Massachusetts 2014
Vibrio parahaemolyticus Presentation

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Learning Objectives

• What is *Vibrio parahaemolyticus (Vp)*?
• Review [2014 Massachusetts Vibrio Plan](#)
• Review changes in MAVEN as of May 30, 2014
  • New Case Report Form
  • Updated Risk & Exposure Question Package
  • New Traceback Question Package
  • [Vibrio Fact Sheet](#)
What is is Vp?

*Vibrio parahaemolyticus*, or Vp, is a bacterium that naturally lives off the coast of the United States and Canada and causes gastrointestinal illness in humans when consumed

- Is part of the same family of bacteria that cause cholera
Where does Vp come from?

- Vp **naturally** lives in brackish water along the coast of Massachusetts
  - Brackish water is water that has more salinity than fresh water, but not as much as seawater
  - May result from seawater mixing with freshwater, as in estuaries
- It is not an indication of pollution
- Thrives in low-salt, high temperature environments
  - Present in higher concentrations during the summer
What type of illness does Vp cause?

<table>
<thead>
<tr>
<th>Clinical features</th>
<th>Watery diarrhea, often with abdominal cramping, nausea, vomiting, and fever. Less commonly, wound or soft tissue infections. Occasionally blood stream infections.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubation period</td>
<td>Less than 24 hours</td>
</tr>
<tr>
<td>Duration</td>
<td>Most persons recover after 3 days and suffer no long-term consequences.</td>
</tr>
<tr>
<td>Risk groups</td>
<td>Everyone is at risk of infection. Individuals with underlying medical conditions, such as alcoholism and liver disease, may be at increased risk of infection and serious complications.</td>
</tr>
</tbody>
</table>
How is Vp diagnosed and treated?

Diagnosis
• *Vibrio* organisms can be isolated from stool, wound or blood cultures

Treatment
• In most cases, no treatment necessary
• No evidence indicating antibiotic treatment decreases the severity or length of illness
• Re-hydration recommended from fluids lost due to diarrhea
How does illness with Vp occur?

- People become infected by eating raw or undercooked shellfish, especially oysters
  - Less commonly, Vp can cause an infection in the skin when an open wound is exposed to warm seawater
- Documented in shellfish on Cape Cod as early as 1972*

Why oysters?

Oysters are filter feeders

- Feed on particles (algae) in surrounding seawater by filtering water through gills
- Each oyster filters up to 5 liters of water per hour
- Oysters can accumulate Vp as they filter water – may result in concentrations 100 times greater than those found in surrounding seawater

Potential for time-temperature abuse after harvest

- Promote growth of bacteria

Consumed raw

- No opportunity for Vp to be killed
Opportunities for Time/Temperature Abuse

- Handling at Harvest
- Transport to Dealer
- Handling by Dealer
  - Receiving
  - Storage

Handling by Retail Establishment
  - Receiving
  - Service
  - Storage

Transport by Dealer to Retailer
Massachusetts Vp cases, 2008-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-VP species</th>
<th>Vibrio parahaemolyticus (VP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>2009</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>2010</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>2011</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>2012</td>
<td>42</td>
<td>42</td>
</tr>
<tr>
<td>2013</td>
<td>67</td>
<td>67</td>
</tr>
</tbody>
</table>
## FOOD SAFETY

### PROGRESS REPORT FOR 2013

<table>
<thead>
<tr>
<th>Disease Agents</th>
<th>Percentage change in 2013 compared with 2006–2008</th>
<th>2013 rate per 100,000 Population</th>
<th>2020 target rate per 100,000 Population</th>
<th>CDC estimates that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>↑ 13% increase</td>
<td>13.82</td>
<td>8.5</td>
<td>For every Campylobacter case reported, there are 30 cases not diagnosed</td>
</tr>
<tr>
<td>Escherichia coli O157</td>
<td>No change</td>
<td>1.15</td>
<td>0.6</td>
<td>For every E. coli O157 case reported, there are 26 cases not diagnosed</td>
</tr>
<tr>
<td>Listeria</td>
<td>No change</td>
<td>0.26</td>
<td>0.2</td>
<td>For every Listeria case reported, there are 2 cases not diagnosed</td>
</tr>
<tr>
<td>Salmonella</td>
<td>No change</td>
<td>15.19</td>
<td>11.4</td>
<td>For every Salmonella case reported, there are 29 cases not diagnosed</td>
</tr>
<tr>
<td>Vibrio</td>
<td>↑ 75% increase</td>
<td>0.51</td>
<td>0.2</td>
<td>For every Vibrio parahaemolyticus case reported, there are 142 cases not diagnosed</td>
</tr>
<tr>
<td>Yersinia</td>
<td>No change</td>
<td>0.36</td>
<td>0.3</td>
<td>For every Yersinia case reported, there are 123 cases not diagnosed</td>
</tr>
</tbody>
</table>

For more information, see [http://www.cdc.gov/foodnet/](http://www.cdc.gov/foodnet/)

Preliminary FoodNet 2013 Data
Transmission routes by species, US, 1988-2012

Species
(N=10,183)

- V. parahaemolyticus (n=4235)
- V. vulnificus (n=1997)
- V. alginolyticus (n=1266)
- V. cholerae (n=965)
- V. fluvialis (n=553)
- Species not identified (n=439)
- V. mimicus (n=268)
- V. hollisae (n=191)
- Multiple species (n=165)
- P. damsela (n=66)
- V. furnissii (n=19)
- V. metschnikovii (n=14)
- V. harveyi (n=3)
- V. cincinnatiensis (n=2)

Percent

Foodborne  Non-foodborne  Unknown
VP cases by week, 2013
Closed August 30th
Reopened October 5th
Changes for this season

• Goals:
  • **EPI**: prompt case interview/communication with LBOH
  • **LBOH**: prompt case interview
  • **FPP**: expedited traceback
  • **DMF**: closure that will **prevent illness**

• Actions:
  • **EPI**: assist with interviews, coordinate data with FPP and CDC
  • **LBOH**: contact case for interview and answer applicable questions in MAVEN QPKS’s
  • **FPP**: traceback QPKG in MAVEN
  • **DMF**: improved **VP Control Plan**, guidance on when to close oyster beds

• **Collaboration** through Vibrio Working Group
Massachusetts Vp Plan

Vp Plan is intended to manage risk of Vp illness by establishing practices, monitoring procedures, documentation and corrective actions designed to reduce time/ temperature exposure and improve traceability

- Covers all oyster growers, wild harvesters, and original dealers are required to comply with some or all of the 2014 Vibrio Plan from May 19 - October 19
- The 2014 Vibrio Plan covers the harvest of all oysters – the whole State.
Health care provider or clinical laboratory

- Patient with *Vibrio sp.* infection identified

MDPH and LBOH
Bureau of Infectious Disease

- Case is populated in MAVEN
- For Vp, BID and LBOH conduct case investigation within 24 hours
- If case consumed shellfish, case assigned to BEH for environmental investigation

MDPH
Bureau of Environmental Health

- VMC initiates environmental investigation
- VCM & LBOH conduct retail inspection and traceback
- Shellfish from Massachusetts
- Shellfish from out of state

- VCM notifies DMF of case
- FPP begins wholesale investigation
- BEH notifies FDA Regional Specialist
- BEH notifies Interstate Shellfish Sanitation Conference

MA Division of Marine Fisheries

- Harvester is interviewed
- DMF notifies Office of Law Enforcement
- If necessary, DMF closes harvest area
- DMF notifies Office of Law Enforcement
- If necessary, DMF closes harvest area
1. Epi-of-the-day (EOD) acknowledges case in MAVEN.
2. If case is a *Vibrio parahaemolyticus* (Vp):
   - EOD calls LBOH, makes note that LBOH was contacted in MAVEN
   - EOD enters note into event with directions on next steps for case investigation and followup for your Vp case.
3. LBOH initiates case investigation by completing Steps 1-3 in Admin QP.
4. LBOH starts investigation by calling case within 24 hours and then completes all questions in MAVEN QPs (excluding Traceback). LBOH finishes case investigation and completes Steps 4-5 in Admin QP.
5. EOD reviews case once investigation is completed.
6. Case is assigned to the Food Protection Program/Vibrio Control Manager for Traceback Question Package followup and case investigation if appropriate.
7. Traceback Question Package is completed by Food Protection Program. LBOH can see and review the Traceback QKPG but not edit. Usually when the LBOH completes their case investigation there will be no information in the Traceback OKPG to see.
8. MDPH Foodborne Team reviews case and extracts data to send to CDC and FDA.

**Please note:** A non Vp case (for example, a case of *Vibrio alginolyticus*) should be treated as a routine event. In these events, you will see a note from an MDPH Epidemiologist stating that this event is not *Vibrio parahaemolyticus* and does not require immediate follow-up. Please complete as a routine investigation.
Cholera and Other Vibrio Illness Surveillance (COVIS Paper Form)
Vibrio treated as an immediate from May 19th - October 19th

----Original Message----
From: ISIISHelp (DPH) [mailto:isishelp@massmail.state.ma.us]
Sent: Friday, May 02, 2014 12:09 PM
To: Troppy, Scott (DPH)
Subject: New Suspect Immediate Vibrio sp. case in MAVEN.


Please coordinate follow-up with MDPH. If this link does not work copy and paste to your Browser!
Notes from Epi-of-the-day regarding next steps for your Vp case

From May 19 - October 19, 2014, Vibrio parahaemolyticus cases are being treated as immediate events in MAVEN to allow for prompt traceback of seafood. Please interview the case as soon as possible to identify any high-risk food items (ex: shellfish) consumed prior to symptom onset.
MAVEN Vibrio Case

Event Summary

Basic Information
- Event ID: 100022781
- Event: Vibrio spp
- Person: Susan Soliva
- Investigation Status: Open
- Linked Events/Contacts: 0 linked event(s)/contact(s)
- Notifications: Event Date: 05/06/2014, Event Status: Confirmed, Event Type: Lab Test Date, Age at time of event: NAI, Age until: Years
- Attachments: 0 attachment(s)

Notes (Add/Edit/View):
05/13/2014 10:13 AM (Generic) - Barbara Westley [bwestley]
From May 19 - October 19, 2014, Vibrio parahaemolyticus case MAVEN to allow for prompt traceback of seafood. Please ensure any high-risk food items (e.g., shellfish) consumed prior to symptoms are identified.

Event Information

Event Data | Lab Results | Concerns | Persons | Tasks | Event History Trail

Question Packages
- Question Package
- Administrative
- Demographic
- Clinical
- Vaccine and IG Information
- Risk/Exposure/Control & Prevention
- Epi-linked and Outbreak Information
- Traceback

New Traceback QP
How are the data collected this year?

• But of course all roads lead to....MAVEN (using updated Risk/Exposure Question Package and new Traceback Question Package)
  • Vibrio cases will be treated as immediate events from May-October 2014
  • MAVEN will notify you of all cases via email for online towns
  • EOD will review events/cases and determine if they are Vp
  • Notes in MAVEN/Phone call to LBOH for immediate follow-up
    • If LBOH can not complete case investigation in 24 hours the EOD will complete CRF using MAVEN
  • If not a Vp then treat as a routine disease event
**Risk/Exposure/Control & Prevention QPKG**


Event ID: 100022781

<table>
<thead>
<tr>
<th>Risk/Exposure/Control &amp; Prevention</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Incubation period for noncholera Vibrio is 23 hours. For cholera it is 1 to 3 days.</td>
<td></td>
</tr>
<tr>
<td>Did case travel out-of-state or out-of-country during incubation period?</td>
<td>Yes</td>
</tr>
<tr>
<td>From date:</td>
<td>05/01/2014</td>
</tr>
<tr>
<td>Destination city:</td>
<td>Destin</td>
</tr>
<tr>
<td>Destination state:</td>
<td>FL</td>
</tr>
<tr>
<td>Destination country:</td>
<td></td>
</tr>
<tr>
<td>Have close contacts had similar illness during incubation period?</td>
<td>Yes</td>
</tr>
<tr>
<td>Did the case consume any high-risk animal products during incubation period?</td>
<td>Yes</td>
</tr>
<tr>
<td>Product type:</td>
<td>Oysters</td>
</tr>
<tr>
<td>When purchased:</td>
<td>05/02/2014</td>
</tr>
<tr>
<td>When consumed:</td>
<td>05/02/2014 02:00 PM</td>
</tr>
<tr>
<td>Time consumed (i.e., 09:30 AM):</td>
<td></td>
</tr>
<tr>
<td>Amount consumed:</td>
<td>12 Oysters</td>
</tr>
<tr>
<td>Was it harvested by the case or a friend of the case?</td>
<td>No</td>
</tr>
<tr>
<td>Where purchased/obtained:</td>
<td>Bobs Oyster Bar</td>
</tr>
<tr>
<td>Type of location where purchased:</td>
<td>Oyster bar or restaurant</td>
</tr>
<tr>
<td>Contact Name/Address/Phone # for purchase location:</td>
<td>123 Ocean Blvd, Destin, FL 36346</td>
</tr>
</tbody>
</table>
How are the data collected this year?

- **Traceback Question Package (QPKG)**
- Used by the Food Protection Program and Vibrio Control Manager
- Traceback QPKG is read-only for LBOH
- Traceback QPKG is completed after LBOH completes their case investigation and follow-up
- FPP or Vibrio Control Manager may contact you at the LBOH if they have additional questions regarding the case investigation and follow-up
New Traceback QPKG for FPP

**Event ID:** 100758914

<table>
<thead>
<tr>
<th>Distributor (name, address, phone)</th>
<th>MF Foley, 24 West Howell Street, Boston, MA 02125 617-268-1300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distributor certification number:</td>
<td>MA-427-88</td>
</tr>
<tr>
<td>Was an inspection completed for this distributor?</td>
<td>No</td>
</tr>
<tr>
<td>Original Shippers Certification Number.</td>
<td>MA1045888</td>
</tr>
<tr>
<td>Implicated food item:</td>
<td>Oysters</td>
</tr>
<tr>
<td>How was product distributed to retail outlet?</td>
<td>Shellstock</td>
</tr>
<tr>
<td>Name of retail establishment:</td>
<td>Duxbury Oyster Bar</td>
</tr>
<tr>
<td>Was an inspection completed for this retail establishment?</td>
<td>Yes</td>
</tr>
<tr>
<td>Establishment inspection date:</td>
<td>04/17/2014</td>
</tr>
<tr>
<td>Date retail outlet received product:</td>
<td>04/10/2014</td>
</tr>
<tr>
<td>Harvest location:</td>
<td>Cape Cod Bay, CCB16 - Boat Meadow River</td>
</tr>
<tr>
<td>Designated Shellfish Growing Areas:</td>
<td>Unknown</td>
</tr>
<tr>
<td>Was seafood imported from another country?</td>
<td>Yes</td>
</tr>
<tr>
<td>Are shipping bags available from the suspect lot?</td>
<td>Yes</td>
</tr>
<tr>
<td>Harvest Date:</td>
<td>04/02/2014</td>
</tr>
<tr>
<td>Harvest status:</td>
<td>Other (Specify)</td>
</tr>
<tr>
<td>Other (Specify):</td>
<td>Need more space</td>
</tr>
<tr>
<td>Are physical characteristics of the harvest area available?</td>
<td>No</td>
</tr>
<tr>
<td>Was there evidence of improper storage, cross-contamination, or holding temperature at any point?</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Vibrio parahaemolyticus** is a bacterium that occurs naturally in coastal marine waters and estuaries (where rivers flow into the sea). It is recognized worldwide as a significant cause of bacterial seafood-borne illness. The United States Centers for Disease Control and Prevention (CDC) estimates that of the approximately 7,800 Vibrio illnesses each year in the United States, approximately 2,800 are estimated to be associated with *Vibrio parahaemolyticus* and raw oyster consumption. *Vibrio parahaemolyticus* is normally present in many types of raw seafood, including fish, crustaceans, and molluscan shellfish. It multiplies and colonizes in the gut of filter-feeding shellfish such as oysters, clams, and mussels. Not all strains of *Vibrio parahaemolyticus* cause illness; on the contrary, pathogenic strains represent a small percentage of the total *Vibrio parahaemolyticus* present in the environment or seafood.
How does MDPH use the data?

- **Burden and trends**
  - ‘Foodborne Illness Acquired in the United States-Major Pathogens’
- **Transmission route**
- **Prevention**
  - Determine host, food, and environmental risk factors
  - Develop information to educate consumers
- **Provide information to regulatory and state partners**
  - Inform food safety policy
  - Aid in outbreak investigation
  - Bed closures
What happens to the data?
Vibriosis transmission, by region, 1988-2012

- Collects information on incidence, exposure, and seafood traceback
  - Monitors trends and used to estimate burden of disease
  - Identifies host, food, and environmental risk factors
- Reporting delays and challenges with traceback completeness limit outbreak detection and response
- Data are summarized annually
Vibrio case investigation and steps for LBOH and MDPH Epidemiologists:

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Thank you

isishelp@state.ma.us
or 617-983-6801 MAVEN Help Phone