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TOXICOLOGY UPDATE

To: ALL HEALTH CARE PROFESSIONALS

From: Ron Kirschner, MD, Medical Director, Nebraska Regional Poison Center

Subject: When acetaminophen levels are off the chart

Date: 10/13/14

- Treatment decisions after acute acetaminophen (APAP) overdose are made by plotting a level obtained at least 4 hours post-ingestion on the Rumack-Matthew nomogram.
- The main risk is liver injury caused by a toxic APAP metabolite. Hepatotoxicity can usually be prevented when treatment with N-acetylcysteine (NAC) is begun within 8 hours of ingestion.
- Occasionally patients presenting with very high APAP levels may need special attention.
- The standard IV NAC regimen is appropriate for most patients, though the maintenance NAC infusion may need to be extended beyond 21 hours if APAP is still > 10 mcg/mL or liver injury is ongoing.
- Those with very high levels (4 hour APAP \geq 500 mcg/mL or 20 hour APAP \geq 30) may also need higher NAC infusion rates.
- At even higher APAP levels, patients can have early CNS depression, elevated lactate, and acidosis before liver injury occurs, suggesting a toxic effect of APAP itself rather than the metabolite.
 - At very high levels, APAP is thought to interfere with ATP production in the mitochondria.
- Patients with APAP levels > 900 mcg/mL AND evidence of mitochondrial dysfunction (coma, metabolic acidosis, high lactate) despite normal liver enzymes may benefit from hemodialysis in addition to NAC.
 - Because NAC will also be removed, it should be continued at a higher infusion rate during hemodialysis.
- Please call the Poison Center for patient-specific recommendations regarding higher NAC infusion rates for selected patients, or consideration of dialysis in patients with mitochondrial dysfunction related to very high APAP levels.

References

Rumack BH, Bateman DN. Acetaminophen and acetylcysteine dose and duration: Past, present and future. *Clin Toxicol* 2012; 50: 91.

Gosselin S *et al.* Extracorporeal removal for acetaminophen poisoning: Recommendations from the EXTRIP workgroup. *Clin Toxicol* 2014; 52: 856.

Our trained staff of nurse specialists in poison information and physician toxicologists is available 24 hours a day to answer your questions and can be reached at 1-800-222-1222.