Chemical Threat (CT) Program: Handling, Packaging and Shipping of Clinical Samples Exposed to Hazardous Chemicals

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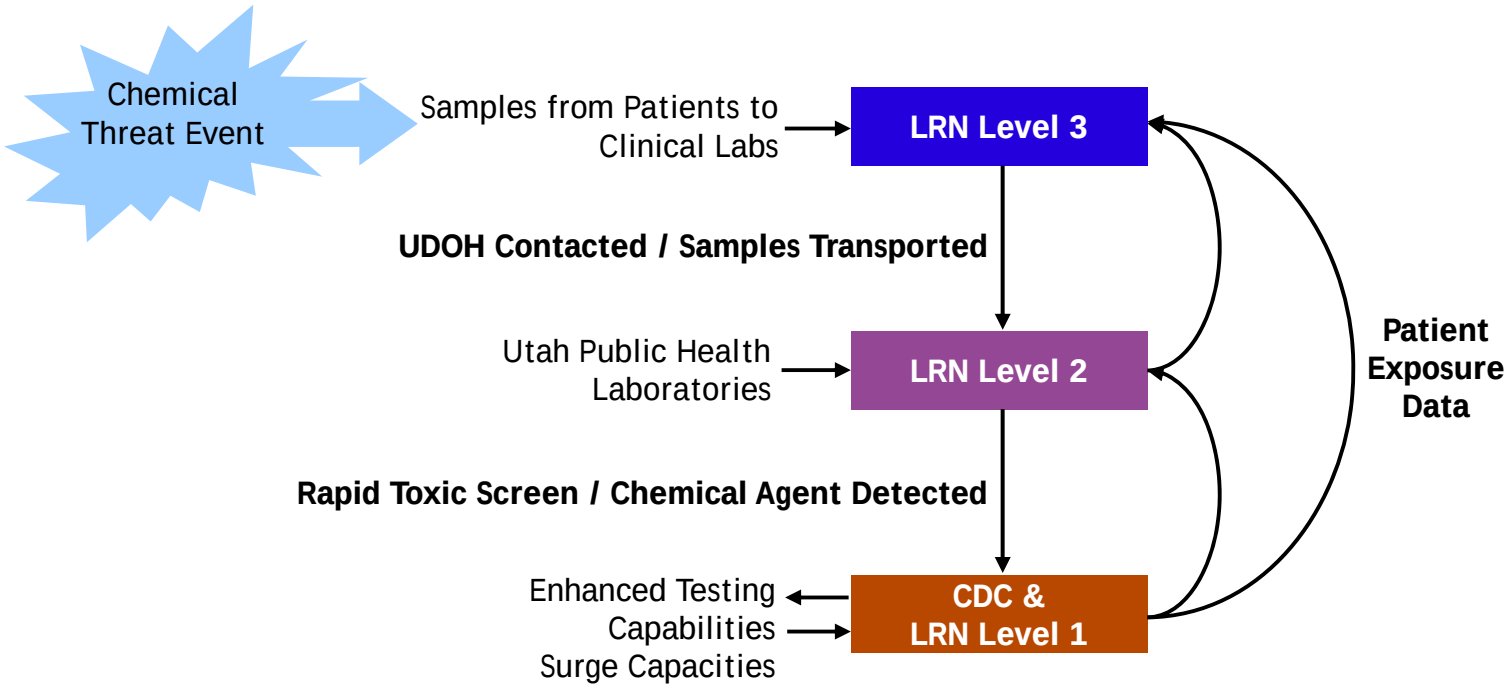
Chemical Threat (CT) Program at the UPHL-UDOH

- Funded by the CDC under the PHEP grant
  - Capability 12
  - Public Health Laboratory Testing: Program for Chemical Testing
    - Manage lab activities
    - Perform sample management
    - Conduct testing and analysis
    - Support public health investigations
    - Report results

What Happens During an Emergency

- Event occurs causing a large increase in patients exhibiting similar symptoms from unknown chemical agents.
- Urine/blood samples collected from patients are sent to the CDC for a Rapid Toxic Screen: Analysis for chemical warfare agents, toxins, incapacitating agents, and Industrial chemicals.
- Patient samples must be sent utilizing the exact procedures outlined by the CDC.
- When the chemical agents are identified, network laboratories (LRN) will be recruited for surge capacity analysis of those agents.
- Patient results are then submitted to the hospitals/clinics and the CDC for patient diagnosis and treatment.

Levels of Chemical Threat Response



Testing at UPHL

- Level-2
- Clinical
  - Nerve Agents
  - Cyanide
  - Volatile Organic Compounds
  - Toxic Elements
  - Tetramine
  - Abrin/Ricin
- Environmental
  - Water
  - Liquids
  - Solids
  - Hazardous Waste

Activities to Maintain Readiness

- Proficiency testing
- CLIA certification for clinical analysis
- CDC and LRN training and exercises
- Provide guidance and training to first responders for collection, packaging and shipping of samples containing chemicals of concern

Expectations of the CT Program

- 24/7 Response
- Manage lab and sample activities
- Prepared for high complexity chemical testing and surge capacity
- Support public health investigations
- Report results

Collection, Packaging and Shipping of Clinical Samples of Hazardous Chemicals

- Guidance on specimen collection
  - Unless otherwise instructed, collect whole blood and urine from each person who may have been exposed

Specimen Collection
Whole Blood

- Adults only (unless specifically instructed to collect from pediatric patients)
- Collect a minimum of 12 mL in vacuum-filled, non-gel, purple-top (EDTA) tubes, e.g. collect three 4 mL tubes per patient.
- Also collect one 3-mL or larger vacuum-fill only, non-gel, green or grey-top tube. Allow to fill to its stated capacity
- Use indelible ink to mark the top of the purple-top tube the order collected.

Sample Collection
Urine

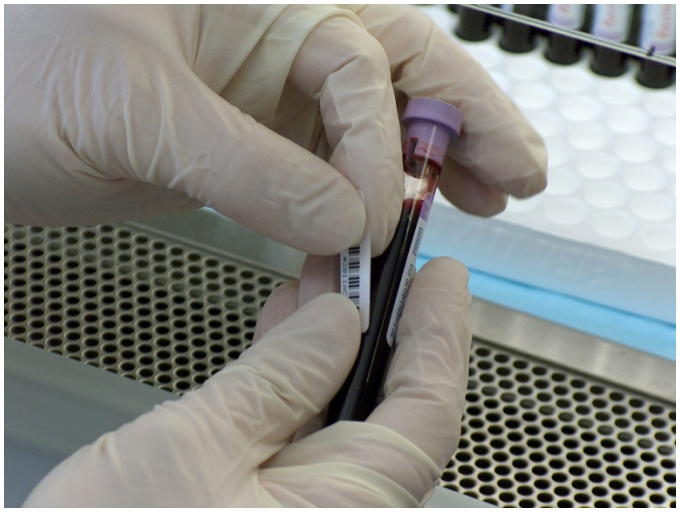
- Collect at least 25-50 mL from potentially exposed adults and children.
- Use screw-cap plastic container.
- Do not over fill.
- Freeze specimen as soon as possible (-70°C or dry ice preferred)
- If other than “clean catch”, note the method of collection on the specimen cup (e.g. obtained by catheterization)

Sample Collection Blanks

- For each lot number of tubes and urine cups used for collection provide:
  - Two empty, unopened purple-top tubes
  - Two empty, unopened green- or grey-top tubes
  - Two empty, unopened, urine cups

Sample Collection Specimen Labeling

- Label specimens following your facility's procedures
- In addition labels should include collector's initials, date and time of collection
- If bar-coded labels are used place the barcode vertically on the tube or urine cup
- Maintain a list of names with specimen identification

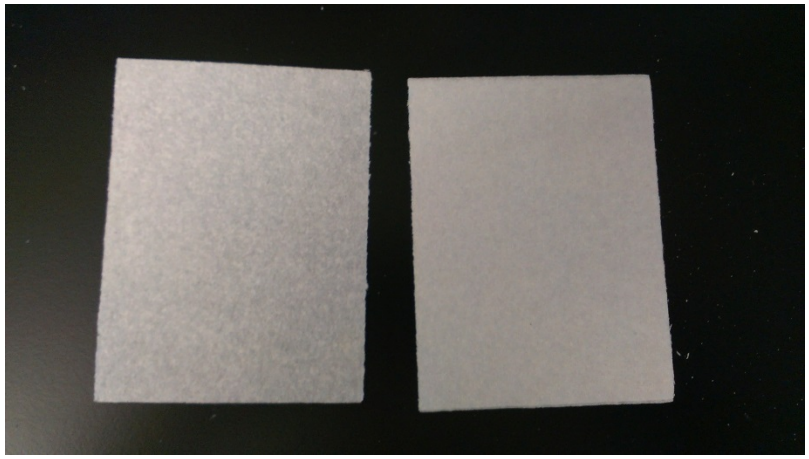


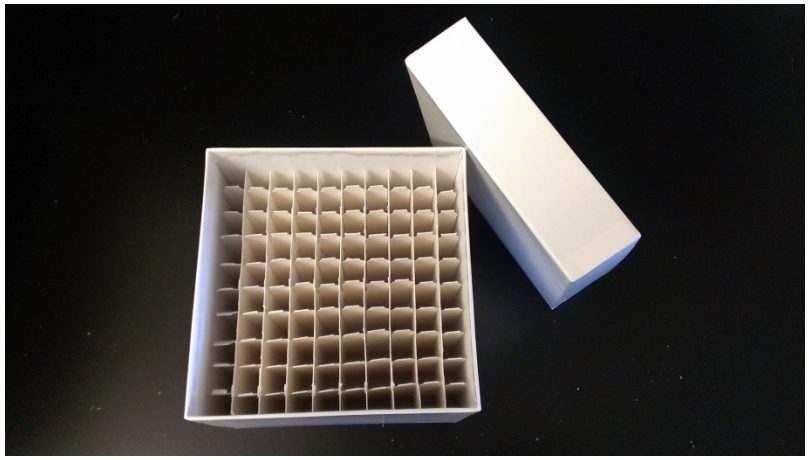
Specimen Packaging Components

- Primary Receptacles
  - Blood Tubes
  - Urine Cups
- Secondary Packaging
  - Materials to protect primary receptacles
  - Absorbent Materials
  - Shock dampening insulation
  - Dry Ice/Wet Ice
- Outer Packaging
  - Polystyrene foam-insulated, corrugated fiberboard shipper

Specimen Packaging
Secondary Packaging for Blood Tubes

- Place absorbent material in bottom of sample container under the separation grid.
- Package blood tubes in prepared shipping container (same patient samples packaged together)





Specimen Packaging
Secondary Packaging for Blood Tubes

- Wrap and seal the first layer of secondary packaging with absorbent material.

Specimen Packaging
Secondary Packaging for Blood Tubes

- Seal the wrapped gridded box inside a clear, leak-proof biohazard polybag.
- Place this bag inside a white Tyvek outer envelope and seal the opening

Specimen Packaging
Outer Packaging for Blood Tubes

- Use Polystyrene foam-insulated, corrugated fiberboard shipper
- For cushioning, place additional absorbent material in the bottom of the shipper.
- Add a single layer of refrigerator (wet ice) packs on top of the absorbent material

Specimen Packaging
Outer Packaging for Blood Tubes

- Place the packaged specimens on top of the refrigerator packs.
- Use additional cushioning material to minimize shifting while in transit.
- Place additional refrigerator packs on top of the secondary packaging to maintain shipping temperature

Specimen Packaging
Secondary Packaging for Urine Cups

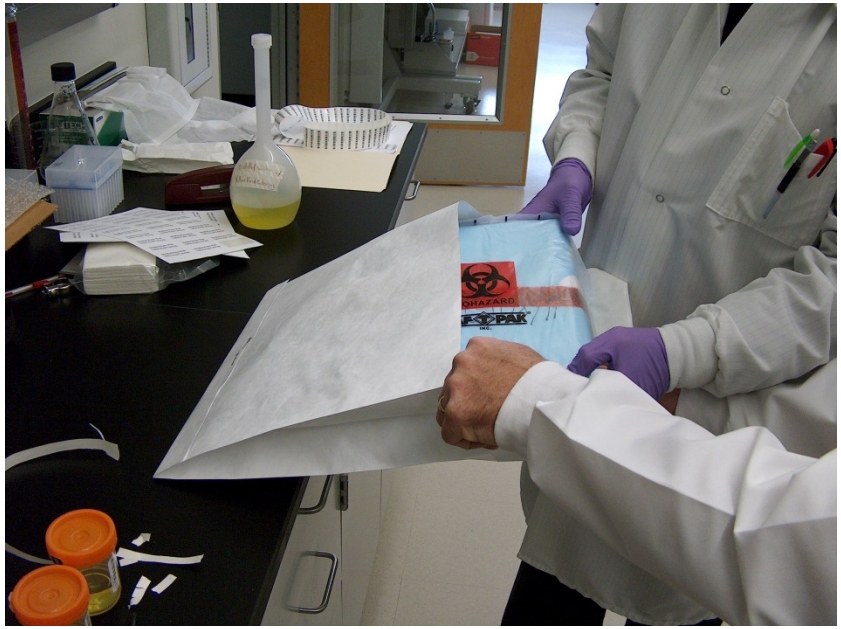
- Pack urine cups in a gridded box lined with absorbent material
- Seal the box with one continuous piece of evidence tape

Specimen Packaging
Secondary Packaging for Urine Cups

- Wrap the first layer of secondary packaging in absorbent material
- Place the boxed samples in a Saf-T-Pack bag with evidence tape.

Specimen Packaging
Secondary Packaging for Urine Cups

- Place this bag inside a white Tyvek outer envelope and seal the opening



Specimen Packaging
Outer Packaging for Urine Cups

- Use Polystyrene foam-insulated, corrugated fiberboard shipper
- For cushioning, place additional absorbent material in the bottom of the shipper.
- Place a layer of dry ice on top of the absorbent. Do not use flakes or large chunks

Specimen Packaging
Outer Packaging for Urine Cups

- Place another layer of absorbent material on top of the secondary packaging material.
- Add another layer of dry ice on top of the absorbent material.
- Ensure that shifting while in transit is minimized and that the specimens remain frozen or will freeze during transport.

Specimen Shipping

- Place shipping manifest in a sealable plastic bag and put on top of the ice packs inside the shipper.
- Keep chain-of-custody documents for your files
- Place lid on shipper and secure with filamentous shipping tape

Specimen Shipping

- Affix labels and markings adjacent to the shipper’s/consignee's address that appears on the shipper
- Place the UN 3373 label and the words “Biological Substance, Category B” adjacent to the label on the front of the shipper
- Place a Class 9/UN 1845 hazard label on the same side if shipping dry ice/carbon dioxide solid.
- Note the weight of the dry ice in kg in the preprinted area of the hazard label or adjacent to the label

Sample and Collection Information

- We maintain a moderate stock of sample collection containers available when needed.
- Make sure to provide appropriate sample information with each sample
  - Date and time of collection
  - Information about field screening tests
  - Contact information
  - Chain of Custody records
- Response Guide Located

  http://health.utah.gov/lab/chemistry/documents/ctresponseguide.pdf

Questions ?