

# Module 5: Specimen Collection & Submission Criteria

**Bureau of Clinical Laboratories  
Microbiology Division**



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# Module Learning Objectives

- Determine testing criteria
- Describe food specimens collection
- Describe clinical specimens collection
- List key items in a sample kit
- Explain purpose for “chain of custody”
- Perform group exercise



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# Decision to Test

- Testing performed determined by Central Office EPI Division
- Lead investigators:
  - Area nurses
  - Environmentalists
  - Epidemiologists
- Consult with Central Office Surveillance



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# TESTING CRITERIA



Photo courtesy of [www.dreamspinnerlearning.com](http://www.dreamspinnerlearning.com)



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# Testing Criteria

- Two or more people from different households with similar symptoms ill from the same source.
- One ill person if botulism suspected
- Food Specimens submitted by Environmentalists through CHD
- Clinical specimens submitted by Field Surveillance Staff through CHD



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# Testing Criteria, continued

The following should be considered:

- Symptoms
  - Refer to Table Acute Foodborne Gastroenteritis Reference Table
- How many persons are affected?
- Has Epidemiology (EPI) been contacted?
- Is there a common source?



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# Testing Criteria, continued

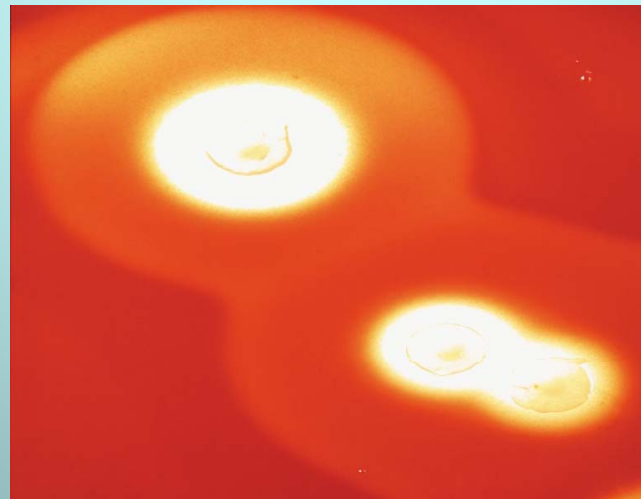
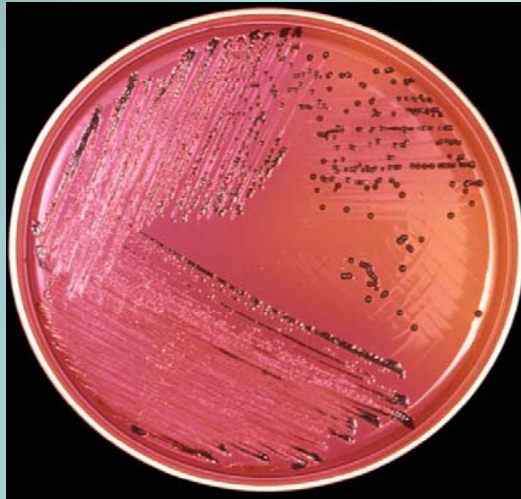
- Is it food-related?
- Is suspect food available?
- Have clinical specimens been submitted?
- Time Interval
- Duration of symptoms
- Central Office will communicate with Lab and indicate what agent is suspected



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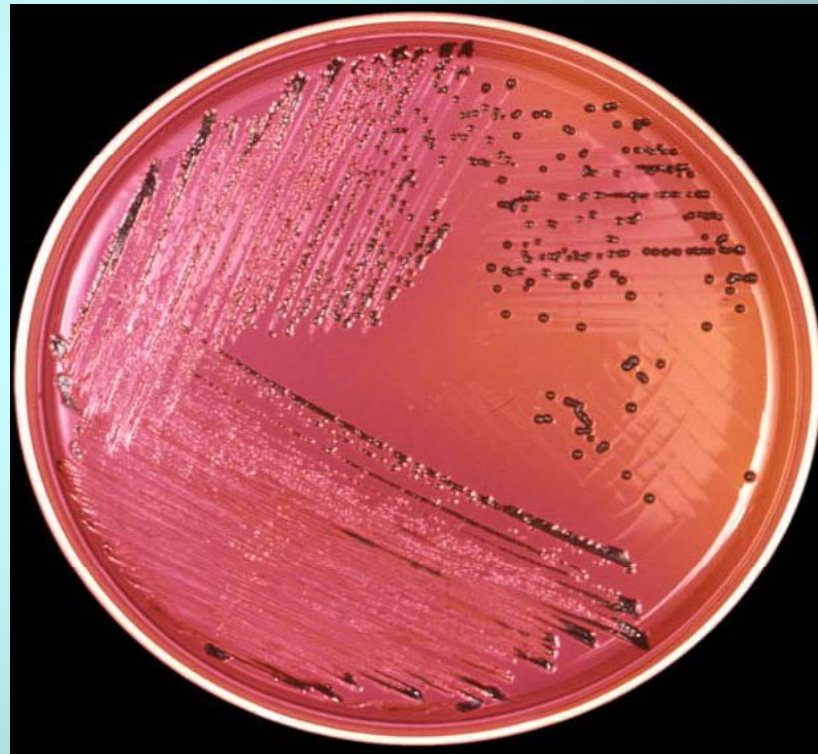
# Types of Foodborne Illnesses



# Types of Illness

Infection = Illness from ingestion of organisms present in food

- Campylobacter
- Hepatitis A
- Listeria
- Norovirus
- Salmonella
- Shigella
- Vibrio
- Yersinia



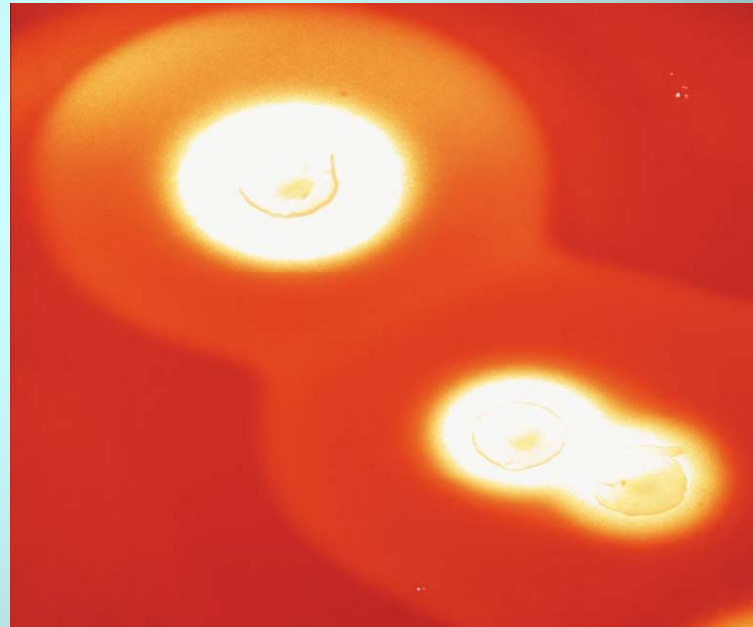
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# Types of Illness

Intoxication = Illness from ingestion of pre-formed toxin present in food

- *C. botulinum*
- *B. cereus*  
(*emetic form*)
- *Staph aureus*



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# Types of Illness

Toxin mediated infection-illness from ingestion of organism in a food followed by toxin production in the body (toxin is not present in food)

- *C. perfringens*
- *B. cereus*  
(diarrheal form)
- *E. coli* 0157:H7



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# Viral/Parasitic Illnesses



- Viruses
  - Norovirus
- Parasites
  - Cryptosporidium
  - Giardia
  - Trichinosis

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# Non-Infectious Illness

- Shellfish Toxins
  - Diarrheic shellfish
  - Neurotoxic shellfish poisoning
  - Amnesic shellfish poisoning
  - Paralytic shellfish poisoning
- Chemical Substances
  - Heavy metals
  - MSG



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# Lab Testing Results

- Bacterial
  - Isolated or not – may indicate Colony Forming Units (CFU)
- Viral
  - Detected or Not (by PCR)
- Parasitic
  - Found and named or Not Found
- Toxins
  - Detected or Not



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# Reference Material

- Control of Communicable Diseases Manual
- Procedures to Investigate Foodborne Illness
- Tables
  - Acute Foodborne Gastroenteritis Reference Table
  - Foodborne Illnesses Tables
    - Bacterial
    - Viral and Parasitic
    - Non-Infectious



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# Notifiable Food Pathogens

- Anthrax, human
- Botulism
- Cholera
- Hepatitis A
- Listeriosis
- Vibriosis
- Salmonellosis
- Shigellosis
- Trichinellosis
- Typhoid fever
- Campylobacteriosis
- E. coli O157:H7 (including HUS & TTP)
- Outbreaks of any kind
- Cases related to nuclear, biological, or chemical terroristic agents
- Cases of potential public health importance



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# Identification of Outbreaks & Samples

- Be consistent when labeling specimens with outbreak name
  - Check with lead investigator
- Properly identify samples
  - Label containers
  - Put sample ID on Food Bacteriology Form



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# Specimen Collection Criteria



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# Clinical Samples

- 10–20 grams (10-20 mls) of fresh stool or vomitus should arrive at Lab within 24 hours of collection in sterile cup
- Clinical patient and food samples should be packaged and shipped separately
- Exception is suspected botulism



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# Clinical Samples (cont')



- Clinical typically tested first
- Collect stool specimen and refrigerate immediately



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# Clinical Specimen Collection Kits

- Enteric Kits for Salmonella /Shigella
- Parasitology Kits
- Other clinical specimens – Contact Microbiology @ 334-260-3400 for assistance



Enteric Kit



Parasitology Kit



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# DETECT Kits



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# Foodborne Illness Investigation Sample Collection and Submission Criteria Chart

- Organisms
- Clinical Specimens
- Food Samples
- Shipping and Storage Requirements



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# Special Points in Food Sampling

- Collect samples early in investigation
- Maintain Chain of Custody, if needed
- Things to remember:
  - Visit the facility
  - Collect food still on hand
  - Label the samples
  - Keep written records



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# Environmental Sampling



- Collect as soon as outbreak is suspected
- Use aseptic technique, sterile containers
- 50 grams (2 oz) solid food or more
- Take representative sample
- Commercially processed foods
  - Identify product & processor
  - Lot #'s, exp dates, use-by dates
- Keep refrigerated unless collected frozen



# Sampling Liquids

- Whenever possible, submit in original container
- Stir or shake to ensure homogeneous sample
- If too large to shake, take multiple samples
  - Pour or ladle into leak-proof container
- Hold and ship under refrigeration



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# Environmental Collection Kits

- Submit solids in sterile plastic containers or plastic bags
- Submit liquids in plastic containers
- See Supply List for items to create your own kits



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# Packaging & Shipping (P&S)



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# Specimen P&S



- Place food in a sterile, leak proof container
- Properly identify & label specimen
- Double bag specimen
- Place specimens in a rigid styrofoam box with ice packs
- Complete Food Bacteriology Form, place in box on top styrofoam container



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# Specimen P&S

- See Foodborne Illness Investigation Sample Collection & Submission Criteria
- Communicate with the Lab (334-260-3400, Micro Div)
- Ship as soon as possible
- If you can't ship, refrigerate!



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# Chain of Custody



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# Chain of Custody

- Chain of Custody form is utilized when
  - FBI is the lead investigator
  - Outbreak could be part of a bioterrorism event
  - EPI Division requests its use
- Each chain of custody form is specific for individual agencies.



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# Chain of Custody (cont')

## How does it work?

- Environmentalist or FSS collecting the sample(s) can initiate Chain of Custody
- Chain of Custody form remains with sample
- Seal sample bags and shipping container with security tape
- Alert the Lab of shipment
- If using a courier, be sure the sample package is traceable



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# Bioterrorism Environmental Report

<b>Bioterrorism Environmental Report</b>	<b>ALABAMA DEPARTMENT OF PUBLIC HEALTH</b>	Lab# _____
	<b>Bureau of Clinical Laboratories</b>	Date Rec'd ____/____/____
	8140 AUM Drive, PO Box 244018, Montgomery, Alabama 36124-4018, (334) 260-3400	Time Rec'd _____
<b>PLEASE SUBMIT A SEPARATE FORM FOR EACH SAMPLE SUBMITTED</b>		

**Please Print Clearly**

Collection Site (e.g. Name of business, school, residence, etc.): \_\_\_\_\_ Phone: ( ) \_\_\_\_\_

Street Address (No PO Box): \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Exact Location Site (e.g. Basement, corridor, specific room, etc.): \_\_\_\_\_

Date Collected: \_\_\_\_/\_\_\_\_/\_\_\_\_ Time Collected: \_\_\_\_\_; BT Agent Suspected: \_\_\_\_\_

Anyone Exposed?     Yes; How many? \_\_\_\_\_     No     Unknown

Collection Mechanism:     Swab     Wipe     Other \_\_\_\_\_

**Sample Description** (e.g., color of powder, material swatch, letter, surface swipe, etc.):

Sample Description is same as indicated on the Chain of Custody Form

Sample is not described or is different from description on Chain of Custody (describe) \_\_\_\_\_

Other Information (e.g. ventilation factors – A/C on/off, windows open, open air situation): \_\_\_\_\_

Has sample been field tested for a biological agent?  No     Yes; What agent was indicated by the test? \_\_\_\_\_

**NOTE: Please contact The Center for Emergency Preparedness at 1-800-338-8374 prior to submission.**

**Laboratory Use Only**

Sample Description (describe sample received, if different from above) \_\_\_\_\_

Results: \_\_\_\_\_

Methodology used:  Conventional method (Bacteriology, DFA, Phage, etc.)     TRF     PCR     Other \_\_\_\_\_

Analyst 1: \_\_\_\_\_

Analyst 2: \_\_\_\_\_    Date Reported: \_\_\_\_/\_\_\_\_/\_\_\_\_

(Side 1)



# Chain of Custody Form

<b>ALABAMA DEPARTMENT OF PUBLIC HEALTH</b> <b>Bureau of Clinical Laboratories</b> <small>3140 AUMI Drive, PO Box 244013                      Montgomery, Alabama 36124-6018, (205) 269-3400</small> <b>CHAIN - OF - CUSTODY</b>	
<b>Collector's Information</b> <small>(Please Print Clearly)</small>	
Collector's Name: _____	Date: _____ Time: _____
Collector's Organization _____	Phone ( ) _____
Street Address _____	City _____ State _____ Zip _____
Email Address: _____	Fax: ( ) _____
Sample/Specimen Description (e.g. identifier number, quantity, and type/description): _____	
Mandatory screening proved negative for: <input type="checkbox"/> Explosive devices <input type="checkbox"/> Chemical agents <input type="checkbox"/> Radioactivity <input type="checkbox"/> *Screened positive for: _____	
Screened By (Print): _____	(Signature) _____ Date: _____
<small>* Please contact the laboratory before submitting any sample that screened positive.</small>	
<b>FBI Information Only</b>	
FBI Approval (Agent's Name) _____	Phone: ( ) _____
Agent's Duty Station (City) _____	Case ID# _____
Please call: <input type="checkbox"/> Results <input type="checkbox"/> For Sample Disposition To Agent _____ at ( ) _____	
Received by: _____ Date: _____ Time: _____	
Reason: _____	
Received by: _____ Date: _____ Time: _____	
Reason: _____	
Received by: _____ Date: _____ Time: _____	
Reason: _____	
Received by: _____ Date: _____ Time: _____	
Reason: _____	
Received by: _____ Date: _____ Time: _____	
Reason: _____	
<b>Laboratory Use Only</b>	
Sample/Specimen received by lab: _____	Date: _____ Time: _____
Sample/Specimen received by lab: _____	Date: _____ Time: _____
<b>SAMPLE DISPOSITION CHECKLIST</b>	
<input type="checkbox"/> Analyst who called Agent: _____	<input type="checkbox"/> Sample returned/forwarded to: _____
<input type="checkbox"/> Date & Time Analyst Called: _____	Name: _____
<input type="checkbox"/> Sample Discarded (Date & Time): _____	Address: _____
	Date & Time: _____

(Side 2)



# Where to send specimens?

Attention: Microbiology  
Bureau of Clinical Laboratories  
8140 AUM Drive  
Montgomery, AL 36117-7001  
(Courier, Fed Ex, or UPS for specimen shipment)



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# What Occurs Next?

- Specimens are received by Lab & tested
- Results are reported to EPI & entities indicated on the Food Bacteriology Form



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# Why Does the Lab Want Your Information?



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Photo courtesy of [www.salisbury.edu](http://www.salisbury.edu)



# Information Highway

- PHLIS – Public Health Lab Information System
- NARMS – National Antimicrobial Resistance Monitoring System
- PulseNet - International network of public health & food regulatory agency labs coordinated by CDC



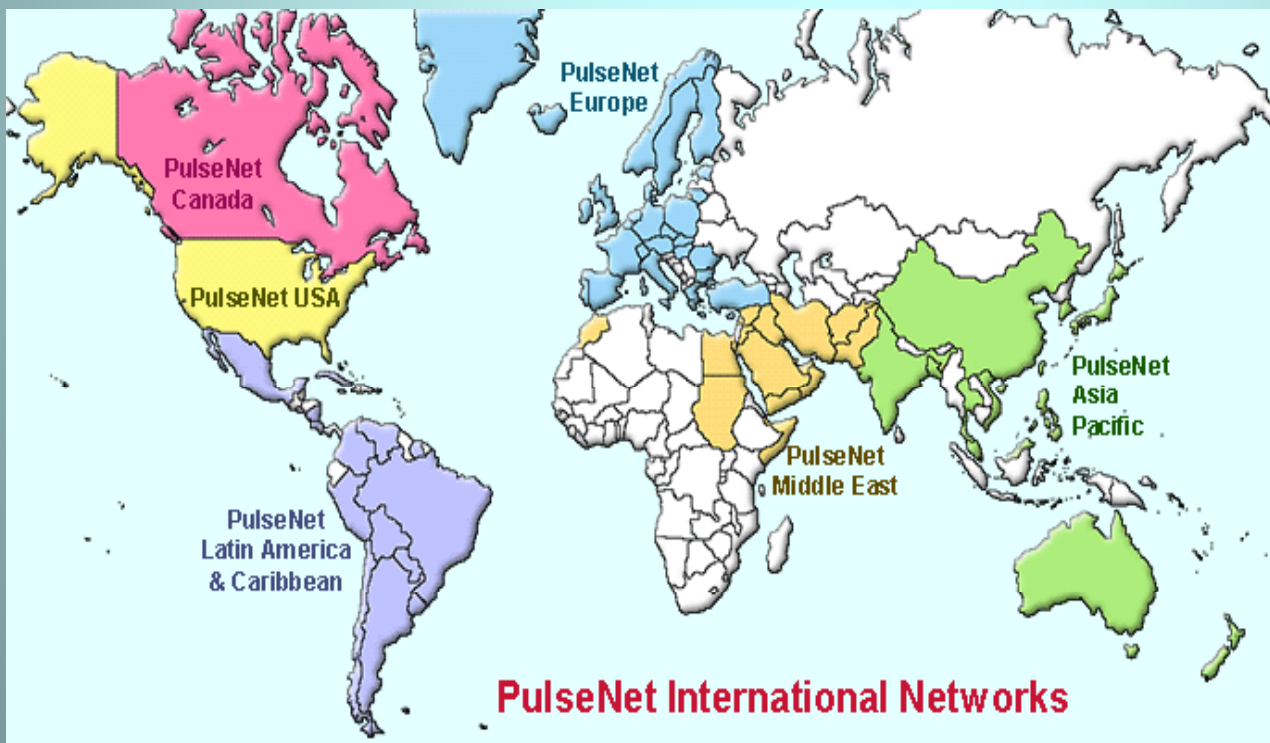
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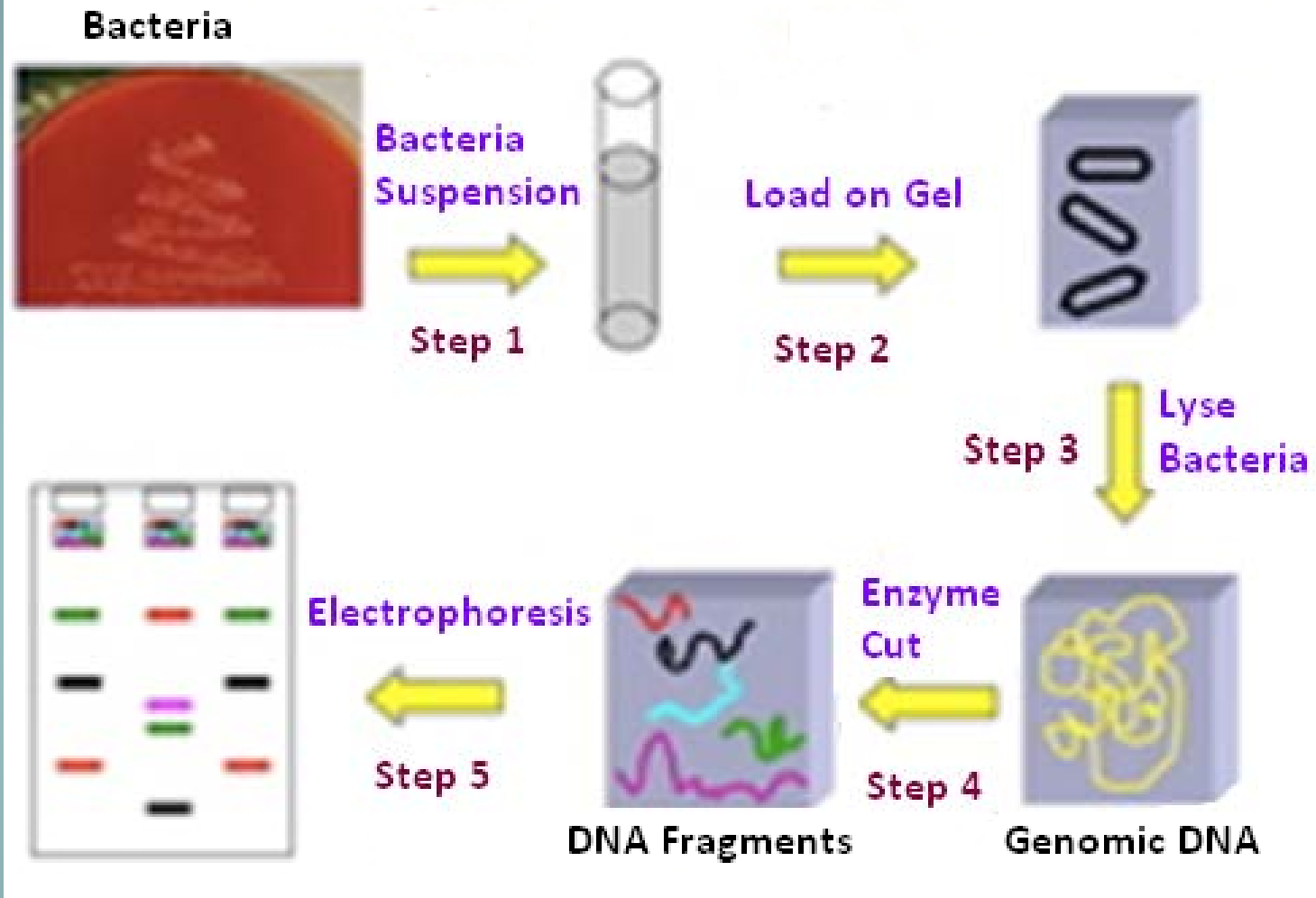
# PulseNet International



- The PulseNet USA (*in yellow*) consists of:
  - State & Local health departments
  - Federal agencies (CDC, USDA/FSIS, FDA)



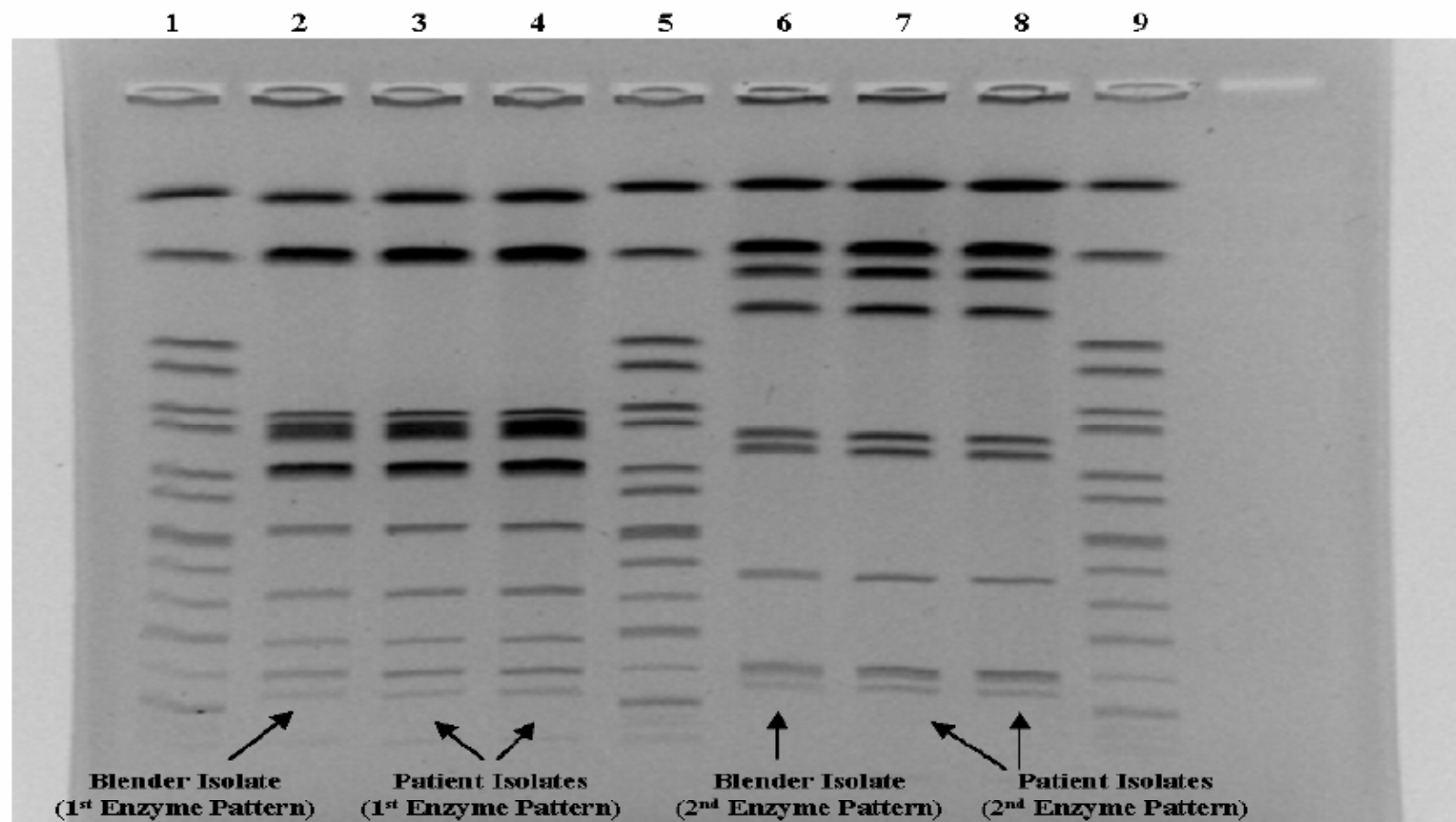
# Pulsed Field Gel Electrophoresis (PFGE)



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# PFGE patterns of two patient isolates and one immersion blender isolate



Source: New Hampshire Public Health Laboratories

# Additional Information or Assistance?

## Contact:

- Central Laboratory at Montgomery @ 334.260.3400 & ask for Microbiology
  - ADPH website @ [www.adph.org](http://www.adph.org)
  - BCL website @ [www.adph.org/bcl](http://www.adph.org/bcl)
- E-mail
  - [joanna.roberson@adph.state.al.us](mailto:joanna.roberson@adph.state.al.us)
  - [jeannine.parker@adph.state.al.us](mailto:jeannine.parker@adph.state.al.us)



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# Module Learning Objectives

- Determine testing criteria
- Describe food specimens collection
- Describe clinical specimens collection
- List key items in a sample kit
- Explain purpose for “chain of custody”



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# Group Exercise

## Collection and Packaging Specimens



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