



## Mushroom Poisoning

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### The Case

The 31-year-old man, generally healthy except for being overweight. Turned to ED due to abdominal pain, vomiting and diarrhea which appeared about half an hour after eating mushrooms which he picked together with his wife during a hike in one of the surrounding mountains.

Upon arrival at the emergency room: fully conscious, panting, sturgeon about 90 in the room air corrected with oxygen. LD 70/40, pulse 70, very sweaty and pale.

On the monitor, a sine rate of around 70-80 per minute, 2 butterfly lines were opened, fluid was infused, but without benefit, his condition continued to deteriorate.

No easily recognizable differences between non-poisonous and poisonous mushrooms.

Mushroom toxins are not heat-labile and so are not destroyed or deactivated by cooking, canning, freezing, drying, or other means of food preparation.

Depending on the type of mushroom, adverse effects from ingestion range from mild GI symptoms to major cytotoxic effects resulting in organ failure and death.

Toxicity varies based on the amount ingested, the age of the mushroom, the season, the geographic location, and how the mushroom was prepared before ingestion.

One person may show significant effects, whereas others may be asymptomatic after ingesting the same mushroom.

Mushroom toxicity early ( 2 hours from ingestion ), late (6-20 hours from ingestion).

Nearly all fatalities in the United States and Europe occur from ingestion of mushrooms of the *Amanita* species (*Amanita phalloides*, *Amanita virosa*, and *Amanita bisporigera*).

*Amanita* species generally have warts on the cap, which give it a spotted appearance, and has a membrane ring around it and widens as it enters the soil.



Source: J.E. Tintinalli, J.S. Stapczynski, O.J. Ma, D.M. Yealy, G.D. Meckler, D.M. Cline:  
Tintinalli's Emergency Medicine: A Comprehensive Study Guide, 8th Edition  
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**Figure 1**



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**Figure 2**

### **Early GI Symptoms:**

Most mushrooms cause GI irritation but usually ends with benign outcome.

Some cases of *Amanita smithiana* ingestion present with early GI symptoms and can progress to renal failure within 3 to 5 days.

### **Late GI symptoms**

Amanita: Amatoxins are actively transported into hepatocytes, where they bind to RNA polymerase II and inhibit the formation of messenger RNA: target cells (GI mucosa, hepatocytes and renal tubules), can end with hepatocellular damage and interstitial nephritis

Gyromitra: gyrometrin toxin, converted to other toxic material that can block the activity of the C-p450 system and acts as free radicals and cause hepatic necrosis.

**All patients who have ingested amatoxin- or gyromitrin-containing mushrooms should be closely monitored for 48 hours for the development of hepatic and renal failure**



**Figure 3**

**Early-onset muscarinic symptoms:**

Muscarine:

Is the first parasympathetic substance isolated by Germans from Amanita Muscaria in 1869 is a parasympathomimetic compound that is heat stable and acetylcholine-like. It is not degraded by cholinesterase and, therefore, has a long duration of action.

The symptoms of muscarinic intoxication are characterized by the **SLUDGE syndrome** (salivation, lacrimation, urination, defecation, GI hypermotility, and emesis), In addition to the SLUDGE syndrome, develop diaphoresis, muscle fasciculations, miosis, bradycardia, and bronchorrhea.

## Possible Symptoms

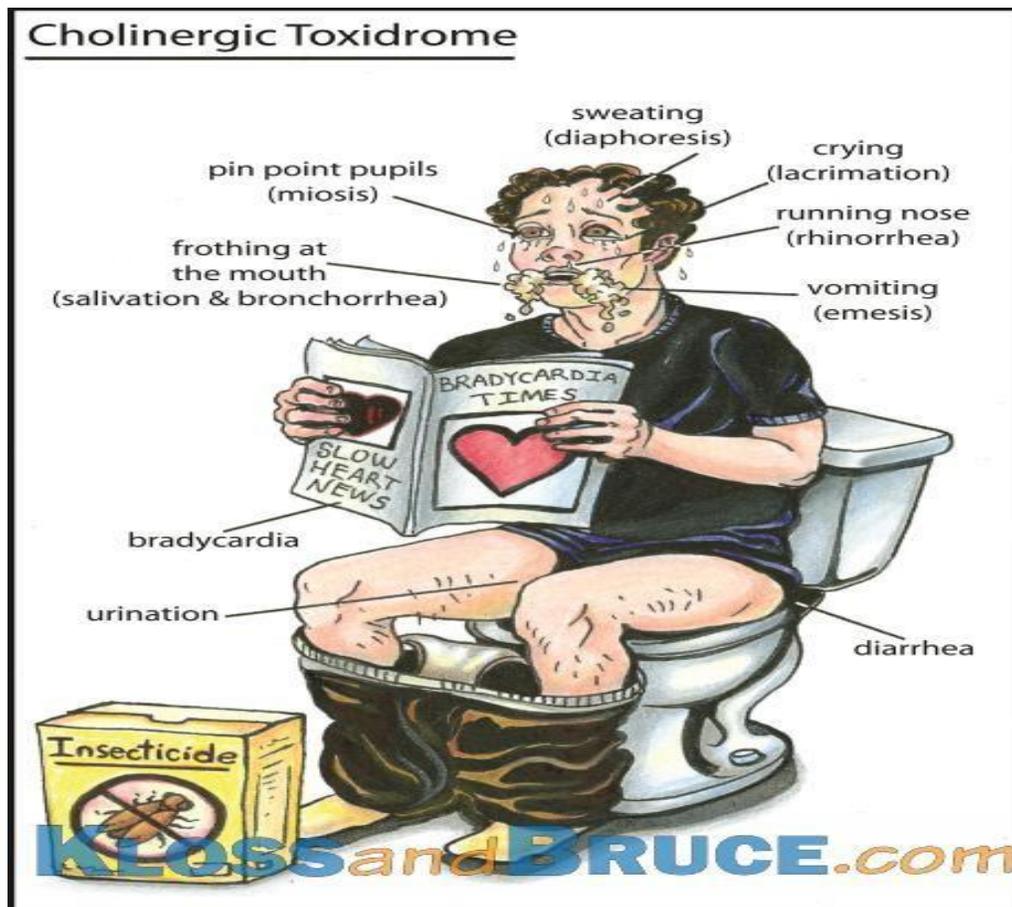


Figure 4

## Treatment

Symptoms typically present within 30 minutes of ingestion and spontaneously resolve in 4 to 12 hours.

Atropine is an antidote for muscarinic symptoms and can be administered to patients with severe symptoms.

## Dose??

## Early Neurological Symptoms:

These include the hallucinogenic mushrooms ("magic mushrooms") that contain the chemical psilocin.

Psilocin acts on serotonergic neurons in the CNS, causing effects similar to those of lysergic acid diethylamide LSD.

**Symptoms typically develop within 2 hours of ingestion of hallucinogenic mushrooms.** Euphoria, a heightened imagination, a loss of the sense of time, and visual distortions or hallucinations are common. Tachycardia and hypertension, Fever and seizures have been reported in rare cases

### Take-home Points

**No major clear differences between poisonous and non-poisonous mushrooms!**

Early and late GI symptoms → renal and hepatic failure.

Cholinergic symptoms → atropine !!!

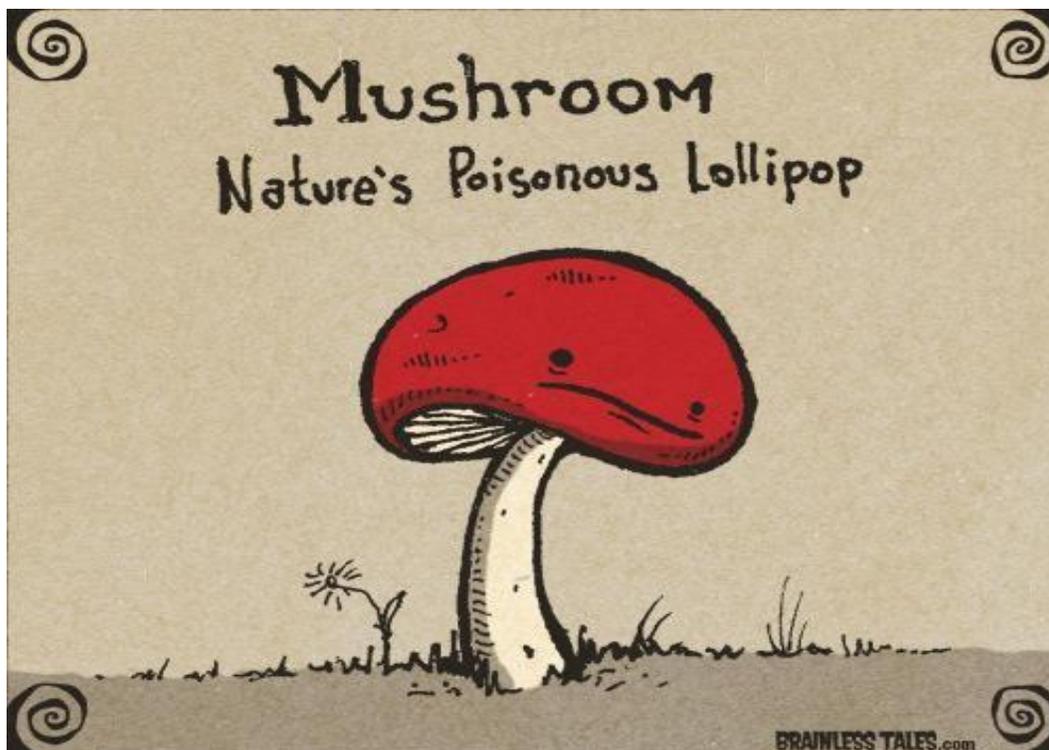


Figure 5