The University of Texas at Austin
Dell Medical School

Night Medicine Guide

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General recommendations:

- Evaluate patient at bedside if RN expresses concern or if CRT (critical response team) present
- Quickly review recent notes and addendums for recent changes to plan of care
- Review MAR for newly added or discontinued medications. Review if med reconciliation incomplete (patient may be missing crucial meds)
- Review vitals to see if temp, BP, heart rate are markedly changed from days prior
- See references for high-quality, evidence-based article(s) pertaining to inpatient management of each issue.

Abdominal Pain[1]

General DDx:

Most common overnight = constipation/ileus, gas/bloating (tube feeds/laxatives), GERD/PUD, electrolyte issue. Consider ischemia/perforation/infection in critically ill pts.
Less common overnight: new pancreatitis, pyelo/cystitis, atypical ACS, dissection.

➔ Diffuse/Cramping/Bloating

- Consider constipation/ileus if last BM >2 days → Stool softener/KUB. NG tube if significant distension.
- Electrolytes: replete if ↓ K, ↓ Mag, ↑ Ca^{2+}
- Hold tube feeds/laxatives, especially if +nausea
- For cramping: Dicyclomine (Bentyl) 20mg QID (PO or IM)

➔ Acute/Sharp

- Eval in person! Check VBG lactate, KUB, EKG initially.
- Consider surgical abdomen if pain out of proportion, rebound tenderness → surg eval or CT A/P (preferably w/ contrast).
- Consider mesenteric ischemia if ↑lactate (especially if recent hypotension/shock) → CT angiogram of A/P. (ESRD patients can receive contrast if getting routine dialysis)
- Consider bowel perf or bleeding if recent surgery/procedure (endoscopy), ileus, ischemia → CXR/KUB to look for free air.
- Consider paracentesis if known/new ascites, has not been on SBP prophylaxis + signs of systemic illness

Altered Mental Status[2]

General DDx: Delirium, sundowning, infection, hypoxia, hypercarbia, medications, drugs, withdrawal, hepatic encephalopathy.

➔ Agitation

- Consider withdrawal of benzos/EtOH if patient has tachycardia, tremor, within 1-3 days of admission (less likely if >4 days)
- Consider intoxication of EtOH/methamphetamines/polysubstances if within 24 hours of admission.
- Consider delirium in elderly, critically ill.[3]
- In elderly, prefer IV haloperidol 5mg (most studied) if a danger to others, themselves, or pulling at medical devices/lines.
- Alternative: IM/PO olanzapine - 5mg if moderate, 10mg if severe

- Caution: blackbox warning with IV olanzapine - increased death/heart-related side effects, but generally IV 2.5mg once considered safe.[4]

➔ Somnolence

- Consider VBG/lactate to eval for hypercarbia, especially if obese
- Check ammonia level if at risk for hepatic encephalopathy or on valproic acid
- Consider intracranial issues/bleed, if +n/v → eval pupils for diminished responsiveness; if high risk (recent thinners/CVA/tPA), stat CT w/o contrast.
- Consider naloxone (narcan) if recently ↑opiates dosing **AND** ↓RR, hypotension, not protecting airway:
  - 0.4-1mg IV if acute, 0.2mg if opiate dependent.
  - Would generally not reverse stable patients without airway/hemodynamic compromise, especially if on chronic opiates; if necessary, use lower dose narcan (0.1-0.2mg) to avoid full reversal of pain control

Anemia/Low Hemoglobin[5]

➔ Transfuse for goal Hgb >7, in most patients.

- If sickle cell patient, no need to transfuse above baseline
- If active CAD/ischemia, transfuse for goal Hgb >8.

➔ Hgb drops of 2-4 points s/p surgery can be normal or if aggressively fluid resuscitated (dilution effect).

Anxiety[6]

➔ PO hydroxyzine 25-50mg (if >65: risk of urinary retention + delirium).

➔ For cancer or palliative patients, OK to use PO benzos in small amounts if conservative measures not helpful

- Alprazolam 0.5mg or Lorazepam 1mg PO tabs
- IV or PO lorazepam 0.5-1mg prior to MRI/CT if claustrophobic

Atrial Fibrillation with RVR[7]

- For hemodynamically stable and asymptomatic patients (no palpitations): would not aggressively treat heart rate with IV medications (even at rates >160).
  - Consider uptitration or initiation of oral beta blockers: Start at **metoprolol tartrate** 25mg PO Q8H with hold parameters for bradycardia/hypotension (HR < 55, SBP < 110), can escalate current total daily dose up to 200mg maximum

        - Can consider addition of PO diltiazem 30mg q6hrs if metoprolol at maximum dose, but **only use if EF this admission >35%**
    - Atrial flutter is often stable at a rate of 150 and very difficult to rate control
        - Treat underlying cause (infection, dehydration or insensible losses, pain, withdrawal, post-operative)
    - Emphasize reassurance with nursing in the setting of stable, elevated RVR
        - Give nursing a HR parameter to call back physician, such as >170 sustained, hypotension, or symptoms
- For hemodynamically stable and symptomatic (palpitations, dizziness):
    - Consider use of IV medications, but **do not use IV metoprolol or IV diltiazem in patients without a known documented EF>35% in the past 6 months**. Using these medications can precipitate acute heart failure.
        - IV metoprolol is dosed at 5mg q5min for up to 3 doses until asymptomatic
        - IV diltiazem is dosed at 0.25mg/kg to start, then 0.35mg/kg 15 minutes later as needed to alleviate symptoms
            - Diltiazem can also be introduced in continuous infusion, but should be quickly weaned off in patients without a known recent TTE/EF>35%
- For chronically hypotensive patients (especially with HFrEF):
    - Prefer IV **digoxin** (use digoxin order set, or call pharmacy for dosing help):
        - Generally Digoxin 0.25 mg IV push q6h for 2 doses if no renal dz
    - Avoid **amiodarone** in most cases (rhythm control can precipitate unwanted emboli):
        - Would not recommend unless adequately anticoagulated (on therapeutic anticoagulation for prior 4 weeks)
        - Would not recommend in recent embolic CVA of unknown origin
- For hemodynamically unstable patients (acutely hypotensive):
    - Use synchronized cardioversion (50-200 J)[8]
    - Do not cardiovert without adequate sedation (midazolam, fentanyl)

Bradycardia[9]

- Asymptomatic bradycardia overnight or while patient is asleep often requires no intervention.
    - Symptomatic bradycardia includes dizziness, lightheadedness, hypotension, or syncope
    - Get an EKG if this is first bradycardic episode and ensure no heart block
        - If symptomatic Mobitz type II or 3rd degree heart block, place pacer pads and transfer to ICU; consult cardiology
    - Common in COVID patients, especially on remdesivir
- Symptomatic sinus bradycardia:
    - Use IV atropine 0.5-1mg q3-5 minutes if <60 with symptoms (including hypotension)
        - Consider dopamine continuous infusion
            - Dopamine is useful in the treatment of symptomatic sinus pauses as well
- Symptomatic heart block patients:
    - Place on pacer pads and immediate cardiology consultation
    - Consider dopamine continuous infusion while awaiting transfer to ICU and consultation
        - Dopamine is present in crash carts

Chest Pain[10]

➔ Start with EKG: look for **NEW** signs of ischemia (ST depression/ST elevation/T wave inversion) by comparing with prior EKG.

➔ Consider troponin, BNP, D-dimer, if CP presentation is moderately concerning. If no EKG changes, and CP presentation unconcerning (another etiology likely [GERD]), hold off labs.

- Anticipate possible elevation in labs due to systemic disease or ESRD, and at what threshold a change in these labs would warrant intervention or imaging (CT PE, echocardiogram)

- Nitroglycerin sublingual 0.4mg every 5 min for 3 doses
    - If pain resolves, increased concern for cardiac etiology

Constipation[11]

- Most patients tolerate **polyethylene glycol** (MiraLax) 17g well with minimal side effects; PO **senna** (2 tablets; 17.2mg) and PO **bisacodyl** (dulcolax) 10mg also relatively gentle
  - Docusate (colace) no better than placebo in multiple studies[12]
  - Magnesium oxide 400mg PO bid (milk of magnesia) and lubiprostone (Linzess) works equally well for patients on chronic opioids[13]

➔ **Magnesium citrate** 296mL and **lactulose** 30mL oral liquids work well but very poor patient tolerability

- If no improvement with orals or already taking, offer bisacodyl suppository 10mg or enema (**Fleet (sodium phosphate)**, Soap suds, Tap water, milk of molasses)
  - Avoid Fleet (sodium phosphate) in ESRD patients

➔ Consider ileus/SBO if no BM with above treatment → KUB.

- If +KUB (large dilated loops of bowel): NG suction for decompression, NPO, IV fluids.
- Full or partial SBO needs surgical consult (better outcomes)[14]

Diarrhea

➔ Start with medication list: is patient receiving stool softeners or tube feeds? If so, likely the culprit. Hold and reassess.[15]

➔ Consider C. diff testing if recent antibiotics or immunocompromised, but requires ID/CMO approval in AM.

- Index of suspicion rises with increasing fevers, WBC.
- Antibiotic-associated diarrhea (without infection) is a relatively common cause of inpatient diarrhea.[16]

➔ Consider partial SBO if especially watery stools alternating with tenesmus or abdominal cramping (obtain KUB).

➔ PO loperamide 2mg x1 q4-8 hrs if non infectious

Epistaxis[17]

➔ All patients: pinch nose below bony ridge (just above nostrils, lower third of the nose) and lean forward

➔ For light bleeding, trial oxymetazoline spray

➔ For heavier bleeds, trial topical tranexamic acid or silver nitrate (physician has to be apply) and hold any anticoagulants (may need to reverse if airway compromise), check CBC
➔ **Call ENT if airway/hemodynamic compromise or posterior bleeding is difficult to resolve.**
➔ If recurrent bleeding, can keep rhino rocket (nasal tampon) bedside.
➔ For prevention in patients on nasal cannula oxygen, use lubricating nasal spray such as **ocean spray** (nasal saline)

Fever

➔ If in the ICU (critically ill), any true fever (100.4+) warrants blood cultures and examination for potential sources (central lines, urinary catheter, ventilator/hospital acquired pneumonia)[18]
➔ Outside of the ICU, can monitor if one low grade fever <101[19]
- If new fever >101, obtain 2 peripheral blood cultures and consider work up with CXR and UA if symptomatic

➔ Consider broad spectrum abx (vancomycin, cefepime) if multiple high fevers >101 + high risk of clinical decompensation **OR** signs of early shock (tachycardia, hypotension, AMS).
➔ Neutropenic fever[20]
- Defined by fever 100.9 or 100.4 x 1 hour + ANC <500.
    - Absolute neutrophil count (ANC) calculated by % neutrophils x WBC.
- Obtain blood cultures and CXR +/- UA if not done this admission
- Abx: First line is cefepime (most common) vs. Pip-tazo (Zosyn)
- If septic shock, consider meropenem, tobramycin, +/- vancomycin
- Review past culture data to evaluate if patient has grown MDROs (multi drug resistant organisms) in the past, and ensure appropriate abx coverage
    - **Review Seton Intranet for Neutropenic Fever guidelines**

GERD / Dyspepsia[21]

➔ For immediate relief: maalox (Mg hydroxide, Al hydroxide, simethicone), calcium carbonate 1000-1500mg TIDmeals (tums), PO famotidine (pepcid) 20mg.
- PPIs are not immediate but first line for persistent symptoms: PO omeprazole 20mg or pantoprazole 40mg.[22]
- Can also trial triple mix (benadryl, lidocaine, maalox)

Hematuria[23]

➔ Hematuria is common if patient has had a foley catheter (whether indwelling or in-and-out) in past 48 hours, especially if thrombocytopenic or on anticoagulation → **No need for acute workup**

- ◆ Hematuria is also common post-urological procedure including TURP or stone procedures
- ◆ Can occur in patients with known renal or ureteral stones - but usually this is microscopic hematuria

➔ If hematuria is new and has NOT had recent catheterization or urologic surgery:

- ◆ Verify true hematuria using urinalysis with microscopic analysis (not dipstick)
- ◆ Ensure patient is not on their menstrual cycle
- ◆ Obtain bladder/renal US or CT urogram scan based on their risk stratification

➔ Frankly bloody output from the urethra warrants evaluation, possible CBC if large volume, and consider urologic consultation depending on degree of bleeding or if there are clots obstructing the flow of urine.

Hypercalcemia[24]

- Most commonly occurs overnight in patients who have already been diagnosed previously with hyperCa, often due to malignancy
  - ○ Be sure to check any endocrine consultation notes that may already exist
  - ○ Ensure PTH has been ordered during the hyperCa workup
- Be sure to calculate corrected Ca = measured calcium + (4-serum albumin) x 0.8
  - ○ Lower albumin = higher true calcium and vice versa
  - ○ May need to repeat this level in 24-48 hours after aggressive hydration as albumin level can change dramatically after fluid resuscitation
- **Most important decision point for these patients is an assessment of mental status**

➢ <u>If normal mentation</u> → Look at volume status.

- ○ If normal renal function, patient is usually quite dehydrated due to osmotic diuresis and should receive aggressive volume resuscitation: 1-2L NS bolus followed by continuous NS infusion 250cc/hr. Ensure strict I/Os ordered and daily Ca check

        - Consider checking ionized calcium on VBG for very low albumin levels <2.5
    - If volume-overloaded and CrCl>35, no IVF bolus but can administer IV bisphosphonate (IV pamidronate 60mg or IV zoledronic acid 4mg – but remember these take 48 hours to take full effect). Can also administer IV furosemide 40mg for calciuresis.
        - If CrCl<35 and no AMS: Nephrology consultation for evaluation of calcium/vitamin D balance, can dialyze against a low calcium bath.

➢ <u>If abnormal mental status</u>: team needs to evaluate if due to hyperCa or some other etiology.

- If likely due to hyperCa and Ca>14, can utilize subcutaneous calcitonin (very quick acting and quite effective, but high cost).
    - If not volume overloaded, also get aggressive fluid resuscitation as above (2L NS bolus followed by 250cc/hr NS) as well as IV bisphosphonate if CrCl>35
    - If volume overloaded with AMS, call renal for dialysis.
    - Consult endocrinology overnight for significant hyperCa>14 and AMS

Hyperglycemia[25]

- Our goal is to determine the underlying etiology of the hyperglycemia and target this issue
    - Investigate whether patient had higher-carbohydrate meals such as take out, snacks, or food from outside the hospital; go see the patient and investigate!
        - Consider communication order “no nutrition from outside sources” and discussion with nurses if this is the case
    - <u>Ensure all diabetic patients are on carbohydrate controlled diet</u>
    - If eating an additional meal outside of breakfast, lunch, and dinner, consider a standing prandial insulin order for this “snack”
- This will often be found on bedtime glucose checks. If glucose >400 overnight:
    - Ensure a correctional insulin dose has not been given in the past 4 hours before giving any additional correctional insulin
        - Nocturnal hypoglycemia is a leading cause of morbidity and mortality in hospitalized patients

    - Can give an additional one time dose of sliding scale insulin subcutaneously (review sliding scale for guidance) but only do this **once** overnight (<u>do not stack</u>)
        - If no sliding scale ordered, start a sliding scale order to be administered depending on patient's nutritional status (if eating TID meals, apply TID; if NPO or on continuous enteral/parenteral nutrition, give q6hrs)
        - Can check again at 4 hour mark post-correctional insulin dose but do not give any more rapid acting insulin in that 4 hour time frame
    - If patient has not been snacking, is on a scheduled insulin regimen, but insulin regimen seems insufficient, consider making a recommendation to the day team and deciding whether it needs to be intensified
- Sign out to day team what cross-cover thinks is the cause of the hyperglycemia: report findings of the investigation to the day team and what was done to correct this (education, correctional scale, was a dose of basal insulin missed because patient was off unit or RN held dose?)
- If BG>400 on multiple checks, consider checking BMP/VBG to evaluate for mild DKA (especially in type 1 DM)
    - <u>Mild DKA</u> (AGAP<16, Bicarb>16, pH>7.25) can usually be managed with aggressive fluid hydration (at least 1L) unless ESRD or volume-overloaded patient.
        - Then start usual subcutaneous fluid regimen
    - If <u>severe DKA</u>, need to start DKA protocol with loading dose of IV insulin followed by continuous insulin infusion.
- If steroid induced (look for higher post-prandial glucose), start with initiating or increasing pre-prandial insulin by 25-50%
- If preparing for surgery, surgery may ask for a particular blood glucose goal. Consider putting NPO patients on a continuous insulin infusion if hyperglycemia is going to bar the patient from having surgery (optimize other medical factors and emphasize reassurance with surgery, and consider discussion with house supervisor to discuss and explain need for insulin infusion for patient outcomes and perioperative management)

Hyperkalemia[26]

➔ Always treat for K>=6. If<6, consider recheck in 8-12 hours.
- If concern value may not be correct (large increase in short amount of time in absence of worsening renal failure or new ACEI/ARB/spironolactone), recheck

➔ Get EKG: If prolonged PR (>200msec) or peaked T waves:
- Stabilize cardiac membrane: **IV calcium gluconate** 1000mg

- Temporizing measures: 0.1u/kg **insulin IV** (generally 5-8u) + 50cc **D50W** (1 "amp") (do not give if blood sugar<100, especially if ESRD). **Albuterol** 15-20mg inhaled. **Na Bicarb** 50cc IV once in conjunction with other temporizing measures (only useful if acidotic, very low effectiveness).
- Definitive measures: **IV furosemide (lasix)** (dose increases with age/BUN, usually 40-80mg IV) or **kayexalate** 15/30mg PO/rectal (takes 24+ hrs)
    - Do not give kayexalate if ileus or bowel ischemia
    - Other options: **Patiromer** (Veltassa)- K-Ca exchanger in gut, 8.4g bid to start, space 6h from other meds or **Zirconium cyclosilicate** (LoKelma)- K-Na exchanger, 5-10g tid, good safety profile

➔ Recheck K in 2 hours post medication administration

➔ If persistent hyperK + ESRD, may need urgent HD (call nephrology)

➔ Ensure patient on K-restricted diet

➔ Suspend K-increasing meds like ACEI/ARB, spironolactone, NSAIDs, tmp-smx

Hypernatremia[27]

➔ Acute hypernatremia >155 at night usually secondary to diuretics, lack of free water during intubation or anorexia, GI/insensible losses, or central DI (key cause in those with intracranial bleed/trauma)
- If concern for central DI→ collect urine/serum Osm (urine should be very dilute <300 & less than serum Osm)
- Generally involve nephrology before administering desmopressin (DDAVP)

➔ Most mild hypernatremia 150-155 can be corrected with gentle free water (per NG tube - start 20cc/h) or parenterally (D5W 30-50cc/hr) + collect Na q4-12 hrs
    - ◆ Calculate free water deficit using MDCalc, aim to correct over 24-48h.
    - ◆ Overly rapid correction can cause cerebral edema
    - ◆ HyperNa also inhibits insulin release, predisposing pts to hyperglycemia

Hypertension[28]

➔ Generally do not need to treat acutely unless >220 SBP or signs of end organ damage (dizzy, blurry vision, HA, chest pain, elevated troponin, AKI, SOB, flash pulmonary edema→ all of these constitute a hypertensive "emergency").

- If end organ compromise→ bring SBP down rapidly with **IV labetalol 10mg** (hydralazine less preferred due to wide variability of effect), or nitroglycerin/nicardipine drip.
- **Nicardipine** drip generally requires transfer to IMC/ICU floor for titration.
- Goal is to decrease SBP by no more than 20-25% in first hour, and then to 160/100 in next 2-6 hours to prevent watershed cerebral infarcts

➔ If asymptomatic and <220, use oral medications from home (uptitrate doses) or can consider rapid oral lowering agent **PO labetalol** 200-400mg PO (if HR>60) or enalapril. **PO Hydralazine** 50-100mg has a peak time to effect of 1-3 hours.

Hypocalcemia

➔ Can occur acutely after large volume/massive blood transfusion[29]

◆ Recommend keeping ionized calcium>0.9 (check VBG): administer 1g calcium gluconate IV after 4 blood products

➔ Generally we replete if serum calcium <7 in other circumstances using either IV calcium gluconate as above or PO calcium carbonate 1000-1500mg TID (especially if chronic issue)[30]

Hypoglycemia[31]

➔ <u>Ensure "Hypoglycemia protocol" order set is ordered</u>

◆ Follow protocol as it will be tailored to patient's PO/enteral access, ability to swallow

➔ Review the chart for recent insulin management changes and examine/discuss with the patient

◆ **<u>Our goal is to determine why the hypoglycemia occurred by gathering information from patient, nurse, and chart review</u>**

◆ If no fast-acting insulin in the past 4-5 hours, hypoglycemia likely related to basal insulin

- Reduce basal insulin dose by 25%
- Patient is at risk for hypoglycemia for the next ~24 hours

        - Increase frequency of POC glucose monitoring by discussing with RN: prefer q2-q3 hr checks for the rest of the night
        - Consider suspending or reducing prandial insulin for the next 24 hours
    - ◆ If hypoglycemia occurs within 4-5 hours of rapid acting insulin dose, that is likely culprit:
        - Review MAR to see whether patient received a dose of rapid acting insulin but did not subsequently eat (reasons include going off the unit for imaging or procedure, or nausea/vomiting preventing eating or vomited up the meal)
        - Reduce rapid acting insulin by 25%
    - ◆ Keep in mind **type 1 diabetics need basal insulin** and should not have all insulin orders suspended without thorough review of the patient's regimen and factors surrounding the hypoglycemia
- ➔ Sign out hypoglycemia events to the day team and any insulin regimen changes/reductions
- ➔ If resistant to hypoglycemia interventions, transfer to IMC/ICU for continuous glucose infusion and frequent glucose checks

Hyponatremia[27]

- ➔ Make sure to correct for hyperglycemia (can appear falsely low)
- ➔ Acute hypoNa <130 or an acute drop 8-10 points overnight is rare.
    - ◆ Basic workup: serum/urine Osm, urine Na.
- ➔ Rate of correction: 8-10mmol/L per 24h (Ideally 8 in those with **ODS** risk factors [malnutrition, alcoholism, liver dx, Na<105, hypokalemia]).
    - **SIADH** is a main consideration for acute hypoNa during hospitalization.[32] Look for serum Osm<275, urine Osm>100 & urine Na>20. Start fluid restriction <1.5L a day (unless SAH) and AM nephrology consult.
    - Underlying cause will predict rate of correction (SIADH self-corrects more slowly, beer potomania/primary polydipsia self-corrects more quickly).
- ➔ **SAH** has special sodium requirements to prevent vasospasm and cerebral edema. Consult neurosurgery for acute Na changes
- ➔ Chronic: >48h hyponatremia; hyponatremia is treated as chronic unless lab evidence to show that it is acute

Hypotension

➔ **MAP<65** is the inpatient definition of hypotension[33]

➔ **Order: VBG with lactate** and examine patient at the bedside

- ↑ Lactate is concerning for septic shock, hypoxia, or ischemia that has caused critical end-organ damage

➔ If febrile, increasing WBC, increased lactate: Consider sepsis

- Fluid bolus: 1L LR (preferred) or NS, healthy people can receive up to 4-5L total without risk of fluid overload
  - Heart failure patients with septic shock should still generally receive fluid resuscitation of 1-2L[34]
  - If cause of hypotension unknown, smaller 500cc bolus appropriate for CHF/cirrhotics

➔ Examine for signs of shock:

- Cool, clammy extremities in a heart failure patient: possible cardiogenic shock → needs dobutamine/dopamine

➔ Can use POCUS to evaluate IVC for fluid responsiveness[35]

➔ If normal lactate, patient well appearing, and baseline BP is low-normal, monitor or consider PO midodrine 5-20mg

Insomnia

➔ All patients at risk of delirium should have melatonin 9mg qHS[36]

➔ Most patients are safe to trial PO trazodone 50mg[37]

➔ Consider PO benadryl 25-50mg but ↑risk urinary retention, delirium if >65

➔ Zolpidem should be avoided in majority of cases; May rarely use PO zolpidem 5mg for insomnia related to cancer-related pain or anxiety, >10mg ↑risk delirium[38]

Lactic acidosis[59]

➔ Think hypoxia/hypoperfusion: sepsis, cardiogenic shock, seizure (even non-convulsive status epilepticus), ischemia (bowel, infarcts)

- ◆ Also can occur in trauma, DKA, TPN, etoh
- ◆ Significant liver dz will slow lactate clearance rates

➔ Rising lactate in the setting of adequate fluid resuscitation and no liver dz should raise concern for serious illness and possible impending decompensation

Nausea & Vomiting

- IV ondansetron 4mg q4hrs or IV promethazine 6.25mg q4hrs PRN
  - QTc can be checked once during admission unless on 3+ QTc prolonging meds, then should be checked every 3-7 days[39] **[Hold if QTc>500]**

➔ Second line: metoclopramide, compazine, prochlorperazine

➔ 3rd line: haloperidol/olanzapine[40] or benzodiazepines (do not prolong QTc)

Pain[41]

➔ Multimodal pain management:
- Acetaminophen 1g q6hrs (2g daily max in cirrhosis)
- Scheduled NSAID tidMeals if normal kidney function
  - Ibuprofen 400-600mg, Naproxen 220mg

➔ IV ketorolac 15-30mg q6hrs (use 15mg in elderly, 30mg in others)
- Avoid if renal injury, GI bleed, coagulopathy, intracranial bleeding

➔ Topicals (arthritis): Diclofenac (voltaren), menthol/camphor, capsaicin

➔ Muscle pain or strain: Lidocaine patch
- Muscle relaxers: Methocarbamol, cyclobenzaprine, baclofen

➔ Neuropathy: Gabapentin 300-900mg tid, duloxetine 30-60mg

➔ "Headache cocktail": IV ketorolac 30mg, IV diphenhydramine 25mg, IV compazine 10mg

➔ PO opiates can be used for acute pain (not chronic) if above conservative measures do not work:
- PO oxycodone 5mg (2.5mg if elderly, 10mg if chronic opiate use); can also be given as Percocet in combination w tylenol
- PO hydrocodone (Norco 5-325mg) also an option

➔ IV opiates for severe, uncontrolled, breakthrough pain:
- IV morphine 2mg (elderly/<50kg), 4mg (average dose), or 6mg (opiate habituated or BMI>45)
- IV hydromorphone 0.2mg (elderly, ≈3mg oxycodone), 0.4-0.5mg (average dose), 0.8-1mg (severe)

Perioperative Management[42]

❖ **NPO Status**

➢ NPO orders begin 8 hours before a scheduled procedure, and general order is "NPO except for medications with sips of water"

- ➢ Strict NPO is rarely necessary, except in case of SBO or specialist rec
- ➢ Special circumstances: avoid extended-release tablets (potassium replacement, antidepressants) or chalky liquids (maalox, sucralfate) before upper endoscopy

❖ **DVT prophylaxis**

- ➢ Generally no need to hold DVT prophylaxis before general surgery, except in high-bleeding risk procedures including neurosurgical, urologic, or vascular surgery – check surgical notes or page surgical team to clarify)

❖ **Insulin management**

- ➢ When NPO for surgery, hold pre-meal rapid-acting insulin + reduce dose of intermediate- or long-acting insulin by 50-80%.[58] Can still give sliding scale q4-q6hrs, be sure to change POC glucose checks to match timing

Pruritus[43]

➔ Common side effects of opioids & antibiotics.

➔ Use conservative measures: PO or IV diphenhydramine 50mg (watch for urinary retention/delirium if >65), topical diphenhydramine (benadryl) cream, Sarna, hydrocortisone or triamcinolone cream

- Avoid oral steroids unless conservative measures fail

Rash[44]

➔ Commonly, contact dermatitis from cleanser, gel, bandages, wound care, tele leads, or latex.

- Circle the rash and eval for spread over hours.

➔ Drug eruption: morbilliform, happens 3-5 days after new antibiotics

➔ Viral exanthem: common in conjunction with viral URI, COVID

➔ If itch, treat with PO/IV benadryl and topical hydrocortisone.

- Topical steroids can affect biopsy results, so if severe/concerning, hold off till derm consult in AM

➔ If any mucosal involvement, immediate derm consult.

Seizures[45]

- Treat any seizing patient immediately with IV lorazepam 4mg (2mg if elderly or respiratory compromise)
  - Alternative is IV/IM midazolam 10mg (both are equally effective)

➔ If concern for alcohol or benzo withdrawal, initiate alcohol withdrawal protocol (CIWA) and transfer to IMC/ICU
  - Do not consult neurology for withdrawal seizures, unless refractory to treatment

➔ If new seizure in patient who is post-neurosurgery, call both neurosurgery and neurology.

➔ If new seizure in patient with intracranial bleed, call neurology first.
  - Load with IV levetiracetam (keppra) 60mg/kg up to 4.5g (usually 1-3mg)
  - Check VBG lactate and CK after seizure if unclear whether or not true seizure→ these immediately elevate
    - If concern for PNES (psychogenic nonepileptic seizure): draw prolactin within 15 min of seizure. True seizures generally elevate prolactin.

- When calling neurology for a new seizure consult, ensure EKG in the chart for proper medication clearance.
    - EEGs generally cannot be done overnight

Shortness of Breath[46,47]

➔ Evaluate in person at the bedside.

➔ Order: VBG with lactate, portable chest X-ray
  - VBG: look for elevated pCO2, lactic acidosis
  - CXR: look for pulmonary edema, pleural effusion, pneumonia, pneumothorax, widened mediastinum
  - If concern for PE: Troponin, D-dimer to eval for R heart strain
  - If chest pressure or tightness: EKG

➔ Exam findings:
  - Crackles/volume overload: Diuresis with IV furosemide (lasix)
    - Common in patients on continuous IV fluids (hold)
    - Good renal function:
      - Lasix naive: 20mg IV
      - Otherwise, use PO home dose as IV (if uses 40mg PO at home, use 40mg IV here)
    - Diminished renal function needs higher dose
      - ESRD needs at least 80mg IV
      - Torsemide users need at least 80mg IV
  - Wheezing:

    - Albuterol 10-20mg inhalation
    - Ipratropium 0.5mg inhalation
    - PO prednisone 40mg or IV methylprednisolone 50mg
- Stridor:
    - Laryngeal edema/spasm can occur post-intubation
    - Racemic epinephrine + IV methylprednisolone 125mg
    - Transfer to IMC/ICU
- Somnolence in the setting of hypercarbia:
    - BiPAP initial settings: IPAP 10/EPAP 5
        - IPAP 15-20 in morbidly obese
        - Ask RT for guidance/titrate to patient comfort
- New fever/SOB in patient with aspiration risk (CVA, seizure, overdose): classically RLL consolidation on CXR
    - Amp-sulbactam (unasyn) IV if other signs of infection (febrile, leukocytosis)
        - If concern for nosocomial pneumonia (inpatient >5 days or recent ventilator): cefepime
        - **Use Seton Intranet antimicrobial guidelines for diagnosis and treatment pathways**
    - If bilateral or one-sided opacities in patient with known aspiration (without fevers, tachycardia, increased WBC), consider aspiration pneumonitis which does **NOT** need antibiotics

➔ Pneumothorax possible post-thoracentesis or central line placement

- ◆ General surgery consultation for chest tube if symptomatic

➔ PE risk in malignancy, immobilization: Calculate Wells score

- ◆ CT Angiography of chest if good renal function (V/Q scan only done in daytime with nuc med)
- ➔ Can also look for DVT with lower extremity venous US
- ➔ Consider empiric anticoagulation if cannot receive imaging but high probability for PE (risk/benefit discussion)

Sinus Tachycardia[48]

➔ Treat the cause, not the number: Ddx includes pain, withdrawal, PE, infection, dehydration, anemia/blood loss, autonomic storming

- Severe fever can cause insensible losses

➔ May consider fluid resuscitation

Supraventricular Tachycardia (SVT)[49]

- SVT tends to be more rapid that AFib/flutter (rates 170-180) and patients tend to be more symptomatic
- First line is vagal maneuvers (bearing down), this is usually already done if on a tele floor
- If vagal maneuvers ineffective, trial IV **adenosine** 6mg, repeat in 1-2 min if ineffective. May repeat w/ up to 12mg
    - Before administering, place defibrillator pads, and ensure continuous EKG ongoing for rhythm strip (cardiology will use this later to determine underlying rhythm)
    - **Adenosine must be administered rapidly via IV push, preferably by an experienced nurse, and with arm held upwards to gravity.** Two-way IV tubing should be used to connect both adenosine and saline flush. Push adenosine over 1-3 seconds followed immediately by saline flush to push the drug to the heart as quickly as possible.
    - Stay at the bedside while administering; counsel patient on anticipated chest pressure & breathlessness
- If still resistant to adenosine 6 and 12mg, trial rate control methods with beta blockers, calcium channel blockers, or digoxin → refer to atrial fibrillation algorithm for suggestions on rate control
    - Consider cardiology consultation if patient remains symptomatic despite above measures
- If true SVT and hemodynamically unstable:
    - Synchronized cardioversion 50J→100J→200J (move to ICU/IMC)

Thrombocytopenia[50]

➔ Always transfuse if plt <10 (↑risk intracranial hemorrhage)
➔ If actively bleeding, transfuse if plt <50; transfuse if oozing and <30
➔ If concern for HIT (heparin induced thrombocytopenia) → 4T score

Transfusion Reactions[51]

➔ Normal variations during blood product transfusions:
- +/- 0.5 °C (+/- 1 °F), +/- 5 respirations a minute, +/- 10 heart rate, +/- 20mmHg of blood pressure

➔ **ABNORMAL**: Hives, itching, ↑fever >1 °C (~2 °F), chills, hypo/ hypertension, dyspnea, hemoglobinuria, flank/back pain, jaundice
- Stop transfusion, call blood bank and tell them you suspect a transfusion reaction. Post-transfusion blood sample will be sent to the lab and analyzed for reaction byproducts.
  - Blood bank will inform you if true transfusion rxn.
- Benign urticaria most common rxn (1-3%)
- OK to resume transfusion after blood bank gives OK, give diphenhydramine for symptoms
- SOB/Volume overload can be life threatening
  - Transfusion related acute lung injury (TRALI)
  - Transfusion associated circulatory overload (TACO)
  - Hold transfusion, obtain CXR, diurese w/ furosemide

Urinary Retention[52]

➔ Common post-operatively, after >48 hours indwelling foley, or in the setting of multiple anticholinergics/opiates.

➔ Order a bladder scan if no void for 6-8 hours or patient discomfort. If scan shows >300cc, consider intermittent urinary catheterization ("in and out cath"); if no discomfort, can hold off until >450cc
- Bladder scan may also be called "PVR": Post Void Residual

➔ If persistent, or on opiates/benzos, can trial PO tamsulosin 0.4-0.8mg (for both males and females)

➔ Males should try to stand to urinate if possible; daily ambulation helps

➔ We try to avoid indwelling foleys (infection risk) unless need for strict measurement of urine output (renal failure, aggressive diuresis), groin or sacral wounds or pressure ulcers (otherwise can use diapers/briefs), or prolonged immobilization (intubation, significant brain trauma)
- Consider placement after >3 in and out catheterizations

Ventricular Tachycardia[53]

➔ **Nonsustained VTach** is <30 seconds
- ◆ If asymptomatic, can benefit from uptitration of PO beta blocker
- ◆ If symptomatic, needs to be placed on pacer pads, transfer to IMC/ICU, and cardiology consult.

- While awaiting above measured, can add or increase PO beta blocker vs. consider amiodarone drip (150mg IV once followed by continuous infusion)

➔ **Sustained Monomorphic VTach** is >30 seconds and necessitates a cardiology consultation unless prior recommendations have been made by daytime cardiology that suggest otherwise
- ◆ Start with IV amiodarone 150mg once followed by continuous infusion (orderset), Move to IMC/ICU
- ◆ If refractory to amiodarone, escalate to IV lidocaine 100mg bolus followed by drip.
- ◆ If hemodynamically unstable, necessitates defibrillation with sedation

➔ Polymorphic VTach/Torsades de Pointes: administer IV **magnesium sulfate** 1g
- ◆ Do NOT administer beta blocker or amiodarone (avoid slowing heart rate)
- ◆ Call cardiology
- ◆ Consider temporary pacing to increase heart rate, thereby decreasing QT interval

➔ Check K and Mag and replete for K>4 and Mag>2 (can help de-escalate frequency of VTach)

➔ If patient has an automated implantable defibrillator (AICD), it will likely need to be interrogated in AM to assess ICD settings

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Miscellaneous Issues & Troubleshooting

Blood cultures[56]

- When deciding to draw blood cultures, 2 sets minimum from separate peripheral sites. Draw from central lines only if concern for catheter-related infxn[57]
- Signs of contaminants: only 1 bottle growing organisms, especially if certain skin flora (Coag-neg staph, gram positive rods) without systemic symptoms

Transitioning off an insulin drip[25]

- Wait until insulin infusion stable for 6-8 hours (insulin requirement needs must be relatively steady per hour to proceed with below calculation)
- Add up units of insulin used over past 6-12 hours and **extrapolate that out to 24 hour requirement.** Ex. If used 16 units of insulin in past 12 hours (check MAR), total daily requirement is estimated as ≈32 units

- Multiply this number by 0.8 (80% as a safety correction factor to avoid hypoglycemia)
  - Ex. 0.8 x 32 ≈ 26 units
- Divide this number in half to calculate how much insulin should be given basal and how much should be given premeal.
  - Ex. ≈13-15u basal detemir and 4-5u tid before meals.
- Can also base on home insulin dosing but may need to be increased if not seeing a physician regularly or not carefully managing their diabetes outside the hospital

- Give basal insulin dose as calculated above and turn off insulin drip in 2 hours
  - Change POC glucose checks from q1hr to qidAC. At that point patient can be transferred to the floor

Foley Catheter Issues[54]

➔ If RN unable to place a regular foley (meeting resistance), try:

1. **Coude catheter** (bent tip)
   a. If patient >55 years, use 18F Coude; curved tip should always be pointed upwards at 12 o'clock
2. **12 French Silicone Catheter** (ask RN to call Central Supply)
   a. Start w/ 12F silicone cath if patient has history of prostate radiation, urethral stricture, or known scar tissue

➢ Do not call urology until the above steps have been trialed, an experienced RN has tried (CRT or ED nurse), and you have assisted in trialing (urology will always ask if **you** as the physician have tried)

- If <500cc in the bladder and no patient discomfort, generally can wait until morning to consult urology
- **If >500cc with discomfort and above steps have been trialed by the primary physician, page urology**
- This indicates there is difficult anatomy or a urethral stricture

➢ If foley not draining:

1. Perform bladder scan to ensure urine is present
   a. This can be falsely positive if large volume ascites in abdomen
2. Verify foley balloon placement:
   a. Trial 60cc saline flush connected w/ Piston tip syringe directly to drainage port (not luer lock port)

b. Obtain POCUS to visualize balloon (want to be fully inflated within the confines of the bladder)

➢ If above steps reveal non-draining urine in bladder and foley catheter in appropriate position:

1. Consider replacement of foley with larger size (20 or 22 Fr; call central supply and ask from urology cart)
2. If extensive debris in bladder on POCUS, may benefit from more aggressive irrigation. Repeatedly use a piston syringe filled with 60cc saline and gently irrigate the bladder. Flush in and aspirate back. Then reposition foley by gently pushing catheter into bladder, and re-irrigate in this new position. This will allow for any dependent debris to be re-irrigated and aspirated out. Repeat these steps as many times as necessary until the irrigant is clear.

➢ If patient pulls out foley catheter, may need restraints if delirious

- Hematuria is a normal consequence, check CBC if profuse
- Evaluate if truly needs cath or can begin voiding trial before replacing

Nasogastric/Dobhoff Tube Placement

➔ NG Tube placement: assess on KUB, generally want NG as close to pylorus as possible (aspiration risk)

- If coiled in stomach, OK to use for meds + trickle feeds (10cc/hour tube feeds) → place communication order

➔ DHT step 1 placement: CXR to see if past the carina (not in lungs)

➔ DHT step 2 placement: KUB to evaluate for placement in stomach (same as NG placement above)

IV Issues

➔ If IV infiltrates and fluid or medication extravasates into surrounding tissue, edema or irritation (phlebitis) is possible. Remove IV, elevate extremity, and monitor for severe skin changes

➔ If difficult to place IV, may need ultrasound guided or PICC/midline request in AM

- OK to draw morning labs from PICC if difficult stick

➔ Alteplase is used PRN to unclog central lines and IVs

Chest Tubes[60]

- ➔ "Suction" vs "water seal": if disconnected from wall suction, it is on water seal (i.e. "to gravity") and will allow for one-way flow of air out of chest.
- ➔ Air leaks: if bubbles present in the water seal chamber. Ask patient to cough to assess for leak if bubbles are not continuous
  - ◆ Ddx: air in pleural space (parenchymal lung injury or bronchopleural fistula) vs. leak in chest tube (check tubing and connections to Pleur-evac)
- ➔ Clogging: look for debris in tube, can try "stripping the tube" by compressing it with your fingers while pulling TOWARDS the drainage system, helpful to have an alcohol prep pad for lubrication.
  - ◆ In cases of both air leaks and clogging, consult specialist to help manage – generally the specialist who placed the tube, but often IR will not follow. ACS or CTVS or pulm can all help.

Tracheostomies[61]

- ➔ Bleeding can be mitigated with silver nitrate stick, but pulm/crit or anesthesia should be involved if they are primarily managing the trach or placed recently
- ➔ Dislodgement: immediate anesthesiology consultation for replacement, call code blue if patient in extremis

Telemetry Tiers

- ➔ I: ICU, cannot be off telemetry leads at any time
- ➔ II: 5th and 6th floor with cardiac care trained nurses, can be off tele for brief lengths of time to shower
  - Best for ACS, decompensated CHF, arrhythmias
- ➔ III: Remote telemetry monitoring, can be done on any floor (4th, 7th), but nurse is not telemetry trained, can be off tele for brief periods
  - ➔ Best for syncope, electrolyte derangement
- ➔ Do not need telemetry for history of stable CHF/atrial fibrillation or asymptomatic bradycardia/tachycardia

Wound VACs

- ➔ If wound vac comes off or question about settings, nurse needs to call the surgical team managing the vac (plastics, general surgery, etc.) or call PT wound care in the morning (if they are managing)

Wound Care

- ➔ For more minor issues (sacral pressure irritation, ostomy care, irritation between skin folds) → **Wound Ostomy Nurse Consult**. (Can use miconazole powder between skin folds to prevent fungal infections.)
- ➔ For more significant ulcers (feet, legs, sacrum) that need debridement, expert assessment, and daily wound care → **PT Wound Care consult**

Electrolyte Derangement & Repletion

- ➔ ↓K : If K<3 on multiple checks consider placing on telemetry tier III
- ➔ ↓Mg, ↓Phos are low risk for life-threatening arrhythmia
- ➔ Can recheck levels 4-6 hours after repletion
- ➔ Prefer PO repletion if possible (use sliding scales)

Hiccups[55]

- ➔ Often due to GERD (if other symptoms, can use PPI)
- ➔ Trial: Baclofen 5-10mg PO, gabapentin 300mg PO, metoclopramide 5mg IV or 10mg PO, chlorpromazine 25-50mg PO, IV, or IM

Scabies/Lice/Bedbugs

- ➔ Place on contact precautions/isolation
- ➔ Scabies: treat with permethrin cream head to toe
- ➔ Lice: Nix scalp application (5% permethrin)
- ➔ Bed bugs: report to housekeeping

Patient wanting to leave AMA (Against Medical Advice)

- ➔ Only patients who have cognitive capacity to understand risks of leaving the hospital can leave the hospital AMA.
- ➔ If known to have capacity, try to discuss why the patient is leaving and if it is something fixable (uncontrolled nausea, nicotine cravings)
  - If no agreement can be reached, patient can leave.
  - Make sure the following are completed:
    - AMA form signed, provided by RN
    - Offer sending prescription to pharmacy for any untreated infections (antibiotics) to pick up in AM

    - Write AMA note on EHR highlighting the events and discussions leading up to the AMA. Include that patient expressed understanding of the consequences of leaving AMA (e.g. death, worsening of infection)

➔ If unclear whether or not the patient has capacity, assess!

- Most importantly, they must be able to verbally state to you the risk of leaving AMA, including worsening of disease death.
- If they cannot verbalize this or you have concern that the patient is not making rational decisions, the physician (**you**) decides the patient does not have capacity to leave or refuse treatment, and may have to call security to restrain/sedate.

Behavioral Contracts

➔ If patients verbally abuse staff or frequently refuse key treatments, nursing staff can initiate a behavior contract. If patient breaks this contract or does not agree to its elements, they can be discharged for violation.

Suicide Risk Assessments

➔ Nursing does a suicide risk screening on admission. Usually, this is a known issue for admission, but occasionally it is a new finding.

- For high suicide risk, order sitter at the bedside.
- For low to moderate risk, physician can assess and decide if low (no active plan) or requires higher intervention like morning psychiatry consultation

Family Updates

➔ Would generally politely decline overnight updates as to the plan of care unless active change to patient status or management; the day team is better able to answer and understand the nuances of care.

Code status

➔ Full code: Full compressions + intubation; would generally not recommend/offer DNR to healthy patients under 40–this would prevent us from administering reversible lifesaving care in the case of anaphylaxis, pneumothorax, etc.

➔ DNR 2A: No compressions, may or may not be okay with intubation, escalate other critical care as normal (transfer to ICU, pressor support, adv therapies)

➔ DNR 2B: Limit scope of care in pre-arrest state (minimize heroic efforts, generally for patients who are older and with significant comorbidities who would not survive resuscitation efforts)
➔ DNR 3: Comfort care (See below) - remove everything not contributing to comfort (blood draws, vitals, IV fluids, tube feeds), although family sometimes wants to continue some or all of these and/or medications like antibiotics

Comfort Care

➔ If patient or family elects to transition to comfort care overnight, there is a "Comfort Care for the Dying Patient" order set with PRN morphine, lorazepam and/or continuous morphine drip

Pronouncing Death

- Feel for pulse, listen for heart and breath sounds +/- shine light for pupillary reflex
- Either 2 RNs or 1 physician can pronounce; daytime provider signs death cert
- Cause of death is the primary disease process (CAD, cancer, DM, renal failure), NOT cardiac arrest or respiratory arrest (everyone dies of those 2 things)

Needle stick injury

- Notify unit charge nurse → You will go to ED for evaluation
- Test the patient for HBV, HCV, and HIV if not done already

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