

# J10: Acetaminophen Toxicity

Mike Sugimoto

Updated: July 26, 2021

Reviewed: March 01, 2021

## Introduction

Acetaminophen is the most widely used analgesic and antipyretic in the world and is found in a wide range of over-the-counter products. It is a generally safe drug, but overconsumption can lead to significant harm, particularly to the liver. It is the most common cause of acute liver failure and responsible for a significant fraction of all liver transplants.

Accidental acetaminophen overdose is more common among individuals who have low levels of health literacy and who do not recognize its prevalence in multiple products.

## Essentials

- In early stages, acetaminophen has no readily observable toxidrome. In the out-of-hospital environment, acetaminophen overdose is most likely diagnosed through history taking, both from the patient and collaterally. Always consider the possibility of co-ingestion of other drugs or substances.
- To the extent that acetaminophen toxicity offers signs and symptoms, they are generally non-specific: nausea and vomiting; malaise; lethargy; pallor; and diaphoresis, associated with right upper quadrant abdominal pain. Patients with significant liver injury may remain asymptomatic for hours prior to their deterioration.
- Single ingestions greater than 250 mg/kg (or more than 12 g in 24 hours) are likely to cause toxicity, but injury can occur at lower doses.
- Individuals with pre-existing liver disease are at increased risk of acetaminophen toxicity and can experience significant liver dysfunction, even with doses of acetaminophen that are generally considered safe.
- Provide supportive care for patients.

## Additional Treatment Information

- The specific antidote to acetaminophen, N-acetylcysteine, is a hospital-based therapy that requires diagnostic testing not available in the out-of-hospital environment.
- Administration of activated charcoal within four hours of ingestion may help reduce the need for N-acetylcysteine treatment and limit the degree of liver injury. Paramedics and EMRs/FRs identifying an acetaminophen overdose should consider the timing of ingestion and strive to deliver these patients to a hospital in a timely fashion.

## Referral Information

Because of its high potential for toxicity, as well as its delayed onset of symptoms, patients suspected of acetaminophen overconsumption should be conveyed to hospital.

## General Information

- There are essentially no signs or symptoms that are unique to acetaminophen overdose. Diagnosis is made on the basis of a history of ingestion combined with serum acetaminophen.

## Interventions

### First Responder

- Keep the patient warm and protect from further heat loss
- Place the patient in a position of comfort, as permitted by clinical condition
- Provide supplemental oxygen where indicated
  - → [A07: Oxygen Administration](#)

**Critical Care Paramedic – All FR, EMR, PCP, and ACP interventions, plus:**

- Consider [N-acetylcysteine](#)
  - Call ETP prior to N-acetylcysteine
  - Administer an initial loading dose of 150 mg/kg IV over 60 minutes.
  - Next, administer a dose of 50 mg/kg over four hours (infusion at 12.5 mg/kg **per hour** IV for four hours).
  - Finally, administer a dose of 100 mg/kg over 16 hours (infusion at 6.25 mg/kg **per hour** IV for 16 hours).
- Significant Troponin levels may occur. This is an ominous late sign of cardiogenic dysfunction.
  - Consider Inotropic support if required
    - [Dobutamine](#)
    - [Milrinone](#)
  - Consider vasopressor support if required
    - [Epinephrine](#)
    - [Levophed](#)
    - [Dopamine](#)
    - [Vasopressin](#)

## References

1. Burns M, et al. Acetaminophen (paracetamol) poisoning in adults: Pathophysiology, presentation, and evaluation. In UpToDate. 2020. [\[Link\]](#)
2. Heard K, et al. Acetaminophen (paracetamol) poisoning in adults: Treatment. In UpToDate. 2020. [\[Link\]](#)
3. Heard K, et al. Management of acetaminophen (paracetamol) poisoning in children and adolescents. In UpToDate. 2020. [\[Link\]](#)

