

## Journal Club Block 6: Wrap-Up

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**“Intralipids... When all else fails! What is the efficacy of intralipids as anecdote in acute medication toxicity?”**

### Scenario:

You are a new attending physician at a busy urban tertiary hospital when the police bring in a drunk but cooperative 38 year-old male who has punched a hole through a plate glass window. The patient is well known to the department, and comes in almost weekly for alcohol related shenanigans. He is otherwise pleasant and cooperative, denies any other drug use, his VS are appropriate. His arm is wrapped in a bloody rag, and after thorough inspection he has a 22 cm laceration on the dorsal surface of his right forearm. The wound is linear and uncomplicated, and there is no muscle or fascia exposure, mostly subcutaneous fat. He is UTD on his tetanus. After a basic metabolic and EtOH screening, the patient is placed in a distant room down the hall. The eager medical student approaches you wide eyed, asking if he can suture the wound. He is a good student, you've seen him suture before and he is more than competent. You are busy and grateful for the extra hands. About 30 minutes later the frantic medical student comes to you stating that the patient has started seizing. On arrival to the room the patient is in a PEA arrest. While the patient's seizures may be explained by polysubstance ingestion, withdrawal or other etiologies, you also suspect lidocaine toxicity. The medical student hands you an empty bottle of 50 ml 2% lidocaine without epinephrine. You begin to code the patient, and call poison control for their input.

**PICO Question:** What is the efficacy of using intralipid emulsion therapy in lipophilic drug toxicity like lidocaine, is there good evidence to support it, and are there any other toxicities that may benefit from intralipid therapy?

### Discussion and Wrap Up:

**Background Article:** *Lipid emulsions in the treatment of acute poisoning: a systematic review of human and animal studies* Lipid emulsions for acute poisoning Chloe J, Benoit B, Alexandre L, Eric N, Karine S, Jean-Marc C. *Clinical Toxicology* (2010) 48, 1–27.

Available data suggest some benefits of IFE in bupivacaine, verapamil, chlorpromazine, and some tricyclic antidepressants and beta-blockers toxicity. No trial assessed the safety of IFE in the treatment of acute poisoning. The evidence for the efficacy of IFE in reducing mortality and improving hemodynamic, electrocardiographic, and neurological parameters in the poisoned patients is solely based on animal studies and human case reports. The safety of IFE has not been established

**Discussion Article #1:** *Intralipid emulsion treatment as an antidote in lipophilic drug intoxications.* Sebnem Eren Cevik, Tanju Tasyurek, Ozlem Guneyysel. *American Journal of Emergency Medicine* 32 (2014) 1103–1108

In this case series, ILE was used for different lipophilic drug intoxications to improve cardiovascular and neurologic symptoms. According to the results, it was found that ILE treatment is a lifesaving agent in lipophilic drug intoxications and it can be used in unconscious patients who have cardiac and/or neurologic symptoms but no history of a specific drug ingestion.

**Discussion Article #2:** *Lidocaine Induced Cardiac Arrest in the Emergency Department: Effectiveness of Lipid Therapy.* Kevin J Tierney, Tiffany Murano, Brenda Natal. *The Journal of Emergency Medicine*, Oct. 22, 2015. pp. 1–4.

The intralipid bolus was then followed by a continuous infusion of 0.25 mL/kg/minute, for an infusion dose of 930 mL. Despite a complicated hospital course, the patient was discharged home neurologically intact. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS? We believe this patient's cardiovascular collapse was secondary to an iatrogenic overdose of lidocaine. This is one of the first cases to support the efficacy of intravenous lipids in the treatment of LAST in humans in the ED.

**Discussion Article #3:** *Clinical experience with intravenous lipid emulsion for drug-induced cardiovascular collapse.* Geib AJ, Liebelt E, Manini AF. *J Med Toxicol.* 2012 Mar;8(1):10-4.

In this study, administration of infusion (versus boluses alone) did not demonstrate a statistically significant improvement in MAP. Adverse events due to ILE therapy that were categorized as "possible" or "probable" based on Naranjo scores included lipemia, digit amputation, lung injury, renal failure, and deep venous thrombosis. ILE administered to patients with drug-induced cardiovascular collapse was associated with 55% survival but with clinically significant adverse effects. At this time, ILE should be restricted to cardiotoxicity involving cardiac arrest or refractory shock until further prospective studies can better evaluate risks and benefits of ILE therapy.

**Bottom Line:** In short, I think these articles were effective in highlighting a topic we know little about, intralipid therapy. While the evidence is largely anecdotal and animal study based, I think we can conclude with relative confidence that that it is likely appropriate therapy for known lidocaine toxicity, as well as BB overdose refractory to other therapy or in conjunction with insulin Tx. Finally, the literature for this topic is easy to criticize; case studies, animal studies, low power and on and on. But it does highlight the underlying difficulty and lack of prospective randomized control studies associated with toxicology literature in general. In this setting, it makes these studies more significant and more likely to change our clinical practice in the absence of RCTs.