Stimulants :

- Senna (2 to 4 tablets daily): Works in 6 -12 hours.
- Bisacodyl
 - 10 to 30 mg tablet daily: Works in 6-10 hours.
 - 10 mg suppository works in 15-60 minutes.

Osmotic agents:

- Magnesium sulfate 1 - 2 teaspoons in water: Acts in 0.5 – 3 hours (Avoid in renal insufficiency).
- Polyethylene glycol 8 to 34 gms daily: Acts in 1-4 days.
- Lactulose (10-20 gms): Works in 2 - 4 hours.

Enemas: If patient is on reasonably good bowel regimen with no BMs in 3 - 4 days with no signs of obstruction, consider enemas. Can use bisacodyl, tap water, lactulose enema. Avoid phosphate enemas in renal dysfunction and elderly.

- Remember, reverse underlying pathologies causing the constipation: pain, urinary retention, recent surgery, opioid use, dehydration.
- In intractable cases, may consider manual fecal disimpaction.

PAIN CONTROL

#1. Information from nursing:

- Acuity: New onset vs. exacerbation of known pain?
- PQRST ?
- Red flags: Fever, focal deficits, LOC, dizziness, chest pain, dyspnea, increased oxygen requirement.
- Wounds? Recent surgery? Incisional pain?
- Hemodynamic stability especially for chest pain, abdominal pain.

#2. Information from chart/sign out:

- Try to find out a cause of the reported pain. Is it known?
- Existing regimen ? Recommendations from primary team.
- Review home pain regimen.
- Review common reasons for contraindication to meds:
 - NSAIDs: GI bleed, GERD, recent ACS, allergy, AKI.
 - Tylenol: Acute / fulminant liver failure, toxicity.
 - Narcotics: Allergy, intolerance, poor respiratory reserve, old age, renal dysfunction.

#3. Triage: Does the patient need to be seen? and initial assessment:

- Chest pain: Please refer to segment on chest pain.
- Headache: New onset, intractable, auras, focal deficits.
- Back pain: Neurological deficits, saddle anesthesia, incontinence.
- Post operative pain: Incisional healing, signs of infection.
- Fall: Evaluate for acute fractures. Does patient need neck stabilization?
- Abdominal pain: Surgical signs? No flatus / feces? Guarding / rigidity?
- H/O of sickle cell disease: Crisis? acute chest? bone crisis?
- ALWAYS ASSESS PAIN IN THE SETTING OF HEMODYNAMIC INSTABILITY.

#4. Management:

- Work up emergent causes of pain if being considered (as explained in #3)
- **Non opioid options:**
 - Tylenol: MDD: 4 gm, MDD with liver failure: 2 gm. Maybe used PRN (650 mg Q6H PRN). If not effective, consider standing doses for 24 hours (inform team). Standing tylenol works better than PRN. Can also be administered per rectal.
 - NSAIDs: Work well for acute pain.
 - Local agents: Lidocaine patch / gel / ointment, diclofenac gel.
- **Opioids:** Use sparingly. Work well for acute pain, especially post operative pain. Order one time doses only. Inform team in AM.
 - Already on opioids: If no C/I, give a one time dose after enquiring about the last dose. Try to give same drug as being used. Do not order long acting doses.
 - Opioid naive: Consider one time doses of lowest dose of opioid (see #4)

#5. Opioid administration:

If patient can take PO and no risk of aspiration: Use lowest dose as one time order.

- Tramadol: Synthetic. Use 50 mg doses PRN.
- Hydrocodone/tylenol: 5/325 or 5/500 mg (may repeat Q4 - 6 hours)
- Oxycodone: 5 mg (may repeat Q4 - 6 hours)
- Morphine IR: 15 or 30 mg dose.

If unable to take PO / aspiration risk:

- Fentanyl 25 to 50 mg IV (based on BMI). May repeat Q2 - 4 hours (shorter acting drug)
- Morphine 2 or 4 mg IV (based on BMI). May repeat Q 2- 4 hours if needed.

#5. Important considerations:

- Avoid ordering standing doses. Avoid long acting formulations.
- Always sign out pain control issues to primary service so they may address it on rounds.
- Always assess sign out. Primary service may recommend not using a certain medication for specific reasons.
- Handy tool to convert dosage (roughly) from one opioid medication to another: <http://opioidcalculator.practicalpainmanagement.com/>

ACUTE ANEMIA (CALL FOR DROP IN HEMOGLOBIN / HEMATOCRIT)

#1. Information from nursing:

- Symptoms ?
- Vitals: Hemodynamically stable? : Tachycardia, hypotension.
- Orthostatic symptoms and vitals?
- Any obvious source of bleeding – GI, urine, sputum, surgical site, wound.

#2. Information from chart review / sign out:

- Is there a known source of bleeding under investigation?
- Trend the Hb / Hct to assess acuity of drop. Is there a drop in WBC / platelets: Dilution ?
- Is patient on anti platelet meds / anticoagulation ?
- Did patient have recent surgery or endovascular procedure.

#3. Initial assessment:

- **Whom to assess:** Decrease in Hb > 1 unit & Hct > 3 units or active bleeding warrants assessment.
- Vitals: Tachycardia, **orthostasis**, hypotension signifies intravascular depletion especially in setting of anemia / dehydration. Orthostatics are a sensitive exam finding.
- If not able to do orthostatic vitals: See HR and BP response to leg raising.
- **Identify source of bleeding:**
 - GI: hematemesis, melena, hematochezia. Do a per rectal exam if suspicious and send for FOBT. Assess abdomen for surgical signs.
 - Post surgical/wound : check surgical site or wound.
 - Hemothorax: Lung exam for decreased sounds.
- **For concealed bleeding:** significant drop w/ hemodynamic compromise: Consider retroperitoneal / abdominal , pelvis or hip bleeding. If recent vascular procedure / cath: Retroperitoneal bleeding high on differential. Consider abrupt in pregnant patients.
- **If no source of bleeding:**
 - Hemodynamic stability with decrease in all cell lines: Dilution / error. Common in 1st 48 hours of hospitalization.
 - Nutritional: review/obtain iron panel, Vitamin B12, folate.
 - Evaluate for hemolysis in appropriate settings: sepsis, autoimmune disease, liver disease, DIC.

#4. Interventions:

- Ensure **adequate IV access:** 2 wide bore IVs.
- **Investigations / labs:**
 - Repeat CBC if suspecting dilution / error.
 - Type and cross.
 - INR / PTT
 - Send anemia work up as mentioned in #3 if warranted.
 - CT abdomen / pelvis if concerned for retroperitoneal bleeding / intra abdominal bleeding.
 - CXR to evaluate for hemothorax.
- **Hemodynamically unstable:** Start fluid resuscitation. Consider PRBC transfusion (see below). Call SNF. Discontinue anticoagulation, consider reversal (please see section on reversal of anticoagulation).
- For mild drop in asymptomatic patient w/o hemodynamic compromise: Observe. Send work up as in #3. Follow through night for stability. Inform primary team.
- Keep **transfusion** threshold at Hb < 7 and Hct < 21 or follow primary team's instructions. For patients with active ACS, transfusion threshold is low (around 8 and 24). Can transfuse 1-2 units at a time.
- **Reversal of anticoagulation:** See #4.
 - For GI bleed: see the section on GI bleed
 - For surgical site bleeding: D/C anticoagulation if significant bleeding. Consult surgical services.

#5. Reversal of anticoagulation (please see section on reversal of anti coagulation for details):

- 2/2 Coumadin / liver disease: Vitamin K (PO preferred, may use IV. Avoid SQ). FFPs. K - centra.
- Platelets if thrombocytopenia.
- Use desmopressin if patient is uremic.
- Hold all anti platelets, especially if hemodynamically unstable.

#6. Special considerations:

- Jehovah's witness: due to cultural beliefs you can't transfuse these patients. Discuss with the patient and document in chart informing possible risk. You can resuscitate with IVF.
- If hemodynamically significant bleed, discuss with SNF, consider MICU consult.
- If unable to obtain good IV access, consider CVC.

LOW URINE OUTPUT

#1. Information from nursing:

- Acuity ? Duration ?
- Does patient have Foley catheter ? Is it draining ?
- If not: What is the post - void residual urine ?
 - If < 100 cc: evaluate etiology.
 - If > 200 cc: straight cath.
 - If > 400 cc: place a foley catheter and leave it in place.
- If patient has ascites, bladder scanning overestimates the bladder volume.
- Associated symptoms: fever, signs of infection ?

#2. Information from chart review / sign out:

- Oliguria (<500 cc/day or <0.5 cc/kg/hr) / anuria (No urine output).
- Fluid status: I/Os, including cumulatives. Does patient have a reason to be hypovolemic ?
- Med review: Diuretics, IV fluids, drugs with anti - cholinergic properties (cause retention).
- Other factors: Pain / recent surgery / constipation (impair bladder emptying).
- Labs: BUN / Cr and Sr. Osm (does it suggest intravascular depletion or overload ?)

#3. Assessment:

- Volume status assessment: Intravascularly depleted or volume overloaded ?
 - Intravascular depletion: Mucus membranes, skin, BP, HR, UOP, mental status. Remember orthostatic signs are sensitive for detecting depletion especially in cases of bleeding.
 - Overload: JVD, crackles, edema, S3.
- Look for underlying causes:
 - Intravascular depletion: Sepsis, poor PO intake, excessive diuresis etc.
 - Overload: Fluids, ACS, arrhythmias, CHF.

#4. Treatment:

- Patient already has Foley ? Ensure it is draining. Ask nursing staff to flush and confirm patency.
- Intravascularly depleted ?
 - IV fluid boluses: 250 - 500 ml. If improvement noted, place on maintenance fluids (for 1000 ml) and inform primary team.
 - Treat primary cause: Sepsis, diarrhea, etc.
- Overload state:
 - Consider diuresis.
 - Treat primary cause or concomitant issues (arrhythmias).
- Remove offending factors: Anti cholinergic meds, pain meds, constipation.

NOTES

HYPOGLYCEMIA

#1. Information from nursing:

- How low is the fingerstick ?
- First time or recurrent ?
- Is patient symptomatic? Diaphoresis, confusion, tremor, fatigue, loss of consciousness.
- When was last insulin dose administered, what type ? Last long acting insulin dose ? Last meal and general PO intake ?

#2. Information from chart review / sign out:

- Is patient diabetic ?
- Trend review: IS patient recurrently low on FSGLU (finger stick glucose) at particular times of day ?
- Medication review: Patient on insulin ? What is the regimen: home vs inpatient ? Any recent changes ? When was last dose of insulin administered?
- Is patient NPO ? Reason ? (pre op vs aspiration precaution etc)
- Does patient have AKI which can lead to decreased excretion of insulin ?
- Does patient have any signs of sepsis (infection), hepatic failure (impaired glucose metabolism), adrenal insufficiency (Hyper Na, hypokalemia, low BP) ?

#3. Assessment / Treatment:

- Confirm serum glucose by point of care glucometer.
- Symptomatic: diaphoresis, confused, seizures, N/V: IV dextrose amp
- If patient does not have H/O DM and not on anti-hyperglycemic medication: try oral juice and recheck FS in 15 minutes
- For patients who are on glucose lowering agents:
 - Hold further doses of hypoglycemic agents.
 - Can take PO: give 15 gms carbohydrate (4 oz juice)
 - Unable to take PO and has IV access, give ½ amp D50 IV and recheck FS. Repeat as needed
 - Unable to take PO and no IV access, give 1 mg glucagon IM
 - Check FS q15 minutes and repeat above till BG>100 mg/dl.
- Re-adjust/hold insulin scale as necessary.
- Inform primary team.

#4. Persistent hypoglycemia:

- If patient received large dose of insulin or received normal dose insulin in light of acute kidney insufficiency, or received long acting insulin, hypoglycemia can recur.
- Place patient on D5NS (@ 75-150 ml / hour) OR D10NS gtt (@ 50 - 100 ml / hour) to maintain FSGLU > 100 mg /dl. Hold all insulin regimens. Be aware of volume status, avoid in patients with heart failure. Preferably use D10 in ESRD / CHF patients.
- If refractory to treatment, discuss with SNF.

NOTES:

CHEST PAIN

#1. Information from nursing:

- Details of pain: Onset, site, nature.
- Hemodynamic stability.
- Associated symptoms.
- Interventions already performed.
- What is the patient being actively treated for? Is he being worked up for chest pain?

#2. Information from chart:

- Reason for admission and pending work up.
- Cardiac history: Look up previous cardiology notes, echos, stress tests (imaging), D/C summaries.
- Rapid risk assessment: Known CAD/CHF?, HTN, HLD, DM, smoking, family and personal history, PVD / AAA.

#3. Initial assessment:

- Details of pain: Determine cardiac vs. atypical vs. non cardiac
- Risk factors: Known CAD/CHF?, HTN, HLD, DM, smoking, family and personal history, PVD / AAA ?
- Hemodynamic stability.
- Focused examination: Reproducibility, BP in both arms, radio-radial and radio-femoral delay, JVDs, heart sounds/murmurs, lung exam, upper abdominal examination.
- R/O life threatening/common differentials on H/O or exam: ACS, PE, PT, aortic dissection, esophageal rupture (esp if recent EGD), foreign body.
- R/O common differentials: GERD, costochondritis, pneumonia, anxiety, pancreatitis or upper abdominal pathology.

#4. Initial interventions:

- ABCs. Call senior on call if hemodynamically unstable and initiate emergent resuscitation.
- EKG, set of cardiac enzymes, electrolytes, chest Xray.
- If considering other life threatening differentials, please approach as detailed in next section.
- Remember to compare EKG to previous.
- Anxiety: Consider morphine or ativan (unless contraindicated)
- GERD: Protonix IV.
- Costochondritis: Tylenol (avoid NSAIDs till ACS ruled out) or morphine.

#5. Management of ACS:

Always discuss with SNF and consult cardiology prior to initiating specific treatments as outlined under.

STEMI:

- Call SNF stat. If confirmed STEMI, in collaboration with SNF call cardiology STAT.
- Per cardiology recs, consider activating STEMI code.
- Rest per under.
- REMEMBER ideal time to cath is under 90 minutes.

Unstable angina / NSTEMI:

- Oxygen to keep saturations > 92%
- Morphine (especially if respiratory distress from pulm edema)
- Aspirin 325 mg stat + Plavix 600 mg stat (confirm with cardiology fellow prior to administering)
- B-blocker therapy if there is no contraindication (hypotension, bradycardia, new onset HF)
- Low dose heparin gtt protocol (if no contraindications)
- Statin, high dose: atorvastatin 40-80 or rosuvastatin 20-40 mg
- Nitrates (SL vs. drip vs. Paste) titrate to relief vs. tolerance (headaches)
- Send lipid panel, HbA1c, CIPs, echo (is not already evaluate or no known H/O)

#6. Management of other life threatening conditions:

- **PE:** Pre test probability? Well's score?. If very low probability: D-dimer. If moderate to high: CT thorax w/ PE protocol, hydrate patient. (check Cr). Consider empirical high dose heparin gtt protocol / lovenox (caution in renal dysfunction, obesity).
- **Tension PT:** Absent lung sounds, JVD, tamponade physiology? Mediastinal shift on exam or CXR? If unstable, emergent surgery consult for needle decompression.
- **Aortic dissection:** Sudden "tearing" pain radiating to back? unstable? Unequal pulses / BP?, Wide mediastinum on CXR? Resuscitate, stop anti coagulation, stat CTA thorax/abdomen/pelvis and check INR. Consider stat Vascular Sx consult.

NOTES:

ARRHYTHMIAS / ACLS

#1. Information from nursing:

- Hemodynamic stability. Vital signs?
- Symptoms. Chest pain, LOC, SOB, fever?
- Duration of arrhythmia: Constant / intermittent?

#2. Information from chart / sign out:

- Cardiac history: A.fib / flutter, SSS, CAD.
- Check past EKGs / echos.
- Current electrolytes. K > 4, Mg > 2?
- Systemic disease that maybe contributing: Sepsis, dehydration, thyroid disorders, pregnancy.
- Risk stratification for common causes: ACS, PE etc.
- Medication review: BB, CCB, digoxin, thyroid medications, clonidine etc.

Decision making flowchart:

1. Pulse? : If no pulse, refer to #3. Activate Code.
2. If pulse present: Unstable or stable ?
AMS, poor UOP, LOC, desaturations, poor organ perfusion, chest pain, pulmonary edema, shock
 - Stable / unstable bradycardia: Refer to #4
 - Unstable tachycardia: Refer to #5.
 - Stable tachycardia: Refer to #6.
3. Always treat underlying cause: Address volume status. Reverse Hs/Ts.
4. ASAP: EKG, CBC, BMP, magnesium, CIPs !
5. Call SNF / MICU to help with situation.

#3. Arrhythmias w/o pulse: **CODE BLUE !!**

FOLLOW ACLS ALGORITHM (See next page)

Reverse Hs and Ts:

Hypovolemia : Fluid boluses with pressured bag

Hypoxia : bag mask ventilation, intubation

Hydrogen ion (acidosis) : Bicarb boluses

Hypo / Hyperkalemia

Hypoglycemia

Tension pneumothorax: Needle decompression (SICU bedside)

Tamponade (SICU bedside)

Toxins / drugs

Thrombosis: Pulmonary / Coronary

#4. BRADYCARDIA w/ pulse:

Unstable:

- Atropine (0.5 mg IV Q 3 - 5 minutes, max dose: 3 mg)
- If considerations for beta blocker toxicity: Consider glucagon and insulin IV.
- Apply pads. Prepare for transcutaneous pacing. Call SNF/ MICU. Consider cardiology consult.
- If hypotensive: Bolus fluids. Treat as shock.
- Discontinue all nodal blockers.

Stable: Patient asymptomatic:

- Sleeping: Physiological. Attempt to wake patient and see response.
- Asymptomatic: Obtain EKG.
 - Sinus bradycardia: "Does not need treatment". D/C blockers
 - AV block: Check old EKG. D/C blockers.
 - Consult SNF. If new 2nd or 3rd degree block, consider cardiology consult.

#5. UNSTABLE TACHYCARDIA w/ pulse:

RRT. Call SNF. Obtain EKG. Attach a Zoll monitor.

- **Regular wide complex** i.e VT / SVT with aberrancy: Assume VT.
 - Sync cardioversion: 100 J, increment if needed.
 - Post resuscitation, consult cardiology and consider amiodarone / lidocaine gtt.
 - Torsades: Magnesium IV. Avoid amiodarone (prolongs QTc)
- **Irregular wide complex:** VF (rarely with pulse): DESYNC SHOCK!
- **Regular narrow complex:** Sinus / SVT / flutter:
 - Sync cardioversion: 50 - 100 J, increment if needed.
 - Treat underlying cause: Volume depletion vs overload (eg sepsis vs. pulmonary edema), pain, recent sx, Hs / Ts.
 - Adenosine (6 mg - 12 mg - 12 mg).
 - See stable tachycardias for other management.
- **Irregular narrow complex:** A. fib, flutter with variable block, MAT:
 - Sync cardioversion: 120 - 200 J, in increments.
 - Treat underlying cause as mentioned above.
 - See stable tachycardias for further management.

#6. STABLE TACHYCARDIA: Usually narrow complex

- **Rx underlying cause.** Hs / Ts. Volume status is very important: Give fluids / diurese !
- **Pharmacology, narrow complex:**
 - If not hypotensive:
 - Cardizem bolus (1 mg/kg, max dose: 20 mg) * 2 Q 10 minutes. Start on Cardizem gtt.
 - Metoprolol 2.5 or 5 mg IV.
 - If hypotensive: Amiodarone 150 mg loading IV, then gtt.
 - If known systolic CHF: consider digoxin (usually avoided 2/2 toxicities)
 - If considering septic shock and have central access: Transfer to ICU, consider esmolol gtt with levophed support (after adequate fluids)

ATRIAL FIBRILLATION

CALL FOR: IRREGULARLY IRREGULAR PULSE / TELE

#1. Information from nursing:

- Acuity: New or old ?
- Is the call because patient's rate is now uncontrolled or because of new A.fib.
- Vitals / hemodynamics.
- Is there a known cause ? (Please see section on causes).

#3. Assessment:

- Vitals: Ensure hemodynamic stability.
- Examine / ask questions to rule out causes of PE (see the section on causes)

#4. Initial interventions:

- stat 12 lead EKG: irregular narrow complex tachycardia with no identifiable P waves - atrial fibrillation. Look for signs of ischemia - peaked T waves, ST segment elevation / depression, T wave inversions, Q waves.
- Repeat BMP, magnesium levels in not sent within the last 4 hours.
- Send a TSH levels if none done recently.
- CIPs to rule out ACS especially if concerning symptoms / signs present.
- If hypoxic, or symptomatic with risk factors, consider CTA for PE protocol.

#6. Treatment / underlying cause:

- Correct underlying cause:
 - Medications: Assess why patient not taking his PO rate controllers. Consider IV formulations from same family.
 - Acute Coronary Syndrome: Trend CIPs (refer to section on chest pain)
 - Acute CHF: Consider diuresis.
 - PE: stat imaging. Consider empiric anticoagulation if high risk.
 - COPD exacerbation: Treat with bronchodilators, however exercise caution since beta agonists can exacerbate atrial fibrillation.
 - Hypokalemia, hypomagnesemia: Replace (see section on electrolyte replacement)
 - Cocaine use: Consider benzodiazepines.
 - Alcohol withdrawal: CIWA protocol.
 - Pain: See section on pain control.
 - Infection / sepsis: See section on sepsis.
 - Dehydration: IV hydration.

#8. Special considerations:

- If A.fib lasts > 48 hours, patient will need anticoagulation depending on CHADS2 / CHADS2 - VaSc score, relay to team regarding considering anticoagulation.

#2. Information from chart review / sign out:

- Acuity: New or old ?
- Are there any recommendations from the team regarding rate control ? What's been tried and what worked ?
- Review of existing rate controlling meds : BB, CCB, amiodarone, digoxin. Did patient miss any medications ?
- Review old EKGs, old cardiology notes.
- Check most recent K, Mg, TSH levels.

#5. Causes / etiologies:

Mnemonic: MARTHA PID

- Medications: missed doses of rate controlled agent. Use of theophylline, caffeine.
- Acute Coronary Syndrome, acute CHF or existing CAD.
- Respiratory (PE, hypoxia, COPD).
- Thyrotoxicosis.
- Hypokalemia, hypomagnesemia.
- Alcohol, illicit drugs (cocaine, amphetamine, bath salts, etc). Always remember withdrawal states!
- Pain. Recent sx / injury ? Open areas ?
- Infection / sepsis.
- Dehydration. Patient not taking PO ? Assess why.

#7. Treatment / rate control:

- If blood pressure acceptable:
 - Metoprolol 5 or 10 mg IV and repeat as necessary. Once controlled, immediately give PO 12.5 / 25 / 50 mg based on BP.
 - Cardizem 0.25 mg / kg over 2 mins (Max: 20 mg) IV. Usual dose 10 mg. May repeat after 15 minutes. Once controlled, can start cardizem 30 mg PO q 6 H. If not controlled, start on cardizem drip at 5 / 10 / 15 mg / hr depending on BP.
- If BP low: CALL SNF.
 - May use lower doses of IV metoprolol or cardizem.
 - Amiodarone 150 mg bolus, followed by gtt @ 1 mg / kg for 6 hours, followed by 0.5 mg / kg for 18 hours. Inform team to consult cardiology for further recs.
 - Esmolol 0.5 mg / kg bolus dose. can use esmolol gtt, but needs MICU consult since may need pressor support.
- If hemodynamically unstable: acute drop in BP / patient unresponsive – synchronized cardioversion (evaluate risk of causing CVA) : Refer to section on tachycardias for details.

HYPERTENSION

#1. Information from nursing:

- Acuity: New or existing issue ?
- Machine or manual ? Request a manual reading and in both arms.
- Ensure right cuff size: Smaller cuffs falsely elevate BP, larger cuffs falsely underestimate BP
- Is patient in pain, anxious, agitated, have urinary retention or constipation ?
- Does patient have any red flag symptoms such as chest pain, SOB, headache, N/V, lightheadedness/dizziness ?

#2. Information from records / sign out:

- Trend the blood pressure to see acute vs. chronic elevation.
- Check medication regimen for BP and see MAR if a dose was missed.
- Review home medications, check if one of the medications was not prescribed (and why).
- Review BMP, recent UOP.

#3. Initial assessment:

- Confirm BP with appropriately sized cuff (as mentioned in #1).
- Signs that BP is reactive: evaluate for pain, anxiety, agitation, urinary retention, constipation.
- Signs of end organ damage, especially if patient has red flag symptoms. Eye exam, chest / lung exam, UOP, pulses, CNS exam.

#5. Treatment / commonly used oral anti hypertensive medications with doses:

- Captopril: 25 mg dose PO / sublingual.
- Carvedilol: 3.125 to 25 mg daily.
- Amlodipine: 2.5 -10 mg daily. (MDD is 10 mg / day)
- Clonidine: 0.1 - 0.3 mg PO

#6. Treatment / special considerations:

- If HR is low (< 60 / min), avoid BB, CCB.
- If patient has AKI (from pre - renal injury) avoid diuretics / ACEi / ARBs.
- Patient can have AKI from overload state (CHF): Use diuretics, monitor BUN / Cr and UOP (should improve).
- Treat underlying causes: Pain, anxiety, agitation, urinary retention or constipation.

NOTES:

#4. Treatment:

- **Hypertensive emergency / malignant HTN (signs of organ damage):** severely elevated BP (DBP>120) with symptoms such as chest pain, SOB, headache, visual disturbance OR / AND labs such as AKI OR / AND testing such as EKG changes, abnormal imaging: Call SNF for MICU / CCU eval.

Aim of Rx: Decrease MAP < 10% in first few minutes and < 15% in first few hours. Possible regimens:

- Labetalol 10-20 mg IV q 4 - 6 hours
- Hydralazine 10-20 mg q 6 hours
- Enalaprilat: 1.25 mg IV q 6 hours
- Esmolol: 0.5 mg/kg q 5 mins

- **Hypertensive urgency: SBP > 180 and DBP >120 without symptoms / end-organ damage.**

Aim of Rx: Lower BP gradually with target of <160/100. May use IV medications one time or PRN basis as described above followed by PO medications or initiate of PO regimens (see section on PO medication).

- **SBP 150 - 180 and DBP < 100 - 120 without symptoms / end organ damage:** can add a dose of scheduled medication early or add a one time PO medication dose (see section on PO meds)

- **SBP < 150 / DBP < 100:** Give scheduled dose of medications early. If possible request to move patient to quite/alone room and decrease stimuli.

ACUTE GI BLEED

#1. Information from nursing:

- Hemodynamically stable ? : Tachycardia, hypotension. Orthostasis?
- Symptoms: Upper vs. lower: melena / hematochezia / hematemesis. Associated symptoms ?
- 1st time or recurrent ?

#2. Information from chart / sign out:

- Review Hb / Hct trend.
- Known source of GIB ? Past GI history ?
- History of liver failure ?
- Last EGD / colonoscopy ?
- Known coagulopathy ? Check medications.

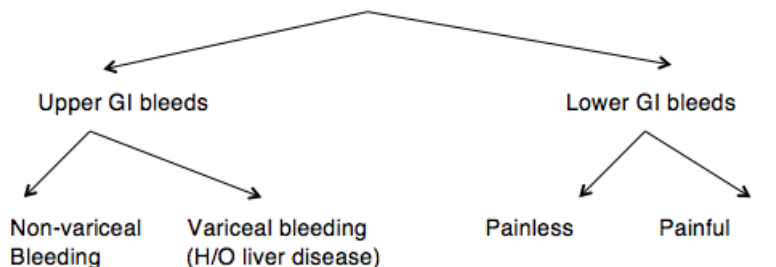
#3. Initial assessment:

- Symptoms: Site of bleeding, dizziness / orthostatics, abdominal pain.
- Examination: Abdominal, oral, rectal.
- Assess intravascular depletion: Skin exam, mucosal exam, tachycardia (early), orthostatics / leg raising (15% loss), supine hypotension (40% loss).
- Assess severity: Rockall score (see reference tables).
- Delineate source, consider etiology (see graphic below)

#4. Initial interventions:

- Ensure **adequate IV access**: 2 wide bore IVs. Consent patient for potential PRBC transfusion.
- **Investigations / labs**: CBC (Hct might not decrease initially), PTT / INR, type and cross, LFTs, BUN / Cr
- **Hemodynamically unstable**: Start fluid resuscitation. Consider PRBC transfusion (see below). Call SNF. Discontinue anticoagulation, consider reversal.
- Keep **transfusion** threshold at Hb < 7 and Hct < 21 or follow primary team's instructions. For patients with active ACS, transfusion threshold is low (around 8 and 24). Can transfuse 1-2 units at a time.
- **Reversal of anticoagulation**: in case of liver disease or Coumadin use when INR>1.6. Use PCC 25 units/kg for INR<4 and 35-50 units/kg when INR>4. If unavailable can use FFPs 10-15 ml/kg. (see section on reversal of anti coagulation for details)

GI BLEED



- Peptic ulcer disease
- NSAID use
- Gastritis
- Esophagitis
- Mallory Weiss tear
- Malignancy

- Esophageal varices
- Gastric varices
- Portal hypertensive gastropathy

- Diverticular bleed
- AVMs

- Ischemic colitis
- IBD
- Ulcers
- Hemorrhoids

Notes:

#5. Specific interventions:

- Suspected **upper GI bleed**:
 - Non variceal: pantoprazole 80 mg stat followed by 8 mg/hr gtt.
 - Variceal: As above plus octreotide 50 mcg IV stat followed by 50 mcg/hr gtt.
- Suspected **lower GI bleed**:
 - Source location:
 - Tagged RBC scan: detect rates of 0.1 - 0.5 ml/hr
 - CTA abdomen/ pelvis: rates > 0.5 ml / hr
 - Colonoscopy
 - If suspecting ischemic colitis: Stat lactate and imaging. Consider surgical consult.
- If patient has **ascites**: Antibiotic ppx with ceftriaxone 1 gm Q 12 hours IV
- Consult GI.
- Inform SNF especially if hemodynamically significant bleeding.
- Please refer to section on acute anemia / drop in H/H for further details.

SHORTNESS OF BREATH

#1. Information from nursing:

- Symptoms: Onset and progression. Associated complaints?
- Vitals?: Pulse ox, hemodynamic stability, fever
- Is patient on tele?
- Are fluids running?: Type and rate.
- Is it known? Is patient being treated for a potential cause?

#2. Information from chart review / sign out:

- Code status: DNR / DNI?
- Baseline / home oxygen requirements?
- Pulmonary / cardiac review:
 - Relevant PMH: COPD / asthma, CHF, PE, recent surgery, anxiety.
 - CXR, PFTs, echo, EKG, previous cath.

#3. Initial assessment:

- Quick ROS: Attempt to differentiate primary pulmonary vs. cardiac etiology.
- Hemodynamic assessment with oxygen requirements.
- Assess severity:
 - RS: Tachypnea, accessory muscle use, cyanosis, ronchii / wheezing. Obtundation / twitching (CO₂ retention)
 - CVS: S₃, JVD, crackles, edema. New murmurs?
- Pertinent differentials w/ clinical findings:
 - CHF exacerbation / flash pulm edema: JVD, crackles, S₃, edema, fluid overload state, high BP.
 - ACS: Chest pain, new cardiac findings.
 - PE: Well's, tachycardia, tachypnea, pleuritic CP, normal lung exam.
 - Pneumothorax: Absent lung sounds, tamponade physiology.
 - Aspiration: New ronchii, tachypnea.
 - COPD exacerbation: wheezing, signs of hypercapnia. Silent chest is indicative of imminent collapse.
 - PNA: fever, leucocytosis, ronchii.
 - Atelectasis: recent surgery?, bed bound.
 - OSA: Asymptomatic, snoring, nocturnal desats on tele.

#4. Initial interventions:

- Place in head propped up position. Oxygen as required to maintain saturation: NC → FM → NRB. (Please see section on oxygen delivery)
- Initial investigations / imaging: CXR, continuous pulse ox, EKG, CIPs (if suspecting ACS), ABG.
- Use ABGs to assess hypercapnia states. Useful in hypoxia to assess for A - a gradient for shunt pathology.
 - Normal pH: 7.34 - 7.45
 - PaO₂: 80 - 100 mmHg
 - PaCO₂: 35 - 45 mmHg
- Pertinent differentials being entertained:
 - CHF exacerbation / flash pulm edema: Clinical + CXR. Consider BNP / pro BNP, EKG, CIPs, echo in AM.
 - ACS: EKG, CIPs
 - PE: stat CTA. If AKI or dye allergy, consider V/Q scan.
 - Pneumothorax: Clinical + CXR.
 - Aspiration: CXR. Consider swallow eval in AM.
 - COPD exacerbation: Clinical. ABG to assess for hypercapnia.
 - PNA: CBC, CXR.

#5. Definitive management of potentially immediately fatal etiologies:

- ACS: Please refer to section on chest pain.
- PE: Imaging as mentioned in #4. If unable to obtain imaging and clinical suspicion high, ensure absence of contra indications and deliver empiric anticoagulation. If imaging +, start on high dose heparin gatt or Lovenox 1 mg / kg BID (provided no renal dysfunction).
- Pneumothorax: If imminent collapse, bedside needle decompression. If stable, consult surgery.

#6. Definitive management of other etiologies:

- CHF exac: Diuresis (Lasix: creatinine * 20 mg IV eg. For creatinine level of 2.0, Lasix dose will be 40 mg IV), morphine, nitro gtt, hemodialysis. Consider MICU consult for CPAP.
- PNA: Appropriate antibiotics (CAP vs HCAP)
- COPD exacerbation: Duonebs Q 4 H, albuterol Q2H PRN, consider IV hydrocortisone bolus, BiPAP if ABG shows respiratory acidosis. Consult MICU.
- Aspiration: Initiate aspiration precautions. Make patient NPO. Sign out to team to order swallow evaluation.
- Anxiety: Consider one time dose of anxiolytic.

Important considerations:

- Consult SNF if unstable patient or sudden increase in oxygen requirements. Consider MICU consult is patient requiring > 50% FiO₂.
- If patient requires positive pressure: BiPAP / CPAP or considering intubation, consult SNF and MICU. Call RT and SWAT to assist.

NOTES:

OXYGEN DELIVERY SYSTEMS

- By definition, oxygen delivery devices used on floors are low flow systems.
- The FiO₂ correlates with the flow of oxygen in L / min. Of note, if patient is tachypnic, they will demand more flow than is provided by most of these systems and hence, patients “entrain” oxygen from room. In effect, patients will inhale lower FiO₂s than demonstrated here.
- If patient’s oxygen requirements are increasing, in terms of flow as demonstrated by L / min on wall unit or need for partial / complete non rebreather masks, it is a cause for concern and needs to be evaluated. Please see section on shortness of breath for details.

NASAL CANULA

Delivers 24 to 44 % oxygen at flows of 1 to 6 L / min.
Up to FiO₂ of 40%, nasal cannula is the delivery device of choice.
May be humidified if not run at < 5 L /min.

L / minute on the wall unit	5
1	24
2	28
3	32
4	36
5	40
6	44

SIMPLE MASK

Delivers 35 to 55% oxygen at flows of 5 to 12 L / min.
Never use at flow rates < 5 L / min to prevent rebreathing of CO₂.
Some patients are mouth breathers when they sleep, and hence will need masks even though their FiO₂ requirements may not be high.

PARTIAL REBREATHER MASKS (PRB)

Delivers 35 to 60% oxygen at flows of 8 to 15 L / min.
Flow rate must be sufficient to keep the reservoir bag inflated 1/3 to 1/2 it’s volume at all times.
Differentiated from non rebreather masks by lack of valve at the connection of tubing in PRB.

NON REBREATHER MASK (NRB)

Delivers 60 to 90% O₂ at flow rates of 8 to 15 L/min.
Flow rate must be sufficient to keep the reservoir bag inflated 1/3 to 1/2 it’s volume at all times.

VENTURI MASK or AIR ENTRAINMENT MASKS

Provide FiO₂ from 24 - 50 %.
Technically a “high flow oxygen system” because they do not allow entrainment of RA.
Size of the entrainment port determines FiO₂ and hence increasing the flow of oxygen does not determine FiO₂.
Different ports are color coded to relate to different levels of FiO₂ delivered.
Please familiarize yourself with ports used in our setup.

INVASIVE / NON - INVASIVE POSITIVE PRESSURE VENTILATION

If patient’s saturations are not maintained with above mentioned delivery devices, patient may need positive pressure ventilation, for which, please call SNF and consult MICU.

ELECTROLYTE REPLACEMENT

POTASSIUM REPLACEMENT

Oral: Potassium chloride (K - Dur in epic as a pill, also available as a liquid)

IV: Potassium phosphate IVPB (10 mEq in 100 ml) or double strength (20 mEq in 100 ml)

- Check renal function and in patients with ESRD / CKD / AKI, be less aggressive in K replacement since these kidneys won't excrete potassium as a normal kidney would.
- If administering intravenous 20 mEq in 100 ml concentration, ensure patient is in ICU on EKG monitoring.
- Check Mg (Intracellular Mg prevents outward K flux in ascending loop via ROMK channel and thus prevents its excretion in urine. **Low Mg leads to increase urinary K loss**)
- 10 mEq replacement will raise serum K by 0.1. In absence of gut dysfunction: **PO = IV.**
- ICU protocols for patients with Cr<1.5.
- Repeat potassium levels after 2 hours of completion of regimen. Do not exceed 400 meq / 24 hours replacement.

Potassium level	If tolerating PO	If not tolerating PO	
		If only peripheral line	If has central line
3.6 – 3.8	40 meq x 1 dose	10 meq in 100ml water over 1 hour x 2 doses	20 meq in 100 ml water over 1 hour x 1 dose
3.3 – 3.5	40 meq q 2 hours x 2 dose	10 meq in 100ml water over 1 hour x 4 doses	20 meq in 100 ml water over 1 hour x 2 doses
2.8 – 3.2	40 meq q 2 hours x 3 dose	10 meq in 100ml water over 1 hour x 6 doses	20 meq in 100 ml water over 1 hour x 3 doses
<2.8 (Telemetry must)	40 meq q 2 hours x 3 doses + IV	Needs central line + PO + within IVF	20 meq in 100 ml water over 1 hour x 4 doses

MAGNESIUM REPLACEMENT

Each 1 gm magnesium will raise serum level by 0.1

- If level 1.8 - 2: give 1 gm IV MgSO₄ (= 8 meq) over 1 hour or Mg Oxide PO 400 mg daily for 2 days
- If level 1.6 - 1.7: Give 2 gm IV MgSO₄ over 2 hours or Mg Oxide 400 mg PO BID for 2 days
- If level < 1.5: Give 2 gm MgSO₄ over 2 hours x 2 doses.

PHOSPHORUS REPLACEMENT

- Consider using K phos orally if levels > 2
- If level < 2: 15 mmol sodium phos IV over 4 hours
- If level < 1.5: 30 mmol sodium phos IV over 6 hours
- If level < 1: 45 mmol sodium phos IV over 8 hours

CALCIUM REPLACEMENT

- Check ionized calcium. Corrects with 1-2 amps of IV calcium gluconate

HYPONATREMIA: Na < 135 mEq / dl

#1. Information from nursing:

- Get a sense of fluid status: Overloaded, dehydrated, euvolemic.
- I/Os. Cumulative since admission?
- Any fluids running? Type and rate?
- Symptoms / signs:
 - Dehydration: Thirst, dry mouth, decreasing UOP.
 - Overload: Edema, crackles, dyspnea.
 - Specifically ask for neurological features: Increasing confusion, changes in mental status, seizures.

#2. Information from chart review / sign out:

- Acuity of change: Acute (< 48 hours) vs chronic (> 48 hours).
- Has patient been hyponatremic in past? Why?
- Review fluid balance.
- Seek etiologies:
 - Hypovolemic pathologies: DKA, HHS, sepsis, dehydration, alcoholism, advanced dementia, vomiting / diarrhea, excessive diuresis
 - Hypervolemic pathologies: Cirrhosis, CHF, renal failure, excessive alcohol use.
- Medication review: diuretics, medications causing obtundation.
- Check blood glucose, lipids and protein levels for pseudohyponatremia.

#3. Initial assessment:

- Symptoms: As above. Specifically check for neurological features: AMS, seizures. In light of acute hyponatremia, they represent a **MEDICAL EMERGENCY**.
- Examination: Assess intravascular volume.
- Consider etiology / differential diagnosis: Refer to diagram below.

#4. Interventions:

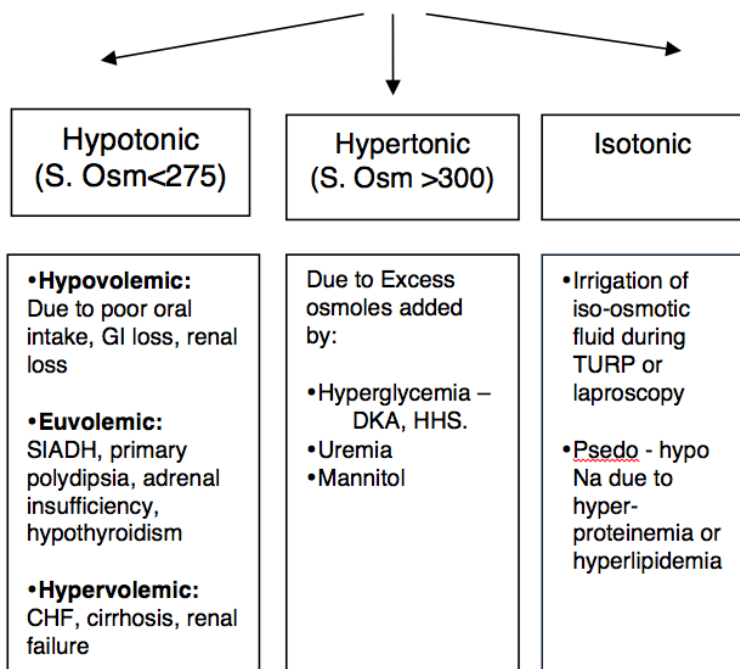
Acute w/ obtundation / seizures: 3% saline, 100 ml bolus over 15 minutes. Check BMP @ 2 hours. Call SNF and MICU consult.

Acute w/o obtundation / seizures: 3% NS at 15-30 ml/hr. Avoid correcting > 12 mEq / 24 hours or > 6 mEq / 12 hours.

Chronic: Treatment based on etiology (see underneath). Obtain BMP with serum osmolality; urine Na, Cr, Osm. Avoid correcting > 10 mEq / 24 hours.

- Chronic hypotonic:
 - Hypovolemic: NS fluid replacement. Hold diuretics / offending meds.
 - FENa < 1, Ur. Na < 10: GI loss / poor PO intake.
 - FENa > 1, Ur. Na > 20: Renal losses.
 - If Euvolemic: SIADH (Urine Osm > 100) vs. primary polydypsia (Urine Osm < 100)
 - Euvolemic: Free water restriction.
 - Hypervolemic: Free water restriction. Consider diuresis (especially in CHF state)
- Chronic hypertonic:
 - Correct underlying pathology
- Chronic isotonic: Usually pseudohyponatremia needs no Rx.
 - If obtundation / seizures after TURP / lap with acute hyponatremia: 3% saline, 100 ml bolus over 15 minutes. Call SNF and MICU consult.

Hyponatremia



HYPERKALEMIA

#1. Information from nursing / sign out:

- When was the BMP sent ?
- Symptoms ?
- Is the patient on telemetry ?
- If patient is being already treated for hyperkalemia, when was the last doses of administered medications (insulin, calcium gluconate, kayexalate) ?
- When was patient's last dialysis session if ESRD patient.

#3. Initial interventions:

- Stat EKG, especially if the hyperkalemia is a new finding. *Tall Peaked T waves, PR prolongation followed by loss of P waves with QRS prolongation and progression to SINE wave. Except T waves all EKG findings need immediate cardioprotective measures*
- Repeat BMP if concerns for sampling error such as sample drawn from a line running TPN.
- Place patient on telemetry.
- BMP Q 4 hours till potassium normalizes.
- Inform SNF and discuss treatment options.

#4. Treatment: Cellular shifts / cardioprotection:

- If evidence of PR prolongation or QRS widening patient should receive 1 gm IV **Calcium Gluconate or Chloride** for myocardial membrane stabilization.
- **Insulin and Dextrose:** 50g of dextrose and 10 units IV regular insulin. *Onset* 30 minutes with *duration* of action 4-6 hours (can last longer if impaired renal function).
- **Insulin Drip:** In cases of refractory hyperkalemia, patient should be moved to the MICU and can be placed on regular insulin drip running at 5 units/hr with D5 or D10 gtt. Titrate your fluids to maintain blood sugars with consistent drip rate. This is only a stop gap; elimination will be necessary.
- **Beta2 Agonists:** Albuterol 10 - 20mg nebulized (Note: standard dose for bronchospasm is 2.5mg) *Onset* 15-30 minutes. *Duration:* 2-4 Hours. Use usually limited by side effects ie. tachycardia. 1/3 of patients will not respond to this.
- **Sodium Bicarbonate:** 1-2 Amps (50 -100meq) IV. *Onset:* 15-30 minutes *Duration:* 1-2 hours. Often reserved for patients with CKD and concomitant acidosis but has the least data to show effectiveness.

#6. Important considerations:

- Discuss with SNF. Consider MICU consult if very high levels, or rapidly rising levels not responding to treatment, or patient hemodynamically unstable.
- Stop offending medications.
- Do not forget: Cellular shift does not equal elimination.
- Give patient's low potassium diet.

#2. Information from chart review:

Evaluate chart for potential cause of hyperkalemia as follows:

Excessive Intake:

- Iatrogenic (overly aggressive replacement), excessive intake

Impaired Excretion:

- Kidney disease: Acute or chronic. In CKD is usually only seen in Stage V, Type IV RTA (Aldosterone resistance). Can be seen in any stage of CKD in combination with K sparing diuretics i.e. ACE, aldactones
- Adrenal insufficiency i.e., Addison's, severe sepsis
- DRUGS: ACE, ARB, Bactrim, digoxin toxicity, heparin, NSAIDs

Cellular Shift:

- Acidosis i.e. sepsis, DKA (CAUTION: DKA can have overall body store depletion of K with serum elevation secondary to Acidosis)
- Cell Lysis ie. rhabdomyolysis, tumor lysis
- Blood transfusions
- Mechanical damage ie. artificial valves

False Elevation:

- Hemolysis
- Lab error
- Improper sampling, eg. from site of fluid replacement/electrolyte replacement, or TPN infusion line.

#5. Treatment: definitive elimination:

- **Kayexalate (Sodium Polystyrene):** Ion exchange resin that works in the gut to prevent GI absorption and cause excretion into GI tract. *Dose* 30-60 grams PO repeated Q 2 hours till patient has BM or 30g as retention enema (Note: K not excreted until patient has BM). *Onset* slow can take approximately 2 hours. *Contraindicated* In allergic patients, can precipitate anaphylaxis and in post op GI patients can cause bowel necrosis and perforation. GI bleeding is not an absolute contraindication.
- **Loop Diuretics:** Cause excretion of K in the loop. At UH we most commonly use Lasix. One of the rare times it would be acceptable to give patient IVF and diuretics. *Dose* 20 -160mg IV depending on renal function and hemodynamics. Least effective in ESRD patients and contraindicated in patients with underlying kidney injury as etiology of hyper K. *Onset:* 30-60 minutes.
- **Dialysis:** Requires Nephrology consult as well as dialysis catheter placement (if not established ESRD patient). If your patient is not responding to conventional methods beginning planning early.

NOTES:

ABDOMINAL PAIN

Very broad topic and beyond the scope of this manual. Here are some of things one should be extremely careful not to miss as cross cover / night float.

If you suspect the following, obtain a surgical consult along with ongoing work up and consult SNF + / - MICU as well:

- **Peritonitis / perforated viscous:** Severe pain, rigid abdomen with rebound and guarding. Absent bowel sounds. Unstable vital signs. Upright X-ray shows air under diaphragm. Rx: NPO + IV fluid boluses + broad spectrum antibiotics + surgery.
- **Ischemic bowel:** Pain out of proportion to physical exam findings. Bloody stool. Lactic acidosis. Rx: NPO + broad spectrum antibiotics + surgery.
- **Obstruction:** Nausea / vomiting, bloating, distention, hyperactive / absent bowel sounds. X-ray shows air fluid levels. Rx: NPO + NG suction (decompression) + surgery.
- **Cholangitis:** Fever, RUQ pain, jaundice. LFTs show obstructive pattern. GI emergency. Rx: NPO + broad spectrum antibiotics + IV fluid boluses. Needs urgent ERCP if septic.

Other commonly encountered differential diagnosis:

- **Diffuse abdominal pain:**
 - Gastroenteritis (nauseas & vomiting , diarrhea)
 - Metabolic (acidosis, DKA) (check BMP, glucose, BHB)
 - Functional ?
- **Localized:**
 - Epigastric: PUD, gastritis (NSAID use) , pancreatitis (lipase, amylase) , MI (EKG, CIPs)
 - RUQ: cholecystitis / biliary colic (USG, LFTs) , hepatitis (LFTs, US), pneumonia (CXR)
 - LUQ: Pancreatitis, gastritis.
 - RLQ: Appendicitis (Mac burney point tenderness, CT) , Renal colic (CT)
 - LLQ: Diverticulitis (CT), renal colic, IBD , IBS
 - Hypogastric: UTI (UA) , ureteric stone , bladder distention (Foley, clogged cath?)

HYPERNATREMIA

- More common in ICU setting, in sedated, sick patients. Also seen in patients who are NPO.
- Usually does not happen in patients who have access to free water (who can drink), or are on TPN.
- Usually not an emergency and it's safe to pass on to the team.
- If sodium levels increasing very rapidly, consider treatment
- Calculate free water deficit: $0.6 \times \text{weight (kg)} \times (\text{current Na} / 140 - 1)$
- Administer the calculated total volume of D5 free water at 75 - 100 ml / hr to correct Na 8-10 mEq over 24 hours. Avoid correct at rapid rates.
- Inform the primary service in AM.

INSOMNIA

- Ask about reason for insomnia. E.g. pain, delirium, withdrawal of any home medication. Correct these before prescribing medication.
- Do not give any sleep medicines towards early morning as patient might be sleepy during primary team's rounds which will impair their evaluation.
- If you have to choose, consider one of the following:
 - Trazodone 25 - 50 – 100 mg. Start low.
 - Ambien (5 mg) – extreme caution in elderly
 - Benadryl (25-50 mg) – in young healthy patients.
 - Never use benzodiazepines for insomnia as it might increase the risk of delirium.

HYPERGLYCEMIA

- **Evaluate for DKA / HHS:** Glucose levels > 400 mg / dl or patient symptomatic with abdominal pain, nausea / vomiting. Check last BMP for anion gap / betahydroxybutarate if AG positive. MICU consult if DKA is diagnosed.
- Trend fingerstick glucose levels in last 24 hours. In hospitalized patients levels between 140 -180 mg / dl are acceptable. Avoid hypoglycemia.
- Review patient's insulin therapy (short acting vs. both short and long acting). Check if patient is getting them regularly (was there a missed dose ?). Is the hospital regimen different from home regimen (if so, why?).
- Is patient receiving any fluids with D5 and if so change it. Make sure patient is on carb control diet.
- In asymptomatic patients with elevated sugar, you can cover with dose of short acting insulin based on sliding scale(e.g. for glucose of 300 if patient should receive 10 units regular insulin, cover patient with the same dose). If this occurs > 1 occasion, let team know in AM to re-adjust insulin regimen. DO NOT change insulin regimen. Only give one time orders.

CONFUSION / AGITATION:

Delirium - Maybe hyperactive or hypoactive: Fluctuating disturbance in attention, awareness and cognition that develops over a short period of time, representing a change from baseline, not explained by preexisting or evolving neurocognitive conditions.

#1. Information from nursing:

- Acuity: New development vs ongoing
- Altered level of consciousness and / or disorganized thinking ?
- Physically violent: Harm self or others ?
- Vitals: EWS score ?
- Pain : Recent Sx / open wounds / trauma ?
- Urinary / bowel retention ?
- Recently administered medications ?

#2. Information from chart review / sign out:

- Med review: Anticholinergics, steroids, anticonvulsants, dopamine agonists, antibiotics.
- Neuro: Stroke, seizures (status)
- Toxidrome / withdrawal state
- Systemic / general medical: CO2 retention, hypoxia, dehydration, sepsis / infection
- Change in environment (ICU delirium) vs above causes
- Dyselectrolytemia

#3. Night float assessment and testing

- Vitals and pain assessment
- Respirations: rate, effort, evaluate for pathology: ?PNA / aspiration
- CVS assessment
- Abd: Distention / surgical abdomen
- Skin: Dehydration, cellulitis, edema
- CNS: GCS, threat response, orientability, focal deficits
- CBC, BMP, electrolytes
- Sepsis work up if appropriate
- Drug levels: Digoxin, lithium, quinidine

#4. Non pharmacological interventions:

- Reorient and decrease stimuli if agitated.
- Involve family and other known faces if available.
- Address comfort: pain / constipation / incontinence
- Provide fluids if asking if no aspiration risk.
- Take off wires / tubes unless absolutely required.

#5. Interventions per cause:

- D/C offending medications. Reverse opioid overdose with naloxone if causing respiratory depression with CO2 retention.
- Stat CT head w/o cont if worried for CVA. Consider stroke code after consulting with senior. ? Neuro
- Ativan IV if seizing. Consult senior stat. ?Neuro
- Ativan for EtOH withdrawal / cocaine use.
- Goal directed Rx for sepsis (see related section).
- Treat pain: if surgical - standing tylenol, PRN oxycodone. Avoid IV pain medications
- Rx constipation: Consider enema if tolerated.
- Acute urinary retention: Straight cath, monitor post void residual urine.

#6. Pharmacological restraint in agitation:

Tolerating PO: (increasing sedative effects, lowest dose first)

- Seroquel 12.5 mg / 25 mg
- Haloperidol 0.5 mg / 1 mg
- Risperidone 0.5 mg / 1 mg
- Olanzapine 2.5 mg / 5 mg
- If Qt. > 500: Aripiprazole 2-5 mg Q2hours PRN. Check EKG after 2nd dose.

Unable to take PO:

- 1st line: Haloperidol 0.5 - 1 mg Q2hours PRN IV/IM
- 2nd line: Olanzapine 2.5 - 5 mg Q2hours PRN IM
- If QTc > 500: Valproic acid 125 - 250 mg Q8hours PRN

Important considerations:

- All antipsychotics carry increased risk of cardiovascular mortality especially in dementia.
- Restraints (discuss with family if possible).

AVOID unless absolutely necessary:

- Benzodiazepines and anticholinergics.
- Restraints (discuss with family if possible).

FEVER

#1. Information from nursing:

- First reading or persistent ?
- Tmax ?
- Route: axillary / oral / rectal / foley ?
- Vital signs: Determine hemodynamic stability.

#2. Information from chart / sign out:

- Review primary team's notes for possible existent causes.
- Is patient already on antibiotics ?
- Source identified ?
- Chronic lines / foley ?
- Has any work up been sent ? Follow that up.
- Any differentials being entertained ? See section on non infectious causes.
- Is patient neutropenic ?

#3. Initial assessment:

- Assess stability.
- Examine to locate common sources: PNA / UTI / Abdominal path / C.diff / cholecystitis / cellulitis / sinusitis / sacral ulcers.
- Examine existing lines / PICCs / ports / recent surgical sites / foley / supra pubic catheters.
- Think about hardware patient may already have: Orthopedic / pacemakers / AICDs / wires / staples / stents.
- Consider non infectious differentials: DVT / PE / malignancy / drug fever / blood product reaction / post op 2/2 anesthesia or atelectasis.

#4. Interventions:

- Treat fever: Tylenol PO, rectal. Avoid IV unless patient can't take PO / rectal.
- **If hemodynamically unstable / sepsis** : See sepsis protocol and call senior on call.
- **If no previous work up**: Basic panculture: B.Cx * 2, sputum cx, CXR, UA / UC and repeat CBC.
- **Expanded work up**: LFTs, USG abdomen, C.diff, stool work up, USG renal (pyelo), CT abdomen/pelvis (if abdominal signs), paracentesis (SBP)
- **Other infectious work up (usually team can do this)**: Osteomyelitis (MRI extremity / spine), LP (nosocomial meningitis is rare unless patient presented with relevant symptoms: neck pain/ rigidity, photophobia etc.), echo (endocarditis)
- **If not on antibiotics**: Choose appropriate regimen (see below)
- **If already on antibiotics**: Consider expanding coverage.
- **If neutropenic**: Expand coverage to include anti - pseudomonas activity.

#5. Important considerations:

- Consider non infectious causes, some can be life threatening like PE !
- Low threshold for considering sepsis and activating pathway.
- Hemodynamic stability comes first, always fix ABCs first.
- Check the sign out / notes: Team may already have worked up the fever / started treating / have a plan.
- Neutropenic fever is a medical emergency !
- Be permissive with treating fever (it is a defense mechanism).

Common empiric antibiotic regimens:

(Please confirm disease specific doses unless otherwise specified here)

- CAP: azithromycin + ceftriaxone / doxy in COPD patients / levofloxacin if patient has cardiac H/O (Azithromycin and levofloxacin prolong QTc).
- HCAP: vancomycin + Zosyn.
- First or uncomplicated UTI: cefazolin / ceftriaxone / bactrim.
- Recurrent / complicated UTI / indwelling foley: Zosyn.
- Meningitis: vanco + ceftriaxone (2 gm Q 12 hours). Add ampicillin for age > 50 years.
- Cellulitis: MRSA coverage (clinda / doxy / bactrim / vanco). No suspicion of MRSA: cephalosporins.
- C.diff: PO vancomycin / Flagyl. Severe: IV Flagyl.
- Abdominal infections: cipro + Flagyl / Zosyn.
- SBP: ceftriaxone. PCN allergy: cipro.
- Suspected line infection: Ensure vanco as part of coverage.
- Endocarditis: vanco + zosyn.
- Osteomyelitis (especially with open wound): vanco + zosyn.
- Neutropenic fever: Expand coverage to include anti pseudomonas antibiotics and continue old antibiotics.

SEPSIS

SIRS: 2 or more of following present:

Temperature > 38.3 C or < 36 C
 Heart rate > 90 beats / min
 Respiratory rate > 20 / min or PaCO₂ < 32 mmHg
 WBC > 12,000 or < 4,000/mm³ or bands > 10%

Sepsis:

Systemic Inflammatory Response Syndrome +
Source of Infection

#1. Initial interventions / work up for sepsis:

- Place on telemetry, vitals Q2H.
- Ensure access: 2 large bore IVs.
- Send lactate levels.
- IV fluids (NS). 30 ml/kg. Usually 4 - 5 liters unless contra indicated (very low EF)
- Initiate empiric antibiotics (**within 1 hour**) with wide coverage after sending blood cultures.
- CBC, CMP, PT / PTT / INR, lactic acid.
- Repeat lactate in **6 hours** to check clearance.

Severe Sepsis:

Sepsis + organ hypo perfusion = **MEDICAL EMERGENCY**
 2014 mortality rate: 32.5 %

Lactate > 4 mmol / L
 Hypotension
 UOP < 0.5 ml/kg/hr for > 2 hours despite fluids
 Acute lung injury. PaO₂ / FiO₂ < 300 w/o pulmonary pathology
 Creatinine > 2 mg / dl
 Bilirubin > 4 mg / dl
 Platelets < 100,000 / microliters
 INR > 1.5

**#2. Interventions / work up for severe sepsis:
(3 hour bundle)**

- Interventions as in #1.
- iSTAT lactate in < 60 minutes. Ensure blood cx before abx.
- Discuss with SNF, consider MICU consult.
- Consider other sources of infection: Echo, LP, CT abdomen/pelvis, C.diff PCR (after appropriate examination), stool examination, cellulitis.
- What organisms are being targeted and what organs?
- Discontinue drugs that may contribute to hypotension.
- Evaluate patient's steroid needs (will he need stress dose steroids ?)

Septic shock: MEDICAL EMERGENCY

2014 mortality rate: 40%

Persistent hypotension despite adequate fluid resuscitation
 requiring pressor support.

#3. Interventions for septic shock:

- As above and consult MICU.
- Check access: Does patient have PICC ? IF not, will he need CVC placement (preferably with CVP monitoring)
- Initiate pressors: Levophed is usually first line but administer only via central access. May start phenylephrine via IV to bridge via central access being obtained.

Goals in 1st 6 hours:

CVP 8 - 12 mmHg
 MAP > or equal to 65 mmHg
 UOP > or equal to 0.5 ml / kg / hr
 Central venous saturation > or equal to 65%

Special considerations:

- Use multiple clinical factors to assess fluid status such as: SBP, MAP, skin turgor, mucosal hydration, orthostatics, leg raising, HR, bedside IVC evaluation, arterial waveform evaluation.
- Tachycardia may not be seen in patients on beta blockers, calcium channel blockers and those with low Mg , K.
- Consult SNF whenever concerned for severe sepsis / septic shock.

Special considerations:

- SWAT nurses respond to and can be requested to help with all acute situations in the hospital. They are experts in gaining quick access and they can obtain iSTAT lactate as well.
- Shock is shock: In acute situations fluid resuscitation comes first.
- Consider adjunctive treatments: Stress dose of steroids, blood for acute anemia.

For any floor: vocera 4-1400 and say floor name (e.g. 6A) to call floor 6A

Bed Board – vocera – Bed control OR Pager 467-2265

Radiology Reading room – 4-8349

Nursing supervisor – 467-7280

Transfer Center – 4-5449

5A – 4-6536

5B – 4-6533

6A – 4-6556

6B – 4-9272

6K – 4-5374

6H – 4-2750

6I – 4-4863

7A

7U – 4-9700

8G – 4-6553

8E – 4-5215

8F - 45460

9G – 4-6566

10G – 4-2770

10E – 4-6500

10H – 4-9100

ODS – 4-3942

Poison Control – 4-5369

Firm-A – 4-5240

Admitting – 4-5047

Cardiac Pacer – 467-2828

Endoscopy – 4-5728

Hematology – 4-6820

Micro – 4-4459

Blood Bank – 4-6701

Lab – 4-6821

MRI – 4-6924

CT Scan – 4-6925