

University of Washington

Standard Operating Procedures for Chemicals or Processes	
#1 Process (if applicable)	<p>Mice receive 50ug DT via injection twice (1x/day for 2 days) or polymer implant in the inner ear. They are euthanized 1-10 days later.</p> <p>Vaccine is available for diphtheria, and must be offered every ten years. If persons working with DT are not current with their immunizations, contact the UW Employee Health Center (EHC) at 206-685-1026.</p>
#2 Chemicals/Hazards	<p>DT can be extremely toxic at very low levels. All contact should be avoided. Symptoms of exposure include skin irritation, respiratory irritation, fever and headache. Do not breathe dust, fume or vapors of DT powder or solutions. DT may cause death if ingested.</p>
#3 Personal Protective Equipment (PPE)	<p>Dilute/mix only in fume hood.</p> <p>Laboratory coat or gown with long sleeves</p> <p>Eye/face protection: safety glasses with side shields or chemical safety goggles, face protection such as a face shield if splash/spatter possible</p> <p>Double gloving with thin nitrile gloves. Change gloves and dispose immediately if contaminated, torn or punctured.</p>
#4 Environmental/Ventilation Controls	<p>Dilute/mix only in fume hood.</p>
#5 Special Handling Procedures & Storage Requirements	<p>Do not work with the toxin in the dried state. Work only with reconstituted material. Work in a well-ventilated area and avoid inhalation of the product. Wear protective gloves when handling the material.</p> <p>Avoid contact with open wounds. Wash thoroughly any area of the body that comes into contact with the toxin. <b>It is recommended that laboratory personnel handling the material have current diphtheria immunization.</b></p> <p>This product is stable for months to years when stored at 4°C. <b>Do not freeze.</b></p>
#6 Spill and Accident Procedures	<p>The toxin has no effect if administered orally, as it is unstable at acid pH. If inadvertent skin pricking should occur, encourage bleeding and perform vigorous flushing of the area with copious amounts of water and/or saline. If i.v. or i.m. injection should occur, seek a physician's attention immediately. The MLD (minimum lethal dose) in humans is # 100 ng/kg when injected intramuscularly in an unimmunized adult.</p> <p>If you are not trained or comfortable cleaning up a spill, call 206-543-0467 for the EH&amp;S spill hotline for assistance. If it is an emergency (risk of exposure to others such as an on-going DT release) call 911.</p> <p><b>Liquid spills:</b> To be cleaned by properly protected and trained personnel. Personnel cleaning up a liquid spill will wear a lab coat/gown, goggles, and two pairs of nitrile gloves. Cover spill with absorbent paper towels and apply 1% sodium hypochlorite (NaOCl) (or 10% bleach), starting at the perimeter and working towards the center, allowing 30-min. contact time to deactivate DT before clean up. Clean the spill area with 1% NaOCl (or 10% bleach) allowing 30 min. contact time, then soap and water. The decontaminated spill waste will be double bagged and disposed of in regular trash.</p> <p><b>Powder spills inside of [fume hood/glove box/BSC]:</b> To be cleaned by properly protected and trained personnel. Personnel cleaning up a powder spill will wear a lab coat/gown, goggles, and two pairs of nitrile gloves. Gently cover powder spill with dampened absorbent paper towels to avoid raising dust. Apply 1% NaOCl (or 10% bleach), starting at the perimeter and working towards the center, allowing 30-min. contact time to deactivate DT before clean up. Clean the spill area with 1% NaOCl</p>

<p><b>EXPOSURE INFORMATION</b> <b>In Case of Emergency</b></p> <p>Where to Call if non-life-threatening emergency</p>	<p>(or 10% bleach) allowing 30 min. contact time, then soap and water. The decontaminated spill waste will be double bagged and disposed of in regular trash. Wash hands thoroughly after completing any spill clean up.</p> <p><b>Powder spills outside of a [fume hood/glove box/BSC]:</b> Remove all personnel from the room and restrict access. A spill cleanup contractor will need to manage the spill since adequate respiratory protection is not available.</p> <p>As soon as possible report the spill by notifying EH&amp;S (EH&amp;S business hours 206-543-0467, outside business hours 206-685-8973 (UWPD)); tell them that a spill has occurred, and you need EH&amp;S to obtain a spill cleanup contractor. Be prepared to provide the following information:</p> <ul style="list-style-type: none"> <li>• Name and phone number of knowledgeable person that can be contacted: <u>Ling Tong (206-616-2056).</u></li> <li>• Name of chemical, concentration and amount spilled:</li> <li>• Number of injured, if any:</li> <li>• Location of spill:</li> </ul> <p>This information can also be used in reporting to the Emergency Department after potential exposure.</p> <p>Any spill incident requires the supervisor to complete and submit the <a href="#">online accident reporting system (OARS)</a> form within 24 hours of the incident to EH&amp;S.</p> <p><b>First Aid Procedures:</b></p> <ul style="list-style-type: none"> <li>• For oral (mouth) exposure or if DT has been swallowed and if the person is conscious, wash out mouth with water while another worker calls 911 on campus phone if available (landline phone tracks the person's location for emergency medical responders.)</li> <li>• For inhalation exposure, move person to fresh air. If breathing becomes difficult call 911.</li> <li>• For contact exposure to the eye, flush eye with copious amounts of water for at least 15 minutes and call 911.</li> <li>• For dermal exposure, rinse area with copious amounts of water for at least 15 minutes, remove any contaminated clothing. Call 911, or go directly to Emergency Department (ED).</li> <li>• Needlesticks are a medical emergency and all work should be halted, with another person securing things while the injured person washes and obtains treatment. Call 911, or go directly to ED.</li> </ul> <p><b>After First Aid Treatment:</b></p> <ul style="list-style-type: none"> <li>• If a non-life-threatening exposure incident occurs, do the first aid as described above, then</li> <li>• Contact the UW Employee Health Clinic (206-685-1026). The nurse will advise whether to be seen at EHC or the ED.</li> <li>• If it has been 5 years or greater since the person received diphtheria vaccine, a booster may be recommended.</li> </ul> <p><b>BRING TO THE ED: the DT MSDS and this entire SOP, including the Emergency Dept. information at the end of this document.</b></p> <p><b>Any exposure incident requires the supervisor to complete and submit the <a href="#">online accident reporting system (OARS)</a> form within 24 hours of the incident to EH&amp;S.</b></p>
<p>#7 Waste Disposal</p>	<p>Any waste DT will be decontaminated or autoclaved before disposal whenever possible. Either lower pH to approximately 1 or raise pH to approximately 12 and follow by boiling for 30 minutes.</p>

	<p>Work space surfaces must be wiped down with [1% NaOCl, 10% bleach or 1N NaOH] daily, during the length of the experiment. To prevent corrosion of metal surfaces rinse with water after using chlorine-based chemicals. Absorbent pads will be replaced daily. The used and contaminated absorbent pads, PPE, etc. will be placed in a biohazard bag and autoclaved. Note that some disinfecting agents may not deactivate DT.</p> <p>If in-lab decontamination/autoclaving is not possible for some DT waste, it should be managed as chemical waste. For chemical waste pick up: Complete a <a href="#">Chemical Collection Request Form</a> and scan, fax or mail it to: <a href="mailto:chmwaste@uw.edu">chmwaste@uw.edu</a>, FAX to 206-685-2915, or mail to Box 354110. A chemical collection request form can be found at <a href="http://www.ehs.washington.edu/forms/epo/1470.pdf">http://www.ehs.washington.edu/forms/epo/1470.pdf</a></p>	
#8 Special Precautions for Animal Use (if applicable)	<p>If bitten by implanted/injected animal, wash bite area thoroughly and consult doctor.</p> <p>Be extremely cautious using needles with DT. Follow the written procedures for safe use of sharps, and practice doing a “dry run” with less hazardous materials as needed. A sharps container must be in the immediate vicinity for safe sharps disposal.</p> <p>DO NOT RECAP needles. Never leave exposed needle tip in work area. Use a syringe holder to secure syringe. Contact EH&amp;S for consultation at 206-221-7770. Perform procedures while wearing double nitrile gloves, lab coat/gown, safety glasses/goggles and face protection such as a face shield if splash/spatter possible.</p> <p>Hands must be washed with soap and water after completion of the injection, and then put on new pair of nitrile gloves. If continuing to inject more animals, remove gloves and wash hands afterwards.</p> <p>After procedures are complete, the work station will be decontaminated using [1% NaOCl, 10% bleach, or 1N NaOH] All reusable lab equipment will be autoclaved.</p> <p>No special disposal requirements are needed for animals that have received DT.</p>	
Particularly hazardous substance involved?	YES:	Blocks #9 to #11 are Mandatory
	NO:	Blocks #9 to #11 are Optional.
#9 Approval Required	No.	
#10 Decontamination	Either lower pH to approximately 1 or raise pH to approximately 12 and follow by boiling for 30 minutes.	
#11 Designated Area	Polymer implant is made from stock solution of TTX liquid in fume hood in room CHDD, CD 186A. Once polymer is dried, material is implanted in animal in room CHDD, CD 055	
Name: Dr. Edwin Rubel		Title: Professor
Signature:		Date:

**EMERGENCY DEPARTMENT RESPONSIBILITIES (POST EXPOSURE TO DIPHTHERIA TOXIN)**

- a. There have been reports of rapid onset of local pain after percutaneous exposure to diphtheria toxin and such an occurrence would indicate a significant exposure. Onset of symptoms following significant diphtheria toxin exposure would typically have onset delayed by days to weeks and are due to the inhibition of protein synthesis. The Emergency Department (ED) shall assess the severity of the exposure and take appropriate actions to include consultation with the Washington Poison Control System: PH 1-800-222-1222. Treatment with Diphtheria Antitoxin (DAT) may be considered in case of an especially severe or large exposure, even in the absence of symptoms.

- b. DAT is currently available from the CDC. In the event of problems obtaining a response at any local or state level, the CDC Emergency Operations Center should be contacted at (770) 488-7100. Contraindications/Precautions in the use of DAT include a history of prior exposure to horse serum, prior history of serum sickness, or a history of asthma or hay fever, especially when near horses.
- c. The ED should draw at least ten milliliters of serum and hold it for possible diphtheria toxin assay. This must be done before any treatment with diphtheria antitoxin.
- d. Any patient seen in the ED and released should be given information about the potential for delayed onset of symptoms/toxicity. Any symptoms would be reason for emergent reevaluation. Any exposed individuals should also be referred to the UW Employee Health Clinic (206-685-1026) for follow-up care.

The **Emergency Department** will need to complete a Physicians Report of Injury Report L&I form. The ED physician needs to contact the Employee Health Clinic (206-685-1026) and report that an exposure has occurred.