- Massive hemorrhage
  - Get CAT tourniquets for the department and consider one or 2 for your car as well.
  - Trauma patients should get minimal (if any) crystalloid.
  - In the absence of blood pressure monitoring, titrate blood infusion to a radial pulse and mental status.
- Airway
  - Chin lift jaw thrust
  - LMA initially and intubation later
- Respiratory
  - Treat tension pneumothorax with a 14 or 10 gauge needle 3.25 inch.
  - Use the 5nd intercostal space anterior axillary line (preferred) or 2nd intercostal space midclavicular line.
- Circulation
  - Use blood in 1:1:1 ratio for massive bleeding or whole blood, avoid crystalloid if possible.
- Hypothermia
  - Keep the patient warm and dry.
    - Warm fluids, blankets

Related Segments:
EM:RAP May 2021: https://www.emrap.org/episode/emrap2021may/tacticalcombat

Cardiology Corner: Updates in SVT

Amal Mattu and Anand Swaminathan

- Narrow complex, regular tachydysrhythmia
  - Likely diagnoses: supraventricular tachycardia, atrial flutter, sinus tachycardia.
  - Supraventricular tachycardia
    - Term encompassing a number of tachydysrhythmias:
      - AV nodal reentrant tachycardia (AVNRT)
      - AV reentrant tachycardia (AVRT)
      - Atrial tachycardia
      - Junctional ectopic tachycardia

- **In the ED, all of these tachydysrhythmias can be treated the same way.**

- Treatment options for supraventricular tachycardia:
  - Unstable: Electrical cardioversion
  - Stable: Vagal maneuvers
    - Adenosine 8-16 mg IV rapid push
      - Works rapidly
      - When it doesn't work, can give additional information on underlying rhythm (eg, atrial flutter or sinus tachycardia)
    - Calcium channel blockers (CCBs)
      - Diltiazem 0.15-0.3 mg/kg IV slow push
      - Verapamil 5 mg IV slow push
    - Beta blockers (BBs)
      - Metoprolol 2.5-5 mg IV

PITFALLS ◆

- Although there is no clear data, guidelines recommend not combining calcium channel blockers and beta blockers (eg, don't start with one and then switch to the other)

- Wide complex, regular tachydysrhythmia
  - **Always consider a wide complex, regular tachycardia to be ventricular tachycardia (VT) until proven otherwise.**
  - Possible alternative diagnosis: supraventricular tachycardia (SVT) with a bundle branch block
    - Existent criteria for differentiating ventricular tachycardia from supraventricular tachycardia with aberrancy will miss 10-40% of VT.
    - When can you make this diagnosis?
      - Prior ECG with bundle branch block
      - QRS morphology that is wide, regular tachycardia and **identical in every lead** to the baseline ECG.
      - Lewis leads can also aid in differentiation.
      - Even in this situation, Dr. Mattu recommends caution.
  - Treatment: focuses on treating ventricular tachycardia
    - Unstable: electrical cardioversion
    - Procainamide

- Recent literature has demonstrated that procainamide is superior to amiodarone.
- Amiodarone may be used as a second line.

- Adenosine
  - Approximately 10% of ventricular tachycardia will break with adenosine.
  - Problem: this is therapeutic but not diagnostic. **If the rhythm breaks with adenosine, it does not necessarily mean that the rhythm was supraventricular tachycardia.**
  - Typically, patients with supraventricular tachycardia are discharged home while ventricular tachycardia patients are admitted.
  - Patients who receive adenosine for a wide complex tachydysrhythmia should still be admitted for further evaluation.

- Wide complex, irregular tachydysrhythmia
  - Differential diagnosis
    - Polymorphic ventricular tachycardia (typically very fast and the patient will be unstable)
    - Atrial fibrillation with aberrancy (eg, Wolff-Parkinson-White)
    - Atrial fibrillation with an underlying bundle branch block
  - Atrial fibrillation with bundle branch block
    - Treat in the same fashion as atrial fibrillation with a rapid ventricular response (https://www.emrap.org/episode/emrap2020march/atrial)
  - Atrial fibrillation with Wolff-Parkinson-White
    - Differentiate from atrial fibrillation with a bundle branch block.
      - ECG will demonstrate segments with ventricular rate approximately 300 bpm.
      - QRS complexes vary in size and width.
    - **AV nodal blockers like adenosine, amiodarone, beta blockers, calcium channel blockers, and digoxin are contraindicated.**

PITFALLS ◆

- **Amiodarone has both beta and calcium channel blocking properties and should not be used in atrial fibrillation.**

        - Treatment
            - Option 1: Sedation and cardioversion (even if not hemodynamically unstable)
            - Option 2: Procainamide (selectively suppresses accessory pathway)
    - Treatment of narrow complex, regular supraventricular tachycardia in pregnancy
        - There is an increased incidence of supraventricular tachycardia in pregnancy.
        - Cardioversion is considered safe in pregnancy. If needed, cardiovert.
        - Vagal maneuvers should still be first line.
        - **The European Society of Cardiology recommends beta-1 specific beta blockers (eg, metoprolol or esmolol) over adenosine and calcium channel blockers. However, adenosine is considered safe in this population.**

References

https://academic.oup.com/eurheartj/article/41/5/655/5556821

Related Segments

CorePendium chapter - Tachydysrhythmias:
https://www.emrap.org/corependium/chapter/recGaV7ak0IY2bMly/Tachydysrhythmias

https://www.emrap.org/episode/emrap2018july/svtadenosinevs

https://www.emrap.org/episode/emrap2020march/atrial

Airway Corner: Ketamine and Intubation: A Deeper Dive

Darren Braude and Brian Driver

- We are often faced with patients who have either fragile anatomy or tenuous physiology when we need to manage their airway.
- In these cases, the classic teaching is to proceed to an awake intubation which involves topical anesthetic and perhaps a touch of sedation but no paralysis.
- Ketamine is an attractive drug in these scenarios because we are familiar with it.
- A recent paper is reviewed that looks at the National Emergency Airway Registry (NEAR) database and compares outcomes in 3 groups: patients who were intubated facilitated by ketamine only, patients who received topical anesthesia only, and patients receiving RSI.
    - Of the approximately 19,000 intubations at 25 academic medical centers, there were 102 patients who received only ketamine and 80 patients who received only topical anesthesia.