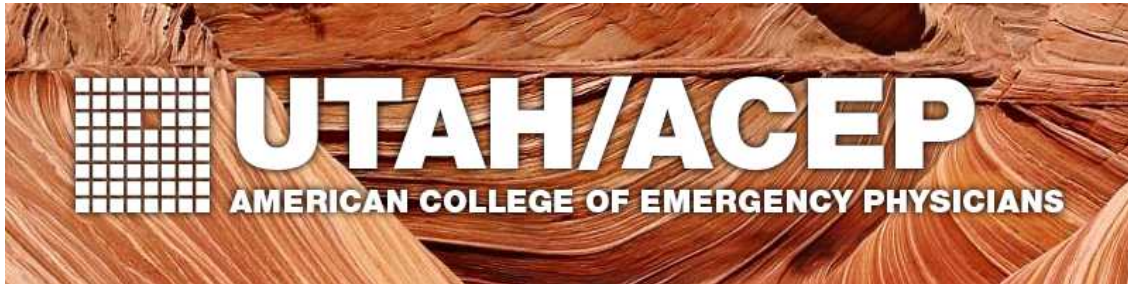


A Newsletter for the Members of the Utah Chapter

Spring 2017



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President

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From the President

John Dayton, MD, FACEP

On Wednesday, September 6th, Utah ACEP will be hosting the Third Annual Emergency Physician Summit. This year, we will be combining our Summit with the University of Utah's Residency Conference.

Similar to past Summits, the event will be **FREE!**

Our speakers will include the following:

Dr. Howie Mell, from EM:RAP and ACEP Public Relations. He will be speaking on difficult cases. We will be webcasting the event and his other lecture is entitled "24 tweets about 12 cases."

Dr. Brian Shiozawa, former ACEP and UMA President, who also serves as State Senator for District 8, will be addressing healthcare legislation in Utah, with a particular focus on legislation created to ban balanced billing.

Dr. Robert Bryant, from Intermountain Healthcare, will address uses for ketamine and intubation and hypotension.

A Patient Safety LLSA review will be led by Dr. Robert Stephen, from the University of Utah. This is a new requirement we need as part of ABEM's Maintenance of Certification.

This year's event will be held at the University of Utah's Officers Club. We chose this location because there have been parking concerns during past events, and we will have free parking. The building is also located close to the "Fort Douglas" stop on the Red TRAX line.

Click [here](#) to RSVP for this free event at this EventBrite web page, and also by contacting Paige De Mille by phone at 801.747.3500x228 or by [e-mail](#).

UCEP | UTAH EMERGENCY MEDICINE
PHYSICIANS SUMMIT

FEATURING:
FREE LECTURES AND
PATIENT SAFETY LLSA REVIEW

**WEDNESDAY,
SEPTEMBER 6TH, 2017**

OFFICER'S CLUB
THE UNIVERSITY OF UTAH
150 FORT DOUGLAS BLVD,
SALT LAKE CITY, UT 84113
FREE PARKING AVAILABLE AND NEAR
FORT DOUGLAS STOP ON RED TRAX LINE

**TO REGISTER, CONTACT PAIGE DE MILLE:
PAIGE@UTAHMED.ORG OR 801.747.3500 X228**

**3RD ANNUAL EMERGENCY
PHYSICIAN SUMMIT**

KEYNOTE SPEAKER
HOWIE MELL MD, MPH, CPE, FACEP
Chair, ACEP Public Relations Committee, Emergency Physician, CEP-America,
@DrHowieMell, How to Swim in Quicksand: What Emergency Physicians Can
Learn From Fighter Pilots, Marines, and the Architect of 'Shock and Awe'

BRIAN SHIOZAWA, MD
HEALTHCARE LEGISLATION

ROBERT BRYANT, MD
TRAUMA AND INTUBATION

ROBERT STEPHEN, MD
LLSA PATIENT SAFETY REVIEW

Management of Drug-Induced Seizures
Jamal Jones, MD, Emergency Medicine, PGY2
E. Martin Caravati, MD, MPH, FAACT, FACMT

Medical Toxicology

Division of Emergency Medicine, University of Utah

Seizures are a very common complaint in the emergency department. Studies have suggested that up to 6% of new-onset seizures, and up to 9% of status epilepticus cases are secondary to drug toxicity.¹ Though the list of drugs associated with seizures is extensive, commonly associated drugs include tramadol, antihistamines (Benadryl), isoniazid, antiepileptics, stimulants (cocaine), and antidepressants, with bupropion being most prevalent.



It is important to distinguish between seizures that are drug-induced versus those that are epileptic in nature due to different treatment strategies for each. Drug-induced seizures are the result of modulations of the excitatory and inhibitory transmitters and receptors involved in neural pathways. There are also numerous toxins that can cause seizure activity secondary to metabolic derangements, and physiological effects such as hypoglycemia and decreased cerebral perfusion.

The overall goal in the management of drug-induced seizures is resuscitation, the cessation of seizure activity, and the identification and treatment of the underlying cause. Here we will briefly review the pharmacologic strategies recommended for the treatment of drug-induced seizures.

Benzodiazepines are the usual first line treatment for drug-induced seizures. They enhance GABA activity and lead to neuronal hyperpolarization. Lorazepam 0.1mg/kg IV is the preferred first line agent. Onset of effect is within 3-5 minutes and can be seen for hours after administration. If IV access is unobtainable, midazolam 0.1mg/kg IM, or diazepam 0.5mg/kg PR can be used. In prehospital studies, IM midazolam has been shown to have a similar safety and effectiveness profile as IV lorazepam.² It is important to be aware that with prolonged exposure to high dose IV benzodiazepines, there is a risk of hyperosmolality and metabolic acidosis. This is thought to be due to use of propylene glycol as a diluent for many benzodiazepine parenteral formulations, which is metabolized to lactic acid.

If benzodiazepines are ineffective, barbiturates are recommended as the second line agent. Barbiturates also interact with GABA channels for inhibitory effects. IV phenobarbital is usually the drug of choice. Recommended dosing is 15–20 mg/kg IV at a rate no faster than 1

mg/kg/min. Phenobarbital has similar efficacy to benzodiazepines, but requires a longer infusion time and may require intubation and ventilatory support.

Propofol is another agent to consider. Like benzodiazepines and barbiturates, propofol has effects on GABA channels. However, it also has antagonistic effects on the NMDA receptor, which could be useful in NMDA related seizures.³ Recommended dosing for seizure control is 2–5 mg/kg IV. This dose is greater than that for sedation and will likely require intubation and ventilatory support.

There is increasing use of leviteracetam for drug-induced seizure adjunct therapy.⁴ Recommended dosing is 1,000 to 3,000 mg IV administered at a rate of 2 to 5 mg/kg/minute. One can expect a rapid onset and it is usually very well tolerated. If there is a suspicion for isoniazid (INH) toxicity, pyridoxine (Vitamin B6) is the drug of choice. Pyridoxine is a cofactor in GABA synthesis and can be successful in suppression of seizure activity within minutes. Dosing is based on amount of INH ingested. If the INH dose is unknown, empiric dosing is 5g IV for an adult and 70mg/kg IV for a child. If INH dose is known, then pyridoxine should be dosed gram for gram.

Though commonly used in epileptic seizure control, phenytoin or fosphenytoin is not recommended for most drug-induced seizures.⁵ Phenytoin is a class 1B antiarrhythmic agent with inhibitory properties on the voltage-dependent sodium channels. It is quite effective in suppressing the spread of abnormal electrical activity from an epileptic focus, but it is not ideal for drug related neuronal excitability. Studies have shown it to be potentially harmful when used to treat seizures induced by tricyclic antidepressants, theophylline, and lidocaine.^{6,7} It is contraindicated in the setting of sinus bradycardia, sino-atrial block, and 2nd and 3rd degree AV block. Feared side effects include bradyarrhythmias leading to bradyarrest, hypotension and local tissue necrosis if phenytoin is infiltrated. Rapid infusion (>50mg/min) increases the risk of cardiovascular adverse effects.

In summary, treatment of drug-induced seizures requires attention to ABC's and initial resuscitation. Pharmacologic management should start with IV benzodiazepines as the first line agent. Second and third line strategies include the use of barbiturates, propofol, and leviteracetam. If INH toxicity is suspected consider the addition of pyridoxine. There is no clear role for, and it is not recommended to use phenytoin or fosphenytoin in the management of drug induced seizures.⁸

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Preserving the Power of Antibiotics in Emergency Rooms

Antibiotic-resistant bacteria make at least 2 million people sick in the U.S. every year. More than 23,000 people die as a direct result, and many more die from conditions that were complicated by a resistant infection. Up to 50 percent of all antibiotic prescriptions are not needed or not optimally effective as prescribed. As prescribers of antibiotics, clinicians have substantial power to educate patients and help preserve the life-saving power of antibiotics.

HealthInsight has funding to help outpatient settings—emergency rooms included—implement the CDC’s Core Elements of Outpatient Antibiotic Stewardship, which align with these Choosing Wisely recommendations made by national specialty societies:

- “Avoid antibiotics and wound cultures in emergency department patients with uncomplicated skin and soft tissue abscesses after successful incision and drainage and with adequate medical follow-up.” —American College of Emergency Physicians
- “Avoid prescribing antibiotics in the emergency department for uncomplicated sinusitis.” — American College of Emergency Physicians
- “Avoid prescribing antibiotics for upper respiratory infections.” —Infectious Diseases Society of America
- “Don’t perform urinalysis, urine culture, blood culture or C. difficile testing unless patients

have signs or symptoms of infection. Tests can be falsely positive leading to over diagnosis and overtreatment.” —The Society of Healthcare Epidemiology of America

- “Don’t use antibiotics in patients with recent C. difficile without convincing evidence of need. Antibiotics post a high risk of C. difficile recurrence.” —The Society of Healthcare Epidemiology of America

HealthInsight’s aim is to help specialists align these Choosing Wisely recommendations with the CDC’s 2016 Core Elements of Outpatient Antibiotic Stewardship as they put the core elements in place in their own practices.

This effort needs you! HealthInsight is committed to providing (free of charge) patient materials, technical assistance and educational activities to support medical practices and outpatient facilities as they put the Core Elements in place. By participating, will you create an environment that surrounds patients with consistent information and education about appropriate prescribing and supports clinicians and staff in making antibiotic stewardship part of daily practice.

For more information, click on this [website](#) or contact [Sandra DeBry](#) at 801-892-6606.

Clinical News

Antibiotic Therapy for Abscesses Medical Dogma Challenged by Evidence-Based Research, Outcomes

Have you wondered when you’d start to routinely confront superbugs resistant to multiple antibiotics in your emergency...

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Should Emergency Departments Do Fewer Red Cell Transfusions, More IV Iron?

You might be surprised to learn that many of the patients who receive red cell transfusions in...

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Treatment for Acute Gastroenteritis, Acute Epididymitis in Pediatric Patients

The best questions often stem from the inquisitive learner. As educators, we love, and are always humbled...

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New! "ACEP Trauma, Stroke, and Cardiovascular CME Collection"

The "ACEP Trauma, Stroke, and Cardiovascular CME Collection" includes 48 lectures with downloadable syllabi that will help you meet your requirements.

Group pricing available.

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Welcome New Members

Justin J. Stubbs

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Salt Lake City, UT 84107**

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