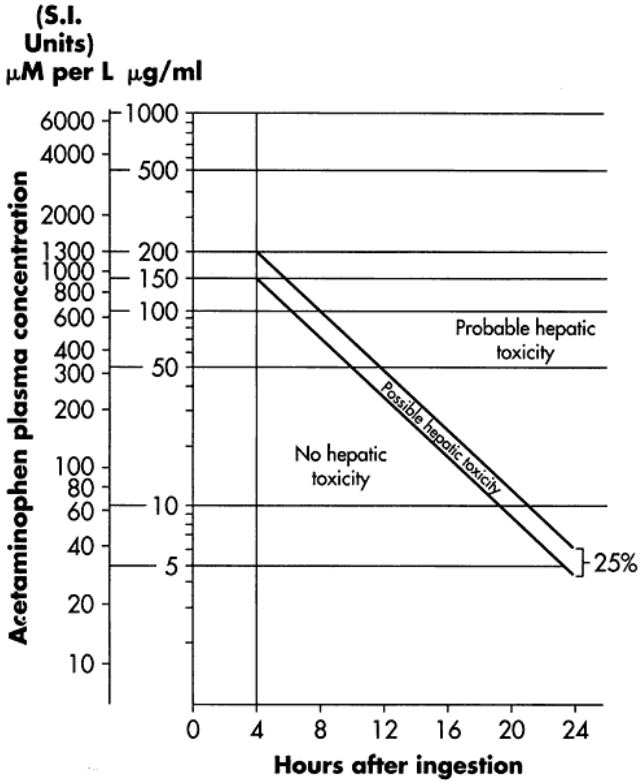
Tylenol (Acetaminophen) Ingestion

California Poison Control 1-800-876-4766

Toxicity

1. **> 150 mg/kg is considered toxic and the dosage which N-acetylcysteine (mucomyst) therapy is initiated if the plasma acetaminophen level is unavailable**
2. **Rumack-Matthew nomogram for the single acute acetaminophen poisoning. Semilogarithmic plot of plasma acetaminophen levels versus time. Cautions for use of this chart: (1) Time coordinates refer to time of ingestion. (2) Serum levels drawn before 4 hours may not represent peak levels. (3) The graph should be used only in relation to a single acute ingestion. (4) The lower solid line 25% below the standard nomogram is included to allow for possible errors in acetaminophen plasma assays and estimated time from ingestion of an overdose. (*Adapted from Rumack BH, Matthew H:* Pediatrics *55:871-876, 1975*.)**



Pathogenesis

1. **Hepatocellular Damage**
   a. **Acetaminophen is metabolized by cytochrome P450 and glutathione in the liver to a mercapturic acid conjugate**
   b. **With an overdose, the hepatic stores of glutathione are depleted to <70% of normal resulting in toxic damage by a highly reactive intermediate from the acetaminophen metabolic pathway**

Clinical Features

1. **Day 1: anorexia, diaphoresis, lethargy, malaise, nausea & vomiting, pallor**
2. **Day 2: (Day 1 symptoms disappear) Hepatic necrosis begins:**
    a. **Abdominal pain and tenderness, hepatomegaly**
    b. **Elevated AST/SGOT, ALT/SGPT, bilirubin, PT**
3. **Day 3 – 4: (Day 1 symptoms reappear) Hepatic necrosis peaks:**
    a. **Jaundice, encephalopathy, acute renal failure, bleeding, hypoglycemia**
4. **After Day 4: resolution of symptoms and hepatic dysfunction**
    a. **Fatalities from: ARDS, cerebral edema, coagulopathy, infection, multiorgan failure**

Investigations

1. **Serum**
    a. **Liver function tests (Aspartate Aminotransferase (AST)/Serum Glutamic Oxalacetic Transaminase (SGOT), Alanine Aminotransferase(ALT)/Serum Glutamic Pyruvic Transaminse(SGPT), bilirubin), glucose, BUN, Creatinine, PT daily if acetaminophen levels are in the toxic range**
    b. **Drug screen (for other toxins)**
2. **Urine**
    a. **Drug screen (for other toxins)**

Management

1. **California Poison Control 1-800-876-4766**
2. **Initial management**
    a. **Airway, Breathing, Circulation**
        i. **If hemodynamically unstable Normal Saline or Lactated Ringers at 10-20 cc/kg IV**
    b. **Draw Blood: liver function tests, PT, glucose, BUN, Creatinine**
    c. **Acetaminophen level (if >4 hours post ingestion)**
3. **Gastric Lavage**
    a. **Insert a large bore NG tube and check position**
    b. **Suction out stomach contents and save for analysis**
    c. **Place patient on side**
    d. **Inject 15 cc/kg of saline per lavage**
    e. **Contraindications: unprotected airway, coma, convulsions**
4. **Activated Charcoal**
    a. **1 g/kg**
    b. **Not recommended if using oral N-Acetylcysteine**

Maintenance Therapy

1. **N-Acetylcysteine (Mucomyst) used for Oral Administration**
    b. **Begin within 10 hours of ingestion if possible but may be used as late as 24 hours post ingestion**
    c. **Indicated if plasma acetaminophen level is in the toxic range or if the level is not available, the ingested dose is >150 mg/kg**
    d. **Administer orally or via NG tube**

e. **Loading dose: 140 mg/kg/dose PO diluted in 3 volumes of soft drink**
f. **Maintenance dose: 70 mg/kg/dose PO q4h x 17 doses (for 3 days)**

2. **N-Acetylcysteine (Acetadote) used for Intravenous Administration**
    a. **Loading Dose**
        i. **Dose 1: 150mg/kg over 30 minutes**
    b. **Maintenance Dose**
        i. **Dose 2: 50mg/kg (12.5 mg/kg/hr) over 4 hours**
        ii. **Dose 3: 100mg/kg (6.25 mg/kg/hr over 16 hours**
    c. **Patients <40 kg and those requiring fluid restriction**
        i. **The final concentration should be 40 mg/ml**
    d. **Patients >40 kg**
        i. **Loading Dose = Dose 1: in 200 ml 5% Dextrose (800ml/hr)**
        ii. **Maintenance Dose = Dose2: in 500 ml 5% Dextrose (125ml/hr)**
        iii. **Maintenance Dose = Dose 3: in 1000 ml 5% Dextrose (62.5ml/hr)**
    e. **Compatible in D5W**

Hepatic Toxicity

1. **Consult Gastroenterologist**
2. **Decrease protein intake**
3. **Bowel decontamination with neomycin**
4. **Antacids to prevent bleeding**

Prognosis

1. **Mortality rate is <0.5%**
2. **There is no long term sequelae after acute toxicity**