

UW Medical Critical Care Primer

This document is not intended to be all-inclusive but to provide tips/tricks/insights into the usual care of these patients. Hyperlinks to existing protocols have been noted where available. If you have any questions or concerns, please contact your ICU Lead. (Updated 4.2.20)

ROUNDING TIPS

- Review AM CXRs prior to seeing individual patients (no daily films, order only if clinically indicated)
- Utilize Critical Care Team Workflow List
- Include bedside nurse (always) as well as pharmacy & RT (if available) for rounds
- Transfer patients to IMC/general care when appropriate, notify primary team of transfer, attending/attending discussion if needed

DRUG OVERDOSE

- Contact Poison Center for Help/Guidance
- Acetaminophen
 - Suspect if AST/ALT >1K or history
 - Start N-Acetylcysteine ASAP
 - Liver Failure = encephalopathy or ↑INR, consult hepatology
- Beta-blocker/ Calcium channel blocker
 - Give 2g CaCl immediately
 - Glucagon 5mg IV, repeat PRN → Drip
 - Epinephrine gtt for HR <50, MAP <60
 - High dose insulin (1un/kg bolus, 0.5un/kg/hr drip, titrate until MAP >60 or 10un/kg/hr)
 - D10 drip to maintain BG >100
 - Electrolytes, K+ q1h until stable
 - Intra-lipid (consult with toxicology)
- Salicylates
 - ↑AG Metabolic acidosis + respiratory alkalosis, N/V, tinnitus, AMS
 - HD for salicylate level >100 or pulmonary edema, coma, renal failure
 - HCO₃ drip (150meq HCO₃ in sterile H₂O or D5) at 200-250ml/hr
- Toxic alcohols
 - Cause AMS, seizures, n/v, myoclonus. Check serial electrolytes, blood gas
 - Methanol (moonshine, household products)
 - ↑AG, ↑Osm gap, blindness
 - Rx: Fomepizole
 - Ethylene Glycol (antifreeze)
 - ↑AG, ↑Osm gap, renal failure
 - Rx: Fomepizole
 - Isopropyl (rubbing alcohol)
 - Normal AG, ↑Osm gap
 - Rx: Supportive
- Serotonin syndrome
 - Hyperthermia, agitation/delirium, HTN, tachycardia, diaphoresis, myoclonus, hyperreflexia, rigidity
 - Stop offending meds. Sedate with IV benzos
 - Cyproheptadine for severe cases

DRUG OVERDOSE (CONT.)

- Neuroleptic Malignant syndrome (anti-psychotics)
 - Hyperthermia, agitation/delirium → catatonia, coma, HTN, tachycardia, diaphoresis, rigidity, tremor/cogwheeling, dyskinesias (think acute, severe Parkinsons)
 - Generally supportive care
 - Dantrolene or bromocriptine for severe cases

ALCOHOL WITHDRAWAL

- Thiamine IV and folate PO if suspected/confirmed
- Phenobarbital 260mg IV x1, then 130mg IV q15-30 min (see order set)
- Dexmedetomidine drip is 2nd line
- Midazolam or Lorazepam infusion is 3rd line
- Intubation and sedation with propofol for severe cases

HYPERCARBIC RESPIRATORY FAILURE

- COPD
 - Determine if acute, chronic, or acute on chronic (look at pH, HCO₃). HCO₃ ↑ 3-4mEq per 10mmHg PaCO₂ chronically
 - Rx: BiPAP. Intubate for worsening work of breathing, or declining mental status
 - Corticosteroids, typically IV initially (e.g. solu-medrol 80mg). Transition to PO prednisone when improving
 - Add azithromycin or doxycycline if no infiltrate on CXR. If CXR shows PNA, treat for CAP
- Asthma
 - Asthmatics typically DO NOT have chronic hypercarbia. If elevated PCO₂ this is VERY SEVERE exacerbation, high risk for needing intubation. Rx as above for COPD.
- Obstructive sleep apnea/obesity hyperventilation
 - Decompensation often precipitated by worsening fluid overload, or sedating meds/ETOH
 - Rx: BiPAP, hold sedating meds
- Narcotics
 - Rx: Naloxone

INTERSTITIAL LUNG DISEASE (ILD)

- Many subtypes. Most common are idiopathic pulmonary fibrosis (IPF), hypersensitivity pneumonitis (HP), and idiopathic or connective tissue disease associated ILD such as non-specific interstitial pneumonitis (NSIP) or organizing pneumonia (OP)
- IPF patients may be on anti-fibrotics (nintedanib or pirfenidone). These are not on hospital formulary. OK to hold if patients don't bring home supply
- Other patients likely to be on mycophenolate (MMF), azathioprine, or other immune modulators. These can generally be held in the setting of infection.
- Acute exacerbations of ILD are associated with very high morbidity and mortality
 - Comprehensive infectious workup (Chest CT, blood & sputum cultures, respiratory viral panel + COVID, 1,3 B-D glucan, histo/blast, galactomannan esp. for immune suppressed patients)
 - Treat pneumonia empirically
 - Diuresis empirically
 - High-dose steroids for HP, NSIP, OP (e.g. solu-medrol 125mg q6h)
 - High dose steroids as last resort for acute exacerbation of IPF
 - HFNC > NIV. If requiring mechanical ventilation prognosis is very poor, would generally advise against this unless transplant candidate.

SEPTIC SHOCK

- Infection + 2 SOFA criteria + MAP <65
- Obtain cultures prior to abx if possible
- Empiric abx based on suspected source and risk for multidrug resistant organisms
- Initial resuscitation with IV lactated ringers (no more than 30ml/kg or ~2-3L, unless obvious signs or history c/w hypovolemia). Less if volume overloaded (CHF, pulmonary edema).
- 1st line vasopressor is norepinephrine. Goal MAP = 65. MAP of 60 in elderly or cirrhotic patients. This can be run via peripheral IV per TLC; peripheral vasopressor protocol if IV access is adequate, and dose < 0.1mcg/kg/hr. For higher doses consider CVC or PICC
- 2nd line vasopressor typically vasopressin, fixed dose 0.03units/min (cannot use peripherally)
- "Stress dose" hydrocortisone 50mg IV q6h if patient is on chronic steroids, or high/rapidly increasing pressor requirement

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PNEUMONIA (IN ICU PATIENTS)

- Dx: CXR, +/- CT. Blood, sputum cultures. Respiratory viral panel. Urine strep and legionella antigens. Consider 1-3 B,D glucan, histo/blasto, galactomannan in immune compromised patients.
- Rx: Community Acquired Pneumonia
 - Ceftriaxone + Azithromycin
 - Alt: Ceftriaxone + levofloxacin or doxycycline
 - Alt: Aztreonam + levofloxacin
- Risk factors for MDR organisms (MRSA, pseudomonas, ESBL gram negatives)
 - IV antibiotics in last 90 days
 - Admitted 5+ days
 - Chronic lung disease, especially bronchiectasis
 - If present, add:
 - Vanc or linezolid for MRSA coverage
 - Pip-tazo, Cefepime for pseudomonas/ESBL coverage

POST CARDIAC ARREST

- Workup
 - EKG
 - Lab: CBC, CMP, glucose, ABG. +/- troponin, lactate
 - Imaging: CXR (for ETT, etiology of arrest), POCUS if available. Consider CT angio, TTE, head CT pending etiology and duration of arrest.
- Treatment
 - Correct any electrolyte abnormalities
 - Address and treat underlying cause (Hs & Ts from ACLS, e.g. MI, PE, arrhythmia, pneumothorax, acidosis)
 - Low tidal volume ventilation
 - Norepinephrine or epinephrine to maintain MAP >65
 - Avoid hyperthermia, consider targeted temperature management (33 – 36C)

CONGESTIVE HEART FAILURE

- Dx: History, edema, JVD, CXR, BNP etc.
- Rx: BiPAP 1st line for respiratory support for respiratory failure (hypoxic, hypercarbic, or combined) due to pulmonary edema
- Maintain MAP >65, norepinephrine 1st line vasopressor
- If hypertensive: nitroglycerin drip is preferred 1st line agent in acute pulmonary edema.
 - Continue/Resume home anti-hypertensives.
- IV furosemide: 2x home PO dose, or 40 x creatinine to start. If no response → 2x last dose → no response, add 5mg metolazone prior to next furosemide dose;
- Careful electrolyte monitoring with diuresis, especially if metolazone has been added→consider BMP+mg BID;
- Cardiogenic shock:
 - If: Cool extremities, poor capillary refill
 - Rising lactic acid
 - Poor urine output despite diuretics
 - Mixed venous SVO2 <70 (if PICC or CVC in place)
 - Consider addition of dobutamine 2.5-5 mcg/kg/min for inotropic support

PANCREATITIS

- IV fluids→may have significant requirements, LR likely superior to NS
- Evaluation for hypertriglyceridemia, biliary obstruction
- Adequate pain control
- Careful monitoring of electrolytes with needed supplementation
- No role for empiric antibiotics→careful monitoring for infection
- Early nutritional support→NJ access

DECOMPENSATED LIVER FAILURE

- Assess for APAP overdose/toxicity→nAC if present
- Frequently complicated by ETOH withdrawal
- Asses for infection with cultures, paracentesis
- Treatment for SBP if PMN >250
- Lactulose +/- rifaximin for encephalopathy
- Avoid narcotics and NSAIDs
- Hepatorenal syndrome: oliguria, AKI without other clear etiology
 - Norepinephrine gtt plus IV albumin 100gm or
 - Midodrine 10mg TID + octreotide 200mcg TID + albumin 100gm IV daily

GI BLEED

- IV access, at least 2 PIV, large bore
- Upper GIB: IV PPI either GTT or q12
- If concern for cirrhosis/variceal bleed:
 - IV octreotide
 - IV ceftriaxone
- GI consultation for EGD for further evaluation
- Consider intubation for airway protection
- Assess for coagulopathy, follow serially given potential for consumption
 - Transfuse aggressively for hemorrhagic shock until MAP >65, then target Hgb >7;
 - Keep platelets >50, INR ~1.5 (with FFP or PCC if severe bleed or ↑↑INR. Fibrinogen >100 (with cryoprecipitate)
 - Massive transfusion protocol sends cooler to bedside. Transfuse ~ 1:1 pRBC to FFP. Platelets are in constant shortage, so may need ~1:3 or 1:4 platelet to pRBC ratio

NEUTROPENIC PATIENTS

- ANC < 1000-1500
- Culture evaluation with blood, urine, sputum (if able)
- Empiric antibiotics:
 - Cefepime
 - Piperacillin/tazobactam or
 - Meropenem
- If history or MRSA, consider vancomycin
- If unresponsive/persistent, severe mucositis→consider empiric anti-fungal therapy with micafungin or voriconazole
- Low threshold for catheter removal if considered source
- Consider addition of gCSF (with guidance from Hematology)

GENERAL RESOURCES – See also separate COVID resources

- UpToDate (may access through EPIC)
- American Thoracic Society (ATS Clinical Resources) - <https://www.thoracic.org/professionals/clinical-resources/>

TLC SPECIFIC ORDERSETS

- TLC mobility protocol - <https://uconnect.wisc.edu/clinical/cckm-tools/content/delegationpractice-protocols/inpatient-delegation-protocols/name-97312-en.cckm>

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