



# TOX-<sup>7</sup>N-KY

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## Provider Update

## Spring and Summer Plants

By Jan Scaglione, PharmD, MT, DABAT and Sara Sans, PharmD

Spring and summer bring many flowers and flowering plants and while they may be pretty, many may also contain toxic compounds poisonous to humans and pets. Toxicity may result from ingestion, topical exposure to the skin and eyes, inhalation, or by a combination of these. Specific parts of a plant may contain toxic compounds or the entire plant may be toxic. Below are just a few selected spring flowering plants that can be poisonous to humans.

### Poison Hemlock



Poison Hemlock (*Conium maculatum*) is a deceptively delicate looking plant with tall, lacy white flowers often confused with Queen Anne's lace, wild parsnip, or parsley.<sup>1</sup> Famous for executing Socrates in

ancient Greece, poison hemlock is entirely toxic due to potent piperidine alkaloids, coniine and  $\gamma$ -coniceine, which mirror nicotine effects on the autonomic nervous system. These produce an initial excitatory phase followed by dangerous inhibition that can progress rapidly depending on the amount ingested.<sup>2</sup> Clinical effects include nausea, vomiting, salivation, thirst, abdominal pain, tachycardia that may shift to bradycardia, hypotension, headache, confusion, and vision changes, with severe cases leading to rhabdomyolysis, renal failure, seizures, respiratory depression, and muscle paralysis. Management is primarily supportive, including airway stabilization when needed, benzodiazepines for seizures, atropine for bradycardia, and fluids and vasopressors for hypotension. For dermal or ocular exposures, decontamination with water or saline and removal of contaminated clothing is essential to reduce further absorption.<sup>3</sup>

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## Daffodil

Daffodil (*Narcissus*), admired for its bright yellow flowers, bloom in the spring and are often celebrated as a symbol of hope and renewal.<sup>4</sup> Although, all parts of the plant are poisonous, the highest concentration of the toxin, lycorine, is in the bulb. This toxin is a crystalline alkaloid that can trigger nausea, vomiting, diarrhea, and abdominal pain. The sap and bulbs also contain sharp microscopic oxalate crystals, which can cause a burning sensation on the lips, tongue, and throat when ingested and are a frequent cause of contact dermatitis. Human toxicity through ingestion is usually limited to gastrointestinal symptoms. Management is primarily supportive, and patients with mild gastrointestinal symptoms after a small taste can often be observed at home with recommendations to rinse the mouth and drink water or milk. Severe throat pain, drooling, or difficulty swallowing warrant medical evaluation. For eye or skin exposures, decontamination with water or saline and gentle washing is recommended, and topical treatments may help reduce irritation caused by dermatitis.<sup>4,5</sup>



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## Cardiac Glycoside Plants (Foxglove, Lily of the Valley, Oleander)

All parts of foxglove, lily of the valley, and oleander are toxic due to their cardiac glycoside content.

- Foxglove (*Digitalis purpurea*, *Digitalis lanata*) produces tall spikes of bell-shaped flowers that may be purple, white, cream, yellow, pink, or rose and is the natural source of digoxin, an inhibitor of sodium/potassium ATPase pump in myocardial cells.<sup>6</sup>
- Lily of the valley (*Convallaria majalis*) is characterized by smooth oval leaves, fragrant white bell flowers, and small berries that can attract children.<sup>7</sup>
- Oleander (*Nerium oleander*) grows as a fast evergreen shrub or small tree with single or double blossoms in shades of white, pink, red, peach, yellow, or burgundy.<sup>8</sup>

These plants contain potent cardiac glycosides, which can produce nausea, vomiting, diarrhea, confusion, visual disturbances, lethargy, hyperkalemia, and life-threatening arrhythmia.

Toxicity varies with the plant part consumed, the concentration of glycoside present, and the age and health of the exposed individual. Digoxin immunoassays may help confirm exposure but cannot accurately quantify plant derived toxins and should not guide therapy. Decontamination with activated charcoal can be considered if the airway is protected but management is primarily supportive. Digoxin immune Fab may be indicated for severe toxicity indicated by unstable ventricular rhythms, progressive bradyarrhythmia, high grade heart block, refractory hypotension, or hyperkalemia, although the ideal dose for plant related poisonings remains uncertain. Standard ACLS measures apply for patients with significant cardiovascular compromise.<sup>9,10</sup>



Foxglove



Lily of the Valley



Oleander

## Hydrangea



Hydrangea (*Hydrangea arborescens*) is a widely grown shrub known for its clustered blooms. All parts of the plant, particularly the leaves and flower buds, contain cyanogenic glycosides capable of causing toxicity.

Ingestion most often leads to gastrointestinal symptoms such as vomiting, nausea, and diarrhea, and although the plant can theoretically release cyanide, true cyanide poisoning from hydrangea is exceedingly rare in humans. A few cases of allergic contact dermatitis have been linked to a sensitizing compound called hydrangenol, but these reactions remain uncommon. Most exposures can be managed with observation and supportive care.<sup>11</sup>

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## Water Hemlock

Water hemlock (*Cicuta douglasii*) is often mistaken for wild parsnip, turnip, parsley, or ginseng, and typically grows in swamps, wet meadows, and along streams, producing small white flowers and laterally veined leaves.<sup>12</sup> All parts are considered highly toxic, with the greatest concentration of toxin found in the lower stems and roots. The plant contains cicutoxin, a potent noncompetitive GABA antagonist in the central nervous system, leading to uncontrolled neuronal firing.

Ingestion can cause severe gastrointestinal distress, tremors, muscle rigidity, mydriasis, delirium, respiratory depression, cardiac dysrhythmias, and seizures, with symptoms appearing as early as fifteen minutes after exposure. Even small amounts may result in life threatening toxicity. All suspected ingestions require prompt medical evaluation, with activated charcoal considered in appropriate patients and treatment with aggressive supportive care.<sup>13</sup>



## Ericaceae (Rhododendron, Azalea, Mountain Laurel)

Rhododendrons, azaleas, and mountain laurels are shrubs in the Ericaceae family known for their distinctive blossoms. Rhododendrons and azaleas typically produce bell- or funnel-shaped flowers, while mountain laurel forms geometric, bowl-shaped blooms.<sup>14</sup> All parts of these plants are toxic and can produce a dark nectar called “mad honey”, which contains grayanotoxins. Grayanotoxins bind to sodium channels and prevent inactivation, with an onset of symptoms within 30-120 minutes.

Mild to moderate toxicity often presents with nausea, vomiting, and bradycardia, while severe poisoning can cause hypotension, dangerous dysrhythmias, atrioventricular block, seizures, transient blindness, paresthesias, and ataxia. There is no specific antidote, and management is supportive, with home observation appropriate only for taste exposures in individuals without cardiac disease. Symptomatic patients require antiemetics, atropine for bradycardia, and/or a pacemaker if bradyarrhythmias are unresponsive to atropine.<sup>15</sup>



Rhododendron



Azalea



Mountain laurel

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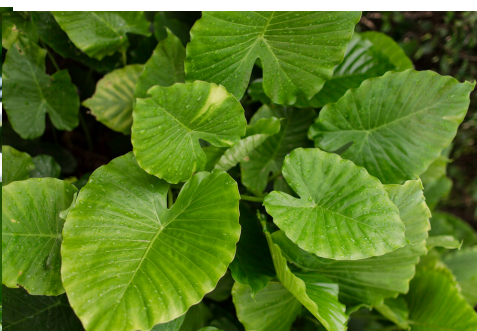
## Oxalates (Calla Lily, Elephant Ear, Hyacinth)

Oxalate containing plants such as calla lilies, elephant ear, and hyacinth are common ornamental plants widely used in gardens and as potted gifts. These plants contain microscopic calcium oxalate crystals in their stems and leaves capable of causing irritation when chewed or handled. Hyacinths also contain additional toxic alkaloids concentrated in the bulbs, which can irritate the skin and cause gastrointestinal upset if ingested.

When the oxalate crystals contact the mouth or throat, they can produce intense burning, difficulty swallowing, and temporary hoarseness, often described as the sensation of chewing ground glass.<sup>16</sup> Minor exposures are managed with immediate mouth rinsing and cold snacks like ice chips or popsicles for comfort, while more serious reactions involving glossitis or laryngeal edema require urgent medical care with airway support, antihistamines, epinephrine, and corticosteroids.<sup>17</sup>



Calla Lily



Elephant Ear



Hyacinth

There are many spring-flowering plants that are partially or wholly toxic to humans and/or animals. Only a selected few have been discussed in this article. Children especially are attracted to colorful things, like flowers, and will eat or attempt to eat most anything they find.

If someone eats a plant that may be toxic, call us at 1-800-222-1222. If the patient has a picture of the plant, it can be emailed to the center for identification. The center can determine whether or not it is poisonous and provide recommendations for management based on the patient's presentation.

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