2012 NAMA Toxicology Committee Report
North American Mushroom Poisonings

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Abstract

In 2012, 35 of the 100 human poisoning cases we have reports for involved amatoxins. The vast majority of the amatoxin cases involved ingestion of the death cap, *Amanita phalloides*. Other cases involved destroying angels, *Amanita ocreata, Amanita bisporigera* and similar all-white *Amanita* species. There were three deaths in the United States from a single incident where elderly residents of a residential care facility were served soup made with deadly *Amanita* species. There were two deaths in two separate cases in Canada.

While we often learn of the majority of amatoxin cases, we only get a small sampling of other mushroom poisonings since they rarely involve death of the victim. Of the cases with symptoms severe enough for the individual to go to the hospital, over 14% were adverse reactions to hallucinogenic mushrooms, predominately *Psilocybe* species. *Chlorophyllum molybdites* accounted for 12% of this year's cases. Adverse reactions to various *Morchella* species accounted for 10%.

We learned of 26 dogs and one horse poisoned by mushrooms, with 11 dog deaths, mostly from amatoxins. In two deaths, *Inocybe* species were implicated. In one death, two doses of atropine were administered to a dog who had consumed *Amanita muscaria*. Atropine markedly intensifies the effects of the toxins ibotenic acid and muscimol and so is contraindicated in such cases.

In 2012, there were once again many reports of amatoxin poisonings, both in humans (five deaths) and in dogs (six deaths from apparent amatoxins). For humans, two cases in Canada each involved one death and one case in the United States involved three deaths.

In the first Canadian case, the victim was an alcoholic. The victim was treated initially as a cardiac patient, but there was a rapid progression to multi-organ failure and death. A relative later found and discarded the remains of a cooked mushroom dish that was in the victim's refrigerator. While no attempt was ever made to identify the mushrooms, the symptoms were consistent with amatoxin poisonings. In the second Canadian case, the mushrooms were identified post mortem as *Amanita virosa*. The man had a history of colitis and thus mushroom poisoning was discounted by his doctor. He was treated for his diarrhea and cramps and sent home. Two days later, he reported to the hospital with fulminant hepatic failure. He died 8 days after his mushroom meal. The poison center was never notified and best treatment practices for amatoxin poisoning were not employed.

All three deaths in the United States resulted from a single case in California where a caregiver at a residential care facility made a soup from mushrooms collected on the grounds. One elderly tenant had refused the dinner and was not ill, alerting investigators to the soup as the cause of the illnesses. The mushrooms were never positively identified, but descriptions by the caregiver implicate either *Amanita phalloides* or *Amanita ocreata.* The caregiver survived

with aggressive rehydration therapy and use of injectable silymarin (Legalon SIL®). Three of the four elderly residents who consumed the soup succumbed. The first death occurred three days after the meal. A woman in her 90s recovered from the poisoning symptoms with use of aggressive rehydration alone but then died 20 days later due to other causes (Todd Mitchell, personal communication). Press accounts attributed her death to mushroom poisoning.

In five other cases in the United States (four in 2012 and one previously unreported case from 2011), at least 24 people consumed deadly *Amanita* species. After hospital admission, all were enrolled in the "Legalon SIL® Mushroom Poisoning Clinical Study." Following protocol, aggressive rehydration therapy was used in every case. The sickest individuals all received injectable silymarin and one individual, who had consumed a staggering quantity of *Amanita phalloides,* was treated using percutaneous cholecystostomy in addition to other therapies. All survived.

In a Connecticut case involving destroying angel mushrooms (*Amanita cf bisporigera*), all four family members survived. There were news reports of three *Amanita phalloides* cases in Ohio. One, involving at least a dozen people, happened in 2011, while two cases, each involving 4 people happened in 2012. In all three Ohio incidents and in the Connecticut incident, some individuals were sick enough to meet the criteria for treatment with injectable silymarin and so received injections of Legalon SIL® in addition to aggressive rehydration therapy.

On December 28, 2012, a California woman consumed approximately six *Amanita phalloides* mushrooms. By coincidence, when she reported to the hospital, Dr. Todd Mitchell was in the emergency room seeking treatment for his son who had dislocated his pinkie at volleyball practice (Todd Mitchell, personal communication). Dr. Mitchell is principal investigator for the drug interventional trial of injectable silymarin (Legalon®SIL) to treat amatoxin poisoning. In addition to aggressive rehydration therapy, the woman was treated with injectable silymarin. An interventional radiologist performed a percutaneous cholecystostomy. The woman was released from the hospital five days later after making a complete recovery even though she had consumed a staggering quantity of mushrooms.

In probably the weirdest case (and one that may well be a fabrication), one of the NAMA toxicology identifiers spotted a long rambling post on the website www.shroomery.org by a heavy user of numerous different hallucinogens. While under the influence of "MSE" (probably actually MXE, methoxetamine, a PCP analog), he claims to have gone out at night and collected, then consumed, about 50 mushrooms. In his drug-influenced state, he identified them as "Big Laughing Gyms." The next day he started feeling more and more ill, returned to his collecting site, and then identified the mushrooms as *Galerina marginata*, a deadly amatoxin-containing species. He reported to the emergency room but they supposedly did not believe there was any mushroom poisoning involved and wanted to do numerous expensive tests, so he reports that he left and treated himself. He claims to have ingested activated charcoal and consumed milk thistle capsules to cure himself – but he started treatment too late for charcoal to be of use and milk thistle capsules, which are widely believed to protect the liver, are ineffective since they are not absorbed into the blood stream and so are of no help either.

There were reports dealing with 75 people (70 incidents) suffering non-life-threatening conditions after consuming mushrooms. Thanks to the work of Marilyn Shaw, the numbers reflect detailed reporting for the region covered by the Rocky Mountain Poison and Drug Center (Colorado, Hawaii, Idaho, Montana, and Nevada). We also have detailed reporting from

Michigan thanks to the cooperation of Susan Smolinske at the Children's Hospital of Michigan Poison Center. Her volunteer intern, Hanady Nasser-Beydoun, prepared a spreadsheet for us of all symptomatic mushroom poisoning cases that their center had handled. For the rest of the country, we know that reporting is very incomplete, so our numbers really cannot be used to indicate whether poisoning incidents are increasing or decreasing with time or whether poisoning incidents are more common in one region than another.

Because of reports to the Rocky Mountain Poison and Drug Center and the Children's Hospital of Michigan Poison Center, we received a significant number of reports of adverse reactions to hallucinogens. At least 14 reports involved adverse reaction to species in the genus *Psilocybe.* In two cases of *Psilocybe* ingestion, the patient became combative.

Chlorophyllum molybdites accounted for 12, possibly 13, of the reports of adverse reactions to mushrooms. Often the victim had only consumed one bite raw. Cooking seems to decrease the severity of the symptoms, but even cooked *C. molybdites* can cause significant gastric upset. One husband (an MD) treated his wife at home using Gatorade® after finding the hospital to be of little or no help. Two other individuals self-medicated with Gatorade® to replace electrolytes lost from excessive vomiting and diarrhea after consuming *C. molybdites*.

Adverse reactions to morels accounted for 10 of the reports. One case involved raw morels, the other cases involved cooked morels. One case involved alcohol with the meal. Whether that individual can eat morels without alcohol was not established. For some people, it is unwise to consume alcohol with a meal of morels, though a significant majority of individuals can enjoy a beer or wine with a morel meal. It is becoming increasingly clear that some people can develop sensitivity to morels and suffer gastric distress after a morel meal when they had previously eaten morels for years without incident. We have even received the first report of life threatening anaphylactic shock from morels. The affected individual had previously eaten morels for years without adverse effect.

Five individuals in three separate incidents were sickened by puffballs, both *Calvatia* species and *Lycoperdon* species. Puffballs are normally only a problem if they are no longer pure white inside. However, in these cases, victims said that they had consumed mushrooms that had not yet started to mature and darken inside.

Five cases involved purchased mushrooms. Four cases involved individual sensitivity to a specific species (one sensitivity to *Pleurotus ostreatus,* two to *Lentinula edodes* (shiitake), and one sensitivity to *Agaricus bisporus* (crimini)). The fifth case was troubling since it involved sale of the poisonous species, *Omphalotus illudens,* by an unreliable wild crafter. The chef at the restaurant where the mushrooms had been purchased sampled the dish before placing it on the menu, so only he became ill.

The final human case of particular note involved a case of kidney failure after mushroom ingestion of an unknown species. Kidney failure is exceptionally rare, having been reported only for *Amanita smithiana* (and possibly some other *Amanita* species in section *Lepidella*) and for a few UV-fluorescent *Cortinarius* species (only one case in North America and that was due to ingestion of *Cortinarius orellanosus*). It is unfortunate that the mushrooms were not identified in this unusual case.

We received 26 reports of dogs and one horse poisoned by mushrooms, 11 of the dogs died. Eight of the dog cases involved suspected amatoxins with six deaths, five from confirmed or suspected *Amanita* species in the section *Phalloides*, one from suspected *Galerina*

marginata. It is notable how rapidly dogs can succumb (as quickly as 55 to 60 hours post ingestion). When amatoxins are suspected, it is imperative that aggressive rehydration be begun rapidly, especially since dogs typically refuse to eat or drink after consuming mushrooms that contain amatoxins.

One dog death was attributed to consumption of *Amanita muscaria.* The dog was given two doses of atropine as part of the treatment. However, atropine is strongly contraindicated with poisonings involving mushrooms in the *Amanita muscaria* group*,* the *Amanita pantherina* group and *Amanita aprica* where muscimol and ibotenic acid, not muscarine is the toxin (Beug and Shaw, 2009). Two dog deaths were attributed to ingestion of *Inocybe* species and one dog death to suspicious unknown causes.

The problem of untrained individuals using the internet (or for that manner a book or other source) to identify mushrooms on their own came to light when a woman wrote that her dog was poisoned by what she had confirmed was *Amanita pantherina* and that the symptoms matched poisoning by ibotenic acid and muscimol. However, the reported symptoms actually matched lycoperdonosis. This was confirmed when a picture of the mushroom was sent in. It was an old *Lycoperdon.* The correspondent confirmed that when the dog bit into the mushroom, a cloud of dark green spores arose. The symptoms had been caused by inhalation of that cloud of spores.

Table I: Human Poisoning Frequency by Species in 2012

Mushroom Species	# People	% of total Cases
Amanita species (section *Phalloides*)	about 33	34%
Psilocybe species	at least 14	14%
Chlorophyllum molybdites	12	12%
Morchella species	10	10%
All other species combined	about 30	30%

Table II: Human Cases involving Amatoxins

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs)	Symptoms and Comments[1]
Amanita cf bisporigera ID by toxicologist	10-14-12 CT	M, 3F 40, 40, 24,20	~12	Severe nausea, vomiting and diarrhea. Three recovered with basic care, the worst case successfully treated with IV Legalon SIL®.
Amanita phalloides (method of ID not given in news articles)	12-28-12 CA	F ?	12?	Cooked and ate ~6 specimens. Treatment included prompt aggressive IV rehydration, percutaneous cholecystostomy, IV Legalon® SIL. Five-day recovery.
Amanita phalloides or *Amanita ocreata* based on caregiver description	11-8-12 CA	M, 4F 90, 92, 86, 73, ?, ?	12?	Caregiver and 4 elderly, infirm residents of a nursing home consumed soup from back-yard mushrooms picked by caregiver. Caregiver survived. Three of four others DIED. Only the one elderly survivor was enrolled in the Legalon SIL® clinical trial.
Amanita phalloides ID from photo by toxicologist	11-4-12 OH	4M 62, ?,?,?	?	Three in intensive care at one hospital, 4th treated and released second hospital. Sickest treated with IV Legalon SIL®.
Amanita phalloides presumed	8-12 OH	Couple 2 child	?	One adult treated and released, other adult and 2 children admitted. Sickest treated with IV Legalon SIL®. All recovered.
Amanita phalloides presumed	Fall 2011 OH	M + 12 others	?	At least 12 ill after man passed out cooked mushrooms at a bar. Four sickest treated with IV Legalon SIL®. All survived.
Amanita virosa ID by Poison Center Toxicologist	10-18-12 ON	M 59	6	Presented to family MD with diarrhea, intestinal cramps. Treated for GI distress, sent home. Two days later in ER with fulminant hepatic failure. Died 10-26.
Galerina marginata ID by victim in www.shroomery.com #17246867 (case may be just a fabrication)	? ?	M ?	14	Consumed about 50 semi-dry specimens while under influence of drug "MSE", mistaking them for "big laughing gyms." Dry heaves and severe diarrhea, 4 days in hospital (CAT scans, EKG, lung X-ray, fighting with staff), self-discharged.
Unknown, presumed amatoxins. Bowl of wild mushrooms in refrigerator were discarded, no ID.	7-2012 ON	M 58	?	History of alcohol consumption. Presented vomiting, diarrhea, left side chest pain. Treated possible cardiac. Substantially elevated LFTs, rapid progression to multi-organ failure, death.

[1]In all cases where Legalon SIL® was employed, patients were enrolled in a clinical trial.

Table III: General Human Poisoning Cases

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs)	Symptoms and Comments
Agaricus bisporus (purchased crimini)	11-26-12 CO	? ?	?	Thanksgiving dish of crimini and spinach caused GI symptoms and hallucinations.
Agaricus placomyces Photo ID – NAMA toxicologist	8-15-12 MI	? 3	7.5	Abdominal pain, fever, vomiting from ½ mushroom consumed raw. Given charcoal, irrigation.
Amanita pantherina Cap photos examined by NAMA toxicologist	6-6-12 ID	F 46	?	Consumed 2.5-3 (raw?) on salad. Fell, upper body twitching. Diarrhea, no vomit.
Amanita "rubescens" (now *A. novinupta)* ID by experienced victim	Years ago CA?	M Adult	?	On two occasions blood-filled pimples on skin after eating red-staining *Amanita* species.
Amanita "rubescens" (now *A. novinupta)* ID by experienced victim (not related to previous)	Years ago CA?	F Adult	?	Periodic red blood cell disorder required hospital. Possible connection between mushroom consumption and symptoms not considered at the time.
Armillaria mellea group? ID from victim who said: "looks like a honey"	10-11-12 ON	F 57	2	Diarrhea, intestinal cramps, sweating, extreme vomiting, drowsiness, nausea, weakness, headache.
Armillaria mellea group ID from photo by NAMA toxicoplogist	9-30-12 PA	? ?	?	Consumed small piece raw and suffered some nausea and intestinal discomfort.
Auricularia auricula Presumed from stomach content photos	5-21-12 CO	F 2	1-2	Vomited twice.
Boletus cf spadiceus? Exact ID unclear to NAMA toxicologist (from photo)	7-31-12 CO	M 23	5	Consumed 1 cooked for 2 minutes. Nausea, vomiting, diarrhea.
Calvatia cf gigantea ID by victim was "giant puffballs"	8-2000 WI	F 51	3	Diarrhea, intestinal cramps, nausea (severe), high temperature, high liver enzymes. Consumed large quantity cooked, yellowed and deteriorating fungi.
Calvatia sculpta and *Calbovista subsculpta* ID by knowledgeable victims	Summer 2012 CA	M,F ?,?	3+	Solid nights of nonstop vivid dreaming 4 out of 5 times after consuming these cooked, usually still white puffballs. Sometimes with a glass of wine.

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs)	Symptoms and Comments
Chlorophyllum molybdites? Victim ID was as a "Lepiota" from looking at an old book	Summer 2012 NC	F 65	2	Dizziness, intestinal cramps, sweating, vomiting, nausea, weakness, atrial fibrillation. MD husband, frustrated at ER, rehydrated her with Gatorade.
Chlorophyllum molybdites Victim ID	8-23-12 TN	M, ?,? 56, ?,?	2	Chills, diarrhea, intestinal cramps, sweating, muscle spasms, vomiting, nausea, weak, moderate leg cramps. Hydration with Gatorade.
Chlorophyllum molybdites? ID from poor photos	9-29-12 NM	M ?	4	In ER with creatinine up to 1.9, LFTs OK.
Chlorophyllum molybdites NAMA Expert photo ID	6-11-12 FL	M Adult	?	Diarrhea and vomiting. Patient afraid he will die.
Chlorophyllum molybdites Photo ID - Toxicologist	8-16-12 MI	? 53	3	Vomiting from 1 bite raw. Treated with oral fluids.
Chlorophyllum molybdites Based on verbal description	10-1-12 FL	M Adult	1.5	One specimen raw (ID was shaggy mane). Severe vomiting and diarrhea.
Chlorophyllum molybdites NAMA expert photo ID	8-26-12 SC	F Adult	?	GI distress, weak.
Chlorophyllum molybdites Photo ID by toxicologist	8-13-12 MI	? 63	2	Nausea, vomiting from cooked. Treatment antiemetics, IV fluids.
Chlorophyllum molybdites Method of ID unknown	8-28-12 MI	? 58	?	Nausea, vomiting after 1 bite. Treatment unknown.
Chlorophyllum molybdites or *C. rachodes* Described by victim	9-30-12 NM	M Adult	2.5	Vomiting and diarrhea after consuming cooked mushrooms.
Coprinus comatus ID as reported by victim, but probably *Chlorophyllum molybdites*	8-2-12 MI	? 57	4	Hypotension, tachycardia, diarrhea, fecal incontinence, vomiting, increased creatinine. Antiemetics, antihistamines, IV fluids, operamide.
Conocybe cf rickenii Based on microscopy by expert	4-29-12 ID	F 1.5	2	Found with mushroom in mouth. Episode of diarrhea, dry heaves 12 hours later.
Gyromitra sp Patient reported "brain"	5-17-12 ID	M 89	2	Raw. Vomiting and diarrhea, irregular heartbeat. Hospitalized for 2 days.
Gyromitra esculenta Patient ID	5-4-12 MI	? 58	?	Fatigue, dizziness, knees buckling after 10 breaded and fried. Fluids.
Hygrophoropsis aurantiaca ID by victim	7-2012 GA	M adult	?	Vomiting, one of two persons ill from unknown amount of cooked fungi.

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs.)	Symptoms and Comments
Inonotus obliquus ID by patient as "chaga"	summer 2010 ME?	M Adult	days	Patient consumed 2-3 cups chaga tea per day for a week. His ulcerative colitis flared up. He stopped tea and symptoms resolved.
Leccinum sp (rusty orange) ID by victim	? CO	M ?	3	Pain in stomach and extreme weakness, fainting 1x, recovery in 6-8 hours after eating rehydrated, cooked mushrooms.
Lentinula edodes Purchased, eaten raw (one of five ill)	11-25-12 GA	F 40	24-30	Diarrhea, intestinal cramps. Rash lasting for days. Prednisone helped, Benadryl®, Solumedrol® ineffective.
Lentinula edodes Purchased	9-6-12 VA	F 22	2.5	Chills, flushing, diarrhea, dizziness, intestinal cramps, sweating, weak, whole body tingling and numbness after small amount eaten cooked.
Lycoperdon candidum Doctor ID	8-19-12 MI	? 7	?	Nausea, vomiting from raw mushroom. Treatment irrigation, IV fluids, ondansetron.
Lycoperdon candidum Doctor ID	8-19-12 MI	? 26	0.5	Nausea, abdominal pain/cramping. Treatment none.
Morchella "angusticeps" Patient ID	5-5-12 MI	? 48	3	Cooked. Nausea, vomiting, diarrhea, cramps, weak. IV fluids, ondansetron.
Morchella punctipes (ID as *M. conica* by "expert")	4-12-12 MI	? 26	?	Diarrhea, cramps, abdominal pains, nausea, vomiting (raw). No treatment.
Morchella sp ID method not given	4-15-12 MI	? 16	?	Fever, vomiting, nausea, diarrhea after 10 mouthfuls cooked. IV fluids.
Morchella sp ID by long-time picker	4-25-12 MI	? 50	2	Nausea, vomiting, diarrhea from deep-fried. IV fluids, antiemetic.
Morchella sp ID by friend of patient	5-6-12 MI	? 46	3	Abdominal pain, nausea, vomiting, oral irritation. Cooked.
Morchella sp ID method not known	5-7-12 MI	? 36	4	Diarrhea, feeling sick. Cooked. Observation only.
Morchella sp ID method not known	5-13-12 MI	? 67	4	Nausea, vomiting, abdominal cramps, diarrhea. IV fluids, antiemetics.
Morchella sp Photo ID by toxicologist	5-11-12 MI	M 59	4	Consumed 3-4 large cooked morels. Had beer. Nausea, bloating, unsteady.
Morchella spp Experienced collector	Previous years OH	M Adult	0.5	Anaphylactic shock after 2 yellows. Years earlier intensive care for days after a morel meal. Previously ate morels for years with no problem.

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs.)	Symptoms and Comments
Morchella sp Pale and black morels described by patient.	6-5-12 ID	F Adult	2	Consumed several bowls-full mushroom creamed soup. No alcohol. Nausea, vomiting, severe back pain.
Omphalotus illudens "jack 'o' lantern" reported by victim (a chef)	9-2012 NC	M 30	1	Severe nausea and vomiting after consuming 2-3 tablespoons cooked. Had been sold to chef as chanterelles.
Omphalotus olivaescens Mycologist ID	12-2012 CA	M 20s	<1	Transient consumed finger-sized piece expecting great trip, shortly returned saying used to "clean out system."
Panaeolus sp Specimens visually examined by toxicologist	Summer MI	F <2	?	Apparent hallucinations. Both *Psathyrella* sp and *Panaeolus* sp in lawn.
Pleurotus sp Purchased cultivated oyster mushrooms (1 of 3 people affected)	Summer NC	F ?	3-6	Awoke hot, heart racing, tripping without hallucinations. Bloating and gas several days. Cooked mushrooms, no alcohol.
Polyporus cf squamosus ID by NAMA toxicologist	9-4-12 MI	? >20	7	Nausea, vomiting. Treatment IV fluids.
Psilocybe cf cubensis MD reported moldy looking bluish stems.	4-12-12 HI	F 20	0.75	Brief hallucinations then mild stomach pain and fatigue – went to ER because symptoms not like previous experiences.
Psilocybe sp Photo ID by mycologist	Fall 2012 OR	M teen?	8	Eight hours after normal high, abdominal pains, nausea, vomiting, shivering, headaches – probable food poisoning.
Psilocybe sp ID method unknown	1-6-12 MI	? 20	?	Visual hallucinations, mydriasis, hypertension, agitation for 6 hours. Treatment IV fluids, cooling.
Psilocybe sp ID method unknown	1-7-12 MI	? 25	?	Agitation, hallucinations, confusion, mild tachycardia for 2 days. Treatment IV fluids, olanzapine, IV pepsid, PEG electrolytes, lorazepam.
Psilocybe sp ID method unknown	1-16-12 MI	? 23	?	Tactile hallucinations, jaw movements, paranoia for 6 hrs. Treat. IV fluids, lorazepam.
Psilocybe sp Presumed from symptoms	1-30-12 MI	? 20	?	Tachycardia, hypertension, vomiting, hallucinations, mydriasis lasting 6 hrs. Treatment IV fluids.
Psilocybe sp ID method unknown	2-24-12 MI	? 16	?	Combative, hallucinations, confusion, flailing. Treatment benzodiazepines.

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs.)	Symptoms and Comments
Psilocybe sp ID based on patient's description	5-1-12 MI	? 16	3.5	Vomiting. Treatment IV fluids, ondansetron, Zofran, B, benzodiazepines.
Psilocybe sp ID method unknown	5-18-12 MI	? 16	?	Unresponsive, slurred speech, confusion, combative, bilateral eye pain for 5 hours. lorazepam, supportive care, IV fluids.
Psilocybe sp ID method unknown	6-1-12 MI	? 16	?	Palpitations, panic attack, chest pain, shortness of breath, insomnia, and tachycardia. IV fluids, lorazepam, PEG/electrolytes.
Psilocybe sp ID method unknown	7-4-12 MI	? 24	1	Visual hallucinations, vomiting. Treatment not known.
Psilocybe sp ID method unknown	8-1-12 MI	? 21	3	Confusion, "tripping." Patient denied agitation and hallucinations. Observation.
Psilocybe sp ID method unknown	8-10-12 MI	? 20	?	Delusions, visual hallucinations, tachycardia. Treatment IV fluids.
Psilocybe sp ID method unknown	9-3-12 MI	? 25	?	Hallucinations, tachycardia, weak, anxiety. Treatment IV fluids.
Psilocybe sp ID method unknown	9-16-12 MI	? 18	?	Vomiting. Treatment IV fluids.
Psilocybe sp ID method unknown	10-15-12 MI	? 24	?	Hypertension, tachycardia, confusion, agitated, hallucinations, mydriasis. Treatment IV fluids, lorazepam, haloperidol.
Russula spp + *Armillaria mellea* group ID by victims	8-28-12 CO	F, M 48, 53	6 (F)	Female nauseated, could not vomit, male unaffected. Several species cooked.
Scleroderma cf citrina or *areolatum* Described by victim	9-2012 ME	F 40s	0.5	Violent diarrhea, vomiting, intestinal cramps, nausea after several oz. cooked. Husband and friend not affected.
Trametes cf versicolor ID by NAMA toxicologist	10-26-12 MI	? 2	10	Vomiting from raw mushroom. Given food, snack.
Tylopilus eximius ID by victims	Historic ME, VT	?,? ?,?	?	Moderate to severe gastro-intestinal distress after eating cooked fungi.

Mushroom Details and ID Method	When/ Where	Sex/ Age	Onset (hrs.)	Symptoms and Comments
Unknown Reported as "chaga" by victim	Summer NC	M 50s	?	Consumed tea several times to improve health. At first great, then bloating, gas, change in bowel habits for > 1 month.
Unknown, possible mixed ingestion/ *Psilocybe*	12-22-12 WA	M 20s?	?	Victim had also consumed a hallucinogenic drug. No details.
Unknown, possible *Amanita* per victim	8-2012 GA	M Adult	3	Nausea and vomiting from unknown amount of cooked mushroom.
Unknown, *Panaeolina*-like	8-13-12 GA	F 50	2-3	Dizziness, dilated pupils after consuming three cooked specimens for food.
Unknown	8-4-12	M 24	1	chills, diarrhea, cramps, vomiting, nausea after ½ cap raw for recreation.
Unknown Photos showed white fibrous stalk, liver-colored cap – ID unclear to expert	11-27-12 MI	? ?	24	Shock. Kidney function impaired and placed on dialysis. Outcome unknown. ID as possible *Gyromitra* but stalk not a match.
Volvariella esculenta (as *Lepiota esculenta*) ID by unknown "experienced identifier"	8-20-12 MI	? 67	?	Abdominal pain, nausea, vomiting, diarrhea, increased AG, respiratory depression. IV fluids, electrolytes, ondansetron..

Table IV: Animal-Poisoning Cases

Mushroom Details and ID Method	When/ Where	Animal sex, age	On-set	Symptoms and Comments
Amanita pantherina? ID a guess	8-16-12 AB	Dog 4	?	Chills, diarrhea, salivation, dizziness, disorientation, muscle spasms, vomiting, nausea, weakness, walking on knuckles of hind feet, fell down, legs stiffened and spasm 2X. Recovered.
Amanita muscaria ID by High School teacher/mycologist	10-18-12 NJ	Dog 10	1-3	Diarrhea, salivation, disorientation, muscle spasms, vomiting, drowsiness, **death** in 5-7 hours. Treated with IV fluids, 1 dose IV valium, and 2 doses atropine. Atropine strongly contraindicated (see Beug and Shaw 2009).
Amanita bisporigera ID by poison center from photos	7-16-12 East	Dog 0.25	~12	Vomiting and severe lethargy. Severe liver enzyme abnormalities, low blood sugar, low blood pressure, coagulation abnormalities. Aggressive therapy including multiple plasma transfusions. Dog survived after 10 days costing $10,000.
Amanita phalloides Owner ID	2-9-12 CA	Dog 0.6	12-15	Fever, diarrhea, salivation, muscle spasms, vomiting, drowsiness, weak, facial swelling, uncontrolled urination. At 60 hr., seizures, vomiting blood, brief recovery. **Death** @ 65 hours. Treatment included liver support drugs, plasma, and breathing assistance.
Amanita phalloides? Amatoxins found by University Lab	1-10-12 CA	Dog 4	?	Salivation, drowsiness, weakness, grand mal seizure, bleeding, ALT and PT not measurable. Given fluids, glucose, FFP. **Died** 1-11-12.
Amanita phalloides? Presumed	3-9-12 CA	Dog ?	?	Dog **death** consistent with amatoxins. No treatment details.
Amanita phalloides? ID a guess	8-21-12 CA	Dog 10	~13	Fever, salivation, drowsiness, weakness, **death**. Unresponsive to treatment, "pancreatic infection."

Mushroom Details and ID Method	When/ Where	Animal sex, age	On-set	Symptoms and Comments
Amanita phalloides ID by Vet Clinic	21-11-12 CA	Dog 4	12	Chills, fever, diarrhea, dizziness, disorientation, muscle spasms, vomiting, drowsiness, nausea, weakness, would not eat or drink. Hypoglycemia, inability to clot, blood in lungs, etc., liver failure, **death** at 55 hours. Given glucose IVs, antibiotics.
Amanita phalloides ID method unknown	7-2012 CA	Dog 2	12	Repeated vomiting, refused food and water, developing grossly bloody diarrhea, severe dehydration, dramatic elevated liver enzymes, positive amatoxin test next day, gall bladder aspirated via needle, recovered 2 more days.
Galerina marginata Suspected based on owner ID from yard	10-12 MN	Dog 8	?	**Died** suddenly (72 hours?) of acute liver failure. Liked to chew mushrooms in yard.
Inocybe lilacina? Photo of top of cap	12-6-12 OR	Dog ?	?	Vomiting and salivating heavily, recovered.
Inocybe mixtilis ID from yard, by NAMA expert. *Inocybe albodisca* reported from spores in stomach contents.	11-2-12 WA	2 Dogs 8,10	?	Two pugs ate mushrooms in yard. First **died** same day, second after 1 week. Muscarinic symptoms plus liver failure (thus suspect additional amatoxin species involved). Treatment unspecified.
Lycoperdon perlatum Photo ID by author	11-5-12 AZ	Dog ?	5	Bit into mushroom causing big puff of dark green spores, became lethargic, appetite loss – Lycoperdonosis. Owner ID as *A. pantherina.*
Scleroderma cf cepa group. Photo ID	9-26-12 OR	Dog ?	?	Vomited several times after eating the mushrooms. Given charcoal and fluids.
Scleroderma cf citrina ID from photo	9-15-12 ?	Dog 2	?	Dog for days loopy, not walking normally, tipping over. Not clear if mushroom was involved.
Scleroderma sp NAMA toxicologist ID	8-16-12 CA	2 Dogs 0.75	?	Vomiting, recovered.
Scleroderma sp Photo ID by NAMA toxicologist	11-2012 AR	Dog ?	<2	Vomiting and listless. Given activated charcoal by vet. Recovered.
Unknown	1-29-12 NC	Dog 1	1	Salivation, muscle spasms, vomiting, weakness, seizures. Charcoal, seizure drugs, stomach flush.

Mushroom Details and ID Method	When/ Where	Animal sex, age	On-set	Symptoms and Comments
Unknown possible *Chlorophyllum*	±4-11 CA	Horse 9	fast	hallucinations, salivation, dizziness, disorientation, bloated, stiff joints, in pain for days.
Unknown	8-7-12 CO	Dog ?	1.5	Apparently consumed 3 button mushrooms in yard. Severe vomiting, elevated LFTs.
Unknown	6-8-12 WY	2 Dogs ?,?	?	Vomiting and diarrhea followed by massive hepatic failure. Yard in Casper had numerous mushrooms growing. No other information.
Unknown *Inocybe? Clitocybe?*	7-4-12 NM	Dog ?	0.5	Salivating after consuming a mushroom in yard. LFTs slightly high. Given fluids and charcoal.
Unknown Author thought photos similar to dried *Tricholomopsis rutilans,* but not it.	11-8-12 PA	Dog 0.3	0.5	Profuse vomiting, diarrhea and shallow breathing. Within 2 hours vomiting blood, lungs filled with fluid. **Death** about 2 hours post ingestion – excessively fast for known mushroom toxins.

References

Beug, M. and M. Shaw. 2009. Animal Poisoning by *Amanita* pantherina and *Amanita muscaria*: A Commentary. *McIlvainea* **18**: 37-39.