UW Surgical Critical Care Primer

This document is not intended to be 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 (NOT every patient needs one every day) prior to seeing individual patients
- Utilize Critical Care Team Workflow List
- Include bedside nurse (always) as well as pharmacy & RT (if available) for rounds
- Ensure transfusion goals and electrolyte repletion are complete
- Transfer patients to IMC/general care when appropriate, notify primary team of transfer, attending/attending discussion if needed
- For dressing changes, surgery team typically does AM dressing change; RN will need order for other changes as needed (please follow most recent UW PPE guidelines)

NECROTIZING SOFT TISSUE INFECTIONS

- Broad spectrum antibiotics (usually vanc & zosyn) until OR cx final. Continue clindamycin until shock resolves.
- If pt not clinically improving, re-engage EGS for potential need for re-exploration.
- If pt clinically improving & MRSA swab negative x2, can d/c vanc.
- Wet → dry BID dressing changes until wound stable & sepsis resolved, then EGS may transition to VAC

INTRA-ABDOMINAL CATASTROPHE & HOLLOW VISCOUS PERFORATION OR NECROSIS

- Broad spectrum antibiotics including diflucan (if upper GI perforation) until OR cx final
- If pt not clinically improving, re-engage EGS for potential need for re-exploration.
- If pt clinically improving & MRSA swab negative x2 or cx from OR negative for MRSA, can d/c vanc.
- "Open abdomen" = fascia open, skin open, intestines covered w/ Abthera dressing
  - If issues w/ Abthera holding suction or high output from Abthera, call EGS.
- Pt may be "left in discontinuity" = bowel resection w/ no anastomosis or ostomy
  - NO oral medications until ok per EGS
  - Usually pt returns to OR in 24-48 hrs for re-exploration
- Do not remove NGT w/o consulting w/ EGS first
- Drains (if left) should be serous/serosanguinous; if turn bloody or have bile, call EGS.

TRAUMATIC BRAIN INJURY

- Monitoring
  - Neuro exam frequency determined by NSG and determines level of care (q1hr = ICU, q2hr = IMC)
- Treatment
  - Reverse anti-coagulation if possible (PCC and vit K for Coumadin)
  - Intracranial Pressure Mgmt Options- directed by per NSG
    - CPP = MAP-ICP
    - Promote venous drainage
      - Reverse Trendelenburg (Head up)
      - Avoid IJ lines
      - Appropriate c-collar fit
    - Sedation → Propofol > precedex
    - Hyperosmolar therapy
      - 3% saline, 7.5% → central line
      - 1.5% → peripheral IV
    - Ventriculostomy
  - Maintain systolic blood pressure 90-140
    - Avoid hypotension – norepi or phenyl
    - Avoid hypertension - hydralazine or labetalol PRN; if persists, nicardipine/labetalol gtt
  - Avoid hypoxia (sat >92%)
  - Avoid hyponatremia – resuscitate w/ NS
  - Acute mental status change or localizing exam change → STAT head CT
  - Seizure prophylaxis
    - Keppra per NSG recs
    - EEG if indeterminate seizure activity
  - Early nutrition (hypermetabolic state)
  - DVT prophylaxis
    - SCDs
    - SQH 24hrs **after** stable CT (no lovenox)
  - Speech consult
  - Pts with TBI **must** be cleared by NSG & Trauma services prior to going to OR for other semi-urgent procedures (i.e., extremity fixation)

BLUNT LIVER INJURY

- Trend Hbg q6hr x 24hr minimum
- Trend LFTs daily
- If patient develops progressive abdominal pain, jaundice, fever, tachycardia, leukocytosis → repeat CT scan to look for abscess or biloma
  - If + for abscess or biloma → IR
  - If ongoing bile drainage → ERCP/sphincterotomy+/-stent
  - If + for blush or pseudoaneurysm → IR

BLUNT SPLENIC INJURY

- Splenectomy not performed
  - Trend Hbg q6hr x 24hr minimum
  - Grade 3 or greater injury → repeat CT in 3 days (or day of discharge)
  - If + for blush or pseudoaneurysm → IR
- Splenectomy performed
  - Drain not routinely left; if left, discuss reason with surgeon (e.g., bleeding risk, injury to pancreas)
  - Post-splenectomy vaccines prior to and after discharge

BLUNT CHEST TRAUMA

- Pneumo/hemothorax
  - Subcutaneous emphysema = ptx decompressed into chest
    - Treatment → place chest tube
  - Occult ptx = only seen on CT chest, not CXR
    - Treatment → repeat CXR in AM (sooner if symptomatic) → if no change & asymptomatic → chest tube not needed, even if intubated
  - Chest tube size
    - Consider smaller tube (pigtail up to 24Fr) for isolated ptx
    - Up to 32Fr for hemothorax
  - Chest tube management
    - >1500mL initially or >200mL/hr for 4hr → OR
    - Initially place on -20 suction
    - Waterseal when ptx resolved & no air leak
    - Keep on waterseal 24hr
    - If no ptx, air leak, & output <150ml/24H→ remove
- Rib Fracture Management Protocol
  - Indications for ICU admission
    - Contraindications to CPAP/BiPAP, card/pulm arrest, GCS <8 or AMS, aspiration, increased work of breathing, severe hypercarbia (pH <7.3, pCO_2 >50)
  - Management
    - Pain Control: Tylenol QID, gabapentin 300mg TID (100mg TID if age >65 or altered mental status), lidocaine patches, PCA or oral oxycodone, APS Consult for epidural/nerve catheters/ketamine, OT kinesiology taping
    - Respiratory: IS, PEP, RN & RT protocols based severity (phases 1-4)
    - Indications for CPAP/HFNC/BIPAP: PaO_2/FiO_2 <150, hypercarbia w/academia, pulsox <92%, RR >25, altered mental status
    - Contraindications to CPAP/HFNC/BIPAP: CPR, some face/skull base fxs, untreated ptx (occult ptx ok → follow CXR), upper airway obstruction, cannot protect airway/cooperate, hemodynamically unstable, upper GI bleed

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BLUNT CHEST TRAUMA (CONT.)

- CXR for pts w/ rib fxs
  - Repeat CXR next AM at minimum – follow occult ptx & development/size of effusion, ptx, or hemothorax
  - Daily CXR if CT in place
  - Retained hemothorax = consider VATS decort

SPINE TRAUMA/SPINAL CORD INJURY

- NSG/ortho switch coverage qwk
- C-spine clearance & management
  - Change field collar to PMT w/in 24h
  - Pts ≥65yo or altered mental status in C-collar → strict NPO until swallow study
  - Clear if no injuries on CT + meets NEXUS criteria (no neuro deficit, midline tenderness, altered mental status, intoxication, distracting injury)
  - CT neg & likely unable to clear clinically → consider MRI w/in 48hrs of injury
  - Injury seen on CT/MRI → Spine cx
  - Cervicalgia (pain w/o CT injury) → PMT x2 weeks w/ Spine follow. No formal inpt consult needed.
  - MRI neg even w/ pain → cleared (no PMT)
- T/L-spine clearance & management
  - If non-tender & no imaging needed per trauma → clear clinically
  - If imaging obtained, clear if no injuries on CT/MRI
  - Lower thoracic & lumbar transverse process fx do not require spine cx
  - Depending on injury, may need bracing by orthotics
    - Some braces need fitting prior to being custom made
    - Upright x-rays in brace & reviewed by spine team before pt can be off precautions & mobilized
  - If T/L spine fx present (as long as not dislocated), ok for HOB to be 30^0 even without brace
- Spinal Cord Injury Protocol & Management
  - Spine team may request higher MAP than 65 (often MAP ≥85 x 5d)
    - Usually achieved w/ phenyl; may need additional fluids or midodrine
  - Respiratory management (for cord injury ≥T10)
    - Assess vital capacity, negative inspiratory force, cough, secretions
    - May need BiPAP, metaneb, bronchodilators, intubation
  - Bladder management - keep foley if high UOP then straight cath w/ frequency based on volumes
  - Bowel management - scheduled bowel regimen, daily digital stimulation
  - Order set in EPIC for both bladder/bowel protocols

ORTHO TRAUMA

- Not all fx require ortho cx → see guidance in trauma manual here
- If pulse/doppler signal not restored after splinting fx → vascular cx
- Open fx
  - Washout ASAP
  - Abx (ancef if uncomplicated) w/in 1hr & continue until washout
- Pelvic fx
  - Pelvic binder across greater trochanter if hypotensive
  - If displaced, may require vaginal & procto exam

PROPHYLAXIS IN TRAUMA PATIENTS

- SCDs
- Lovenox 30mg BID (adjust for obesity)
- Heparin (5000u subq q8hr) not lovenox if
  - Renal failure
  - Traumatic brain injury
  - Epidural catheter in place

POST-OP LIVER TRANSPLANT

- **Frequent communication with transplant fellow**
- **Liver transplant pathway in SICU Manual -** https://apps.surgery.wisc.edu/intranet/resource_files/6681
- **Transplant Fellow MUST CALL**
  - HR <40 or >125
  - SBP < 90
  - RR <8 or >30
  - Pulse oximetry <90% with supplemental oxygen
  - Urine output <50 cc in 4 hrs
  - Acute change in mental status
  - Marked nursing concern
- Get sign-out from transplant surgery fellow immediately post-op including products given and transfusion goals
- Baseline labs upon arrival & q6h (inc LFTs, fibrinogen, PT/INR, iCal)
- Attempt to wean pressors (Epi then NE then Vaso last)
- Transplant writes for 5% Albumin 12.5g q12h x 6 doses
- Many pts have R chest tube given dissection near diaphragm
- Transplant dictates immunosuppressive meds (MMF, dexamethasone, tacrolimus, etc)
- Most pts will also get Ursodiol immediately post-op and ASA several days post-op.
- Discuss ID concerns with Transplant ID
- Discuss dialysis/renal disease with Transplant Medicine

TRANSFUSION TARGET GUIDE
(after POD#2 transfuse for symptoms)

NON-BLEEDING			BLEEDING OR w/ICP		
	Day 0	POD #1		Day 0	POD #1
Hct	<24	<22	Hct	<28	<25
Plt	<30	<20K	Plt	<100k	<100
INR	>2.2	>2.2	INR	>1.8	>1.8
Fibr	<80	<80	Fibr	<100	<100

POST-OP THORACOABDOMINAL AORTIC ANEURYSM

- **Frequent communication with vascular team**
- **Protocols available:**
  https://apps.surgery.wisc.edu/intranet/resources/4822
  a. TAAA and TEVAR guidelines in SICU Manual
  b. Rescue protocol in SICU Manual
- Get sign-out from Vascular resident/fellow immediately post-op including transfusion goals and PVS-specific orders
  [*Some or all of these will apply so need to clarify for each pt*]
  - Naloxone infusion (1mcg/kg/hr x 48 hrs for spinal protection)
  - Continuous FFP infusion x 24 hrs (with normal INR)
  - Passive rewarming (no BAIR hugger)
  - Hourly leg lifts (**CALL IF NEW WEAKNESS/DEFICIT**)
  - NO arterial dilators (hydralazine, nitroprusside, etc)
  - NO heparin, warfarin
  - NO benzos, morphine, hydromorphone
  - Spinal drain to target goal (usually <5 SFP)
    - Cardiac anesthesia with ANY questions/concerns
    - **CALL IF NEW BLOODY OUTPUT FROM DRAIN**
  - Often flat in bed for 24h to de-air the graft
  - Typically come out of OR on LR & NS each @125cc/hr
- Common goals
  - SBP 120-150
  - With MAP 85-100
  - HR < 90
- AKI not infrequent based on location of aortic clamp
- Maintain high index of suspicion for colonic ischemia based on location of aortic clamp and stool output

GENERAL RESOURCES – *See also separate COVID resources*

- SCC Manual - https://apps.surgery.wisc.edu/intranet/resources/4817
- Trauma Manual – https://uconnect.wisc.edu/clinical/references/trauma-manual/

SCC/TLC SPECIFIC ORDERSETS/NOTES/.DOT PHRASES

- TLC mobility protocol - https://uconnect.wisc.edu/clinical/cckm-tools/content/delegationpractice-protocols/inpatient-delegation-protocols/name-97312-en.cckm
- SCI bladder/bowel protocols – in EPIC
- Note templates and .dot phrases

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