48th Annual Meeting

SCCM and ACEP Meeting Summaries
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Navigating the Oceans of Opportunity

Disclosure
- I do not have a vested interest in or affiliation with any corporate organization offering financial support or grant monies for this continuing education activity, or any affiliation with an organization whose philosophy could potentially bias my presentation.

Objectives
- Review opportunities for involvement in focused specialty organizations like the Society of Critical Care Medicine (SCCM) and the American College of Emergency Physicians (ACEP).
- Discuss therapeutic updates from the 2014 SCCM Annual Congress in the areas of drug shortages, pulmonary hypertension, delirium, alcohol withdrawal and stress ulcer prophylaxis.
- Describe therapeutic updates from the ACEP meeting in areas of rapid sequence intubation, top articles of EM and toxicology.
- Apply meeting updates and recent significant critical care and emergency medicine literature to pharmacy practice.

Society of Critical Care Medicine (SCCM)
- Largest multidisciplinary organization dedicated to the practice of critical care.
  - Nearly 16,000 members in over 100 countries.
- Variety of activities to promote patient care, education and research.
  - Research support and networking.
  - Guidelines and LearnICU.
  - Webinars.

SCCM Website

Clinical Pharmacy and Pharmacology Section
- SCCM members with a special interest in pharmacy or pharmacology.
  - One of the most active sections in SCCM.
- Opportunities for involvement.
  - Research Support.
  - Mentor/Mentee Programs.
  - Journal Club.
  - Visiting Clinical Professor Program.
  - Quarterly Newsletter.
SCCM Annual Congress

- Offers large variety of critical care focused programming for multi-professional CE
  - Poster Sessions, Oral Abstracts
  - Pro-Con Debates, Plenary Sessions
  - Formal CE Lectures
- Networking
  - Clinical Pharmacy and Pharmacology Section Events
- Next Annual Congress
  - Phoenix, Arizona
  - January 2015

Government Action!

- Food and Drug Administration Safety and Innovation Act (FDASIA) – signed 7/9/2012
  - Requires notification of FDA 6 months prior to discontinuation or interruption of production
    - Life-supporting or sustaining therapies
    - Emergency care medications
    - Medications for treatment or prevention of debilitating disease
  - Allows expedited review of product from new manufacturer if shortage occurring

Drug Shortages

- Causes
  - Regulatory
  - Economics
    - Inelastic supply and demand
  - Industry
  - Supply Chain
- Market issues
  - Lack of redundancy in production
  - "Just in time" production
  - No reward in market for quality

Compounded Alternatives

- Drug Quality and Security Act – signed 11/27/13
  - Compounding pharmacy can become "outsourcing facility"
    - Subject to FDA inspections and current good manufacturing processes
    - Reporting requirements for adverse events, etc.

We’re Out of What?

- Risks
  - Lack of familiarity with alternative products
    - Medication errors increase
  - Lack of built-in safety checks
    - Automated systems – CPOE, ADCs
  - Removal of clinicians from patient care activities
  - Delays in care
- Benefits
  - Impetus for change in clinical practices

Available Resources

- SCCM website
- LearnICU
- Knowledge Areas
- Pharmacology
- ASHP website:
- FDA website:
- Wholesaler or manufacturer
- Group Purchasing Organization (GPO)
### Pulmonary Hypertension

- Three new FDA approvals
  - Riociguat (Adempas®) – 10/2013
  - Macitentan (Opsumit®) – 10/2013
  - Treprostinil (Orenitram®) – 12/2013

- REMS programs for two of those medications – female patients only
  - Adempas® REMS
  - Opsumit® REMS

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### PATENT-1

**Design and Population**
- Multicenter RCT
- PAH patients with mPAP ≥ 25 mmHg, mean PVR of > 300 dynes/sec/cm⁵ and 6MWD 150-450 m

**Intervention**
- Placebo
- Riociguat to max 2.5 mg PO TID
- Riociguat to max 1.5 mg PO TID

**Results**
- Significant change in 6MWD at end of week 12
- Significant change in all but the quality of life secondary outcomes

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### SERAPHIN

**Design and Population**
- Multicenter RCT
- PAH patients with 6MWD > 50 m and in functional class II, III or IV

**Intervention**
- Macitentan 3 mg or 10 mg PO daily
- Placebo

**Results**
- Significant reduction in morbidity and mortality over median 115 weeks
- First oral agent to use clinical outcome for study endpoint instead of 6MWD
Delirium

- Key feature: altered attention or consciousness
- ICD-10 diagnostic criteria for delirium
- Assessment tools
  - CAM-ICU
  - ICDSC
- ABCDE Bundle

Alcohol Withdrawal

- Dexmedetomidine and AWS
  - Single-center RCT evaluating DEX as adjunct to symptom-triggered lorazepam
  - Low-dose (0.4 mcg/kg/hr), high-dose (1.2 mcg/kg/hr) or placebo (N=8 per group)
  - Significant difference in lorazepam use in the 24 hours post-study drug initiation (-56 mg v. -8 mg, p=0.037)
  - No statistically significant difference in lorazepam use at 7 days
  - May decrease BZD exposure, but further study needed
- Review articles

Stress Ulcer Prophylaxis

- Which patients?
  - Fewer than generally thought
  - Bleeding definitions are key in studies
  - Decreasing rates over time (estimated 2-4%)
- Risk factors
  - Most commonly cited:
    - Mechanical ventilation > 48 hours
    - Coagulopathy
  - Others:
    - Hepatic failure, chronic renal failure, H. pylori, traumatic brain injury, burns, spinal cord injury, high dose steroids

The Battle Continues

- Which agent?
  - Ideal agent
    - Effective, safe, minimal interactions, diverse administration options, economic justification
  - Multiple meta-analyses
    - Need to assess risk of bias in individual trials
      - Never replicated
    - Weight of each individual study within the meta-analysis impacts overall result

Summary

- Drug shortages continue to impact pharmacy practice in significant ways
  - Communication is key to error avoidance
- Pulmonary hypertension treatment continues to evolve with more options and more patient-friendly therapies
- Delirium remains a significant concern with early management key to success
- Alcohol withdrawal management with adjuncts to benzodiazepines currently of significant interest
- Stress ulcer prophylaxis – focus is starting to move back to right population v. right agent

American College of Emergency Physicians (ACEP)

- ACEP supports quality emergency care and promotes the interests of emergency physicians.
- Founded in 1968
  - 1970 – First EM residency
  - 1979 – Emergency medicine recognized as a specialty by AMA & ABMS
- >32,000 members
- Only physicians can be members
- Reach out to pharmacy groups when writing policies & statements
ACEP Values

Through continuing professional education, patient advocacy at all levels, public information and research, ACEP strives to uphold these values:

- Quality emergency care is a fundamental individual right and should be available to all who seek it.
- There is a body of knowledge unique to emergency medicine that requires continuing refinement and development.
- Quality emergency medicine is best practiced by qualified, credentialed emergency physicians.
- The best interests of the patient are served when emergency physicians practice in a fair, equitable, and supportive environment.
- The emergency physician has the responsibility to play the lead role in the definition, evaluation and improvement of quality emergency care.

Benefits from ACEP

- Career and Practice Management Resources
  - Annals of Emergency Medicine
  - Scientific Assembly
  - Practice Resources
    - Guidelines
    - Statements
    - Links
- Leadership and Networking Resources
  - Sections
  - Leadership & Advocacy Meeting

Scientific Assembly

- Offers large variety of emergency medical care focused programming
  - Formal CME Lectures
  - Poster sessions
  - Section Meetings
  - Networking
- Future Scientific Assemblies
  - 2014 Chicago, IL Oct 27th – 30th
  - 2015 Boston, MA Oct 26th – 29th

Networking Lunch with EM Pharmacists

- 3rd year
- 15 pharmacists
- Others couldn’t make due to conflicts
- Meet face-to-face
  - Great for residents networking
- Discussion
  - Different practices & models
  - Issues & needs
  - New services
  - Resident & student involvement
Opening Session: Boston Bombings

- Panel of physicians, nurses and first responders
  - Reviewed event and each role
  - Medical providers at scene
  - Pharmacists at tents & hospitals
- Key points
  - Scene
    - Bystanders helping at scene
    - Medical professionals & supplies available
    - Good distribution of patients to healthcare facilities

Key Points

- Hospital
  - Clearing EDs of current patients
  - Psychiatric care patients were still in ED even after the incident
  - Create “micro zones”
  - Prevent overwhelming both providers & patients
  - Improve communication
  - Early identification
  - Debriefing – variable
    - Patient advocacy groups
    - Rescue animal visits

Rapid Sequence Intubation

Ketamine

- 2 case reports of cardiac arrest after RSI
  - Both in septic shock
  - 2 and 2.4 mg/kg doses
  - Bradycardia to asystole or PEA

Cardiovascular stimulation

- Sympathomimetic effect
  - Inhibition of norepinephrine re-uptake
  - Negative inotropic effects
    - Normally overridden
    - Catecholamine stores depleted – may increase effect

Etomidate Discussion

1. Meta-analysis of RCT & observational studies
   - Jan 1950 – Feb 2012
   - 865 & 1303 subjects included
   - Results
     - Increased all-cause mortality: pRR = 1.2
     - Increased likelihood for adrenal insufficiency: pRR = 1.33
2. Large retrospective cohort from eICU database
   - 2014 ICU patients with sepsis
     - 1102 patients receive single-dose etomidate
     - 912 patients receive other induction agent
     - No difference in mortality, duration of mechanical ventilation, hospital or ICU duration

Steroids & Pressors in Cardiac Arrest

- Multicenter RCT in Greece
  - 368 consecutive pts in cardiac arrest requiring epi

Design and Population

- Vasopressin 20 units + 1 mg epinephrine Q 3 min for 1st 5 cycles + 40 mg methylprednisolone with first dose
- Stress dose steroids with ROSC
- Saline / 1mg epinephrine

Intervention

- Higher ROSC (83.9% vs 65.9%; OR = 2.98)
- Higher hospital discharge w/CPC 1 or 2 (14% vs 5%; NNT = 11)
- Higher discharge w/CPC in VSE shock group (21% vs 8%; NNT = 8)

Results


Diagnostic Accuracy of Nitroglycerin

- Systematic review – 5 included articles
  - 1978 adults in ED with CP
- Sensitivity = 0.52 & Specificity = 0.49
- OR = 1.2 (95% CI 0.97-1.5)
- Not good indicator for coronary cause of pain
- GI cocktail is also not good for diagnostics!
Marijuana: Changes in Medicine & Social Use

- Reviewed articles on evidence in marijuana in medicine
  - Pain
      - N=38
      - High-dose (7%), low-dose (3.5%) or placebo cannabis
      - Response but minimal difference between doses
    - Neuropathic pain in HIV adjunctive therapy - Neuropsychopharm 2009
      - N=34
      - Double-blind, placebo, cross-over
      - 30% decrease in pain

- N/V & cachexia:
  - Data mainly in animals
  - Cannabinoid hyperemesis

- Adverse Effects:
  - Stroke
    - Increased risk
    - All but 1 patient also smoked cigarettes
  - Psychosis
  - Overdose

New Drugs of Abuse

- Large increase in new drugs!
  - “Crocodile bites”
    - Desomorphine - Krokodil
    - Made from codeine in Eastern EU
  - Cannabinoid Hyperemesis Syndrome
    - Chronic N/V
    - Relieved by hot showers
    - Length of hyperemesis dependent on use & duration
  - Clean Kill
    - Toilet cleaner + plant food = hydrogen sulfite
    - Death pretty quick when in enclosed setting
    - Make sure caregivers are safe
    - Treat with sodium nitrite

- Methoxetamine (MXE)
  - Dopamine blocker
  - Large pupils, staring off
  - Acts like Ketamine but longer duration
  - Case just published in Annals of Emerg 2012
  - Treat complications

- Phenazepam- whiffing zannie
  - Old benzo in Russia
  - Delayed onset, peaks at 4 hrs, half-life of 60 hrs + active metabolite
  - Fatalities in UK
  - Doesn’t show up on drug screen even with benzos

Other Great Topics

- Cardiology
  - Advanced ECG - Dysrhythmias & Syncope – Mattu
  - Heart failure

- Pregnancy emergencies

- Pediatrics
  - Procedural sedation

- Toxicology

- Wilderness & travel
  - Infections from abroad
  - Survival
  - Altitude diseases (AMS, HAP, HACE)

- Leadership
Summary

- Disasters can create learning environments, including ways to handle large influx of patients & debriefing
- Ketamine & etomidate literature continues to expand with patient specific considerations
- Medications are still secondary to CPR in cardiac arrest, but steroids may play a role in the future
- Marijuana’s role in medicine should continue to be evaluated but may have a role in n/v & pain control
- New drugs of abuse will continue to grow in numbers, all providers & parents should work to keep informed