PHARMACY TO DOSE
THE CRITICAL CARE PODCAST

Trauma Alert Part I: Acute Management

Special Guest: Brian Gilbert, PharmD, BCCCP, BCPS

I. Pre-arrival preparation → "Preparation prevents panic"
    a. Play-out the scenario of what might happen
        i. What is the mechanism of injury? How much support do I currently have?
        ii. Anticipating medications that may be needed (In the ADC? IV access? Compounding necessary?)
II. Role of Pharmacist on trauma team
    a. Medical team doesn't have to think about anything medication-related
        i. Appropriate preparation and anticipation of medication-related issues
III. Primary survey
    a. Recognize the patient acuity, prepare for what may happen, and anticipate pharmaceutical needs
    b. Listen for ABC (airway, breathing, circulation), disability (GCS), and exposure (ensure nothing is missed)
        i. "GCS less than 8: Intubate"
IV. Bleeding and coagulopathy management
    a. Massive transfusion protocol (Activation varies by institution)
        i. Generally present hypotensive with suspected/confirmed active bleeding
            1. Treat them as if they are bleeding until proven otherwise
        ii. Avoid getting behind in resuscitation, be aggressive
            1. DON'T give crystalloid, administer blood/blood products
            2. Give in a 1:1:1 manner (PRBC:FFP:Platelet +/- Cryoprecipitate)
    b. Viscoelastography (TEG/ROTEM)
        i. Provides functional clot performance from initiation to clot breakdown
        ii. Able to assess clotting factors, fibrinogen, platelet function, and the degree of fibrinolysis in a single test
            1. Conventional lab assays only give a static, quantitative value
        iii. Benefits include: Patient-specific resuscitation and avoid inappropriate blood/factor product administration
        iv. Historically a research tool now being used as a clinical assessment tool

c. Tranexamic acid (or aminocaproic acid)
    i. Consider the mechanism of action
        1. Penetrating injuries: more endogenous tPA released and inhibition of plasminogen activator inhibitor (may respond better to TXA)
    ii. If hypotensive, not responding to blood product administration, starting massive transfusion protocol → Consider giving TXA
        1. May don't have time to wait for full TEG results
    iii. Remember risk:benefit for giving TXA
d. Prothrombin complex concentrates (PCC)
    i. Anticoagulation prior to presentation: Traditional weight-based PCC
        1. DOAC: 25 u/kg
    ii. Trauma-induced coagulopathy: 25 u/kg Fixed-dose PCC
        1. Generally 1000-2000 unit range with re-dosing based on labs/TEG
    iii. PCC is an adjunctive treatment in addition to FFP/blood products
e. Calcium
    i. Blood products contain citrate to prevent pooling/clotting
    ii. Citrate, which can build up with PRBC administration, chelates calcium
        1. This creates hypocalcemia-induced coagulopathy
            a. Won't overcome coagulopathy without calcium administration and it will likely continue to worsen
    iii. Calcium chloride v. Calcium gluconate
        1. Remember patient access
            a. Peripheral only: calcium gluconate may be preferred
        2. 3g Calcium gluconate = 1g Calcium chloride
        3. No evidence-based calcium administration protocols in trauma
            a. Patient-specific administration may be necessary
            b. Look at vitals (HR/BP) and remember calcium can act as a positive inotrope and cause peripheral vasoconstriction
f. RSI
    i. Try to work with medical team (within reason) and use their preferred induction/paralytic agents to reduce time the patient is hypoxic
        1. If patient is seizing: avoid etomidate
        2. Difficult airway: consider succinylcholine
g. PAD
    i. Prefer IV push in the acute setting
    ii. Favorite combination: ketamine infusion + fentanyl PRN

1. Important to utilize analagosedation in these patients

h. Open fractures and antibiotics
    i. Goal to administer antibiotics within 1 hour of arrival to prevent future complications
    ii. Consider antibiotic administration prior to chest tube insertion for patients with hemo-/pneumothorax
        1. Drug of choice: Cefazolin 2-3g
i. Elevated ICP management
    i. Things to consider: IV access, vital signs (BP), previous doses (receive treatment at outside hospital?), appropriate administration (IV filter), past medical history (CHF, CKD)
        1. 50 mEq sodium bicarbonate syringe has same amount of sodium as 30 mL 23.4% sodium chloride for equimolar dosing

V. Take-home points
    a. Practicing possible scenarios will help you remain calm in the trauma bay
    b. Understand different clinical scenarios and don't be tied to one specific drug/treatment, consider patient-specific treatment
    c. Bounce ideas off others to see how others treat and manage these patients
        i. Collaboration and networking can lead to better patient care