

Summary of the Poisoning Reports in the NAMA Case Registry for 2006 through 2017

By Michael W. Beug, Chair NAMA Toxicology Committee

In the early years of NAMA, toxicology was one of the concerns of the Mycophagy Committee. The existence of toxicology committees in the Puget Sound and Colorado clubs stimulated the NAMA officers to separate the good and bad aspects of ingesting mushrooms. In 1973 they established a standing Toxicology Committee initially chaired by Dr. Duane H. (Sam) Mitchel, a Denver, Colorado MD who founded the Colorado Mycological Society. In the early 1970s, Sam worked with Dr. Barry Rumack, then director of the Rocky Mountain Poison Center (RMPC) to establish a protocol for handling information on mushroom poisonings resulting in the center becoming nationally recognized for handling mushroom poisonings. Encouraged by Dr Orson Miller and acting on a motion by Kit Scates, the NAMA trustees then created the Mushroom Poisoning Case Registry in 1982. Dr. Kenneth Cochran laid the groundwork for maintaining the Registry at the University of Michigan. Individuals can report mushroom poisonings using the NAMA website (www.namyco.org). The reporting is a volunteer effort and at the end of each year members of the NAMA toxicology committee assemble all of the reports for the previous year as well as any other earlier cases that can still be documented. Individuals are encouraged to submit reports directly through the NAMA website. In addition, members of the toxicology committee work with Poison Centers to gather mushroom poisoning reports. The toxicology committee has 160 toxicology identifiers living in 36 states and 3 Canadian Provinces. Quebec, Canada has the greatest concentration of toxicology identifiers (17) followed by California and Oregon (15 in each state) and Washington State (13).

The first annual NAMA report of mushroom poisoning cases was published by Dr. Cochran in Mushroom: The Journal in 1985 (Cochran, 1985). All subsequent reports are in McIlvainea. Historically, mushrooms account for about 0.4 to 0.5% of total toxic exposures and NAMA was receiving reports for about 1% of mushroom poisoning cases. However, with new laws protecting individual privacy, the reporting to NAMA has dropped significantly.

This paper summarizes all reports in the NAMA database where the mushroom could be reasonably well identified and where the poisoning was from ingestion of just one mushroom species. We cover the 12-year period from January 1, 2006 through December 2017. Unlike the annual reports, we will not delve into treatments or why the person may have consumed the mushroom (e.g. for food, for recreation, mistaken identification, etc.). The only age determination we make is for adults (and here we treat teenagers as adults) versus children. However, bear in mind that symptoms can be most severe in individuals whose health is previously compromised (due to age, alcohol or chronic disease) and in children whose digestive and immune systems are not yet fully developed.

The reports that have been summarized here are voluntary reports. In some regions (the Rocky Mountain region and the Pacific Northwest), the reporting is quite extensive

(though undoubtedly not complete). In other regions the reporting is very spotty because at times during the past 36 years there have been few active experts in the area.

Sometimes one can be quite certain about what mushroom was consumed, and we even have DNA confirmation of the species involved. At other times, it is just an educated guess based on mushrooms gathered near where the suspect mushrooms were picked or from pictures that the victim pointed out in a book.

We have generally not attempted to use the most current name but have followed the names used in the reports. The approach has also been that of a “lumper.” For example *Armillaria mellea* and *Laetiporus sulphureus*, are now recognized as complexes of several species, but there has often been no way to figure out what the actual culprit was, though by looking at the location one can sometimes make a good guess. A confounding factor here is that mushrooms can be contaminated by bacteria and molds and the symptoms from bacterial and mold contamination are extremely similar to most mushroom poisoning symptoms. Some of the cases certainly do appear to have been a result of consumption of spoiled mushrooms that were old before consumption or had been frozen raw (which allows the bacteria to keep growing). Also for mushrooms growing in lawns, flower beds, along roads and on golf courses there is the question of contamination by insecticides, herbicides or heavy metals. We have a table of poisonings where alcohol is implicated because there were individuals who said that they could eat the mushrooms if they did not drink alcohol. We are certain that several additional GI cases were also alcohol related. We have tabulated all of the reported dermatitis cases because that information has remained scattered. The large number of flagellate dermatitis cases due to *Lentinula edodes* is tabulated with the gastrointestinal distress cases since these incidents often include significant GI distress. For GI cases, we have included two tables – one for cooked mushrooms and a separate table for raw, undercooked, spoiled mushrooms.

We were surprised at some of the things that we found (or did not find). While we have often seen 50% quoted as a death rate for consumption of mushrooms containing amatoxins, we calculated an 11% death rate for reported cases of people who became ill during the first thirty plus years of maintaining the NAMA database covering the period 1975 through 2005 plus scattered earlier reports (Beug *et al.* 2006). Furthermore, we found record of five liver transplants for a transplant rate of 3.5% in amatoxin cases from 1975 through 2005. In the period from 2006 through 2017, we believe that the death and transplant rates decreased, but the data is too fragmentary for us to be certain.

Orellanine, the other deadly mycotoxin in mushrooms that people eat, was involved in just one incident. Orellanine, found in a few *Cortinarius* species, is characterized by a long latent period (often more than 1 week) followed by kidney failure.

To our surprise, there were no reported deaths from two other species of mushrooms noted for causing kidney failure, *Amanita smithiana* and *Paxillus involutus*. Though *Amanita smithiana* was at one time thought to contain orellanine, orellanine is not present. A toxin in *Amanita smithiana* is allenic norleucine that is probably bound to a sugar in the mushroom. A second compound, chlorocrotylglycine, may also be toxic. The toxins in *Paxillus involutus* are unknown.

We found cases where mothers became ill from a mushroom ingestion and nursing infants (and nursing puppies) became ill (a puppy died) from toxins in the milk. Though many people still eat *Gyromitra esculenta*, the large number of cases found where there was liver and/or kidney damage may lead individuals to cease this practice.

In examining animal poisoning cases, we were struck by how frequently dogs (and even cats) consume either *Amanita muscaria* or *Amanita pantherina*. Neither of these species is deadly in humans, but both can be lethal to cats and dogs. Similarly, there were deaths of dogs from both *Inocybe* species and *Scleroderma* species, though we have no record of human deaths from these same species. We looked for mushroom poisonings of horses or cows. There are no reports of cows consuming wild mushrooms in the NAMA database. However, there are anecdotal reports (from Texas) of cows getting high from consuming *Psilocybe cubensis* on the range and reports of cows going mad from unknown mushrooms in Washington State. For horses, we have only a few new reports and for pigs there were no new reports from 2006 through 2017. We have never received reports of poisonings of poultry.

Table I
Amatoxin Syndrome: Poisoning by the Amanitins

Species and Location ¹	Number and onset ²	Symptoms ¹
<i>Amanita amerivirosa</i> nom. prov. New York	1 ?	Victim survived acute liver injury and kidney failure.
<i>Amanita cf bisporigera</i> CT, MD, MN (2), MO, NJ (3), NY (7), OH, ON, PA, QB, VI (2), WI, ?	29 Adults, 7 Children, 5 Unknown ?, 6-12 hours (12-18), 12.5	Hospitalized and recovered (12), hospitalized, transplanted and died a few days later from an infection; diarrhea (10), salivation, cramps (7), sweating, vomiting (18), nausea (15), abdominal pain (9), headache, three to ICU - 1 child died, 1 death awaiting liver transplant, 1 death after refusing liver transplant. One death after consuming 10-15 mushrooms. Another death 2 days after two large meals. One death and one transplant – no other details. After consuming just one, person had extensive diarrhea, intestinal cramping, vomiting, nausea, slightly elevated LFTs. Vomiting and diarrhea from 1 mushroom (2). Three children hospitalized and treated within 2 hours of ingestion had no symptoms develop.
<i>Amanita bisporigera</i> ID as <i>A. virosa</i> NJ	20 Adults 17 hour	Diarrhea (20) and vomiting (20), mildly elevated LFTs (1) from shared soup with three species of mushroom in it.
<i>Amanita bisporigera</i> in mixture of other species VI	2 Adults 2 hours	Wife not sick enough to be hospitalized. Husband profuse watery diarrhea for three days then renal failure and slow recovery.
<i>Amanita cf bisporigera</i> possible MT, MI	2 Adults 1 child ?, 5 hour	Vomiting (1), severe bloody diarrhea (1), elevated LFTs (1), kidney damage (1).

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table I Amatoxin Syndrome: Poisoning by the Amanitins (continued)

<i>Amanita ocreata</i> CA (6 cases)	10 Adults 6-12 hours (24 hours)	Three considered for liver transplant, one transplanted, diarrhea, severe diarrhea 48 hours, abdominal cramps, nausea, vomiting (2), elevated LFTs, coagulopathy, liver failure and death (2). One mild elevation of liver enzymes after consuming one button. One fast onset mild case from consuming one cap (nausea, abdominal pain, vomiting, diarrhea, slightly elevated liver enzymes).
<i>Amanita phalloides</i> BC (2), CA (8), MA, ON, OR (2), WA (3)	27 Adults, 3 children ?, 12-16 hours, 12 hours, 8-10 hours, 11 hours	14 Treated with "Santa Cruz protocol", recovered (11). Severe coagulopathy and acute renal failure but recovered (1), liver transplant (1), death (2); 1 liver transplant (facing \$800,000 medical bill, \$1500/mo for meds). Nausea (4), vomiting (4), diarrhea (2), weak (2), hospitalized at 44 hours with elevated liver enzymes, discharged day 17 (1). Diarrhea (5), intestinal cramps (5), vomiting (4), hepatitis with elevated hepatic transaminases (3). Death (1). Mild to moderate symptoms from 4 caps (1), survived liver failure (2), survived liver failure after consuming 5 large caps (1). One woman survived consumption of 6 specimens – had gall bladder drainage and IV silibinin. One child death but no details. Two adults survived with only supportive treatment (IV fluids).
<i>Amanita phalloides</i> or <i>A. ocreata</i> CA (4)	7 Adults ?	Caregiver and 4 elderly patients consumed meal – all four elderly died despite IV silibinin late in course of poisoning. Man presented at hospital days after mushroom consumption with liver completely necrosed and no transplant available (died?). Diarrhea, vomiting, nausea, weakness, drowsy from one small piece (1).
<i>Amanita cf phalloides</i> or more likely <i>A. bisporigera</i> group OH (3 cases)	17 adults, 5 children ?, ?, ?	Laotian family of 4 – 3 in intensive care, 1 treated and released; Chinese family of 5 – 2 admitted, 3 treated and released; Caucasian man and 12 acquaintances ill, four with severe hepatitis.
<i>Amanita sturgeonii</i> Tulloss, Q. Cai & Kudzma nom. prov. New Jersey (3 cases)	3 Adults ?, ?, ?	In case one, less than one small mushroom was ingested and the patient survived with no false recovery period. In case two, the only information was that the patient survived and there was no false recovery period. In case three, the patient died after several servings of a curry containing the toxic mushrooms.
<i>Amanita "virosa"</i> (<i>bisporigera</i> group) ON	1 Adult 6 hours	Presented with diarrhea and intestinal cramps. Treated and discharged. Two days later returned in fulminant hepatic failure, death day 8.
<i>Galerina marginata</i> (suspected) BC, CA, IL, MI, ?	5 Adults ?, 10-14 hours	Possible liver damage when mushroom mistaken for a <i>Psilocybe</i> (1). One Death from multi-organ failure (Legalon-SIL used late in course), all others survived. Multiple drug abuser survived 4 days of dry heaves and diarrhea while self medicating with oral milk thistle. Chills, flushing, diarrhea, dizzy, intestinal cramps, sweating, ill for 1 week (1).
<i>Lepiota subincarnata</i> = <i>L. josserandii</i> IL, NY, QB	3 Adults ?, 9 hours	Death, no other details. Successful liver transplant, no other details. Vomiting, profuse diarrhea, intense cramps in lower limbs, metabolic acidosis, slightly elevated LFTs (1).

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table II
Inebriation and Poisoning by Isoxazole Compounds (Muscimol, Ibotenic Acid, etc.)

Species and Location ¹	Number and onset ²	Symptoms ¹
<i>Amanita albocreata</i> QB	3 Adults ?	Typical ibotenic acid/muscimol poisoning (3), comatose for 2 days (2), convulsions, respiratory distress (1).
<i>Amanita alpinicola</i> OR	2 Adults ?	Nausea.
<i>Amanita aprica</i> OR	2 Adults 4 hours	Feeling drunk, feeling but not seeing hand tremors, coma-like sleep, incontinent.
<i>Amanita flavoconia or muscaria</i> MI	1 Child ?	Vomited after given charcoal.
<i>Amanita gemmata</i> CA, OR	1 Adult, 1 child ?, ?	Vomiting, sweating, wild visions for several hours, unwell for days. Child salivation, muscle spasms, drowsy, fixed dilated pupils then unconscious.
<i>Amanita muscaria</i> CO, CT, ID (3), ME, MI (5), MT, PA (2), VA, WA, ?	24 Adults 0.25-1.5 hour (3-5 hours)	Hallucinations (10), sweating (5), vomiting (16), diarrhea (2), drowsy (6), bradycardia (4), rigidity, agitation, tremors, coma (4), hypotension, respiratory depression (2), nausea (6), awoke aggressive towards friends, blurred vision (4), dizzy (3), unsteady (4), violent, hospitalized 1 week, metallic taste in mouth, like 3-day drunk, unresponsive, incoherent, gas, disoriented, paranoid, frightened.
<i>Amanita muscaria</i> WY	1 Adult 2 hour	After consuming 6-7 dried specimens, male was sweating, flushed skin, slurred speech, deep sleep for 2 hours, found dead next morning.
<i>Amanita muscaria in mixed ingestion</i> CO	2 Adult 1.5-2 hour	Agitation, rapid eye movement, dilated pupils, muscle spasm, vomiting.
<i>Amanita muscaria</i> or <i>Amanita pantherina</i> MT	2 Adult 0.5 hour	Vomiting (2), trouble walking (2), confused, very combative.
<i>Amanita muscaria</i> (partially detoxified) MT	1 Adult 1 hour	“Buzzing in hands”, abdominal pains from ½ cap cooked after soaking overnight in salt water.
<i>Amanita cf pantherina</i> CO (6), MI, MN (2), MT, NM, OR (4), WA (6)	22 Adults, 3 child (0.5) 1-1.5 hour (one notable case where 10 mushrooms consumed produced only mild effects)	Found vomiting and twitching (3), dizzy (5), disoriented (9), drowsy (7), blurred vision (3), not breathing (2), diarrhea (2), nauseated (6), vomiting (10), cramps, muscle spasms, incontinent (1), uncoordinated (7), hallucinating (7), seizures (3), drowsy then coma (1), coma for 4 hours (6), agitated (1), drooling, hyperactive, sweating (3), urinating (2), awake but unresponsive (2), low blood pressure (2), hospitalized but no details (1), intubated and intensive care (3), memory loss for about 3 months (1), confused, shouting.
<i>Amanita velatipes</i> NH	2 Adults ?	Hallucinating (2), disoriented (2), nausea (2), muscle spasms (2), agitation (2), fear (2).

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table III
Hallucinogenic Syndrome: Effects of Psilocybin and Psilocin and other Tryptamines¹

Species and Location ²	Number and onset	Symptoms ¹
<i>Calbovista subsculpta</i> and <i>Calvatia sculpta</i> AZ	2 Adults hours	Non-stop vivid dreaming 4 of 5 times after a meal of either species. Cooked, sometimes 1 glass of wine each.
<i>Conocybe cf cyanopus</i> (possible) CO	2 Child Soon	Giggling, laughing, dilated pupils (2).
<i>Gymnopilus penetrans</i> WA	1 Adult 5 hours	Consumed in attempt to get high but only got nauseated.
<i>Gymnopilus spectabilis</i> CT	Adult ?	Hallucinations, disorientation, vomiting, nausea, septic shock.
<i>Gymnopilus cf villosipes</i> WA	1 Adult 0.5 hour	Diarrhea, intestinal cramps, disorientation, nausea, dry mouth, week-long joint pain and sweating, tingling sensations.
<i>Inocybe sp</i> NM	1 Child ?	Agitated, apparently hallucinating, fever, seizure, coma. Note: <i>Inocybe</i> confirmed.
Magic Mushroom tea BC	1 Adult 6 Hours	Had been consuming same mushrooms over course of a year, died in a hot springs. Autopsy showed heart, lung and intestinal lesions, brain swelling.
Magic Mushrooms plus Marijuana MT	1 Adult ?	Confrontational, agitated, pulled knife, maced, flat-lined in ambulance, coma for 2 days while screaming and thrashing, after 10 days vision still not returned.
Magic Mushroom + <i>Salvia divinorum</i> ? CO	1 Adult ?	Sweating, anxiety, hallucinations.
<i>Gymnopilus spectabilis</i> PA	1 Adult ?	Woman hit three cars while driving – three species of fungi found on seat beside her including probable <i>Gymnopilus</i> .
<i>Panaeolus cinctulus</i> HI, OH	3 Adults <1 hour, ?	Consumed raw (2), dizzy (2), nausea (2), abdominal pain (2), headache (1), diarrhea.
<i>Panaeolus sp</i> OH?	1 Child ?	Hallucinations (lawn grazing incident).
<i>Psilocybe sp?</i> CO	1 Adult ?	Hands tingling, back hurting, reported “hands look strange”, too terrified to work for three weeks.
<i>Psilocybe azurescens</i> OR	1 Adult 6 hours	Unable to focus eyes, jaw muscles weak, next day loss of balance, felt like being squashed.
<i>Psilocybe cubensis</i> ID, HI, WA	3 Adults ?, ¾ hour	Dilated pupils, tachycardia. Second case of slightly moldy mushrooms gave brief hallucinations followed by stomach pain and fatigue. Severe hyperthermia (108F).
<i>Psilocybe sp</i> HI, OR, MI (7)	9 Adults ?, 0.75 hour, 8 hour	Abdominal pain after consuming handful dried fungi. Normal 6 hour high followed by abdominal pain, nausea, vomiting, shivering, headache. Two days of hallucinations, confusion, mild tachycardia, possible hypertension. Combative (3), flailing, panic attack, palpitations, chest pain, shortness of breath, insomnia, vomiting (3).

¹Note: Hospital admissions due to “bad trips” are the most common mushroom poisoning that hospitals deal with, but they are rarely reported to NAMA. Furthermore, most reports we do get are very sketchy.

²Number in parentheses is number of times observed.

Table IV
Long Delayed-Onset Renal Failure: Orellanine or Cortinarin Poisoning in North America

Species and Location ¹	Number and onset ²	Symptoms ¹
<i>Cortinarius orellanosus</i> MI	1 Adult ?	Kidney failure requiring dialysis (for five weeks at time of report)

Table V
Bleeding Syndromes

Species and Location ¹	Number & onset ²	Symptoms ¹
<i>Auricularia sp</i> TN	1 Adult 2 Days	Excessive bleeding from a small cut
<i>Amanita "rubescens"</i> CA	2 Adults ?	Male had blood filled pimples pop up on skin on two occasions. Female had unexplained red blood cell disorder.

Table VI
Mushrooms with Unique Toxins, Kidney Failure common

Species and Location ¹	Number and onset ²	Symptoms ¹
<i>Amanita smithiana</i> BC, OR (2), WA (2)	1 Child, 4 Adults ?, 6 hours	Failing kidneys and elevated creatinine levels in child. Ongoing nausea and vomiting, urine stopped day three, hospitalized day, renal problems (4).
<i>Amanita smithiana</i> + <i>Tricholoma focale</i> OR	1 Adult 5 hour	Acute renal failure with hepatic involvement after a meal of 3 <i>T. focale</i> + 1cap <i>A. smithiana</i> (all as Matsutake)

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table VII
Gyromitrin Poisoning Suspected due to Hydrazines

Species and Location ¹	Number & onset ²	Symptoms ¹
<i>Gyromitra esculenta</i> BC, ID, MI (12), WA, MT, ?	2 Children, 15 Adults 2-5 hours, >6, 12 hours	Intense abdominal pain (6), vomiting (7), diarrhea (6), fatigue, dizzy (2), unable to walk, nausea (4), chills, flushing, headache, tachycardia (2), LFT 1,000 (1), liver failure (placed in ICU and considered for liver transplant), jaundice, twitching stomach muscles on two meals in a row (2), ALT 52. One case Alt 161, AST 139, elevated transaminases, jaundice, dark red urine, Bilirubin 4, 3 days ICU. Second case elderly couple AST 64 & 81, Alt 52 & 97, Bilirubin elevated, Bilirubin 32 & 6.3, both 4 days in hospital. One case rapid hepatic and renal failure resulting in 1 month hospitalization.
<i>Gyromitra esculenta</i> BC, ID, KS, ME, MI	4 Adults 1 Child 0.3-2 hours (24 hour)	Intense abdominal pain, stomach ache, fatigue, jaundice, elevated liver tests, nausea (2), vomiting (3), weakness, 2 nd day diarrhea (2), light headed.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table VIII

Poisonings where Effects Appear to be Associated with Alcohol Consumption

Species and Location ¹	Number & onset ²	Symptoms ¹
<i>Coprinopsis atramentaria</i> CO	1 Adult 3 hours	Vomiting, diarrhea, heart palpitations.
<i>Coprinus comatus</i> MI	1 Adult 11 hours	Flushing.
<i>Leccinum fibrillosum</i> CO	1 Adult 3 hours	Chills, diarrhea, intestinal cramps, vomiting, nausea, weak for three hours.
<i>Morchella elata</i> clade MT (2)	4 Adults 2 hour, 12 hour	Vomiting (3), diarrhea (3), vomited 3x, diarrhea, dizzy (with lots of beer).
<i>Pholiota spumosa</i> complex WA	1 Adult ?	After several glasses of wine and mushroom meal. presented with "Serotonin syndrome" – hyper reflexive arms and legs, global seizures, unresponsive, sweating.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table IX

Cases Involving Dermatitis, Spore Inhalation, or Contact Effects

Species & Location	Ingested, handled or spores inhaled?	Onset	Symptoms
<i>Amanita muscaria</i> or <i>A. pantherina</i> CO	Child hit in leg	16	Red rash lasting days on legs, arms and face.
<i>Amanita muscaria</i> CO, UT	Carried only, handled only	0.5 & <1 hour	Skin itching, then after 1 hour paranoid, confused, irritable, vision changes. Second case diarrhea, intestinal cramps, vivid dreams, tingling fingers.
<i>Amanita muscaria</i> WA	Inhaled spores	?	Dizzy, disoriented, nausea, headache, loss of balance.
<i>Amanita phalloides</i> CA (2)	Handled, not eaten	?, 48 hours	Cold-like symptoms of irritated sinuses and sore throat – 2 persons affected. Second case – rash.
<i>Cantharellus formosus</i> OR	Ingested	3 hour	Vomited day one, next day could not hold second meal in mouth and then noticed rash on arms, stomach and later back.
<i>Morchella</i> sp ?	Cooked	?	First year rash on left arm, second year rash in armpits, back of legs, crotch area. Second person developed rash several days after three successive morel meals.
<i>Russula</i> sp ID	Ingested raw	?	Eyes red and puffy
<i>Sparassis crispa</i> WA	Carried only	3-5 days	Hives and itching lasting 4 days. Mushroom not eaten.

Table X
Gastrointestinal Syndromes from Cooked Mushrooms

Species and Location ¹	Number & onset ²	Symptoms ¹
<i>Agaricus</i> (commercial cremini) CO, MI, ?	3 Adults ?, 6 hours	Vomiting (2), nausea, intestinal cramps, diarrhea, hallucinations. Second report was of nightmares following every meal with cremini.
<i>Agaricus</i> (commercial Portobellos) ?, MA	3 Adults ?, 6 hours	Hospitalized multiple days each of three times they ate Portobellos. Intestinal cramps, diarrhea, headache weakness.
<i>Agaricus xanthodermus</i> CO, MI, MT	2 Adults, 1 Child ?, 5 hours	Gastro-intestinal distress, vomiting (2), nausea, diarrhea, elevated LFTs.
<i>Agaricus</i> (porcini) NY	1 Adult 3 hours	Diarrhea, vomiting, cramps, nausea.
<i>Agrocybe vernalis</i> group CA	1 Child 2-4 hours	Severe abdominal pain.
<i>Amanita calyptroderma</i> CA	1 Adult 2 hours	Swelling of the tongue – two episodes with same person.
<i>Amanita vaginata</i> complex WA	1 Adult 2 hours	Severe upset stomach.
<i>Amanita verrucata</i> CA	1 Adult 3 hours	Chills, sweating, vomiting, nausea.
<i>Apiosporina morbosus</i> & <i>Daldinia concentrica</i> MD	1 Adult ?	Stomach issues for three days after making medicinal tea.
<i>Armillaria cf solidipes</i> AB, ON (2), OR, WA	7 Adults 3-6 hours	Vomiting and nausea in one of 6 at meal. Ten hours of nausea (3), vomiting (4). diarrhea (3). sweating, dizzy (3), intestinal cramps (2), chills, nausea, headache, drowsy, weak (2), body aches.
<i>Armillaria tabescens</i> NJ	1 Adult 5 hours	Diarrhea, vomiting, sore stomach following day, bad taste in throat.
<i>Boletus castaneus</i> MA	2 Adults 2-3 hours	Gas pains (2), diarrhea.
<i>Boletus edulis</i> CA, WA, ?	4 Adults 4-5 hours, 0.75 hour	Diarrhea (3), chills, nausea (3), headache (3), flushing (2), fever (2), intestinal cramps (2), drowsy (2), weakness (2), and vomiting (4).
<i>Boletus huronensis</i> ME (2), VT	4 Adults 1.5-3 hours	Dry heaves then 5 hours severe vomiting and diarrhea (2). Chills, diarrhea, vomiting (2), nausea, muscle spasms, intestinal cramping, cramps in legs, feet and back.
<i>Boletus cf marshii</i> WA	1 Adult 12 hours	Chills, flushing, nausea.
<i>Boletus [Rubroboletus] satanas</i> CA (2)	6 Adults ?, 3.5 hour	Severely ill in hospital (4), bright red blood (1). Vomiting many times over 24 hours (2), diarrhea (2), gas.
<i>Boletus subvelutipes</i> ME	1 Adult 6 hours	Intestinal pain, dizzy.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table X (continued): Gastrointestinal Syndromes from Cooked Mushrooms

<i>Cantharellus "cibarius"</i> ID, OR	1 Adult 2 hours	Intermittent stomach cramps lasting 5-6 hours. Second case extreme hypertension, increased visual acuity, cold intolerance, nightmares.
<i>Cantharellus formosus</i> WA (3), OR (3)	6 Adults <2 hours, 3 hours	Vomiting and sick for hours (2 successive occasions, 2 different people), diarrhea (2 successive occasions). Intestinal cramps, vomiting and nausea (2 successive occasions). Nausea, drowsy. Severe abdominal pain with slightly elevated creatinine and BUN (2).
<i>Cantharellus lateritius</i> NC	1 Adult 2 hour, 2 days	First episode was diarrhea 2 days after meal. Two hours after second meal - vomiting for 2 hours.
<i>Cantharellus roseocanus</i> CO, AZ	1 Adult, 1 Child 1-2 hours	Vomiting (2), fever, cramps, nausea, weakness.
<i>Chlorophyllum molybdites</i> CA (2), CO (5), HI (2), ID, IN, KS (2), MD, MI (5), MN, NB, NY (2), QB, TN (3), TX (2), WV	32 Adults, 0.5-4.5 hours (7 hours)	Abdominal cramps (11), vomiting (24), severe vomiting (4), vomiting for 24 hours, diarrhea (25), diarrhea for 24 hours (2), bloody diarrhea (2), nausea (11), sweating (6), cold sweats (3), flushing (2), fever (2), abdominal pain (4), chills for 9 hours (4), muscle spasms (3), hyperglycemia, electrolyte imbalance, salivation, appetite loss, light sensitive, prostration, weak (3), headache, discomfort, disoriented, attempting to get high (2), critically sick in hospital, ataxia, elevated creatinine, pneumonitis, hospitalized for 1 week.
<i>Chlorophyllum rachodes</i> WA	1 Adult 3-4 hours	Vomiting and feeling awful.
<i>Clitocybe dealbata</i> NE, PA	2 Adults 1 hour	Chills (2), diarrhea, excessive salivation (2), intestinal cramps, profuse sweating (2), vomiting for 5 hours, drowsy, sneezing and runny nose..
<i>Coprinus comatus</i> QB, AB	2 Adults 12-24 hours, 1 hour	Slight nausea, then second meal 2 days later – chills, nausea, muscle spasm, trembling and numbness over whole body. Year previous, no problems. Second case bloating followed by nausea on two occasions.
<i>Entoloma cf sinuatum</i> (white) NF	2 Adults 0.75 hour	Vomiting for 5 hours, vertigo, complete loss of bowel control.
<i>Entoloma cf rhodopodium</i> HI	2 Adults 1 hour	Nausea, vomiting, intestinal cramping.
<i>Floccularia luteovirens</i> CO	1 Adult 3-4 hours	Mild headache, felt a little drunk.
<i>Ganoderma applanatum</i> CO	1 Adult 3 hours	Small piece in tea led to tingling around mouth.
<i>Gomphus floccosus</i> + <i>Fuscoboletinus?</i> OR	1 Adult 6.5 hour	Severe vomiting, dizziness, weakness. Assumed Field Guide "Not Recommended" meant it would not taste good.
<i>Grifola frondosa</i> NY, ON	2 Adults 0.5, 4 hours	Flushing, intestinal cramps (2), nausea, vomiting.
<i>Hygrophoropsis aurantiaca</i> GA	1 Adult ?	Vomiting.
<i>Hypomyces lactifluorum</i> ?, BC	2 Adults 2, 3 hours	Dizzy, stomach cramps (2), sweating (2), nausea (2), vomiting.
<i>Inocybe rimosa</i> QB	3 Adults 0.5-1 hour	Chills (2), headache (2), diarrhea (2), nausea (2), sweating (3), weakness (2).

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table X (continued): Gastrointestinal Syndromes from Cooked Mushrooms

<i>Laccaria ochropurpurea</i> IL	1 Adult 1.5 hour	Chills, vomiting, nausea weakness.
<i>Lactarius cf fragilis</i> OH	2 Adults 3 hour	Vomiting (2).
<i>Lactarius sp</i> (white) NC	1 Adult 1 hour	Salivation, extensive vomiting, diarrhea.
<i>Laetiporus cincinnatus</i> MO, NJ	2 Adults ?, Rapid	Face red and puffed, rapid pulse, difficulty walking for 2 days, difficulty breathing for 4 days. Second case nausea, vomiting.
<i>Laetiporus conifericola</i> WA	Adult 0.75 hour	Salivation, dizzy, vomiting, nausea for 3 hours.
<i>Laetiporus gilbertsonii</i> CA (2)	2 Adults ?, 2 hours	Nausea (2), vomiting, weak, fear of having consumed wrong mushroom.
<i>Laetiporus sulphureus</i> ?, OH, CA, ME	8 Adults ?, 0.25 hour, 1.5 hours	Mild drowsiness every time. Vomited for hours (6), nausea (3), intestinal cramps, constipation.
<i>Leccinum insigne</i> CO	2 Adults 5-6 hours	Chills (2), diarrhea (2), dizzy (2), intestinal cramps (2), sweating (2), vomiting (2), nausea (2).
<i>Leccinum sp + Boletus edulis</i> (?) ME	2 of 3 Adults 3 hour	Severe vomiting (2), dizzy (2), low blood count over 3 days
<i>Leccinum sp + Russula sp</i> CO	1 Adult 6 hours	Severe diarrhea, severe vomiting, cramps, stomach upset lasting 36 hours (from conference mushroom tasting event)
<i>Leccinum sp</i> CO (3), WY	4 Adults 3-15 hours	Diarrhea (3), vomiting, stomach pains and extreme weakness (2), fainted, drowsy, nausea.
<i>Lentinula edodes</i> CA, GA, MN, NC, VA	4 Adults 2.5, 12, 48 hours	Chills, flushing, diarrhea, dizzy, intestinal cramps, sweating, weak, tingly and numb all over, painful hands. Flagellate dermatitis (4), fever.
<i>Leucopaxillus cf albissimus</i> HI	1 Adult 1 hour	Diarrhea, vomiting.
<i>Leucopaxillus gentianeus</i> ?	1 Adult ?	Intestinal cramps, hot flashes, paranoia, horrible taste.
<i>Lycoperdon candidum</i> MI	1 Adult 0.5 hour	Nausea, abdominal pain.
<i>Lyophyllum sp</i> NV	1 adult 3.5 hours	Vomiting, diarrhea, unwell for 12 hours from one bite.
<i>Macrocybe spectabilis</i> HI	1 Adult ?	Vomiting.
<i>Marasmius nigrodiscus</i> CT	1 Adult ?	Acute nausea after 0.75 tsp consumed for research.
<i>Marasmius oreades</i> OR	1 Adult 5-6 hours	Vomited three times and then more vomiting for several days.
<i>Megacollybia rodmanii</i> CT	1 Adult 5.5 hours	Diarrhea, fatigue.
<i>Morchella cf americana</i> MI, OH	2 Adults 5 hour, 0.3 hour	Diarrhea, cramps, sweating, spasms, vomiting, nausea (had eaten for 30 years, no ill effect). One person went into anaphylactic shock 2 years in a row right after meal.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table X (continued): Gastrointestinal Syndromes from Cooked Mushrooms

<i>Morchella sp</i> ID (2), MI (9), WA (2), MO (2), NY	14 Adults 1-4 hour (12 hour)	Vomiting (7), diarrhea (6), nausea (6), bloating, unsteady, severe back pain, fever, confusion, abdominal pain (5), oral irritation. Violently ill if he eats just one, after eating them for years, with no problem. Muscle weakness with tremors. One case of severe diarrhea, nausea, abdominal pain followed by hypoglycemic shock and acute renal failure. Chills, diarrhea, intestinal cramps, sweating, vomiting, nausea, weak on two occasions after eating them for years (3).
<i>Morchella elata</i> clade BC, CA (2), ID (2), MI, WA	8 Adults 1-8 hours	Vomiting 5 hours after meal (2 meals in a row) on morels eaten previously for years without adverse effect. Double vision, GI upset, tremors after years with no problem (1). Vomited and violently ill on fourth day after morels in pasta three days in a row. Nausea (4), vomiting (3), diarrhea (4), intestinal cramps (4), weakness (2), salivation, dizzy, hallucinations, chills, fever, sweating, disoriented, gas, terrible gas, bloating.
<i>Morchella tomentosa</i> WY	1 Adult ?	Severe gastrointestinal distress, bloody stools.
<i>Omphalotus illudens</i> GA, KS, ME (5), NC, NJ, NY, ON, MN	23 Adults, 1 child 0.5-3 hour	Vomiting 16x over 8 hours (2). intestinal cramps (16), vomiting (20), nausea (19), GI distress, then vomiting for 1.5 hour (1), chills (3), sweating (4), weak (8), weakness for 1 week, headache, diarrhea.
<i>Paxillus involutus</i> BC	1 Adult ?	Hospitalized, no details.
<i>Pholiota squarrosa</i> group OR	1 Adult 1 hour	Bloating and cramping, vomiting.
<i>Pleurocybella porrigens</i> BC, OR	2 Adults ?, 2 hours	Feeling stoned, itchy, hot and cold flashes, sweating, vomited then better. Second case gastrointestinal upset, no vomiting or diarrhea.
<i>Pleurotus ostreatus</i> CA, NC	2 Adults 2, 5 hours	After years of eating oyster mushrooms safely, one meal led to cramps, nausea, and next meal led to worse cramps and nausea. Second man awoke hot, heart racing, “out of body tripping”, anxious, then bloating and gas for days.
<i>Pleurotus sp</i> CO, MI, SD, UT	3 Adults 3-10 hours	Cramps followed by watery then bright red bloody diarrhea. Diarrhea (3), vomiting (2), dry heaves, stomach and intestinal cramps (2), fever (101F), nausea after consuming 1 cup cooked (2).
<i>Polyporus squamosus</i> MI	1 Adult 7 hours	Nausea, vomiting.
Puffball, small CO	1 Adult 1 hour	Gas then nausea and cramping, four others not ill.
<i>Pycnoporellus alboluteus</i> CO	1 Adult 7 hours	Cramping, vomiting, diarrhea for 4-5 hours, intestinal irritation for a few days.
<i>Ramaria rasilispora</i> var <i>scatesiana</i> WA	1 Adult 12 hours	Diarrhea.
<i>Ramaria sp</i> (yellow) CA	1 Adult ?	Acute gastrointestinal distress.
<i>Ramariopsis astrella</i> (form of <i>R. kunzei</i>) ME	1 Adult 5 hours	Intense upper GI distress, AST liver enzymes 10x normal after meal of 4 corals.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table X (continued): Gastrointestinal Syndromes from Cooked Mushrooms

<i>Russula brevipes</i> NJ	1 Adult 6 hours	Vomiting and nausea.
<i>Russula cf brevipes</i> & <i>R. cf virescens</i> SC	1 Adult 3 hours	Vomiting, diarrhea, nausea, sweating, chills.
<i>Russula decolorans</i> CO	2 Adults ?	Increasing gastrointestinal distress over several days (2).
<i>Russula sp</i> (red) FL, CO (3), MI	6 Adults 4-6 hours	Nausea (4), diarrhea (2), vomiting (4). Vomiting and diarrhea for 24 hours.
<i>Scleroderma cf cepa</i> OR (2), WA	4 Adults ?, <1 hour	Hospitalized with severe gastrointestinal distress. Two vomited after eating ½ mushroom each. Sweating, vomiting, weakness, hypotension, malaise.
<i>Scleroderma cf citrina</i> ME	3 Adults ?	Cramping (3), vomiting (3), diarrhea (3).
<i>Scleroderma sp</i> MA, ME	4 Adults 0.5-3 hours	Abdominal pain (4), sweating (3), vomiting (4), diarrhea (4), fainting.
<i>Spathularia spathulata</i> MA	1 Adult 10 hours	Vomiting, nausea.
<i>Stropharia rugosoannulata</i> PA	1 Adult ?	Diarrhea, intestinal cramps.
<i>Suillus sp</i> WI	2 Adults 4 hours	Diarrhea (2), vomiting (2), weakness (2), headache (2), dizzy (2).
<i>Tricholoma focale</i> CO	1 Adult ?	Severe gastrointestinal distress.
<i>Tricholoma cf pessundatum</i> CO	1 Adult 0.5 hour	Gastrointestinal distress.
<i>Tuber gibbosum</i> ID	1 Adult 6 hours	Felt cold, stomach uneasy, diarrhea 3x, fainting 3x.
<i>Tylopilus eximius</i> MA, ME (2), VT	4 Adults 2-3 hour	Diarrhea (3), Dizzy, Cramps for 24 hours, disoriented, vomiting (3), nausea (3), weakness.
<i>Verpa bohemica?</i> MT, OR	6 Adults 0.5 hour	Feeling bloated (1), nauseated (4), light headed and tremors next day (1) – restaurant meal. Couple consumed large meals for several days then severe diarrhea (1), woozy (1).

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table XI

GI Distress Cases Involving raw, unknown preparation, and/or spoiled mushrooms

Species and Location ¹	Number & onset ²	Raw or Spoiled?	Symptoms ¹
<i>Agaricus augustus</i> OR, WA	2 Adults, 1 child ?	Raw and unknown prep	Gastrointestinal distress (2), weakness for days (2), diarrhea.
<i>Agaricus bisporus</i> CA	1 Adult <1 hour	Unknown prep	Chills, diarrhea, intestinal cramps, throat swelling.
<i>Agaricus</i> (Portobello) CT	1 Adult 15 hours	Some Raw & more Cooked	Excessive stomach bloating, blood in urine, unwell for several days, lost 8 pounds.
<i>Agaricus cf hondensis</i> WA	! Adult ?	Unknown Prep	Nausea, vomiting.
<i>Agaricus placomyces</i> MI	1 Child 7.5 hours	Raw	Abdominal pain, vomiting, fever.
<i>Agaricus sp</i> CO, WA	2 Child 1, 8 hour	Raw	Vomited (2).
<i>Agaricus xanthodermus</i> CO (3), ID, NV	3 Adults 3 children 0.5-1.5 hour (10 hours)	Raw	nausea (3), vomiting (3), diarrhea (3), abdominal cramps (2), vomiting for 6 hours, staring like high, dizzy.
<i>Agaricus cf xanthodermus</i> CO, ID	1 Adult, 1 child 1.5 & 2 hours	Raw	Vomiting 3-4x (2), diarrhea
<i>Amanita frostiana</i> MA	5 Adults 2 hours	Raw	Sixteen hours of explosive vomiting (3), severe stomach cramps (3), cramps (2), feeling awful (2) from seeking <i>A. muscaria</i>
<i>Amanita cf pantherina</i> OR	1 Adult ?	Unknown prep.	Nausea, vomiting, acting strange, aggressive.
<i>Armillaria cf mellea</i> WI, PA	2 Adults ?, 6-8 hours	Raw	Chills, diarrhea, vomiting, weakness. Intestinal discomfort and nausea after small bite.
<i>Armillaria cf ostoyae</i> VT	1 Adult 3-5 hours	Raw	Nausea, vomiting, diarrhea.
<i>Armillaria tabescens</i> SC, AL	3 Adults, 2 child 8-10 hours	Raw & unknown prep (1)	Diarrhea (5), Intestinal cramps (4), vomiting (4), weak (4), headache, sinus problems.
<i>Armillaria cf solidipes</i> ?	1 Adult ?	Unknown Prep	Ill.
<i>Auricularia auricula</i> CO	1 Child 1-2	Raw	Vomited 2x.
<i>Boletus edulis</i> WA	1 Adult 7 hours	Very wormy, cooked	Flushing, dizzy, vomiting, weak, headache, stomach pains for three days.
<i>Boletus [Rubroboletus] pulcherrimus</i> CA	1 Adult 1+ hours	Tasted raw 2 times	Nausea, gastro-intestinal distress and dizzy for a few hours after tasting and spitting, or after simply touching of tongue.
<i>Boletus [Butyriboletus] regius</i> OR	1 Adult 0.5 hour	Raw	Mycologist took one bite of raw mushroom to test bitterness and lips swelled for ½ hour.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in average

Table XI (Continued)

GI Distress Cases Involving raw, unknown preparation, and/or spoiled mushrooms

<i>Boletus cf spadiceus</i> CO	1 Adult 5 hours	Lightly cooked	Brief nausea, vomiting, diarrhea.
<i>Calvatia gigantea</i> WI	1 Adult 3 hours	yellowed from 24 hours in warm room, then cooked	Diarrhea, intestinal cramps, nausea, temporary elevated live enzymes.
<i>Cantharellus formosus</i> OR	1 Adult 1 hour	cooked moldy mushrooms	Chills, diarrhea, hallucinations, disorientation, dizzy, weakness.
<i>Cantharellus sp</i> WA	1 Adult 1 hour	Raw	Chills, salivation, intestinal cramps, vomiting, headache.
<i>Chlorophyllum cf brunneum</i> CA (2), WA	3 Adults ?, 6-16 hours	Unknown prep (3)	Gastro-intestinal distress, bloody diarrhea, diarrhea (2), vomiting (2), intestinal cramps, sweating, nausea.
<i>Chlorophyllum molybdites</i> CA (4), CO (11), FL, HI (12), KY, MI (12), MN (2), NV, NY, PA, TN	37 Adults 11 Children 0.5-5 hours	Raw (45), Unknown prep (3)	Vomiting 7x (5), vomiting 10-15x (2), vomiting for 24 hours from one bite (6), pinkish urine, vomiting (30), diarrhea (17), greenish diarrhea (2), bloody diarrhea (3), flushing (3), salivation, dizzy, intestinal cramps (10), sweating (6), disorientation (2), muscle spasms (4), chills (5), nausea (15), weakness (5), anxiety, fussy, gassy, hallucinations, bloody sputum, hypotension (2), rapid, dry heaves, headache (2), elevated creatinine, elevated bilirubin.
<i>Chlorophyllum sp</i> MI	1 Adult 2 hours	Raw	Tingling, headache, nausea.
<i>Clitocybe dealbata</i> NY	1 Adult 0.25 hour	Raw	Racing heart, painful spasms in back of throat, profuse sweating
<i>Clitocybe sp</i> WA	1 Adult ?	Unknown prep	Vomiting.
<i>Coprinellus micaceus</i> ?, OR	2 Child, 1 Adult ?, 8 hours	Raw	Vomiting 5-6x (2 children). Nausea, vomiting, diarrhea.
<i>Coprinopsis atramentaria</i> CO	1 Adult 5 hours	Raw	Dizzy, weak, sharply increased heart rate.
<i>Coprinus comatus</i> MI	1 Adult 4 hours	Unknown prep	Hypotension, tachycardia, diarrhea, vomiting.
<i>Cortinarius sp</i> WA	1 Adult ?	Unknown prep	Gastrointestinal upset.
<i>Cortinarius cf vanduzerensis</i> WA	1 Adult ?	Unknown prep	Ill, but no details.
<i>Entoloma sp</i> CO	1 Child 0.5 hour	Raw	Vomiting and diarrhea.
<i>Gomphus (Turbinellus) floccosus</i> WV	1 Adult "hours"	Unknown prep	Twenty hours of vomiting, diarrhea, dizziness.
<i>Grifola frondosa</i> NC, MO	4 Adults ?, 0 hours	Unknown prep (3)	Several hours of flushing and tachycardia (2 from one case). Chills, dizzy, sweating, weakness, tingling mouth and numb throat (2) from second case.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table XI (Continued)

GI Distress Cases Involving raw, unknown preparation, and/or spoiled mushrooms

<i>Gymnopilus cf sapineus</i> GA	2 Adults 2 hours	Unknown prep	Explosive burning diarrhea (2).
<i>Hydnum cf repandum</i> WA	1 Adult ?	Kept 1 week in trunk, eaten	Gastrointestinal cramps so severe that victim passed out.
<i>Hypoholoma fasciculare</i> WA	1 Child 5 hours	Raw	Diarrhea for 2 days, stool burns skin.
<i>Inocybe geophylla</i> CA	1 Child 14 hours	Raw	Rash, vomiting.
<i>Laccaria laccata</i>	1 Adult 6 hours	Refer 5 days after cooking	Diarrhea.
<i>Lactarius cf luculentus</i> WA	1 Adult ?	Unknown prep	Vomiting.
<i>Laetiporus gilbertsonii</i> CA	2 Adults ?	Lightly cooked	Vomiting (2), spitting up blood (2).
<i>Laetiporus sulphureus</i> FL	1 Adult 1 hour	Unknown prep	Chills, hallucinations, dizzy, intestinal cramps, disoriented, muscle spasms, drowsy, nausea, weakness.
<i>Leccinum cf aurantiacum</i> NH	1 Adult 6 hours	Lightly cooked	Very severe diarrhea, intestinal cramps, sweating, vomiting, nausea, weakness.
<i>Leccinum cf alaskanum</i> AK	1 Adult 6-10 hours	Raw	Diarrhea, salivation, intestinal cramps, nausea, vomiting, drowsy, weakness.
<i>Leccinum cf insigne</i> CO (4)	6 Adults 1-3 hour	Raw	Diarrhea for 24 hours, diarrhea for 6 hours (3), vomiting, nausea (2). for 5-6 hours, headache, abdominal pain.
<i>Leccinum cf insigne</i> + <i>Suillus brevipes</i> CO	1 Child 0.5 hour	Raw	Vomited 4x.
<i>Leccinum sp</i> CO, WA	3 Adults 0.5, ? hour	Lightly cooked and raw - dried	Nausea, vomiting 3x, watery diarrhea. Mild intestinal distress (2).
<i>Lentinula edodes</i> AL, CA (3), FL, GA (2), IN, LA, NY, OH (2), OR (2), SC, TX, VA, WA, ? (2)	20 Adults 0.2, 0.5 hour, 10 hours, 24-84 hours	Lightly cooked (5) raw (13) Unknown (2)	Nausea (3), chills (3), flushing (3), unspecified rash (4), stinging ears and face, diarrhea (5), intestinal cramps (3), sweating, muscle spasms (2), drowsy (2), weakness (3), vomiting, diarrhea, headache, vomiting and diarrhea from one bite raw. Flagellate dermatitis (14), odd stomach cramps, tightness in chest twice after Chinese restaurant meals, diarrhea, intestinal cramping. Note: dermatitis lasting up to 7 days (at least 3).
<i>Lentinula edodes</i> MT	1 Adult 2 hours	Contaminated with listeria?	Flushing, salivation, dizzy, sweating, disoriented, muscle spasms, nausea, weakness, painful tingling fingers.
<i>Lepiota cristata</i> PA	1 Adult 2.5 hours	Prep unknown	"Gastrointestinal distress."
Purchased <i>Leucangium carthusianum</i> PA	4 Adults 0.25 hour	Raw infused in soup	All four suffered Chills, fever, diarrhea, intestinal cramps, nausea, intense burning of GI tract, 3 days vomiting and diarrhea. Contamination suspected.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table XI (continued)

GI Distress Cases Involving raw, unknown preparation, and/or spoiled mushrooms

<i>Leucoagaricus americanus</i> OH	1 Adult 4 hours	Raw	Chills, hallucinations, disorientation.
<i>Leucoagaricus leucothites</i> ID	Child 3 hours	Raw	Vomiting.
<i>Lycoperdon candidum</i> MI	Child ?	Raw	Nausea, vomiting.
<i>Megacollybia platyphylla</i> VT	Adult 0.5 hour	Raw	Vomiting and diarrhea for 6 hours.
<i>Morchella sp</i> ID (2), MI, MN, MT (6)	11 Adults ?, 0.5-3 hour	Raw (6), unknown prep (3), lightly cooked (1)	Feeling unwell, nausea (6), vomiting (9), diarrhea (4), swollen nasal passages, bloated feeling, chills (2), burning throat, elevated BUN, intestinal cramps, disoriented, drowsy, sweating.
<i>Morchella sp</i> (almost raw, old) CA	2 Adults 1-2 hours	Lightly cook, refer 5 days	felt ill (2), vertigo next day, hospitalized with low blood pressure, low heart rate, 2 days later fluid and blood clots in lungs.
<i>Morchella (elata clade)</i> MT, ID (2), WA	6 Adults, 1 child 0.5-2 hours	Raw (1 case unknown prep)	Vomiting (6), diarrhea (5), watery diarrhea, severe gastrointestinal distress.
<i>Morchella (esculenta clade)</i> MI, OH, PA	4 Adults 0.3-1.5 hour	Raw & unknown (2)	Nausea, vomiting (3), diarrhea, hypotension, hypothermia, drowsy for 2 days (3), vertigo (2), burning rash, flushing, dizzy.
<i>Omphalotus illudens</i> PA	1 Adult ?	Unknown prep	Vomiting, intestinal cramps, diarrhea.
<i>Pholiota</i> WA	1 Adult 8-10 hours	Raw?	Vomiting after mistaking for a hallucinogen.
<i>Pleurotus ostreatus</i> WA, ?	2 Adults Fast, 2 hour	Raw	Vomiting (2), nausea, tingling in mouth.
<i>Psathyrella gracilis</i> (suspected) MI	1 Child 1-2 hours	Raw	Salivation, hallucinations
<i>Russula sp (red)</i> CO (2)	2 Adults 4-8 hours	Raw & Unknown prep	Severe vomiting (2), diarrhea (2), intestinal cramps (2).
<i>Sparassis crispa</i> OR	1 Adult ?	Prep unknown	Vomiting.
<i>Scleroderma cepa</i> CA	1 Adult 0.5 hour	Unknown prep	Vomited 8x, nausea, intestinal cramps.
<i>Scleroderma cf citrina</i> OR	1 Child 1 hour	Raw	Vomiting.
<i>Scleroderma sp</i> TX	1 Adult 1-2 minutes	?	Vomiting, diarrhea, salivation, chills, dizzy, sweating, disoriented, headache, low blood pressure, low heart rate, dry mouth, fainting, difficulty breathing.
<i>Sparassis radicata</i> WA	1 Adult ?	Unknown prep	Severe vomiting.
<i>Stropharia rugosoannulata</i> MN	1 Adult 1 hour	Unknown prep	Hallucinations.
<i>Suillus americanus</i> IA	1 Adult 4 hours	Cleaned and refrigerated 3 days, cooked	Chills, diarrhea, intestinal cramps, vomiting, nausea, weakness.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in average

Table XI (continued)

GI Distress Cases Involving raw, unknown preparation, and/or spoiled mushrooms

<i>Suillus cavipes</i> ID	2 Adults 0.1 hour	Frozen mushrooms, pickle, cooked	Mouth "on fire" for 0.5 hour
<i>Suillus granulatus</i> CT	1 Adult 0.75 hour	Very buggy & old, cooked	Diarrhea and weakness.
<i>Suillus sp</i> WA	1 Adult ?	Frozen raw, then cooked	Vomiting, diarrhea, low blood pressure.
<i>Tricholoma myomyces</i> ON	1 Adult 4 hours	Raw	Major diarrhea.
<i>Verpa bohemica</i> ID, MI	3 Adults 0.1 hour, 1 hour	barely cooked, raw	Immediate flushed feeling (2), vomiting (2), vomiting for 16 hours.
<i>Volvariella esculenta</i> MI	1 Adult ?	?	Abdominal pain, nausea, vomiting, diarrhea, respiratory depression.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in averageTable XII
Poisonings of Animals

Species and Location ¹	Animal & onset ²	Symptoms ¹
<i>Agaricus cf meleagrif</i> ID	1 Dog ?	Vomiting and diarrhea, ALT 387.
<i>Agaricus cf placomyces</i> MD	1 Dog ?	"Severely afflicted."
<i>Agaricus sp</i> CO	1 Dog ?	Shaking, vomited grass and mushroom bits
<i>Agaricus xanthodermus</i> suspected NV	1 Dog 2 hour	Vomited 4-5 times.
<i>Agrocybe sp</i> MD (2)	2 Dogs ?	Vomiting, "not doing well."
<i>Amanita aprica</i> WA (2)	2 Dogs ?, 2 hours	Excessive drooling, vomited 2x, muscle spasms, poor hindquarter control. "Typical ibotenic acid/muscimol symptoms."
<i>Amanita bisporigera</i> VT, NY (3)	4 Dogs ?, about 12	Case 1 No details. Case 2 vomiting, lethargy, severe liver abnormalities, low blood sugar, low blood pressure, slow coagulation, recovered day 10. Case 3 two dogs died.
<i>Amanita cf bisporigera</i> MI, MN, MT	3 Dogs >2.5 hour, ?, 32 hours	Vomiting (2), lethargy (2), diarrhea, chills, salivation, bleeding from mouth, motionless, liver failure (2), death about 24 hours (1), death about 48 hours (1), unknown outcome (1).
<i>Amanita cf cokeri</i> NC	1 Dog ?	Diarrhea, vomiting, drowsy, death on day 3.
<i>Amanita cf cothurnata</i> OH	1 Dog ?	Drooling, ataxic, unequal pupil size, disoriented.
<i>Amanita farinosa</i> MI	1 Dog 1 hour	Diarrhea, vomiting, salivation, nausea from ½ mushroom.
<i>Amanita gemmata</i> WA, MA	Dog ?, 14-15 hours	Classical ibotenic acid/muscimol symptoms, then passed out. Lethargic next day. Salivation, vomiting, drowsiness, weakness.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in average

Table XII (continued): Poisonings of Animals

<i>Amanita muscaria</i> or <i>pantherina</i> ? CO (4)	4 Dogs ?, ?, 2-3hours	Tremors (2), weak hind legs, constricted pupils, salivating, ataxia, collapsed, lethargic, vomiting, vomited lots of mushrooms, “out of it” for 17 hours, coma, death (1).
<i>Amanita muscaria</i> CT, DC, NJ, NL, NY, OH, PA, WA (2)	10+ Dogs 1-4.5 hours	Diarrhea (4), watery diarrhea, salivation (6), disoriented (5), muscle spasms (4), vomiting (4), drowsy (2), tachycardia (2), weak, seizure, in coma for several hours. One case coma and death where treatment unfortunately included two doses of atropine. Second case of death with just supportive treatment.
<i>Amanita muscaria</i> + <i>Panaeolus</i> (?) WA	Horse	Video posted of horse “under the influence”
<i>Amanita ocreata</i> ?, CA (2)	3 Dogs ?, 7.5 hours	Diarrhea (3), disoriented (2), nausea, weak, muscle spasm, liver failure, death (2) within 35 hours.
<i>Amanita ocreata</i> CA	1 Cat 12-16 hours	Diarrhea, salivation, intestinal cramping, disorientation, vomiting, weakness, death.
<i>Amanita ocreata</i> or <i>A. phalloides</i> suspected CA (9)	13 Dogs ?, 6 hours, 10-12 hours	Violently ill (2), vomiting (7), salivation (6), nausea (5), drowsy, weak (2), diarrhea, fever, disoriented, grand mal seizure, bleeding, ALT and PT not measurable, acute liver failure (3), kidney failure (1), extensive intestinal tract lesions (1), death (8), death from bleeding out (2), survived (2), unknown outcome (1).
<i>Amanita pantherina</i> WA (9), OR, PA	12 Dogs 0.25-3, ?	Almost stopped breathing (2), tremors (5), seizure (2), heavy salivation (4), mild hypothermia (2), vomiting (5), diarrhea (4), lethargic (2), shivering, slow response to stimuli (2), weak in hind legs, obtunded, bradycardic. Death in one old, weak dog.
<i>Amanita pantherina</i> and other species WI	1 Dog ?	Diarrhea, salivation, cramps, disorientation, vomiting, drowsy. Vomited 2-3 cups of mushroom material of several species. Death after 7-8 hours.
<i>Amanita phalloides</i> ?, CA (14), OR, MA	16 Dogs 5.5 hours, 6-10 hours, 12 hours, ?, 24 hours	Chills, fever (3), repeated vomiting (9), diarrhea, salivation, disoriented, muscle spasms (2), lethargic (4), vomiting, bleeding from nose and mouth, blood in urine, GI tract, lungs, liver damage (13), blood not clotting, sepsis, unresponsive, death (9), death after 2 days (1), death after 3 days (3). One dog survived when owner forced prompt vomiting. One dog survived bloody diarrhea and very elevated liver enzymes after gall bladder aspiration. A different dog did not survive gall bladder aspiration.
<i>Amanita phalloides</i> CT	Horse ?	Died after consuming one mushroom, no details
<i>Amanita sp</i> (white) NC	Dog ?	High platelets, abnormal white cells, normal LFTs.
<i>Amanita sp</i> suspected MN, NY, VI	3 Dogs ?	Vomiting, loss muscle and bowl control, internal bleeding, bloody stool, very elevated LFTs, brain swelling, seizures, death in 9 hours. NY case - no details except death. MN case – death.
<i>Armillaria cf mellea</i> MD	1 Dog ?	Vomiting, weakness, “out of it.”
<i>Astraeus hygrometricus</i> CA	1 Dog ?	Diarrhea.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

Table XII (continued): Poisonings of Animals

<i>Boletinellus meruliooides</i> IA	Dog ?	Not eating, lethargic, vomiting.
<i>Calvatia cyathiformis</i> OR	Dog Immediate	Bit into mature puffball releasing spore cloud and losing breath, then alternating lethargic with apparent tripping.
<i>Calvatia cyathiformis</i> NC	Horse ?	Horse high then lame, mushroom observed in water pail may or may not have been cause.
<i>Calvatia sp</i> PA	1 Dog ?	Vomiting.
<i>Chlorophyllum molybdites</i> CA, CO, IL, PA, TN, TX	6 Dogs ?, 0.5-2.5 hour	Diarrhea (5), apparent cramps (2), weak (2), drooling, vomiting (2), malaise (2), apatite loss, head drooping, disoriented, seizure.
<i>Chlorophyllum molybdites</i> KS	Horse ?	Inflamed, ruptured stomach, death (horses cannot throw up). Note in KS, cows known to eat this without adverse effects but puppies have died.
<i>Chlorophyllum olivieri</i> WA	1 Dog ?	Vomited.
<i>Clathrus columnatus</i> CA	1 Dog ?	Died.
<i>Clitocybe sp</i> BC, CA (2), CO, MD, NC, PA	7 Dogs 6-12 hours, ?	Hyper salivation (5), panting, restless, dizzy, cramping, disoriented (2), muscle spasms, vomiting (3), horrible diarrhea (4), unable to stand, sweating, shaking. One case bloody diarrhea, vomiting, bradycardia.
<i>Conocybe albipes</i> & <i>C. apala</i> WA	1 Dog ?	Vomiting and diarrhea with some blood in feces.
<i>Conocybe cf apala</i> CA	1 Dog ?	Liver failure.
<i>Conocybe sp?</i> Lumpy puffball? OR	2 Dogs ?	Dead (2), elevated LFTs. Cause unclear. Conocybe and lumpy puffball found in yard later.
<i>Coprinopsis atramentaria</i> WA	1 Dog ?	Tremors.
<i>Coprinopsis sp</i> WA	1 Cat ?	Cat repeatedly digs up and consumes mushrooms growing at site of old poplar tree – goes crazy, then vomits.
<i>Entoloma sp</i> NC	1 Dog 12 hours	Fever, diarrhea, hallucinations, salivation, vomiting, disoriented.
<i>Galerina?</i> in lawn WA (1 case)	Cat and dog 3-4	Vomiting, weakness.
<i>Galerina sp</i> NY	1 Dog ?	Diarrhea, vomiting, severe liver necrosis, death. Positive amatoxin test.
<i>Galerina marginata</i> CT	1 Dog ?	Diarrhea, salivation, vomiting, extreme thirst, urination, altered liver and kidney function same dog, two occasions.
<i>Galerina cf marginata</i> CA, CO	2 Dogs ?, >1 hour	Hyper salivating and vomiting, bloody vomit, bloody stools, death. Second dog vomiting.
<i>Gymnopilus sp</i> CA	1 Dog ?	Puppy at vet in critical care after consuming large orange <i>Gymnopilus</i> .
<i>Gyromitra esculenta</i> MI	1 Dog 12 hours	Diarrhea, vomiting, BUN 84.2, Creatinine 5.8, fever (102.4 F), tense, painful abdomen, scleral hemorrhage, hyphemia, dark mucous membranes, very dark blood, unable to stand, euthanized on day 4 (from cooked mushrooms that made whole family ill).
<i>Helvella cf vespertina</i> MD	1 Dog ?	Diarrhea, salivation, projectile vomiting, weakness.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in average

Table XII (continued): Poisonings of Animals

<i>Hypholoma fasciculare</i> WA	1 Dog ?	Seizures.
<i>Inocybe fastigiata</i> NC	1 Dog 1 hour	Diarrhea, salivation, intestinal cramps, vomiting, weakness. Death at 5 hours after consuming several specimens.
<i>Inocybe geophylla</i> var. <i>lilacina</i> ME	Dog 2 Hours	Diarrhea, salivation, cramps, vomiting, disoriented, weak, lacrimation.
<i>Inocybe cf lilacina</i> WA	Dog ?	Vomiting and salivating heavily.
<i>Inocybe mixtilis</i> BC, WA	2 Dogs ?, 2 hours	Case 1 - found dead. Case 2 - violent vomiting (same dog two occasions one week apart).
<i>Inocybe mixtilis</i> and <i>I. albodisca</i> WA	2 Dogs ?	Dog one died on day 1, dog two died after 1 week. At least one had liver damage.
<i>Inocybe</i> (red blushing) WA	1 Dog ?	Vomiting.
<i>Inocybe</i> sp AB, BC, CA, IL, MD, MN, MT, NH, NY (2), OR, WA (2)	12 Dogs ?, ?, ?, 0.1-4 hours	Death (2), no details (2); vomiting (9), diarrhea (6), hyper salivation (5), tremors, seizure, mild elevated ALT, weak collapsed, severe bradycardia, watery eyes (2), coma, pancreatitis. Critically ill with muscarinic symptoms (2) and recovered with atropine treatment.
<i>Lactarius cf deliciosus</i> ?	Dog ?	Lethargic, not eating or drinking, vomited, urinated in bed, extreme elevated LFTs. White mushroom reported but photos of <i>Lactarius</i> .
<i>Leratiomyces ceres</i> CA, WA	2 Dogs ?	Lethargic, no appetite. "Ill at vet."
<i>Lepista sordida</i> AL	1 Cat ?	Lethargic, vomited, unable to eat, drink or stand.
<i>Lepista sordida</i> or <i>L.</i> <i>tarda</i> IA	1 Dog ?	Diarrhea for three weeks.
<i>Leucoagaricus</i> <i>leucothites</i> ?	Dog	Vomiting.
<i>Leucoagaricus</i> <i>rubrotinctus</i> PA	1 Dog ?	Vomiting.
<i>Lepiota</i> sp IL	1 Dog ?	Severe seizures.
<i>Lepiota cf subincarnata</i> AR	2 Dogs ?	Fever, salivation, dizzy, intestinal cramps, disoriented, vomiting, drowsy, nausea, weakness, blood not clotting, liver failure, death (2 with all above symptoms).
<i>Lepiota subincarnata</i> OR, BC	2 Dogs ?	Death from massive liver damage (2).
<i>Leucoagaricus</i> <i>leucothites</i> OR	1 Dog ?	Lethargic for a day or so.
<i>Lycoperdon perlatum</i> AZ	1 Dog "hours"	Dog bit into over mature puffball and mass of dark green gleba then became very sleepy, lethargic and no appetite.
<i>Lysurus cruciatus</i> ?	1 Dog ?	Vomiting and not eating.
<i>Morchella</i> sp ?	1 Dog ?	Dog died after consuming pile of morels collected by its owner.
<i>Paneolina foenicicii</i> WI	1 Dog 3 hours	Nausea, fatigue.
<i>Paxillus involutus</i> OR, WA	2 Dog ?, 0.5-0.75 hours	Vomiting for 2 hours, unsteady. Vomiting and diarrhea for 2 days.

¹Number in parentheses is number of times observed²Number in parentheses is one report of unusually long or short onset not included in average

Table XII (continued): Poisonings of Animals

<i>Phyllotopsis nidulans</i> FL	1 Dog ?	Neurological problems, liver damage.
<i>Polyporus squamosus</i> MI	1 Dog ?	Profuse vomiting and diarrhea, then 2 seizures at vet, unresponsive, constricted pupils, extensor rigidity, low white blood cell count.
<i>Russula cf nigricans</i> ME	1 Dog 1-4 hours	Chills, diarrhea, salivation, dizzy, intestinal cramps, muscle spasms, vomiting, drowsy, nausea, weakness, visual impairment after consuming about 15.
<i>Russula cf pectinata</i> IL	1 Dog 1 hour	Diarrhea, vomiting, fever of 105F.
<i>Russula sp</i> WA	1 Dog ?	Hyperactive.
<i>Scleroderma cepa</i> group OR (2), NV, WA (3)	6 Dogs ?, 1.5 - 2 hours	Vomiting (5), dizzy, staggering, acts like wants to vomit after ½ mushroom, lower eye lid down and red lining of eye showing.
<i>Scleroderma cf citrina</i> ?, CA, MO	3 Dogs ?, immediate, 1 hour	Loopy and had trouble walking for several days, vomited (2), diarrhea, intestinal cramps, weakness, rapid heart rate.
<i>Scleroderma sp</i> AR, CA (2), MD, MS. OR, ?	9 Dogs ?, 3-4 hours	Hyper salivation (3), diarrhea (5), disorientation (2), muscle spasms (3), vomiting (9), drowsy (2), lethargic, weak (2), elevated heart rate, death (1).
<i>Suillus albivelatus</i> AB	1 Dog 0.5 hour	Diarrhea, salivation, intestinal cramps, disorientation, vomiting.
<i>Suillus luteus</i> WA	1 Dog < 1 hour	Vomiting, drooling.
<i>Suillus sp</i> IL, NJ	2 Dogs ?	Hyper salivation, unable to stand, tremors, 2 seizures, diarrhea, drinking lots of water. Second dog vomited.
<i>Tricholoma myomyces</i> group, MI	2 Dogs 1.5 hour	Diarrhea (2), salivation (2), vomiting (2), weakness (2).
<i>Tulostoma sp</i> NV	5 Dogs ?	Terrible diarrhea for 2 weeks (5), elevated ALT (3).
<i>Xerula sp?</i> MD	1 Dog 1 hour?	Vomiting and diarrhea, death at vets. A <i>Xerula</i> species found in area.

¹Number in parentheses is number of times observed

²Number in parentheses is one report of unusually long or short onset not included in average

References

Beug, Michael W; Shaw, Marilyn; and Cochran, Kenneth W. 2006. Thirty Years of Mushroom Poisoning Reports: Summary of the Approximately 2,000 Reports in the NAMA Case Registry. *McIlvainea* 16 (2): 47-68

Cochran, Kenneth W. 1985. Mushroom Poisoning in 1984. *Mushroom* 3 (2): 30-33