



RICIN POISONING

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Ricinus communis, the castor oil plant, is a small-statured tree that comes from northeastern Africa and the Middle East. It is non-native to Florida and considered a Category II invasive species by the Florida Exotic Pest Plant Council because it is abundant throughout Florida but has not yet displaced native plant communities. This fast-growing plant is found throughout tropical and subtropical climates on disturbed sites such as edges of roads, old fields, and rocky slopes.¹

Ricin is a toxic plant protein found naturally in the seeds produced by the trees, the castor beans. If castor beans are chewed and swallowed, the toxin can be released which may cause serious health conditions, including death.

Purified ricin has greater potential for causing illness. Special technical processes that are not readily available are required to purify ricin. In



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Special points of interest:

- Medical Errors course available in FL TRAIN
- Meet the Staff—Biosafety Outreach Officers
- Sentinel Laboratory Guidelines updated November 2015
- 2016 CAP LPX is looking for participants

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In addition to the complexities involved in producing ricin that is highly purified, it is also very difficult to produce ricin that retains the physical properties needed to make it easy to inhale.³ It is a stable substance under normal conditions but inactivated by heat above 80 degrees centigrade (176 degrees Fahrenheit).² Military and terrorist organizations have attempted to employ ricin as a chemical warfare agent in the past.

If ricin is ingested, initial symptoms typically occur in less than 6-12 hours. These initial symptoms are most likely to affect the gastrointestinal system and include nausea, vomiting and abdominal pain. The symptoms of ricin poisoning are then likely to rapidly progress over 12 to 24 hours to include severe dehydration, kidney and liver problems. This rapid progression of symptoms and illness is noticeably different from what typically occurs with most, but not all, commonly encountered infectious foodborne illnesses, which generally resolve within a day or two. Nevertheless, it is important to note that ricin is not the only potential cause of such symptoms. Other illnesses due to chemical and non-chemical causes (e.g., infectious) can also present with these signs and may be cause for concern.³

If ricin is inhaled, initial symptoms may occur as early as 4-6 hours after exposure, but serious symptoms could also occur as late as 24 hours after exposure. The initial symptoms are likely to affect the respiratory system and can include difficulty breathing, shortness of breath, chest tightness, and cough. The symptoms of ricin poisoning are likely to quickly progress over 12 to 24 hours to include worsening respiratory symptoms, pulmonary edema (fluid within the lungs), and eventually, respiratory failure. As with symptoms resulting from ricin ingestion, the sudden progression of symptoms and illness from ricin inhalation is quite different from what typically occurs with most common colds and cough-type illnesses. Once again, ricin is not the only potential cause of such symptoms. Death from ricin poisoning can take place within 36 to 72 hours of exposure, depending on the route of exposure (inhalation, ingestion, or injection) and the dose received.³

The Centers for Disease Control and Prevention (CDC) Laboratory Response Network chemical (LRN-C) testing component has 62-member state, territorial, and metropolitan public health laboratories. A designation of Level 1, 2, or 3 defines the level of network participation, and each level builds upon the preceding level. All 62 laboratories participate in Level 3 activities, which include training in specimen handling,

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shipping and chain-of-custody procedures. Thirty-seven labs participate in Level 2 activities. At this level, laboratory personnel are trained to detect exposure to a limited number of toxic chemical agents in human blood or urine. Analysis of cyanide and toxic metals in human samples are examples of Level 2 laboratory activities.

Ten laboratories also participate in Level 1 activities. At this level, personnel are trained to detect exposure to an expanded number of chemicals in human blood or urine, including all Level 2 laboratory analyses, plus analyses for mustard agents, nerve agents, and other toxic chemicals. CDC has developed a method for measuring ricinine, a biomarker of ricin exposure, in urine. Ricinine is present along with ricin in castor beans. CDC has transferred the ricinine testing method to selected LRN laboratories.⁴

The Bureau of Public Health Laboratories (BPHL) Chemical Threat Preparedness Laboratory (CT Lab) in Jacksonville is a Level 1 laboratory. The CT Lab is the only lab in the state of Florida with the analytical method to identify ricin exposure in clinical samples by quantification of its metabolite, ricinine. The amount of ricinine measured in the urine indicates the level of dose of ricin in the exposed patient. Ricinine is quantified by solid phase extraction followed by liquid chromatography tandem mass spectrometry analytical technique.

“The CT Lab in Jacksonville is a Level 1 laboratory.”

Case Studies

In an attempted suicide, a 49-year old female patient in central Florida reportedly ingested a single castor bean along with other pharmaceuticals. Patient urine specimens collected by the admitting facility in coordination with regional and county health epidemiologists were shipped to the BPHL CT Lab. Analysis measured 20 ng/mL ricinine in the 36-hour urine specimen indicating ricin toxicity. In another case of attempted suicide, a 21-year old male patient consumed a pizza with 16 castor beans in it. Urine analysis revealed ricinine levels above the detection range of the analytical method estimated at more than 3000 ng/mL of ricinine. In central Florida both cases, the BPHL -Jacksonville CT Lab was able to perform analysis and return results within the same day of specimen receipt.

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With current capabilities, the BPHL-Jacksonville-CT Lab is able to analyze approximately 100 patient specimens and report results within 24 hours. The CT Lab is an invaluable resource for health professionals and citizens of Florida to help identify chemical exposures.

References:

1. ***Ricinus communis*, Castor Bean.** Melissa H. Friedman, Michael G. Andreu, Heather V. Quintana, and Mary McKenzie. University of Florida IFAS Extension. <https://edis.ifas.ufl.edu/fr306>
2. Centers for Disease Control and Prevention. What ricin is <http://emergency.cdc.gov/agent/ricin/facts.asp>
3. Centers for Disease Control and Prevention. Questions and Answers About Ricin. <http://www.bt.cdc.gov/agent/ricin/qa.asp>
4. Centers for Disease Control and Prevention. Laboratory Testing for Ricin. <http://emergency.cdc.gov/agent/ricin/labtesting.asp>

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MEDICAL ERRORS COURSE FOR CLINICAL LABORATORY PERSONNEL NOW AVAILABLE IN FL TRAIN LEILA FILSON, STATE SAFETY/TRAINING COORDINATOR

The "FDOH Medical Errors a Public Health Perspective" course available in FL TRAIN for nurses has opened up to also include clinical laboratory personnel. This course will fulfill the licensure requirements for the 2014-2016 biennium. For access, go to TRAIN Florida at <https://fl.train.org/Desktopshell.aspx>. If you do not currently have a TRAIN account, click the "Create Account" button. Once registered, the course can be found by either typing in the search box "FDOH Medical Errors a Public Health Perspective" or the course identification number 1052160. This course offers two (2) Continuing Education Unit (CEU) contact hours. If you have questions or problems with TRAIN, please contact Leila Filson at Leila.filson@flhealth.gov or at 904-791-1706.

MEET THE STAFF—BIOSAFETY OUTREACH OFFICERS



Emilie M. Cooper
Biosafety Outreach Officer



Edgar W. Kopp, IV
Biosafety Outreach Officer

The events of the Ebola outbreak in 2014-15 emphasized the importance of biosafety for laboratory workers and hospital infection control professionals. A large part of biosafety is the assessment and mitigation of risk that laboratory workers might face from the testing of emerging infectious diseases.

Emilie Cooper and Ed Kopp are the new Biosafety Outreach Officers (BOOs) for the state of Florida. Their primary job is to develop risk assessment tools and provide training to hospital laboratory personnel on how to use these tools for implementing their own risk assessment programs. Emilie and Ed will begin their risk assessment work in Jacksonville, Tampa, and Miami.

After the BOOs have completed training public health laboratory staff on how to conduct risk assessments using the developed tools, they will visit sentinel hospital laboratories in the state. These visits will be for the benefit of the laboratory personnel and surrounding communities to increase safety and decrease risk. The BOOs will not perform inspections, but will serve in an advisory capacity to help make hospital laboratories safer.

Emilie and Ed are looking forward to working with all the laboratory staff and management to understand their needs and concerns and to develop tools and resources that can be used in conducting biosafety risk assessments.

For more information about the biosafety outreach program, please contact Emilie Cooper at Emilie.Cooper@flhealth.gov, telephone (904) 791-1569 or Ed Kopp at and Edgar.Kopp@flhealth.gov, telephone (813) 974-3097.

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Editor - Betty Wheeler

SENTINEL LABORATORY GUIDELINES HAVE UPDATED



The American Society for Microbiology (ASM) Sentinel Level Clinical Laboratory Protocols For Suspected Biological Threat Agents and Emerging Infectious Diseases for the following sections: General Introduction, Recommendations and Biochemical Procedures, *Bacillus anthracis*, *Brucella*, *Burkholderia*, *Coxiella burnetii*, *Francisella tularensis* and *Yersinia pestis* updates were released in November 2015. Please remember to update all of your laboratory's biodefense reference manuals.

***“updated
November
2015”***

The current edition is compliant with the Clinical Laboratory Standards Institute (CLSI) format based on current information and recommendations of the APHL Sentinel Laboratory Partnerships and Outreach Subcommittee. These protocols reflect the standard practices for specimen processing as well as agent specific guidance. In addition to promoting standardization and uniformity of testing, adherence to, and maintaining the highest level of safety practices is emphasized in the respective protocols. Updated guidelines can be found at the ASM website: <http://www.asm.org/index.php/issues/sentinel-laboratory-guidelines>.

2016 COLLEGE OF AMERICAN PATHOLOGISTS' LABORATORY PREPAREDNESS EXERCISE (CAP LPX)

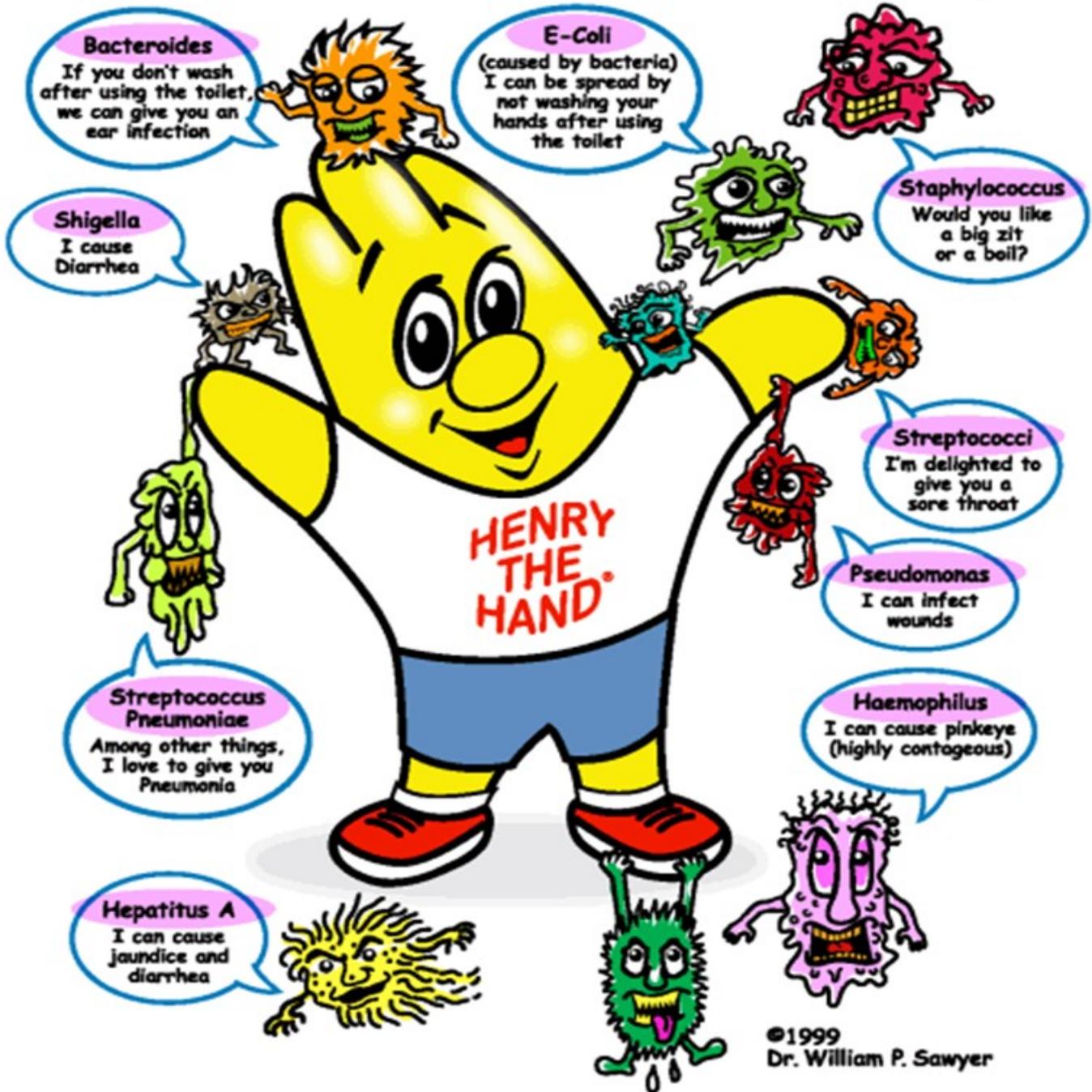
The Florida Department of Health Bureau of Public Health Laboratories has once again received funding to provide the CAP LPX through the CDC Cooperative Agreement for Public Health Emergency Preparedness. It is time to submit the list of participating Sentinel Laboratory partners to CAP for the 2016 CAP LPX order.

If your facility ordered the 2015 CAP LPX through us, there is no further action required. You will automatically receive it again in 2016 unless you notify Betty Wheeler in writing to cancel your order.

If your facility is not currently participating through the Bureau of Public Health Laboratories but would like to, please send me your facility's name, CAP and CLIA number, address, and lab phone number; plus contact information for the "ship to" person including phone number, email, and title. After receiving this information, Betty Wheeler will send you a certificate of acceptance form to sign and return to her. Please note that if your facility participates with us, there is no charge to your facility for the challenges.

Again, if you would like to enroll your facility in the 2016 CAP LPX or you would like to cancel your participation with the Bureau of Public Health Laboratories please contact Betty Wheeler at (904) 791-1568 (Betty.Wheeler@FLhealth.gov)

Do You Have Any Idea What Germs Could be on Your Hands?



The 4 Principles of Hand Awareness have been endorsed by the AMA & AAFP
www.henrythehand.com

CHEMICAL THREAT (CT) PREPAREDNESS TRAINING



The CT laboratory coordinators continue to reach out to the health and medical community by offering training for CT preparedness at hospitals and county health departments (CHDs). This training covers chemical terrorism awareness and the collection of clinical specimens after a chemical terrorism event. Hospital and CHD staff play an important role in the response to a chemical exposure event since clinical specimens will be collected for analysis. For your convenience and to increase participation, this training can be presented at your facility. Each course lasts approximately one hour with one 15-minute break between courses. Florida clinical laboratory and nursing continuing education credits will be offered. Training manuals, “hands on” exercise materials, and CT preparedness kits will be provided. This training is recommended for physicians, nurses, epidemiologists, emergency department personnel, phlebotomists, hospital and health department laboratory personnel, and others who may collect clinical specimens. Contact the CT laboratory coordinators in your region for more information (see the Bureau of Public Health Laboratories Directory on the back of this document for contact information).

LABORATORY RESPONSE NETWORK (LRN) TRAINING— BIOLOGICAL DEFENSE

The Bureau of Public Health Laboratories is currently offering an LRN sentinel laboratory training course at no cost to you at your facility. This training follows the American Society for Microbiology (ASM) Sentinel Level Clinical Laboratory Protocols for Suspected Biological Threat Agents and Emerging Infectious Diseases. Scheduling the training at your facility is a relatively easy process. Determine when you would like to have the training and how many people will be attending. A time will be set up that is convenient for all. The training materials are provided, as well as the biodefense reference manuals for your laboratory.

*“at no cost to
you at your
facility”*

The training syllabus includes: 1) an overview of the LRN; 2) the ASM protocols for ruling out potential bioterrorism agents and how to refer a sample to the state LRN Public Health Reference Laboratory when a bioterrorism agent cannot be ruled out; 3) the role of the sentinel laboratory in responding to pandemic influenza; 4) a brief introduction to packaging and shipping of infectious substances; 5) an introduction to the CDC Select Agent Program; and 6) the College of American Pathologists Laboratory Preparedness Exercise (CAP LPX).

This class awards Florida clinical laboratory continuing education credits based on five hours of instruction. Please contact Betty Wheeler at (904) 791-1568

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