

1.26 TOXIN INGESTION AND EXPOSURE

Introduction

In 2016, the National Data Poison System captured more than 4 million calls to poison control centers in the United States, 2.2 million of which were calls regarding human exposures. Close to 50% of reported toxin exposures occur in children under age 6 years. Furthermore, ingestion accounts for 75% of all toxin exposures in younger children. In this age group, toxin ingestion is frequently unintentional and involves non-pharmacologic agents, but therapeutic errors in the administration of pharmacologic agents do occur. In adolescents, toxin ingestion is more often intentional or secondary to substance abuse and is associated with greater morbidity and mortality, particularly when pharmacological agents are involved. Pediatric hospitalists often provide immediate care, coordinate care with subspecialists, and arrange for transfer to another facility when appropriate.

Knowledge

Pediatric hospitalists should be able to:

- List the pharmacologic and non-pharmacologic agents commonly ingested by pediatric patients, including how the relative frequency of each changes with age.
- Compare and contrast the risk factors and comorbidities associated with unintentional versus intentional ingestion.
- Describe the signs and symptoms of acute ingestion, including known toxidromes for commonly ingested agents such as salicylates, acetaminophen, narcotics, hallucinogens, stimulants, and others.
- Discuss the risk factors for and presentation of acute and chronic lead poisoning.
- List common laboratory tests that aid the diagnosis or assist with the management of common exposures and ingestions.
- List the agents detected in locally available blood and urine toxicology screens, including the benefits and limitations of this testing.
- Describe the benefits of comprehensive drug screens, attending to which screens are available to be sent from local institutions.
- Explain the indications for and limitations of decontamination therapy, including dermal, ocular, and gastric decontamination methods.
- Identify toxins that have a specific antidote available, including the indications and limitations of each.
- List local resources that provide information and advice regarding pediatric toxin exposure and ingestion management, acknowledging that there is a single phone number in the United States to access all regional poison center resources.
- Summarize the indications and goals of hospitalization, attending to acute and chronic medical needs and psychosocial intervention.
- Describe elements of a safe discharge for patients with toxic ingestion or exposure, including pre-discharge psychiatric and substance abuse evaluation, establishment of outpa-

tient providers, development of a home safety plan, and others as indicated.

- Discuss risk factors for opioid and other prescription medication misuse and abuse.
- Identify locations and other local resources for safe medication disposal in the community.

Skills

Pediatric hospitalists should be able to:

- Obtain a focused history, including detailed information about the type, quantity, timing, and duration of potential exposures and ingestions.
- Perform a focused physical examination, with attention paid to signs and symptoms that may indicate exposure or ingestion of a particular toxin.
- Access institutional and local resources to obtain information and advice regarding the diagnosis and management of acute ingestion.
- Identify patients presenting with common toxidromes and efficiently institute appropriate therapy.
- Identify life-threatening complications of exposures or ingestions, such as cardiac dysrhythmias, respiratory depression, or mental status change, instituting appropriate therapy in a timely fashion.
- Recognize potential co-morbidities associated with intentional ingestion, such as depression, abuse, or other mental illness.
- Order and interpret basic tests, such as serum chemistries, blood gases, and electrocardiograms, and identify abnormal findings that require additional testing or consultation.
- Develop an appropriate treatment plan based on the presumptive or confirmed agent and provide decontamination or antidote therapy when appropriate.
- Determine the appropriate level of care and duration of observation for a given toxin, understanding that some agents may have delayed toxic effects.
- Consult subspecialists, including social work and/or psychiatry, for care of non-accidental ingestion as appropriate.
- Identify patients at high risk of opioid and other prescription medication misuse and abuse, efficiently utilizing state monitoring websites when appropriate.
- Counsel the family/caregivers in safe medication practices and disposal.

Attitudes

Pediatric hospitalists should be able to:

- Realize the importance of counseling the family/caregivers and other professional staff on the possible etiology and outcomes of an exposure or ingestion episode.
- Consider the social environment to determine the risk of future exposure or ingestion and the need for mitigation of risk factors prior to discharge.
- Reflect on the importance of educating the family/caregivers regarding proactive risk reduction measures, such as the safe and effective storage, use, and administration of med-

ications, and potential availability of reversal agents in the home environment.

- Realize the importance of remaining vigilant regarding changes in recreational drug availability and use, as well as safety profile updates on pharmacologic and non-pharmacologic agents.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Lead, coordinate, or participate in the development of systems that integrate hospital, community, and national resources to provide up-to-date and evidence-based information about toxin exposures and ingestions, promoting timely recognition and treatment of both intentional and unintentional events.
- Lead, coordinate, or participate in efforts to educate health-

care providers about the most common exposures and ingestions in the pediatric population.

- Lead, coordinate, or participate in efforts to educate health-care providers and the community regarding ways to mitigate medication errors.
- Lead, coordinate, or participate in efforts to educate health-care providers and the community in safe opioid prescribing during the transition of care from the hospital to outpatient setting.

References

1. Current annual report. National Poison Data System. The American Association of Poison Control. 2017. <http://www.aapcc.org/>. Accessed August 20, 2019.
2. Bryant S, Singer J. Management of toxic exposure in children. *Emerg Med Clin North Am.* 2003;21:101-119. [https://doi.org/10.1016/s0733-8627\(02\)00083-4](https://doi.org/10.1016/s0733-8627(02)00083-4).
3. Osterhoudt K. *Pediatric Toxicology*. New York, NY: Elsevier Mosby 2019.