Anthrax

SURFACE SAMPLING

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

Agenda

- Introductions
- Background
- Objectives
- Swab Collection Procedure
- Sponge Collection Procedure
- Sample Decontamination
- Sample Shipment
- Exercise
- Debrief
- Evaluation
- Adjournment

Why Do Anthrax Surface Sampling?

- Confirm or identify contamination
- Assess extent of contamination
- Determine risk for human exposure
- Inform medical treatment
- Guide decontamination

Background

These sampling procedures were prepared by the Centers for Disease Control and Prevention (CDC) to

- Standardize collection procedures
- Ensure samples can be analyzed
- Obtain comparable results

Background

These procedures are meant to be used on smooth, nonporous surfaces:

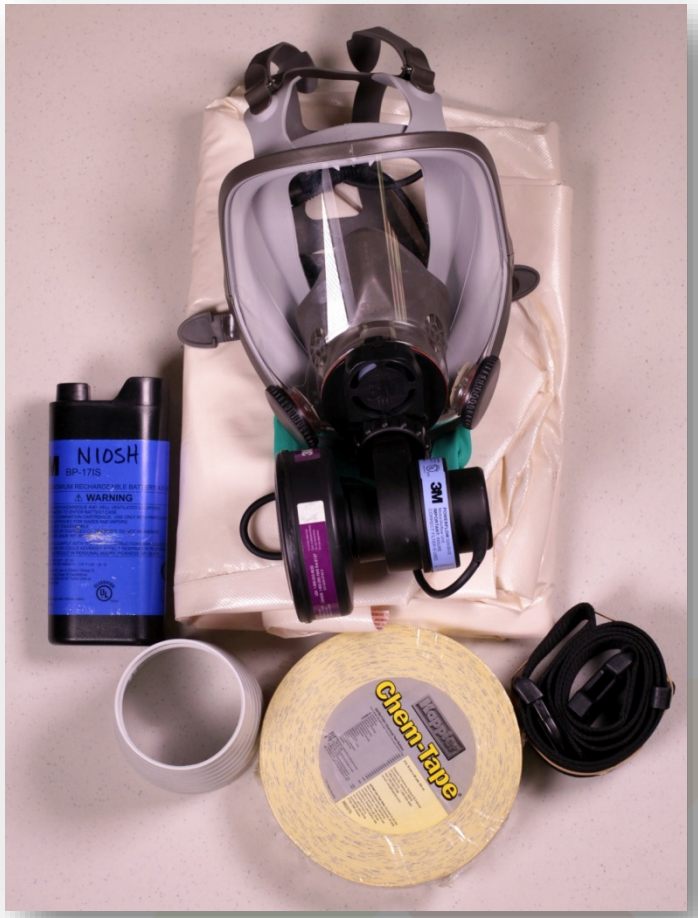
- Stainless steel
- Painted wallboard
- Floor tiles
- Wood laminate

Sampling Plan

- Collection should be part of a sampling plan including
  - Objectives
  - Approach
  - Analytical and laboratory coordination
  - Handling, packaging, and transport
  - Interpretation of results

Health and Safety Plan

- Follow a health and safety plan for protection during sampling:
  - Personal protective equipment (PPE)
  - Medical countermeasures (antibiotics and vaccinations)
  - Decontamination procedures for both responders and samples



Health and Safety Plan

- Recommendations on protecting yourself from getting sick can be found on the NIOSH website at www.cdc.gov/niosh/topics/anthrax/workers.html

Sampling Team

- At least 2 people
- At least 1 sampler and 1 assistant
- Minimizes chance of cross-contamination

Sampling Team

- Decide who will sample, who will assist
- *Do not change roles during sampling*
- Assistant handles all supplies
- Sampler touches supplies only as assistant hands them over
- Minimize contact with potentially contaminated surfaces

Sampling Team

- Remember that all surfaces in the sampling area could be contaminated
- Bring a clean working surface such as
  - Disposable towel
  - Portable cart
  - 5-gallon buckets
- Take only the supplies that you need

Training Outcomes

You will…

- Observe macrofoam swab and cellulose sponge sampling
- Observe decontamination of samples
- Learn what material is required for sampling and decontamination
- Access sampling and decontamination procedures, as well as dangerous-goods regulations
- Demonstrate knowledge of sample collection, decontamination, and methods to limiting cross-contamination

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SURFACE SAMPLING

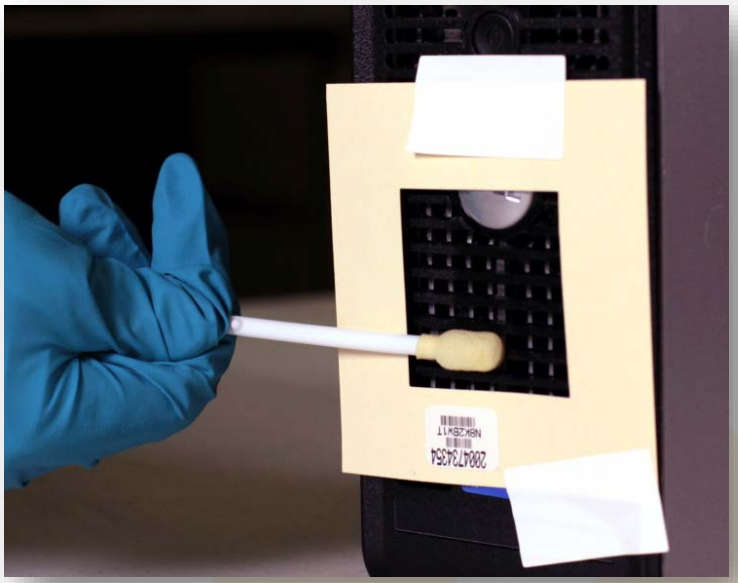
HOW TO SAMPLE WITH
Macrofoam Swab
ON NONPOROUS SURFACES

NIOSH National Institute for Occupational Safety and Health
CDC Centers for Disease Control and Prevention

Appropriate Circumstances

Small surfaces equal to or less than 4 square inches

- Supply air diffusers
- Air-return grills
- Keyboards/computer fans
- Hard-to-reach places
- Crevices
- Corners



Supplies Needed, in Addition to PPE

Gloves

Template

Disposable Ruler

Tape

Macrofoam Swab

Buffer

Screw-cap tube

Paraffin film

Resealable Plastic Bag

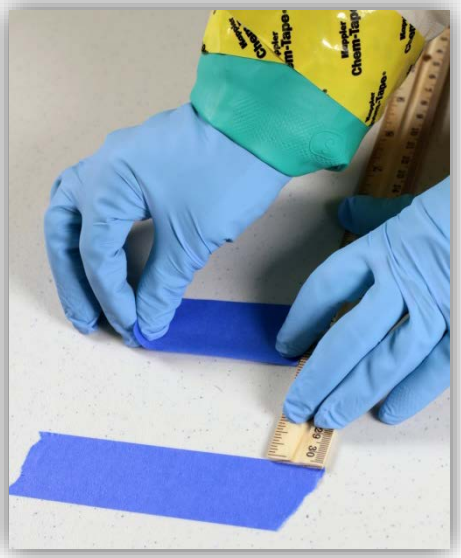
Permanent Marker

See www.cdc.gov/niosh/topics/emres/surface-sampling-bacillus-anthracis.html for specifications.

Step 1

- Sampler and assistant put on new gloves
- Gloves go on top of normal PPE to prevent contamination of sample

Step 1, continued

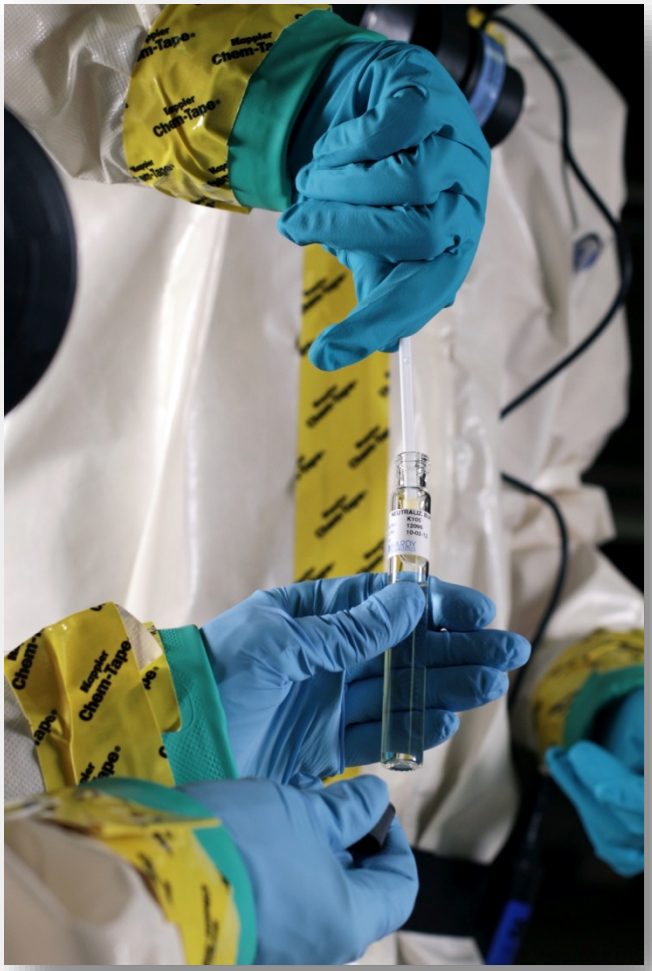


- Sampler puts 2 x 2–inch template over sampling area
- Or measures out an area 4 square inches or less

Step 2

- The assistant opens the swab package without touching the swab or its handle
- The sampler removes the swab from the package by grasping only the swab handle
- When handling the swab, do not touch below the thumb stop

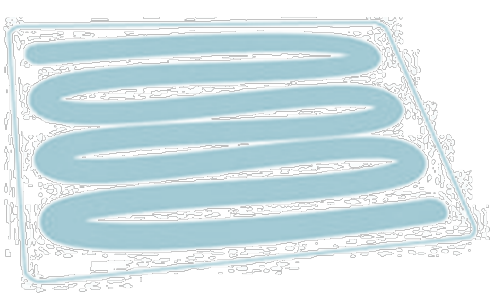
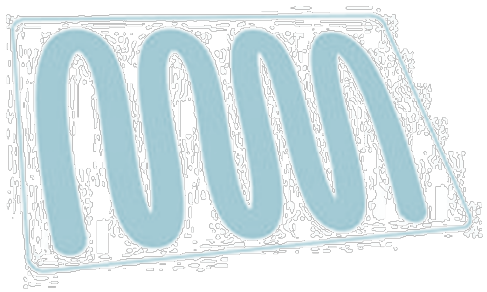
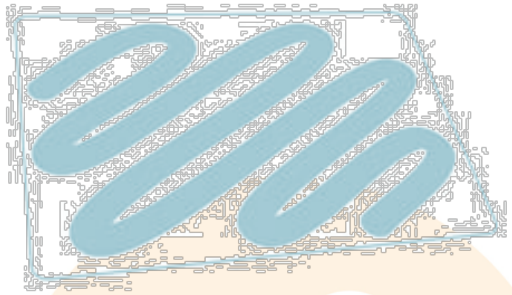
Step 2, continued



- Sampler dips swab (if not premoistened) into tube of neutralizing buffer solution
- Assistant opens and holds tube for sampler
- Sampler presses swab against inside of container to remove excess
- Throw away any leftover buffer and tube; do not use for next sample

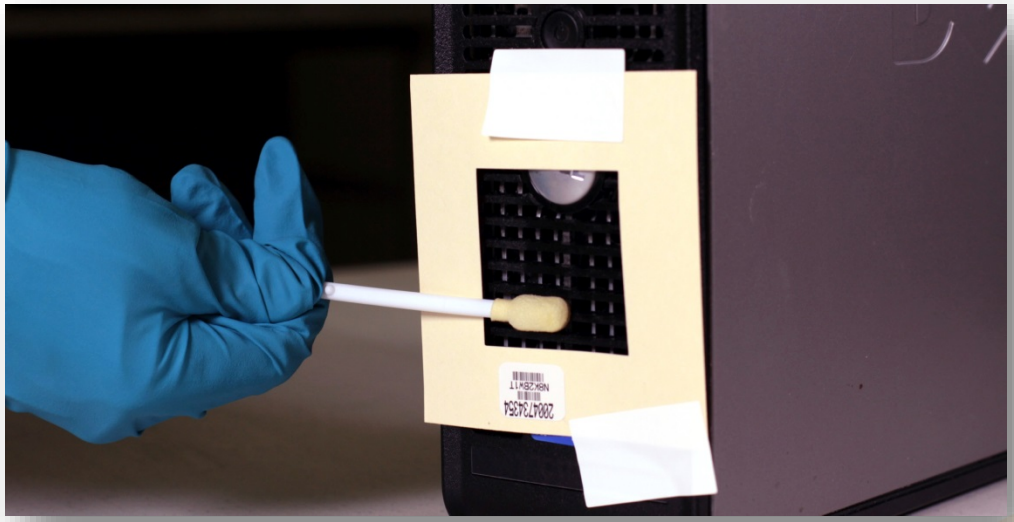
Steps 3, 4, and 5

- Sampler makes 3 passes over sampling surface: horizontal, vertical, and diagonal

- A rolling motion will maximize swab contact with surface

Step 3: Horizontal Pass

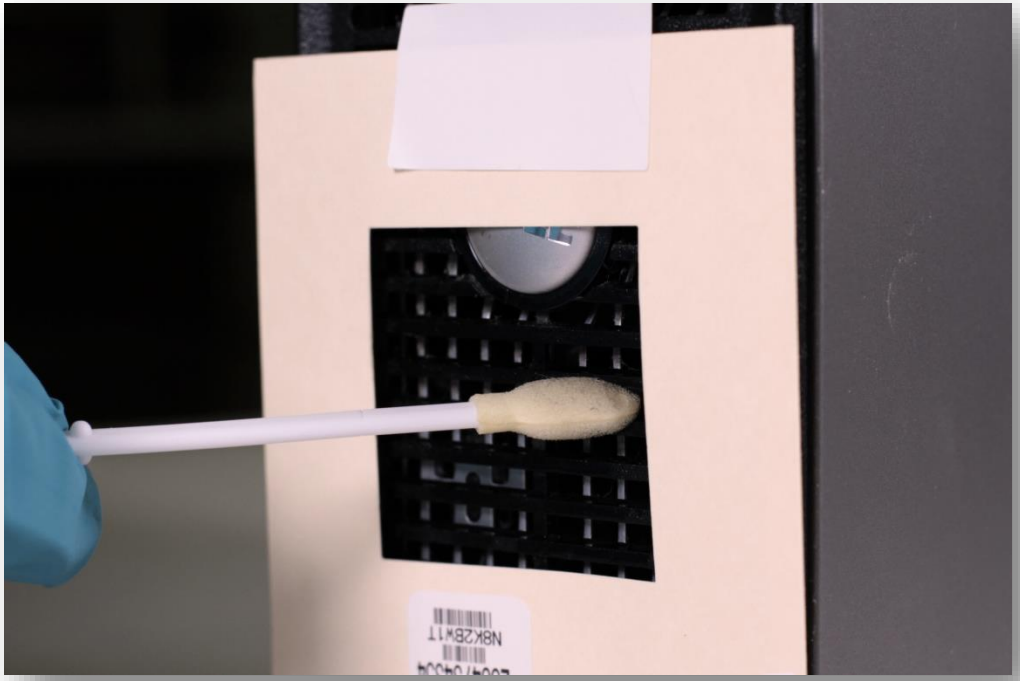


- Place side of swab on surface with gentle but firm pressure to ensure direct contact
- Use an overlapping ‘S’ pattern to cover entire surface with *horizontal* strokes

Step 4: Vertical Pass

- Rotate swab and cover area again, with *vertical* ‘S’ strokes
- Strokes will be at 90° angle to first ones

Step 5: Diagonal Pass



- Rotate swab once more and cover area again, with *diagonal 'S'* strokes
- Strokes will be at 45° angle to first ones

Step 6

- Place swab into screw-cap tube
  - Assistant opens and holds tube
  - Sampler breaks off head of swab by bending handle at scoring
  - Do not insert handle beyond thumb stop

Step 6, continued

- **Assistant** caps and labels tube:
  - unique identifier
  - sample location
  - initials of collector
  - date and time

Step 6, continued

- Assistant wraps tube with paraffin film to prevent leakage during shipment

Step 7

- Assistant places sample into resealable bag
- Assistant seals and labels the bag with same information as on tube
- Check that the bag is watertight for decontamination

Steps 8

- Leave template in place after sampling
- Sampler and assistant remove outer gloves and discard
- Use new template and gloves for each sample

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HOW TO SAMPLE WITH
Cellulose Sponge
ON NONPOROUS SURFACES

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CDC Centers for Disease Control and Prevention

Appropriate Circumstances

Areas of 100 square inches or less

- Countertops or tabletops
- Floor tiles
- Walls

Supplies Needed, in Addition to PPE

Gloves

Template

Disposable Ruler

Tape

Cellulose Sponge

Buffer

Screw-cap Specimen Container

Paraffin Film

Resealable Plastic Bag

Permanent Marker

See www.cdc.gov/niosh/topics/emres/surface-sampling-bacillus-anthracis.html for specifications.

Step 1

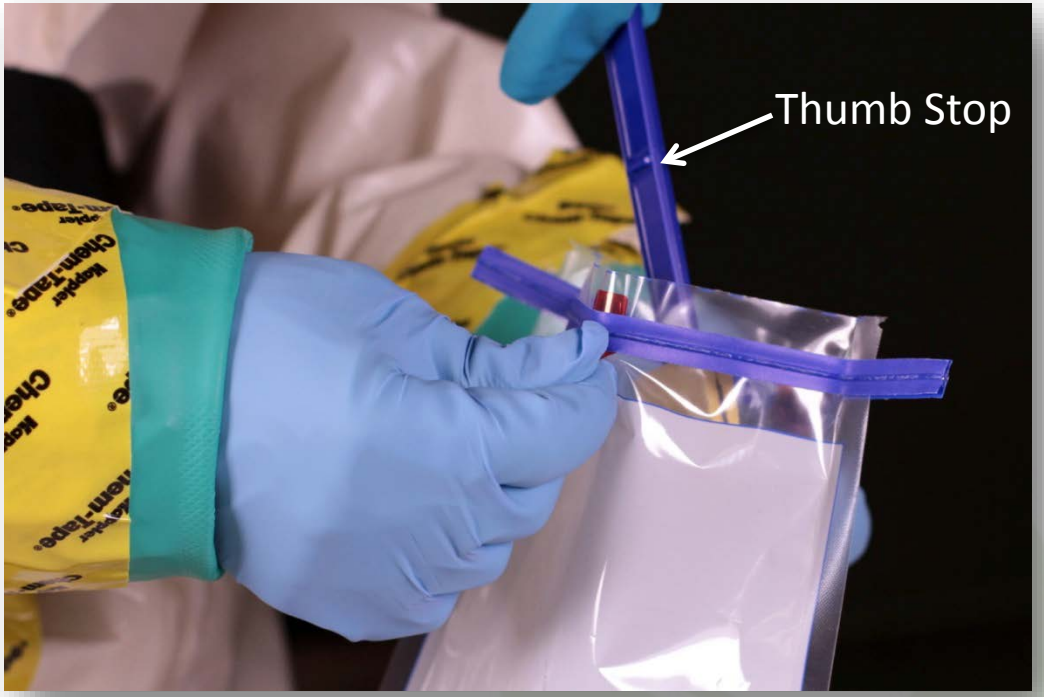
- Sampler and assistant put on new gloves
- Gloves go on top of normal PPE to prevent contamination of sample

Step 1, continued

- Sampler puts 10 x 10–inch template over sampling area
- Or measures out an area 100 square inches or less

Step 2

- Assistant opens sponge package without touching sponge or handle
- Sampler removes sponge by grasping only handle
- Never touch below thumb stop



Step 2, continued

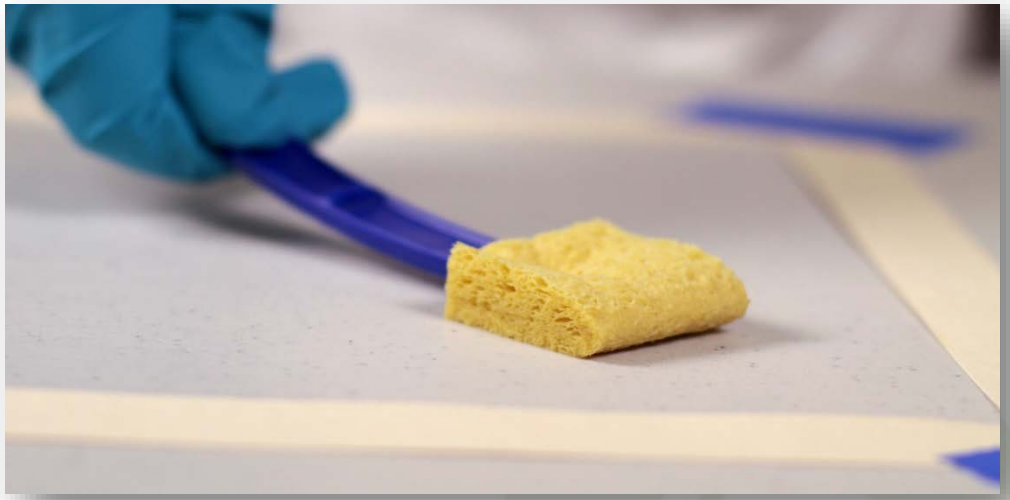
- Sampler holds sponge by handle, and assistant pours neutralizing buffer solution over it (if not premoistened)
- All 10 mL must be absorbed by sponge
- Discard solution container

Steps 3, 4, 5, and 6

- Sampler makes 4 passes over sampling surface: horizontal, vertical, diagonal, and perimeter of template

Step 3: Horizontal Pass

- Place sponge flat on surface with gentle but firm pressure to ensure full, direct contact
- Using overlapping ‘S’ pattern, cover entire surface with *horizontal* strokes

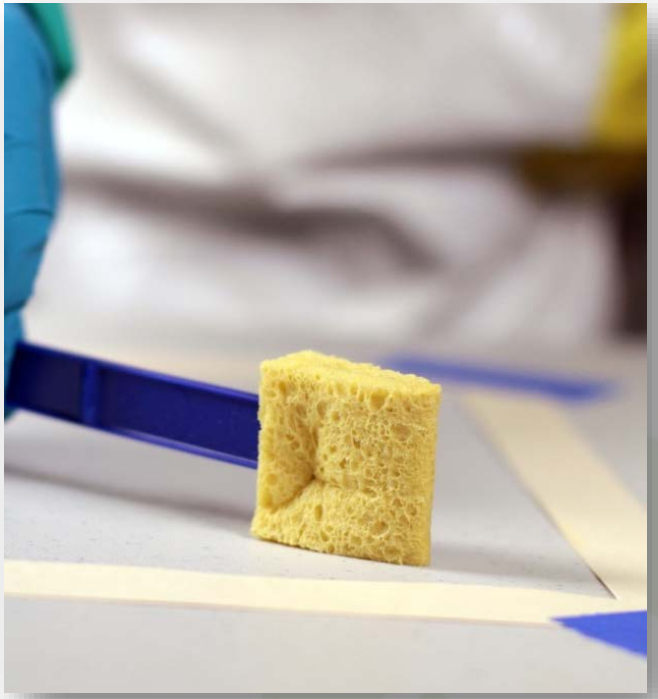


Step 4: Vertical Pass

- Turn sponge over and use wide part to wipe area again, with *vertical* ‘S’ strokes
- Strokes will be at 90^{o} angle to first ones

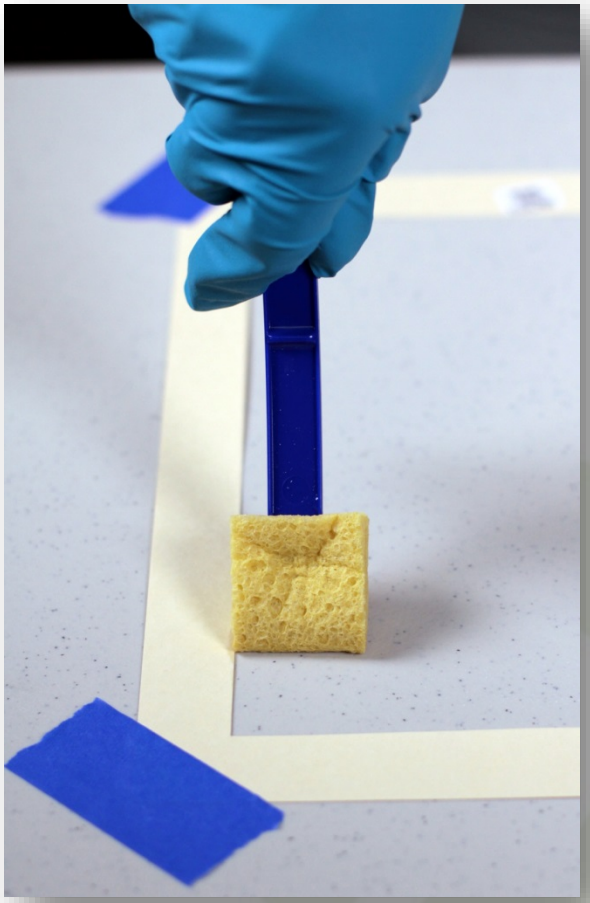
Step 5: Diagonal Pass

- Using narrow side of sponge, wipe once more, with *diagonal* 'S' strokes
- Strokes will be at 45^{o} angle to first ones



Step 6: Perimeter Pass

- Using full width of sponge tip, wipe perimeter of sampling area once



Step 7

Place sponge into specimen container:

- Assistant opens and holds container
- Sampler breaks off head of sponge by bending handle at scoring

Step 7, continued

- Assistant caps and labels container:
  - unique identifier
  - sample location
  - initials of collector
  - date and time

Step 7, continued

- Assistant wraps container with paraffin film to prevent leakage during shipment

Step 8

- Assistant places sample into resealable bag
- Assistant seals and labels the bag with same information as on container
- Ensures bag is watertight for decontamination

Step 9

- Leave template in place after sampling
- Sampler and assistant remove outer gloves and discard
- Use new template and gloves for each sample

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HOW TO
Decontaminate
SAMPLES

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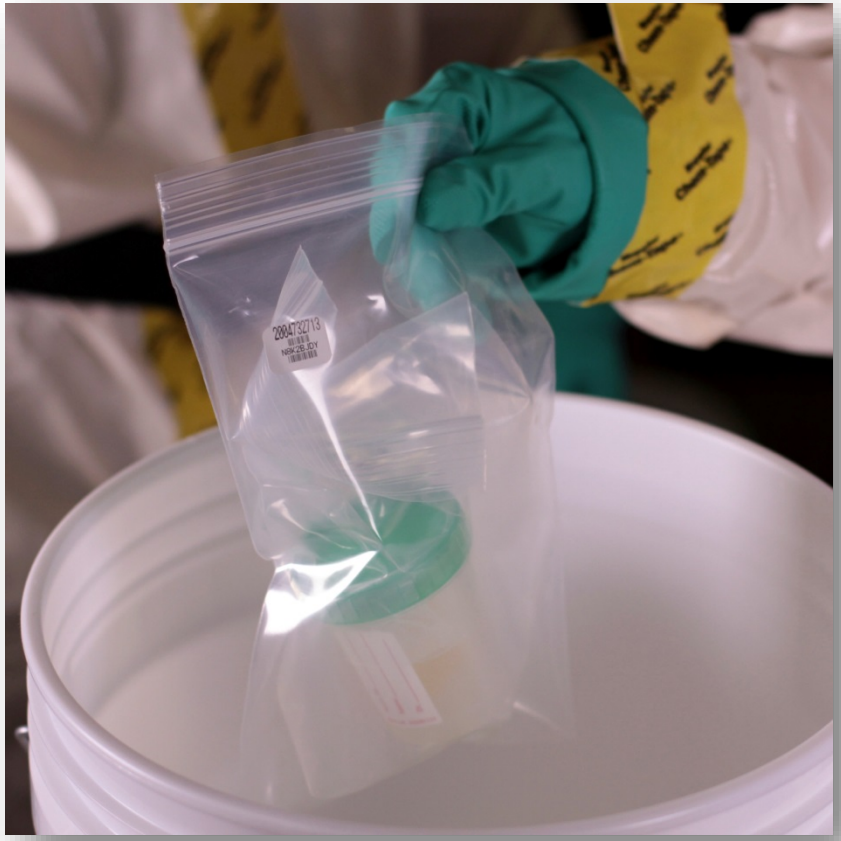
Bagging and Handling of Samples



Double-bag and seal

- For a group of samples: put into a second, larger resealable bag
- For a single sample: put into a second bag of same size
- Remove as much air as possible for shipping; bags cannot be opened once decontaminated

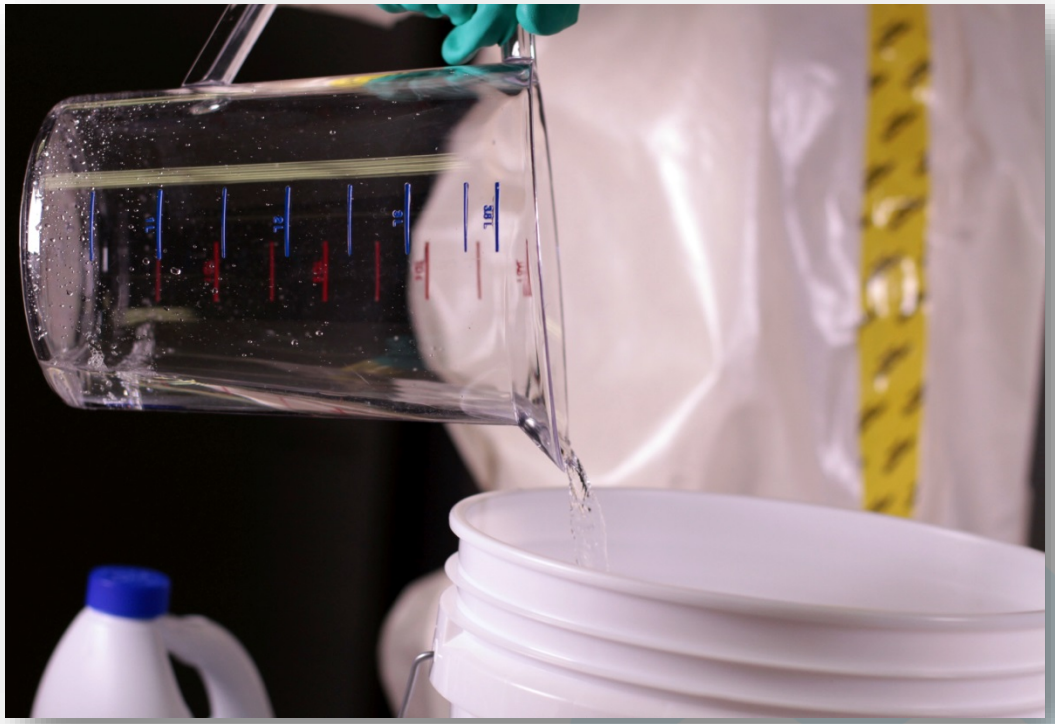
Decontamination Supplies

Household bleach, white vinegar, water, measuring device, container, and disposable paper towels

Step 1

Mix 1 part bleach with 5 parts water.

Step 2



Add 1 part white vinegar.

Step 3

Add 3 parts of additional water.

Steps 4 and 5

4. Submerge item to be decontaminated in the solution for 10 minutes.
5. Thoroughly dry the outside of the item.

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HOW TO
Ship/Transport
SAMPLES

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How to Ship Samples

- Coordinate shipment with the local Laboratory Response Network (LRN) lab
- Transport all samples to processing laboratory on ice or cold packs
- Samples should be processed within 48 hours of collection

Shipping Dangerous Goods

- Prepare and ship containers and documentation according to appropriate regulations (Division 6.2, Infectious substance)
- See these sources for regulations:
  - U.S. Department of Transportation
  - International Airline Transportation
  - U.S. Postal Service, Domestic Mail Manual
- Adherence to current, appropriate regulations is *your* responsibility

Chain of Custody

- Follow chain-of-custody guidelines set by law enforcement and laboratory
- Place the chain-of-custody forms between the outer packaging and inner packaging
- Do not put chain-of-custody forms inside the inner packaging

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Exercise

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Exercise

- Demonstrate comprehensive application of anthrax surface sampling by macrofoam swab and cellulose sponge methods
- Use the checklists provided to assist you

Additional Resources

NIOSH has additional resources on anthrax, available at www.cdc.gov/niosh/topics/anthrax/:

- Overview of anthrax
- Recommendations for protecting workers
- Environmental sampling
- Past responses and investigations
- Other resources

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